Bridging Digital Divide in India -

Role of Universal Service Obligation Fund

With Special Focus On Andaman and Nicobar Islands

A Dissertation submitted to the Indian Institute of Public Administration, New Delhi for the award of Master's Diploma in Public Administration, in partial fulfilment of the requirements of the Advanced Professional Programme in Public Administration (APPPA)

By

Vilas Shivshankar Burde

(Roll No. 4705)

Under the guidance of

Dr Charru Malhotra

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CERTIFICATE

I am pleased to certify that **Shri Vilas Shivshankar Burde** worked under my guidance and supervision to complete his research and prepared the current dissertation titled **"Bridging Digital Divide in India - Role of Universal Service Obligation Fund with Special Focus on Andaman and Nicobar Islands".** The dissertation is the outcome of his own research, and no part of it has appeared in any other monograph, dissertation, or book to my knowledge. This is being submitted to Indian Institute of Public Administration (IIPA), New Delhi for the aim of obtaining a Master's Diploma in Public Administration in partial fulfilment of the requirements for the Advanced Professional Programme in Public Administration (APPPA).

I recommend that the dissertation of **Shri Vilas Shivshankar Burde** is worthy of consideration for the award of Master's Diploma in Public Administration of the Indian Institute of Public Administration, New Delhi.

(Dr Charru Malhotra)

Associate Professor

Indian Institute of Public Administration

I.P. Estate, Ring Road,

New Delhi - 110002

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ABSTRACT

The term ‘digital divide’ was introduced in the mid-1990s and defined as the gap separating those who have access to new forms of information technology from those who do not. It remains an important public policy debate that encompasses social, economic and political issues. In today's world, communication services such as voice, video, data, internet, and multimedia are essential and played a critical role in bridging the rural-urban divide in India's vast geography, and emerged as a crucial enabler of the country's economic and social progress. However, some remote places in India, including isolated villages, still remain without telecommunication services. The study of data on telephone subscribers, teledensity, internet subscribers and broadband subscribers in India established the fact that digital divide between rural and urban areas still exists.

The study focuses on India's digital divide and attempted to investigate the problem of digital divide, particularly in Andaman and Nicobar Islands (ANI). It concentrated on the government's involvement especially Universal Service Obligation Fund (USOF) policies in bridging the digital gap.

In the 1970s, India made public phone availability a policy goal. Universal service was initially embodied in a policy statement in India in 1994, when the government released the National Telecom Policy. It was defined in the policy paper as the provision to all residents of certain ‘basic telecom services at affordable and appropriate costs’. In 1999, the government introduced the next version of telecom policies which stipulate raising of resources to meet the universal service obligation through levy.

In 2013, ITU carried out study titled ‘Universal service funds and digital inclusion for all’ which provides a detailed overview and comparative analysis of sixty-nine Universal Service Funds in world and highlighted the principal factors that contribute to the successful performance of a number of these USFs. As per findings, funds appear to have been established without conducting substantive analysis of the actual service funding/subsidy levels needed, and as a result, many funds appear to receive contributions far in excess of the actual universal service funding needs or capabilities. Further it reveals that the project allocation process is the main area where fund performance can be severely impacted.

The Indian parliament passed the Indian Telegraph (Amendment) Act, 2003, which gave the statutory status to USOF to provide financial support for telecom services in commercially unviable rural and remote areas of the country. The fund was founded with the primary goal of enabling people in rural and isolated locations with inexpensive and appropriate access to basic telegraph services. Since then, the scope of the USOF has been steadily expanded to include subsidy support for all types of telecom services, including mobile services, broadband connectivity, and the creation of infrastructure such as Optical Fibre Cable (OFC) connectivity in rural and remote areas, including submarine OFC connectivity for islands. The USO funds are generated through a five percent levy on Adjusted Gross Revenue levied on all telecom service providers.

From the study of annual report of TRAI for the year 2019-2020, it is established that digital divide exists between urban and rural areas of India. Therefore USOF can play a vital role in bridging this digital divide by utilizing available funds for development of

telecom services in rural and remote areas of India. Further there is also a need to develop a realistic use of USOF funds, notably in ANI which have both features in terms of rural and distant parts of India and are extremely important to national security.

This research will look into the role of the USOF in bridging the digital divide gap, with a particular focus on ANI. USOF has implemented programmes that would assist the government in implementing different social sector reforms and improving service delivery to citizens throughout India. However the USOF's potential to bridging the digital divide gap has not been completely exploited. There is no academic literature on the role of the USOF in bridging the digital divide, especially in ANI. As a result, exploratory research in developing countries like India is needed to examine the role of the USOF in bridging the digital divide, particularly in ANI.

The ongoing activities of the USOF includes implementation of BharatNet project, Comprehensive telecom development plan for Islands, Provision of mobile services in all uncovered villages including North Eastern Region, Aspirational Districts, Left Wing Extremism affected areas and remaining parts of India.

In accordance with telecom regulator’s recommendations in 2014, DoT adopted, an integrated and comprehensive telecom development plan for islands of Andaman and Nicobar and Lakshadweep. The plan included provision of submarine OFC connectivity between islands and mainland. The non-availability of submarine cable connecting to the mainland was a major impediment to people of ANI for receiving high-speed broadband and voice services and has resulted in huge digital divide in ANI.

The goal of this research is to look into the role of the USOF in bridging India's digital divide particularly in ANI. The regulators' recommendations for improving the telecom network in islands were also studied, as were the impediments in improving the telecom network in islands, as well as ways to improve the role of the USOF in bridging the digital divide in India. Hence two distinct survey questionnaires were created, one for respondents of Port Blair, ANI and the other for USOF officers who are dealing with implementation of USOF schemes in the ANI.

First set of survey tool was prepared to understand the 'Role of USOF in bridging digital divide particularly in ANI'. In order to improve ANI's telecom connectivity, the USOF funded the CANI submarine optical fibre cable project, which laid an undersea cable connecting eight islands (including Port Blair) with Chennai. ANI's internet services were only available through satellite until August 9, 2020, with a total capacity of 3.5 Gbps. However, after the launch of CANI project, 200 Gbps of bandwidth has been made available between Port Blair and Chennai, as well as 100 Gbps between eight islands. The bandwidth usage in ANI has increased from 3.5 Gbps to 43 Gbps within a year. In today's world, internet services through broadband connectivity are essential for various purposes to citizens. The questions were simple statements on whether the CANI project helped ANI improve its broadband connectivity. The second survey, which focused on the issues and challenges of USOF schemes implementation, was distributed via email to senior USOF officials in charge of policy, planning, and implementation of USOF activities, particularly in ANI. Simple statements were requested about USOF activities, particularly in ANI, and whether they are assisting in bridging the digital divide.

ABBREVIATIONS

Abbreviation	Definition
IIPA	Indian Institute of Public Administration
USOF	Universal Service Obligation Fund
ICT	Information and Communication Technologies
DoT	Department of Telecommunications
GoI	Government of India
OECD	Organisation for Economic Co-operation and Development
NTP	New Telecom Policy
USO	Universal Service Obligation
UAL	Universal Access Levy
TRAI	Telecom Regulatory Authority of India
USS	Universal Service Support
USL	Universal Service Levy
AGR	Adjusted Gross Revenue
CFI	Consolidated Fund of India
TSP	Telecom Service Providers
USP	Universal Service Providers
ITU	International Telecommunication Union
APT	Asia-Pacific Telecommunity
OFC	Optical Fibre Cable
ANI	Andaman and Nicobar Islands
CANI	Chennai Andaman and Nicobar Islands
VSNL	Videsh Sanchar Nigam Limited
MTNL	Mahanagar Telephone Nigam Limited
VSAT	Very Small Aperture Terminal
TDSAT	Telecommunications Dispute Settlement and Appellate Tribunal
NDCP	National Digital Communications Policy
FDI	Foreign Direct Investment
GSMA	Global System for Mobile Communications Association
GPs	Gram Panchayats
DBT	Direct Benefit Transfer
COAI	Cellular Operators Association of India
GNP	Gross National Income
NDGs	National Development Goals
MDGs	Millennium Development Goals
WSIS	World Summit on the Information Society
ICT4D	Information and Communication Technologies for Mass Development

USA	United States of America
AT&T	American Telephone and Telegraph Corporation
BBNL	Bharat Broadband Network Limited
BSNL	Bharat Sanchar Nigam Limited
USF	Universal Service Funds
ISP	Internet Service Providers
FTTH	Fibre to the Home
ITI	Indian Telephone Industries Limited
Gbps	Giga bytes per second
VPT	Village Panchayat Telephone
DHQ	District Headquarters
BHQ	Block Headquarters
RCP	Rural Community Phones
DEL	Direct Exchange Lines
SDCA	Short Distance Charging Areas
NOFN	National Optical Fibre Network
CPSU	Central Public Sector Undertakings
RailTel	RailTel Corporation Limited
PGCIL	Power Grid Corporation of India Limited
SPV	Special Purpose Vehicle
Wi-Fi	Wireless Fidelity
PPP	Public-Private Partnership
VGF	Viability Gap Funding
DEA	Department of Economic Affairs
RFP	Request for Proposal
CTDP	Comprehensive Telecom Development Plan
NER	North-Eastern Region
BSCCL	Bangladesh Submarine Cable Company Limited
KLI	Kochi Lakshadweep Islands
EIA/CRZ	Environmental Impact Assessment/Coastal Regulation Zone
IMA	Independent Monitoring Agency
NSIL	NewSpace India Limited
DSPT	Digital Satellite Phone Terminals
LAHDC	Ladakh Autonomous Hill Development Council
LWE	Left Wing Extremism
AP	Access Point
ROW	Right of Way
ISRO	Indian Space Research Organization
LSA	Licensed Service Area
PRI	Performance Indicator Report

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1. Introduction

1.1 Background

In the sphere of science and technology, India has made significant progress. Through information dissemination, Information and Communication Technologies (ICT) have made important contribution in the development of Indian society. Technology today is what industrial machines were to the industrial revolution. In today's world, they are engines of growth, power, and wealth, and critical for economic and social development. However, the benefits of ICT have not yet reached the lowest poor of the society, all demographic groups, or all genders equally.

1.2 Digital divide

The term "Digital Divide" refers to the disparity between individuals, households, businesses, and geographic areas of various socioeconomic levels in terms of both their access to ICT and their use of the internet for a number of purposes (OECD, 2002)[1]. It is divided into three categories: global, regional, and national. There is no single divide at the national level, but several divides: for example, within countries, there are differences between men and women, young and old, rich and poor, and, most crucially, rural and urban (Singh, 2010)[2]. The digital divide is the separation that exists between people who have access to new types of information technology and those who do not (Srinuan and Bohlin, 2011)[3]. Various organizations, notably the Department of Telecommunications (DoT), Government of India (GoI) have launched several projects to bridge the digital divide in India.

[1] https://www.oecd.org/sti/1888451.pdf
[2] https://www.researchgate.net/publication/220136939_Digital_Divide_in_India_Measurement_Determinants_and_Policy_for_Addressing_the_Challenges_in_Bridging_the_Digital_Divide
[3] https://www.econstor.eu /bitstream/10419/52191/1/672623358.pdf

1.3 New telecom policy

The main goals of the DoT's New Telecom Policy (NTP'99) were to strike a balance between providing universal service to all uncovered areas, including rural areas, and providing high-level services capable of meeting the country's economic needs, as well as encouraging the development of telecommunication facilities in remote, hilly, and tribal areas of the country. The NTP'99 stipulated that the funds needed to meet the Universal Service Obligation (USO) would be raised through a Universal Access Levy (UAL), which would be calculated as a percentage of revenue earned by telecom licensees and determined in consultation with the Telecom Regulatory Authority of India (TRAI).

1.4 Universal Service Obligation Fund

1.4.1 Policy

The policy of Universal Service Support (USS) went into effect on April 1, 2002. On March 27, 2002, the DoT announced recommendations for USS policy. In December 2003, both houses of parliament passed the Indian Telegraph (Amendment) Act, 2003, which gave the statutory status to Universal Service Obligation Fund (USOF).

1.4.2 Rules

On March 26, 2004, the Indian Telegraph (Amendment) Rules, 2004 were notified as the rules for the fund's administration (Appendix A). The fund is to be used exclusively for meeting the USO, according to the Indian Telegraph Act 1885 [as revised in 2006 (Appendix B) and thereafter].

1.4.3 Levy

USO funds are now generated through a 5 percent Universal Service Levy (USL) levied on all telecom providers' Adjusted Gross Revenue (AGR). This levy is

deposited in the Consolidated Fund of India (CFI) and dispatch out after the Indian Parliament approves it. The fund does not lapse due to under-use on a yearly basis.

1.4.4 Objectives and functions

In this context, USO can be characterised as delivering telecommunication services to all consumers in India at a lowest price, with a mandated minimum service of specified quality. A comprehensive examination of the fund's official website[4] reveals its goals and functions, which are outlined below.

1.4.5 Objectives and functions

1.4.5.1 The objectives of USOF are as follows.

i. Economic: Network extension and stimulate uptake of the ICT services.
ii. Social: Mainstreaming the underserved and un-served areas/groups by bridging the access gap.
iii. Political: To enable citizens exercise their political rights in an informed way and
iv. Constitutional: Equitable distribution of the fruits of the telecom/digital revolution and fair allocation of national resource (pooled USO levy) via targeted subsidies.

1.4.5.2 The functions of USOF are as follows.

i. Implementation of the guidelines lay down by government for providing USS.
ii. Suggesting such changes in policy as may be deemed necessary for implementation of USS.
iii. Formulating USOF projects/schemes under the various streams provided in the Indian Telegraph Rules, 1951, in consultation with Telecom Service Providers (TSPs) and various stakeholders.

[4] https://www.usof.gov.in/usof-cms/home.jsp

iv. Designing a rational subsidy support model underlying the scheme/project, for reducing/closing the viability gap in provisioning of telecommunication service.

v. Determining desirable subsidy level, structure and disbursement schedule after undertaking a suitable costing and modeling/benchmarking exercise and competitive tendering process.

vi. Designing the bidding process and carry out the tendering.

vii. Entering into aptly drafted agreements with the Universal Service Providers (USPs) with incentives and disincentives to ensure the achievement of the deliverables.

viii. Monitoring the implementation of USOF projects/schemes and to disburse subsidy in accordance with the terms and conditions of the respective USOF agreement.

ix. Accurate and timely settlement of all claims of subsidy/financial support in respect of USOF schemes.

x. Designing the format of various records and return to be maintained by the USPs.

xi. Carrying out post-implementation review of USOF projects/schemes.

xii. Budgeting and audit of USOF activities.

xiii. Interfacing with international organizations such as International Telecommunication Union (ITU), Asia-Pacific Telecommunity (APT) and USOF of other nations.

xiv. Forecasting the requirement of USOF for each financial year and obtaining approval of government through DoT.

xv. Ensuring that the prescribed UAL is credited to the appropriate USOF on a regular basis.

As can be seen from the foregoing, USOF was founded with the primary goal of providing individuals in rural and distant locations with affordable and reasonable access to "basic" (wireline) telecom services. Since inception, the scope of the USOF has been steadily expanded to include subsidy support for all types of telecom services, including mobile services, broadband connectivity, and the creation of infrastructure such as Optical Fibre Cable (OFC) connectivity in rural and remote areas, including submarine OFC connectivity for islands. The "eligible operators," i.e. entities with a valid licence, registration, or authorization from the GoI / DoT for providing telecom services or infrastructure, or any other entities as specified by the central government from time to time, carry out the USO related activities.

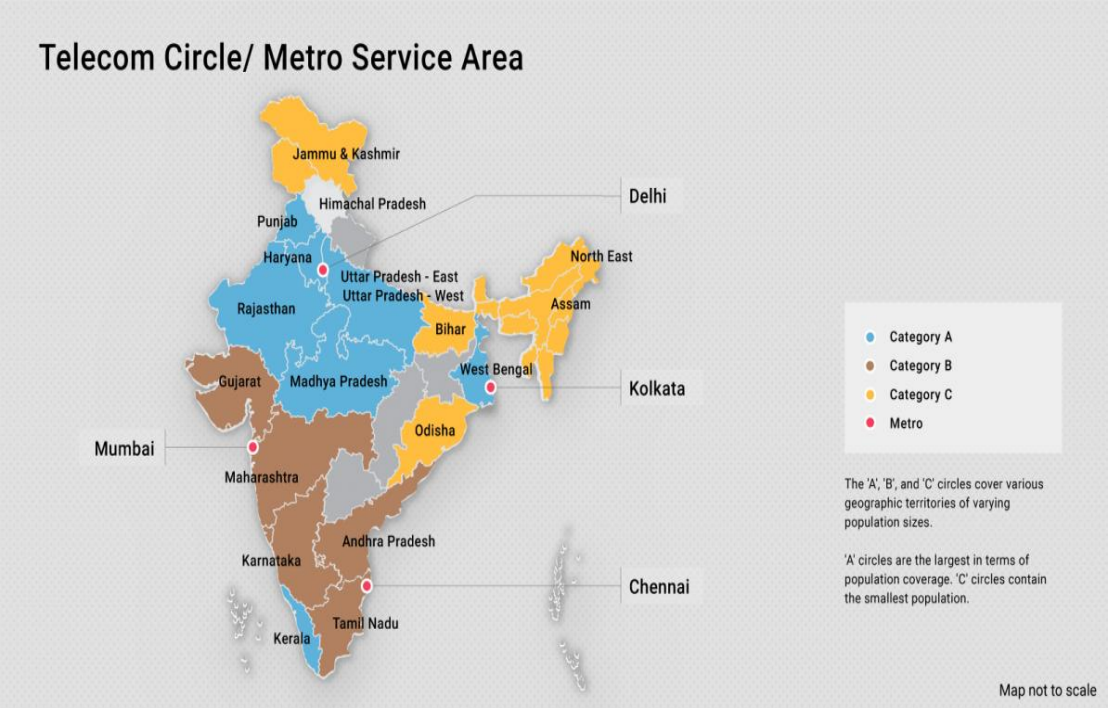
1.5 Andaman and Nicobar Islands

Andaman and Nicobar Islands (ANI) have both features in terms of rural and distant parts of India. ANI is extremely important to India's national security. Until recently, the only way to connect the mainland and ANI was via satellites, which have limited capacity. On the August 10, 2020, the submarine OFC between Chennai and the eight islands of Andaman and Nicobar (CANI project) was dedicated to the nation. Previously, the satellite bandwidth of around 3.5 Gbps was operational. The bandwidth utilisation of the submarine OFC increased to 40 Gbps within a year of its commissioning. The deployment of 4G mobile services in uncovered communities and along the national highway is another ongoing USOF project in ANI.

1.6 Telecom regulatory framework in India

The erstwhile Department of Posts and Telegraphs was split into two separate departments on December 31, 1984, with the Department of Telecommunications

(DoT) and the Department of Posts (DoP). The DoT's Overseas Communications Service was renamed Videsh Sanchar Nigam Limited (VSNL) in 1986. At the same time, the DoT's two operational units, Delhi Telephones and Mumbai Telephones, were turned into Mahanagar Telephone Nigam Limited (MTNL). Following that, in the early 1990s, the Indian telecom market was liberalised, and private sector participation was gradually allowed. Presently the Indian telecom sector is regulated by the following departments and authorities.



Source: https://dot.gov.in

Figure 1.1: Telecom circle / Metro service area in India

1. **DoT:** Telecom services have long been acknowledged as a significant instrument for a country's socioeconomic development, and as a result, telecom infrastructure is viewed as a critical component in achieving socioeconomic goals. The DoT in India has been developing policies to promote the rapid growth of telecommunications services. The department is also responsible for granting licences for various telecom services such as Unified Access Service, Internet, and VSAT

service, as well as frequency management in the sphere of radio communication in close collaboration with international authorities. It also enforces wireless regulatory measures by monitoring wireless transmission of all users in the country.

2. **TRAI:** The emergence of private service providers necessitated the establishment of an independent regulator. The authority was established by an act of Parliament, the Telecom Regulatory Authority of India Act, 1997, with effect from February 20, 1997, to regulate telecom services, including the fixation and revision of tariffs for telecom services that were previously vested in the Central Government. One of TRAI's key goals is to create a fair and transparent policy environment that encourages a level playing field and fair competition. In order to achieve the above goal, TRAI has issued a large number of regulations, orders, and directives to address issues that have come before it, as well as providing the necessary direction for the evolution of the Indian telecom market from a government owned monopoly to a multi-operator, multi-service open competitive market.

3. **TDSAT:** The TRAI Act was amended by an ordinance that went into effect on January 24, 2000, and established the Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) to take over TRAI's adjudicatory and dispute resolution powers. TDSAT was established to resolve any disagreement between a licensor and a licensee, two or more service providers, or a service provider and a group of customers, as well as to hear and decide appeals against any TRAI direction, judgement, or order.

1.7 Various laws and regulations:

The following are the various laws and regulations that govern India's telecom sector.

- Indian Telegraph Act 1885 (the Telegraph Act);
- Indian Wireless Telegraphy Act 1933 (the Wireless Act),

- National Telecom Policy 1994,
- Telecom Regulatory Authority of India (TRAI) Act 1997,
- New Telecom Policy 1999,
- Information Technology Act 2000 (the IT Act),
- Broadband Policy 2004,
- National Telecom Policy 2012 (NTP'2012),
- Prohibition of Discriminatory Tariffs for Data Services Regulations, 2016, and
- National Digital Communications Policy 2018 (the NDCP 2018).

Apart from the aforementioned regulations, most telecom services are eligible to receive up to 100 percent foreign direct investment under the Foreign Direct Investment (FDI) Policy. Any investment in the telecom business that exceeds 49 percent would need to be approved first by the government.

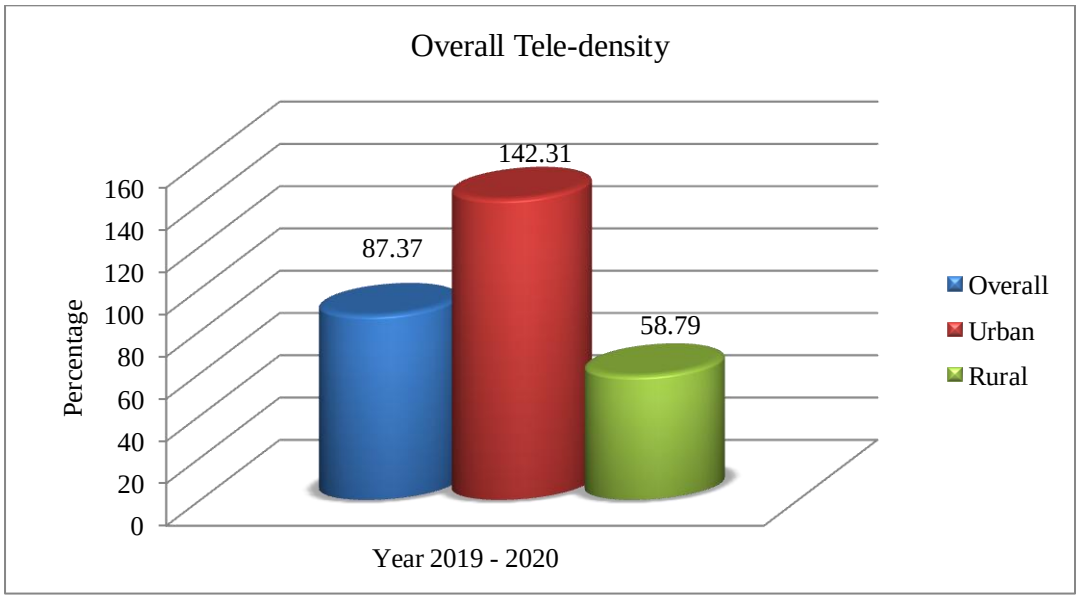
1.8 About the study

1.8.1 Statement of the problem

The detailed scrutiny of annual report of TRAI for the year 2019-2020[5] revealed various facts as follows.

[5] https://www.trai.gov.in/sites/default/files/Annaul_Report_02032021_0.pdf

1.8.2 Teledensity: The overall teledensity in India was 87.37 percent. However the urban teledensity was 142.31 percent and the rural was far behind at 58.79 percent.

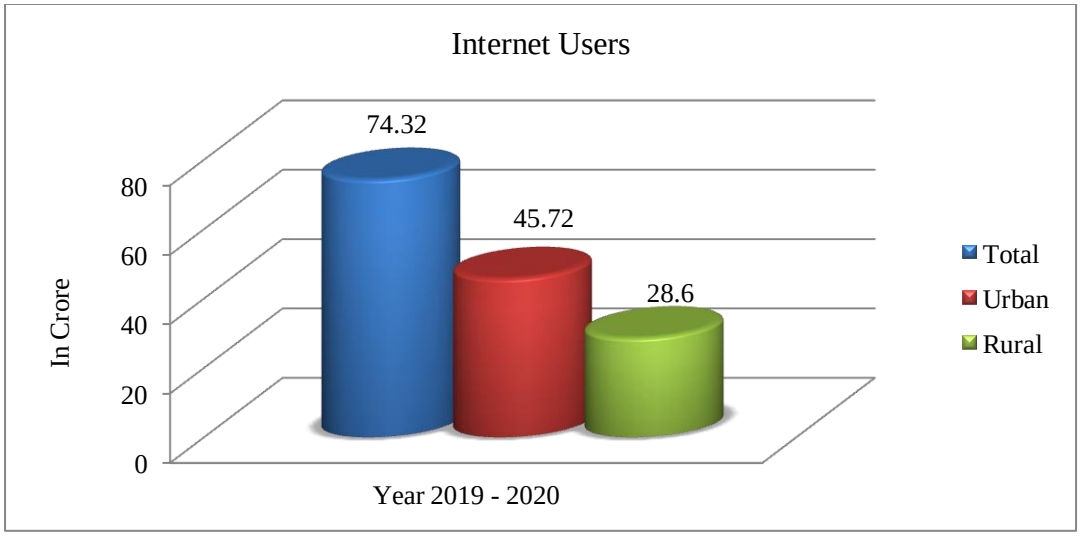


Source: https://www.trai.gov.in/sites/default/files/Annaul_Report02032021_0.pdf

Figure 1.2: Overall teledensity in India (2019-2020)

1.8.3 Internet users:

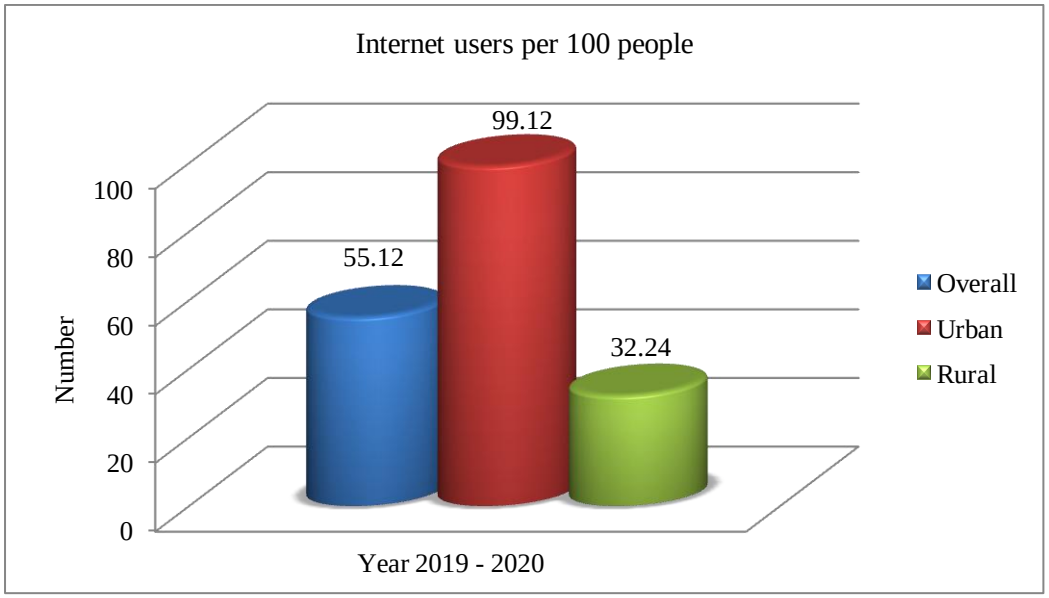
The TRAI report further revealed that there were total 74.43 crore internet users in India out of which 45.72 crore from urban area. The internet users in rural area were at 28.6 crore.



Source: https://www.trai.gov.in/sites/default/files/Annaul_Report02032021_0.pdf

Figure 1.3: Internet users in India

1.8.4 Internet users per 100 people: Out of 100 people, overall 55.12 people were using internet in India. However in urban area 99.12 were using internet as compared to only 32.24 people in rural area out 100 people.



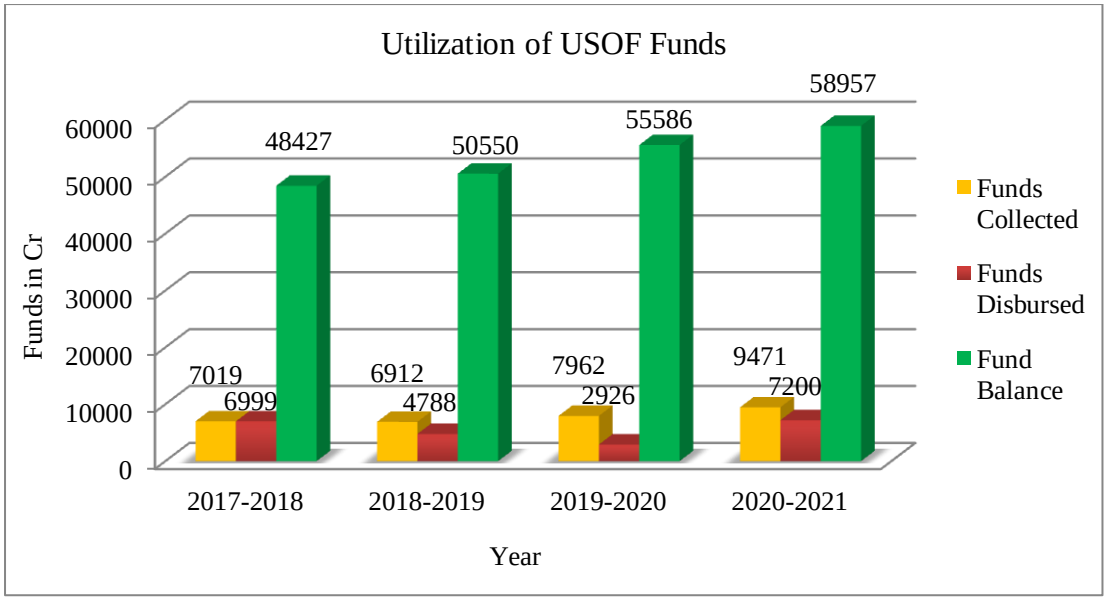
Source: https://www.trai.gov.in/sites/default/files/Annaul_Report02032021_0.pdf

Figure 1.4: Internet users per 100 people in India

The study of above figures as per TRAI report, it is undeniable fact that India's digital divide is still wide.

As of January 31, 2022 the following is the current USOF corpus (in INR and crores): Total collected: 123318, Disbursed: 62687 and Balance: 60631.[6]

[6] https://www.usof.gov.in/usof-cms/usof-fund-status-chart.jsp



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 1.5: Utilization of USO funds in India

The USOF has implemented several schemes in accordance with its mandate since creation. However a looking at above fund utilization chart, it is revealed that lot of USO fund is still lying un-utilized. USO fund has been formed to provide financial support for the provision of telecom services in commercially unviable rural and remote areas of the country. From the study of annual report of TRAI for the year 2019-2020, it is established that digital divide exists between urban and rural areas of India. Therefore USOF can play a vital role in bridging this digital divide by utilizing available funds for development of telecom services in rural and remote areas of India. As a result, research into the role of the USOF in bridging the digital divide, particularly with regard to ANI being remote, rural and strategically important, is required. To bridge digital divide in India, there is also a need to develop a realistic use of USOF funds, notably in ANI.

2. Literature Review

2.1 Background

The gap between individuals, households, businesses, and geographic areas at different socioeconomic levels in terms of both their access to ICT and their use of the internet for a wide variety of activities requires a review of various factors such as the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels in terms of both their access to ICT and their use of the internet for a wide variety of activities. There is no single gap at the national level, but several: for example, between men and women, young and old, rich and poor, and, most crucially, rural and urban areas. The digital divide is the separation that exists between people who have access to new types of information technology and those who do not. Various agencies, notably the DoT, have taken steps to bridge the digital divide.

2.2 Digital divide and USOF

Telecommunication services have played a critical role in bridging the rural-urban divide in India's vast geography, and have emerged as a crucial enabler of the country's economic and social progress. However, some remote places in India, including isolated villages, still remain without telecommunication services. The factors for non-provision of telecom services in these areas includes challenging terrain, dispersed populations, low accessibility, and commercially unviable operations for telecom companies.

This chapter includes a literature review that shows how prior studies have looked at the digital divide.

1. Pandey, A. (2004) in study titled ‘Digital Divide in India and Strategies to Bridge it’ argued that ICT is not a magic wand that, when used, can eliminate all disparities in the globe. While universal access is a must, ICT based solutions must be holistically created after taking into account the users' goals and wants. The study focuses on India's digital divide.

2. Ramachandran, T. (2008), Director General, Cellular Operators Association of India (COAI); body representing Indian Telecom Industry, in a study on ‘Leveraging the potential of USOF to roll out to rural areas’ argued that communication networks assist to bring people together, allow them to be informed, integrate them, and be better citizens in a democracy. Many countries have set the objective of providing universal access to communications, at the very least on a community level, through a combination of private and public access infrastructures. He goes on to say that the USOF fund should be put to good use by establishing allied infrastructure such as shared backhaul, public telecom information centres, and encouraging the use of non-conventional energy sources such as solar, wind, and biogas fuels. He also advised that the USO fund and objectives be evaluated on a regular basis, say once a year, with the government/regulator determining the amount of funds required for USO objectives and deciding on an appropriate levy to recover the same. The research focuses solely on the role of TSPs.

3. India’s Telecom Regulator; TRAI (2008) in a study on ‘Measures to improve telecom penetration in rural India - The next 100 million subscribers’ stated that the significance of telecommunications in helping rural residents to efficiently integrate into the Indian economy, and ultimately into the emerging global economy, requires

special attention. It goes on to say that the USO Administrator is empowered effectively in administrative, budgetary, and ultimate decision making capabilities. It should be split from the DoT, and a framework similar to the National Highway Authority should be studied. The study focuses on the expansion of broadband.

4. According to Fong, M. (2009) in a study titled "Digital Divide: The Case of Developing Countries", an increase in mobile phone, PC, and telephone adoption by one percent will increase average income per person in lower-middle-income and low-income developing countries by approximately 2.8 percent, 4.1 percent, and 6.3 percent, respectively. This might be accelerated by deliberate policies and advice from these countries' governments, with international cooperation. Furthermore, governments in these nations must regularly review the impact of regulations and match them with societal goals in order to remain user-focused in the need to fast harness technology. The study examines the influence of ICTs (the Internet, mobile phones, computers, and telephones) on Gross National Income (GNI) per capita in developing nations in 2005.

5. The digital divide has various aspects and can be classified as global, regional, and national, according to Singh, S. (2010) 'Digital divide in India: Measurement, drivers, and strategy for addressing the issues in bridging the digital divide.' The study was mostly focused on India, and it attempted to investigate the problem of digital divide, particularly in rural-urban India. In the context of this study, digital gap refers to the disparity in teledensity, mobile phone use, and internet access between rural and urban areas. If India is to diminish the digital divide, hurdles such as illiteracy, a lack of skills, infrastructure, and investment in rural areas must be addressed,

according to the report. Connectivity provision, content production, capacity augmentation, core technology creation and exploitation, cost reduction, competency building, community participation, and commitment to the deprived and disadvantaged should all be prioritised by the government to assist in bridging the digital gap. It only looked at three indicators: teledensity, mobile, and the internet divide.

6. The impact of the digital divide has been studied extensively. In their work titled 'Understanding the Digital Divide: A Literature Survey and Ways Forward,' Srinuan, C., and Bohlin, E. (2011) presented a literature review and classification scheme for digital divide research. The evaluation includes publications from three types of journals published between 2001 and 2010: Information Technology and Information Systems, Economics and Business and Management, and Social Science. According to research, the term "digital divide" was coined in the mid-1990s. The digital gap is still a hot topic in public policy, affecting social, economic, and political challenges. The study makes no recommendations for government intervention programmes.

7. In a paper titled 'Information Technology for the Masses: Bridging the Digital Divide,' Malhotra, C. (2011) underlined that benefits enabled by ICT, such as rapid outreach and accurate information transmission, are projected to alleviate the situation of the marginalized and poor rural. As a result, the common thread running across all global initiatives like the National Development Goals (NDGs), Millennium Development Goals (MDGs), and World Summit on the Information Society (WSIS)

is to harness information and communication technologies for mass development (ICT4D). Data sources are not quantified in the study.

8. In a study titled 'Digital Discrepancy in India: Bridging the Gap,' Dixit, P. (2012) claimed that while India has made significant progress and many of the data are remarkable in absolute terms, there remains a significant divide between rural and urban areas. To improve the situation, a number of policy actions must be implemented. Infrastructure, limited internet accessibility, low bandwidth, unpredictable electric supply, literacy and skill, content, and other factors all contribute to India's digital divide, according to the report. Only secondary data is used in this study.

9. In a study titled 'Review of universal service support policy: formulation and implementation issues confronting rural telecom,' Bhagat, K. (2013) stated that the USOF should be treated as one of many tools for increasing rural teledensity/broadband penetration, and that efforts should be made to facilitate policy dissertation outcomes on a variety of dimensions. It's also crucial to monitor if the expected socioeconomic outcomes of ubiquitous connectivity are being realised. The research focuses solely on USOF policies. More study is needed to ensure that USO funds are used effectively to achieve all of the organization's stated goals.

10. In a research titled 'e-Inclusiveness: Bridging the Digital Divide with ICT,' Malhotra, C. (2014) examined how new digital divide gaps are being established across groups of people due to technologies such as global economics, people who choose not to be connected, and content based Internet obstacles. It went on to explain

the various types of digital divides, including those caused by technology, internet access, mobile access, human resources, social/community resources, education, and gender. The study focuses on India's digital gap, with a particular emphasis on the causes, classification, and policy trends in the country. If India is to diminish the digital divide, the researcher believes that difficulties such as illiteracy, a lack of skills, a lack of sufficient infrastructure, and issues connected to rural investment must be addressed. The government must make a big push toward achieving goals linked to connectivity, content development, capacity enhancement, core technology creation and exploitation, cost reduction, competency building, community engagement, and commitment to the poor and disadvantaged. The study concentrated on the government's involvement in bridging the digital gap.

11. TRAI (2016) recommended that in order to bridge the affordability gap for the persons residing in rural areas and to support governments efforts towards cashless economy by incentivizing digital means, a reasonable amount of data per month may be made available to rural subscribers for free. The cost of implementation of the scheme may be met from USOF. The study concentrates on encouraging data usage in rural areas through provisioning of free data.

12. In their study titled 'Bridging digital divide in India: some factors and initiatives,' Sipre, Y., and Malik, M. (2017) said that various attempts are being made in India to bridge the digital divide. All of these efforts may be seen in the different initiatives launched by the government, the corporate sector, and libraries. Apart from providing separate terminals in libraries, many libraries and information centres also provide training to users so that they may access information over the Internet. Many

libraries have created digital and institutional repositories so that users can access books for free. The study is solely focused on the role of libraries.

13. The power and transformational potential of internet access and use are not evenly spread, according to an ITU research (2018) on 'Bridging the gender divide.' The majority of the 3.7 billion unconnected people are women and girls. The survey also confirms that the digital gender gap is widening in many developing nations, necessitating additional support for digital gender equality. Women and girls use the internet 12.5 percent less than men and boys around the world. The research is confined to addressing the gender gap.

3. Methodology

3.1 Research objectives

This research will look into the role of the USOF in bridging the digital divide gap, with a particular focus on ANI. As a result, the research's objectives will be as follows:

1. To understand background, scope, schemes and existing status of USOF
2. To examine the role of USOF in bridging digital divide in India, particularly in ANI
3. To understand the current status of digital divide in India with special reference to ANI
4. To identify various factors responsible for digital divide in India with special reference to ANI
5. To suggest an implementation strategy for optimum utilization of USOF to bridge digital divide in India, particularly in ANI
6. To suggest policy inputs for bridging digital divide in India to strengthen achievement of broad band for ANI

3.2 Research strategy and Research design

The research would be qualitative (explanatory) as well as quantitative (exploratory, descriptive).

3.3 Research methods/ Data sources

To answer the research questions posited, following methods of data collection/ study are proposed:

3.3.1 Secondary data:

It will be gathered through a review of related articles in academic journals, periodicals, policy documents, academic reports, and annual reports published by the Government of India, the Department of Telecommunications, the International Telecommunication Union, and the GSM Association (GSMA), among other sources. This would assist us in comprehending the numerous indicators that are responsible for the implementation of the USOF.

3.3.2 Primary data:

3.3.2.1 Aim-1: To understand the "Role of USOF in bridging digital divide". Primary data would be collected using survey method as follows.

i. Sample type: Identified citizens of Port Blair, ANI
ii. Sampling technique: Quota sampling
iii. Sample size: 100 identified citizens
iv. Design of tool: Semi-structured tool on quality of broadband availability using both open ended and closed ended questions, implemented telephonically.
v. Before implementation, pilot test of the survey tool would be done by sharing it with identified experts from IIPA and others.
vi. Data hence captured would be analyzed using appropriate tools as well as would be presented as case-stories

3.3.2.2 Aim-2: To identify the issues and challenges of USOF implementation, with special reference to islands. Primary data would be collected using survey method employed on experts who would be the related government officials dealing with the USOF implementation in ANI.

i. Sample size: Director, Dy. Director General and Administrator dealing with the USOF implementation particularly in ANI.

ii. Design of tool: (pilot tested) Semi-structured tool on the issues and challenges of USOF implementation both open ended and closed ended questions implemented through e-mail.

iii. Data hence captured would be used to triangulate/augment findings.

3.4 Sample and Research tools

Two semi-structured research tools had been designed, one to understand the role of USOF in bridging digital divide in ANI (Appendix C) and the second to identify the issues and challenges of USOF implementation, particularly in ANI (Appendix D, Appendix E and Appendix F).

3.4.1 Understanding the role of USOF bridging digital divide in ANI: The first tool was administered to a sample size of 100 respondents of Port identified Blair, ANI.

3.4.2 Identify the issues and challenges of USOF implementation, particularly in ANI: The Director, Dy. Director General and Administrator in USOF dealing with the implementation of schemes were requested to provide their experience/observations on the issues and challenges in implementation of USOF schemes, particularly in ANI. Time given to submit response was one week.

In both the cases, since the target population is different, quota sampling method was employed to choose the sample.

3.5 Rationale / Justification

3.5.1.1 Due to the COVID-19 pandemic (first instance recorded in India in January 2020), many vital services are being pushed online, putting individuals without broadband internet connection in rural and distant locations further behind their peers in terms of digital inclusion.

3.5.1.2 The Government of India's NDCP-2018 aims to accomplish ‘Broadband for All’, a goal of digital empowerment and enhanced people's well-being. It also emphasized the importance of using USO funds to include underserved communities and those who are digitally illiterate.

3.5.1.3 The GoI is rolling out the BharatNet project, which will connect 2.5 lakh Gram Panchayats (GPs) and all six lakh villages across the country with digital connectivity and high-speed broadband.

3.5.1.4 Digital India is the GoI's flagship programme, with the goal of transforming India into a digitally enabled society and knowledge economy.

3.5.1.5 The USOF's role in bridging India's digital divide is critical since it can assist different sectors in rural and remote areas, such as healthcare, education, automotive, retail, banking, energy, agriculture, service delivery, Direct Benefit Transfer (DBT), and others, in achieving "broadband for all."

3.5.1.6 On the August 10, 2020, while dedicating CANI project, the Hon'ble Prime Minister stated that all of India's islands would play an essential role in India's new Indo-Pacific trade policy.

3.5.1.7 USOF has implemented programmes that will assist the government in implementing different social sector reforms and improving service delivery to citizens throughout India.

3.5.1.8 The goal of the NDCP-2018 is to achieve "broadband provisioning for everyone by 2022." However, pandemic has pushed the deadline back, necessitating a new strategy.

3.5.1.9 The present study revealed

i. In India, there is a significant digital divide, particularly in ANI.

ii. The USOF's potential to bridging the digital divide gap has not been completely exploited.

iii. There is no academic literature on the role of the USOF in bridging the digital divide, especially in ANI.

iv. As a result, exploratory research in developing countries like India is needed to examine the role of the USOF in bridging the digital divide, particularly in ANI.

3.6 Research questions

The following research questions have been designed with the study's goal in mind: to investigate the function of the USOF in bridging the digital divide in India, with a focus on ANI.

1. What are the schemes formulated by USOF ever since its inception?
2. How USOF is contributing in bridging digital divide in rural and remote parts of India, particularly in ANI?
3. What is the current status of digital divide in India particularly in ANI?
4. What are digital divide and its various types?
5. What could be the new avenues/ strategies to implement USOF schemes for optimum utilisation of USOF help to bridge the digital divide particularly in ANI?
6. What are the possible policy inputs for USOF in bridging digital divide in India?

3.7 Scope/ Limitations/ Delimitations

Because of the consequences of Covid-19, eventual beneficiaries would be reached via telephone; making triangulations of observation techniques are not possible.

3.8 Chapterisation scheme

The broad chapterisation scheme for this research report is proposed as follows:

Chapter 1	Introduction
Chapter 2	Literature Review
Chapter 3	Methodology
Chapter 4	USOF: An Overview
Chapter 5	Digital Divide in India with Special Focus on ANI
Chapter 6	Findings and Conclusions
Chapter 7	Recommendations
Chapter 8	References / Bibliography
Chapter 9	Appendix

4. Universal Service Obligation Fund: An Overview

4.1 Background: Comparative global perspective

The concept of universal service was first enunciated in United States of America (USA), about 100 years back by American Telephone and Telegraph Corporation (AT&T) and since then it has been adopted by most of the countries as a policy objective.

In 2013, ITU carried out study titled "Universal service funds and digital inclusion for all"[7] which provides a detailed overview and comparative analysis of sixty-nine Universal Service Funds (USFs) in world and highlighted the principal factors that contribute to the successful performance of a number of these USFs. The core notion of Universal Service, according to the study, is to ensure that telecommunication services are accessible to the broadest possible number of people (and communities) at affordable prices, and it is based on the following concepts:

- Availability: At all times and without geographical discrimination, the level of service should be the same for all users in their place of work or residence.
- Affordability: The cost of a service should not be a barrier to service access for any consumer.
- Accessibility: In all places, regardless of ethnicity, sex, religion, or other factors, all telephone subscribers should be treated equally in terms of pricing, service, and quality of service.

Various jurisdictions use a variety of techniques to meet universal service criteria, including the following:

- Market based reforms

[7] https://www.itu.int/en/ITU-D/Digital-Inclusion/Documents/USF_final-en.pdf

- Mandatory service obligations
- Cross subsidies
- Access deficit charges
- Private Public Partnerships (PPPs)
- Universal funds.

Telecommunication administrations and regulatory agencies throughout the world have been progressively resorting to the concept of a dedicated universal service funding mechanism established as an incentive to help operators in achieving their universal service targets during the last two decades. A USF is the name given to this funding structure.

TSPs / operators often finance USFs through some type of contribution system. The operator contributions are almost always in the form of a charge based on a percentage of annual operating income. The USF charge is not a separate fee in some countries, but rather a percentage of an overall annual regulatory fee. The portion of the annual regulatory fee allocated to the USF that is sometimes fixed, but in other situations is subject to annual review and calculation. Other sources of fund, in addition to operator levies, include license fees, whole or partial proceeds from spectrum auctions, direct contributions from government budgets, and payments from international institutions such as the World Bank and Regional Development Banks, among others.

The manner in which levy's are collected and then managed differs greatly from one jurisdiction to the next. The fees could, for example, be paid directly to the USF or the USF Administrator. Alternatively, they could be collected by the regulator and then passed on to a fund management or Administrator. There are numerous variations in how a USF is administered and managed after that point.

4.2 Background: Indian perspective

In the 1970s, India made public phone availability a policy goal. It entailed providing Long Distance Public Telephones (LDPT) based on a village's population. The policy's scope was gradually expanded to include the supply of a Public Telephone within five kilometers of any dwelling. Following that, the goal of the public phone policy was expanded to include the provision of a public telephone in every village having a Gram Panchayat (GP), and then a Village Public Telephone (VPT) in every village. The DoT installed all of these public phones, which generally included incurring net expenditures, i.e., they were installed even if they were unprofitable.[8]

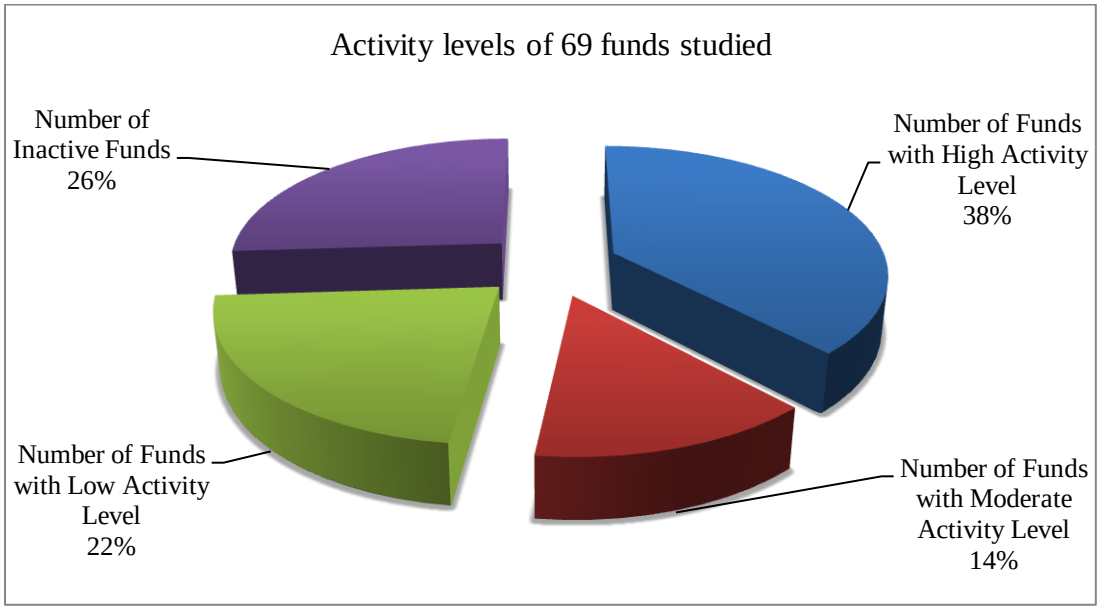
Universal service was initially embodied in a policy statement in India in 1994, when the government released the National Telecom Policy (NTP'94). The goal of NTP'94 was to make telecom services accessible to all people of the country, including providing services in every community. Universal Service was defined in the policy paper as the provision to all residents of certain "basic telecom services at affordable and appropriate costs".

In 1999 the government introduced the New Telecom Policy (NTP'99). This policy paper placed a strong focus on universal access to basic telecommunications services, as well as the availability of these services at reasonable prices, ensuring that all citizens have effective means of communication. One of the key objectives of the universal service duty imposed on TSPs under NTP'99 was to provide telecom services to all low teledensity areas, including rural areas, remote, hilly, and tribal areas.

[8] https://www.trai.gov.in/sites/default/files/15m.pdf

4.3 USOF in global context

ITU conducted a thorough study on USFs in order to give an in-depth analysis of both the success factors and the obstacles that a variety of existing USF models face.



Source: https://www.itu.int/en/ITU-D/Digital-Inclusion/Documents/USF_final-en.pdf

Figure 4.1: Activity levels of sixty-nine funds studied by ITU

4.3.1 Success factors in the management of the USF

According to an ITU study, instances of best practices in USF management differ from region to region. There are certain components inside many different funds that, when merged in a unified framework and administrative package, would create in an efficient, effective, and well-governed USF. The elements that make up success factors are listed below.

(a) **Legal and regulatory framework:** A legal or regulatory framework that is flexible enough to allow for adaptation and modification as needed is essential to a USF's continued success.

(b) **Autonomy and independence:** Some funds have been established to operate in a fully independent manner.

(c) **Policy articulation:** One of the most important aspects of a successful USF is policy articulation. Although the telecommunications or ICT law directs the creation of a USF, it must be supplemented and supported by a clear statement of the USF's overarching vision and policy, as well as the actions required to carry out the goal. Some of the most important considerations to keep in mind are; what is the fund trying to achieve, and how should its resources be distributed to achieve these goals?

(d) **Consultation with stakeholders:** Stakeholder participation is acknowledged as particularly beneficial since operators and other telecom players frequently have in-depth knowledge and, as a result, can provide valuable suggestions and guidance on fund emphasis and execution. This contributes to the perception that USF management is open and transparent, with well-established consultative processes.

(e) **Delineation of responsibilities between USF and other government entities or external agencies:** This clarity is critical, especially when dealing with the frequently pressing demands of a USF project. As a result, standards and processes for collaborating with other government agencies aid the fund's administrative efficiency.

(f) **Defined and measurable objectives:** The formulation of specified and measurable targets must accompany the definition of USF policy. It is exceedingly difficult, if not impossible, to determine the extent to which the fund has been effective in carrying out the overall policy and vision on the funding of universal service requirements without clearly stated objectives.

(g) **Flexibility and neutrality in service deployment:** The underlying need for a technology neutral strategy in service deployment is one of the important success criteria that cannot be disregarded. Technology and services evolve at such a quick pace in today's world that no one can precisely foresee how and when technology will evolve. As a result, the overarching concept should be that any technology can be

used and deployed as long as it adheres to an internationally recognized standard and meets the service and/or coverage requirements. Given the vast and rising global demand for broadband, the flexibility of a technology neutral approach has been very useful in its deployment.

(h) **Fair and objective project allocation process:** An equitable project allocation process needs to be preceded by an equitable fund contribution process with the understanding that those who contribute to a USF can also, where feasible, have the potential to bid and/or apply for projects that will be financed via the USF mechanism. The fund administration must establish clear and understandable criteria for proposed projects and for evaluating project proposals. This should be followed by a formal proposal solicitation and evaluation process to approve selected bids and to distribute funds. In order to ensure the greatest possible participation in a USF project allocation process, one of the most successful approaches has been the use of a well-publicized, competitive and transparent bidding process.

(i) **Capacity building, sustainability and complementary services:** An equitable project allocation process must be preceded by an equitable fund contribution procedure, with the understanding that people who contribute to a USF can also bid and/or apply for projects that will be financed through the USF mechanism, if that is possible. The fund administration must provide clear and intelligible criteria for proposed projects and project evaluation. Following that, a formal proposal request and review process should be used to approve selected bids and disburse cash. One of the most successful techniques to ensuring the widest possible participation in a USF project allocation process has been to adopt a well-publicized, competitive, and transparent bidding procedure**.**

(j) **Innovation and incentives:** Rather than providing direct and immediate compensation, some funds provide incentives for efficient deployment and/or innovation, as well as cost minimization when possible, in order to stimulate good project implementation. To guarantee that the incentives are justified, appropriate fund administration and project oversight are also required.

(k) **Visibility, transparency and accountability:** Given the size of most operators' contributions and the fact that the underlying regulations governing individual USFs typically necessitate regular reporting of financial performance, visibility and transparency are critical.

(l) **Digital inclusion responsiveness:** Several funds have attempted to address the unique situations or needs of specific population groups.

4.3.2 Challenges in USF administration

ITU study elaborated that when it comes to the administration of USFs, there are numerous obstacles and roadblocks to overcome. There are a variety of variables that could contribute to this predicament, including fundamental faults or flaws in the underlying legal and regulatory structure; social and political realities in the country where the fund operates; or the fund's core design's lack of economic sustainability.

(a) **Underlying legal and regulatory framework:** Many funds' underlying legal frameworks appear to have been poorly thought out or conceived from the start (e.g., not technology neutral or service flexible, excessively bureaucratic, insufficient oversight, etc.), resulting in a number of ineffective or severely constrained funds, as well as funds that are legally challenged. In other circumstances, for example, the architecture is designed to accommodate just fixed line service funding. However, in certain situations, this might be attributable to the fact that many USFs did not anticipate the fast development of mobile technology, or other technologies, at the

time they were established. These same concerns with underlying legal frameworks offer a big hurdle to the introduction of rural and non-commercially viable broadband through the USF funding mechanism, as many of the frameworks require revisions in many cases to accommodate broadband supply.

Given the age of many funds, it's understandable that little or no thought was given at the outset to the possibility of ancillary and complementary services or tools that would be required in conjunction with or in addition to the USF-funded project (e.g. equipment needed to complement basic telephony, the need to develop specific content and applications, etc.). This resulted in some frameworks that are so specific that they prevent the deployment of any new and innovative solutions that might be the best fit for the needs of population groups that are typically targeted by USFs (e.g., rural populations) or population groups or other entities that should be targeted by USFs (e.g., children). In other circumstances, the law or regulation is quite broad in scope, necessitating the issuing of a supporting decree or rule before the fund can be fully established and operational. There appears to be little or no subsequent effort in the majority of countries where such a scenario occurs to develop or issue the appropriate decree, rules, or instructions that will control the fund's functioning for reasons that are unknown. As a result, a number of funds have been established and collected, but no relevant fund activity has been begun, resulting in collected funds probably lying inactive and not being put to the intended use.

(b) **Difficulty to adapt to changing requirements and focus:** Many funds in their current state are unable to adapt to new conditions and requirements or evolve in accordance with technological or societal change due to the aforementioned restrictions or oversights in the legal and regulatory framework, or due to a general lack of ability or, in some cases, will on the part of regulators and fund

Administrators. As a result, such funds are less flexible than required, and these limitations can limit the fund's responsiveness and use in meeting the needs of the unserved and/or underserved. For several years, it has been evident that many funds, in their current configuration, are less effective than expected, based on the establishment of overall objectives and specified target areas, and that structural change is required. However, only a small number of countries confronted with these limits have attempted to overhaul or re-orient the fund's goal, structure, and administration, whether by legal, regulatory, or policy changes. This is expected to be a concern in the future, even for funds with a more future-oriented framework and strategy, because outlooks and what is considered forward thinking at one time can quickly become outmoded in the face of rapid societal change and technology evolution.

(c) **Correlation between USF levies and demand:** In general, even for the most effective funds, most USF contributions appear to have been established without conducting substantive analysis of the actual service funding/subsidy levels needed, and as a result, many funds appear to receive contributions far in excess of the actual universal service funding needs or capabilities. In other circumstances, the funds appear to be having trouble coming up with enough projects to fully utilize the levies collected. This is owing to the lack of access gap evaluations and reliable demographic surveys in many cases. In any event, the funds could end up with significant unspent surpluses.

(d) **Structural matters:** Many funds are restricted due to fundamental structural flaws that might show in a variety of ways. Defects in general could include things like a clear delineation of duties and responsibilities or explicit recommendations for how levies should be computed, administered, and collected. Other instances could

include vague or weak descriptions of what the fund can be used for, resulting in restrictive approaches to project identification and distribution.

(e) **Strategy and objectives:** To guarantee that USF fund are put to the appropriate use and to achieve desirable levels of supervision and governance, a clear explanation of the overall USF strategy and objectives is required. Many USFs, on the other hand, do not have a clear statement of either. The lack of a clear plan has resulted in a number of issues and hurdles with a number of funds, in addition to the difficulties described with regard to oversight and governance.

(f) **Managerial, operational and capacity issues:** Many funds have been hampered or even severely harmed by the selection of management employees that lack the necessary skills and experience to effectively administer a USF, resulting in inadequate overall administration. There appear to be multiple fundamental reasons for this scenario, including an incorrect definition of the various USF management responsibilities, as well as the skill set and expertise required to perform them. In addition to these flaws in fund management, similar issues arise at the project level, where project descriptions and definitions may not always account for all of the expertise, skill levels, or time commitments required for successful project execution. Additionally, in a lot of circumstances, the fund management team's resources are insufficient to closely monitor and/or oversee successful project execution.

(g) **Transparency, visibility and accountability:** Among the existing funds, there is a notable lack of financial reporting. Over half of the nations studied had no formal public reporting procedure in place for the use and management of fund, and many have not followed the specified reporting process, despite the fact that many of these countries do issue ad hoc project reports. As a result, it is usually impossible to determine the state of ongoing initiatives, and in many situations, the linkages

between funds collected, funds dispensed, and residual balance are ambiguous, inconsistent, or non-existent. The apparent lack of transparency is so serious that a number of funds have been linked to various allegations (not all of which have been proven) of financial mismanagement.

(h) **Oversight and governance:** Even in funds with some autonomy and independence, political influence or meddling from other government bodies might have an impact on the fund's performance. In other cases, the established governance process has failed to account for external factors that obstruct oversight and governance, such as delays in budget approvals when they are required from Parliament or the National Assembly (or similar bodies), or where multiple approvals are required from various committees and government organizations. In others, the supervisory procedure, particularly when it comes to the allocation of funds and project approval, has become so onerous and bureaucratic that fund operation has been severely hampered or halted entirely.

(i) **Project allocation process:** One of the main areas where fund performance can be severely impacted is the project allocation process. All of these factors can have an impact on USF projects, including a lack of competent and/or interested vendors to bid on projects, or a defective design of economic incentives for vendors to bid. Overall flaws or oversights in project structuring, allocation, administration, and monitoring will only result in subpar project inception and execution, or, in some situations, failed and abandoned projects. Even when many current funds appear to have transparent project allocation processes, project monitoring, tracking, and reporting often fall through the cracks.

(j) **Consideration of digital inclusion:** In general, the bulk of funders have disregarded the overall concept of digital inclusion until date. Once again, the basis of

this exclusion often arises from an omission or exclusion in the basic USF legal and regulatory framework, and thus, digital inclusion cannot be addressed without revisions to the underlying legislation and/or framework. This is not always the case, and it's also worth noting that, while a number of funds have established policies on specific aspects of digital inclusion, such as services for people with disabilities, many of these funds have yet to translate those policies into precise targets and activities. The largest mistake in terms of digital inclusion right now is that almost all of the funds have failed to address the requirement to target and support programmes for rural and remote areas.

(k) **Constraints to broadband deployment:** With the expanding proof of the economic and social benefits provided by broadband implementation and the ever-increasing global demand for speedy and cheap access to information, many USFs' prohibitions on broadband financing are a major roadblock. Many governments have looked for alternate funding methods to support broadband growth and deployment for a variety of reasons, one of which is that the regulatory or legal changes required to expand the scope of the USF are either delayed or non-existent. Many funds exist with sufficient resources to assist in the funding of broadband deployment, but the funds are unused since they cannot be disbursed for this purpose.

(l) **Underlying infrastructure and facilities:** It's crucial to remember that the frequently rural and difficult-to-reach places that require USF assistance typically lack other fundamental necessities as well, not just adequate communications. In many cases, the programmes overlook the importance of power supplies, water availability, ongoing maintenance, security, and other long-term necessities.

(m) **Availability of resources and knowledge:** Many of the programmes and targets established for the deployment of community information centres and cyber labs have

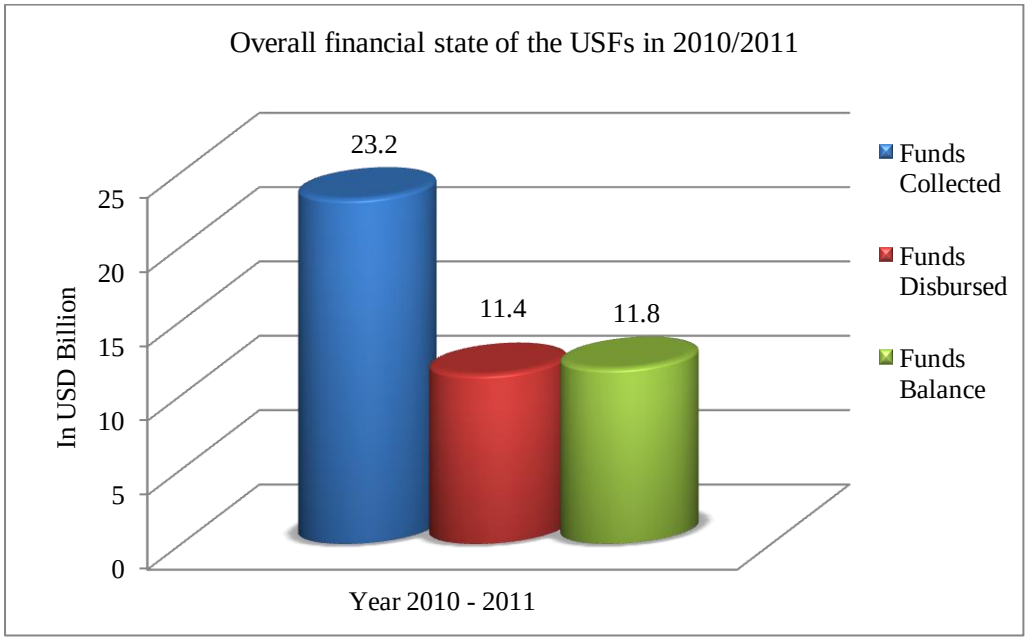
failed to address issues related to training and education that must be addressed due to widespread illiteracy and general lack of knowledge among many segments of poor and disadvantaged populations. Examples of funds where the technology and services are not being used demonstrate that installing computers, data networks, and other services and then waiting for people to use them is insufficient. Access to sophisticated information technologies necessitates widespread education and awareness of their availability, as well as the development of the knowledge and skills required to properly use the services. The criteria for training and education are not limited to USF project recipients. The lack of sufficiently skilled people to maintain services has also hampered the successful completion of several USF projects.

(n) **Local conditions and related security:** Because of the remote and frequently challenging locations that USFs must cover, there will inevitably be conditions that stymie or completely prevent USF projects from progressing forward. These include inhospitable terrain, harsh climatic circumstances, and perilous political situations, to name a few. There is little that can be done in such instances except to 'wait it out' until the issue becomes less difficult.

4.3.3 Although a number of USFs mention to or make policy declarations about some aspect of digital inclusion, it is crucial to emphasize that these references do not always translate into specific policies or project execution to meet these critical needs. Even if the intentions are excellent, the reference to services for the target group is often just that - a mention. Although provisions in the fund mission exist in some cases, the fund is not yet functioning; hence there is no visible evidence of any digital inclusion activities. It is clear that there is much to be done on a global level to either encourage USFs that have a written policy to address target population segments or to

promote the expansion of the USF mandate and policy to include target population segments in cases where the USFs do not currently have such a policy.

The ITU calculated the overall financial state of the USFs in 2010/2011 based on the fragmentary information collected:



Source: https://www.itu.int/en/ITU-D/Digital-Inclusion/Documents/USF_final-en.pdf

Figure 4.2: Overall financial state of USFs studied by ITU

4.4 USOF in Indian context

4.4.1 Initiation: The NTP'99 set the following particular goals for the country's telecoms spread:

(a) Provide voice and low speed data services to the balance (i.e. uncovered) villages in the country by the year 2002.

(b) Provide Internet access to all district head quarters by the year 2000.

(c) Make available telephone on demand by the year 2002, and sustain it thereafter so as to achieve a teledensity of 7 by the year 2005 and 15 by the year 2010.

(d) Encourage development of telecom in rural areas, making it more affordable by suitable tariff structure and making rural communication mandatory for all fixed service providers.

(e) Increase rural teledensity from the level to 0.4 to 4 by the year 2010 and provide reliable transmission media in all rural areas.

(f) Provide reliable transmission media to all the exchanges by the year 2002.

(g) Provide high-speed data and multimedia capability using technologies including Integrated Services Digital Network (ISDN) to all towns with a population greater than 2 lakh by the year 2002.

While the first two objectives concerned public telecom services, such as Internet access, the third and fourth objectives concerned the provision of individual household telephones in low-income rural areas by introducing appropriate tariff structures and other measures to make them more affordable. This entails low, and if necessary, even zero, rental and call prices, especially in rural regions, so that phones become more affordable to the general public and demand for basic services increases. Thus, public phones like as Village Panchayat Telephone (VPT) and residential phones were covered by the universal service policy objective's duty imposed on fixed service providers.

4.4.2 Levy: The NTP'99 has also established the following recommendations for obtaining financial resources for the purpose, taking into consideration the affordability criterion and the need to subsidize loss-making phones:

"The resources for meeting the USO would be raised through a **'universal access levy'**, which would be a percentage of the revenue earned by all the operators under various licenses. The percentage of revenue share towards universal access levy would be decided by the Government in consultation with TRAI. The implementation

of the USO obligation for rural/remote areas would be undertaken by all fixed service providers who shall be reimbursed from the funds from the universal access levy. Other service providers shall also be encouraged to participate in USO provision subject to technical feasibility and shall be reimbursed from the funds from the universal access levy".

4.4.3 Steps by DoT: In order to meet the goals of NTP'99, the DoT solicited TRAI's advice on the following issues in 1999:[9]

(a) Class of operators to fund the UAL.

(b) Various possible cost models/approaches to determine:

  (i) Percentage contribution from revenue of the operators and the mechanism for computing it;

  (ii) Per unit subsidy for VPTs and rural DELs separately to cover capital and recurring expenditure;

  (iii) Whether per unit subsidy will be the same or different in different geographical areas/tribal and non-tribal areas of the country; and

  (iv) Per unit subsidy for low calling urban DELs.

The DoT has brought the following items to the attention of the regulator while making the reference:

(a) NTP-99 stipulates raising of resources to meet the Universal Service Obligation through the Universal Access Levy (UAL). UAL is required for providing VPTs and Rural telephones and should cover both capital expenditure and recurring expenses to run the service. UAL would be a percentage of the revenue earned by the operators under various licenses. The percentage referred to above has to be decided by the Government in consultation with TRAI.

[9] https://www.trai.gov.in/sites/default/files/15m.pdf

(b) Voice communication facility has been provided to 3,40,640 villages and the remaining villages are proposed to be covered by the year 2002; Internet access to all district headquarters (DHQ) has already been achieved through 172 code and efforts are being made to provide nodes at all DHQs progressively by the end of year 2000;

(c) Making telephone on demand in rural and urban areas of the country is also proposed to be achieved by the year 2002;

4.4.4 Recommendations of TRAI: In accordance with the NTP'99 objectives, the TRAI recommended in 2001 that the task of providing voice and low-speed data services in all villages be given top priority, as this would make both telecommunications and information services available to the poorer section of our population within a reasonable distance of their homes. As a result, the regulator advised that the implementation of USO be split into two distinct streams.

Stream – I: Provision of Public Telecommunication and Information Services

Stream – II: Provision of Household Telephones in Net High Cost Areas.

The regulator believes that not just public phones, such as VPTs, but also their eventual up-gradation into Public Tele Infoservices Centres (PTICs) to provide information services in rural regions, will assist bridge the existing digital divide between urban and rural areas. It was also suggested that after accomplishing the goal of one VPT per village, a second phase of Rural Community Phones (RCPs), or the hamlet's second public phone, be installed in public venues such as schools, primary health centres, and so on. RCPs will be supported by USF in the same way that VPTs are. To make the Universal Service strategy more sustainable, the regulator suggested compensating all TSPs for the net cost of installing village public phones. TRAI

further advised that operators be given support for all Direct Exchange Lines (DELs) in rural and remote Short Distance Charging Areas (SDCAs).

4.4.5 Quantum of Universal Service Levy: NTP'99 not only established explicit aims for public phones such as VPTs, but also established defined targets for Universal Service. The regulator calculated that five percent of all telecom operators' adjusted gross revenue would be sufficient to sustain the Universal Service Programme in its first phase, as well as VPTs/PTICs and DELs in rural and isolated locations.

4.4.6 USO Fund Administrator: The practice adopted by various countries in regards to USOF was as follows.

France: An autonomous financial entity overseen by the Ministry of Economy manages and administers the Universal Service Fund. The institution is paid a fee to cover its administrative costs. Each operator contributes a portion of the cost, which is computed on a prorata basis based on traffic volume. The fund raised each year is given to France Telecom to help them satisfy their USO obligations. The fund is replenished three times a year by the operators. These figures are based on a best-guess estimation. The Ministry evaluates and fixes the final amounts to be paid by the operators based on the audited costs for the year in question. If the preliminary sums paid into the fund exceed the real amounts due from them, operators are refunded.

USA: The US government programme is administered by the National Exchange Carrier Association (NECA), an intra-industry group formed by the Federal Communications Commission (FCC). The NECA is governed by a Board of Directors made up of members from over 1000 local telephone companies in the United States. The FCC ordered NECA to form an autonomous non-profit subsidiary, the Universal

Service Administrative Company, in 1997 (USAC). The Universal Service Support Mechanism is presently administered by the USAC.

As a result, in 2001, TRAI recommended the establishment of the USF Administrator's Office, which will deliberate and decide on the broad policies and guiding principles for the administration of USO, based on the experiences of other countries input from stakeholders, and its own deliberations and analysis. It may examine the scope of USO as well as the utilization of the universal service budget from time to time and, if required, make changes. The Authority also suggested that USL be implemented on April 1, 2002 and the position of USF Administrator be established on January 1, 2002.

4.5 Universal Service Obligation Fund in India

The latest Annual Report 2020-2021 published by DoT[10] on February 24, 2021 gives information about telecom sector scenario in India. It also provides detailed information about USOF along with its various schemes. The study of DoT's Annual Report 2020-2021 has revealed various facts about USOF in India as follows. In addition, the information provided by USOF officers was also examined.

4.6 Organizational structure, functions and objectives of USOF

4.6.1 Organizational structure

The Universal Service Obligation Fund, established by an Act of Parliament, is administered by the Administrator USO Fund, who is appointed by the Central Government. It is an attached office of the Ministry of Communications' Department of Telecommunications.

4.6.2 Amendment to telegraph act for creation/ administration of USO Fund

From April 1, 2002, the Universal Service Support Policy for providing telecom

[10] https://dot.gov.in/sites/default/files/Annual%20Report%202020-21%20English%20Version.pdf

facilities in rural and remote areas of the country came into effect. On March 27, 2002, the DoT announced guidelines for universal service support policy, which were posted on the department's website. Following that, in December 2003, the Indian Telegraph Act, 1885 was changed by the Indian Telegraph (Amendment) Act, 2003, resulting in the creation of the USOF. The fund was founded with the primary goal of enabling people in rural and isolated locations with inexpensive and appropriate access to 'Basic' telegraph services. Following that, on December 29, 2006, the Indian Telegraph (Amendment) Act 2006 was passed, repealing the term "basic" and expanding the scope of the USO Fund to provide access to new services including mobile, broadband connectivity, and infrastructure creation such as OFC in rural and remote areas.

4.6.3 Rules for administration of USOF

The Indian Telegraph (Amendment) Rules, which govern the administration of the fund, were first published on March 26, 2004 (Appendix A). The Rules were later revised as the Indian Telegraph (Amendment) Rules 2006 to provide for the support of mobile services and broadband access in rural and remote areas of the country, and they were published in the Gazette on November 17, 2006 (Appendix B). The Rules have since been revised on a regular basis.

4.6.4 Functions and objectives

The USO Fund was founded with the primary goal of providing inexpensive and reasonable access to 'basic' telecom services to persons in rural and remote places. Following that, the scope was expanded to include financial support for all sorts of telecom services, including mobile services, broadband connectivity, and the development of infrastructure such as OFC in rural and remote locations.

The "eligible operators," i.e. entities with a valid licence, registration, or authorization from the Central Government/DoT for providing telecom services or infrastructure, or

any other entities as specified by the Central Government from time to time, were to carry out the USO-related activities.

4.6.5 Services supported by USOF

As per the rules, presently the following services are supported by USOF, categorized in the form of streams, as under.

1. **Stream-I** - Provision of Public Telecom and Information Services
2. **Stream-II** - Provision of household telephones in rural and remote areas as determined by the Central Government from time to time
3. **Stream-III** - Creation of infrastructure for provision of Mobile Services in rural and remote areas
4. **Stream-IV** - Provision of Broadband connectivity to villages in a phased manner
5. **Stream-V** - Creation of general infrastructure in rural and remote areas for development of telecommunication facilities
6. **Stream-VI** - Induction of new technological developments in the telecom sector in rural and remote areas

4.6.6 Utilization of USOF funds

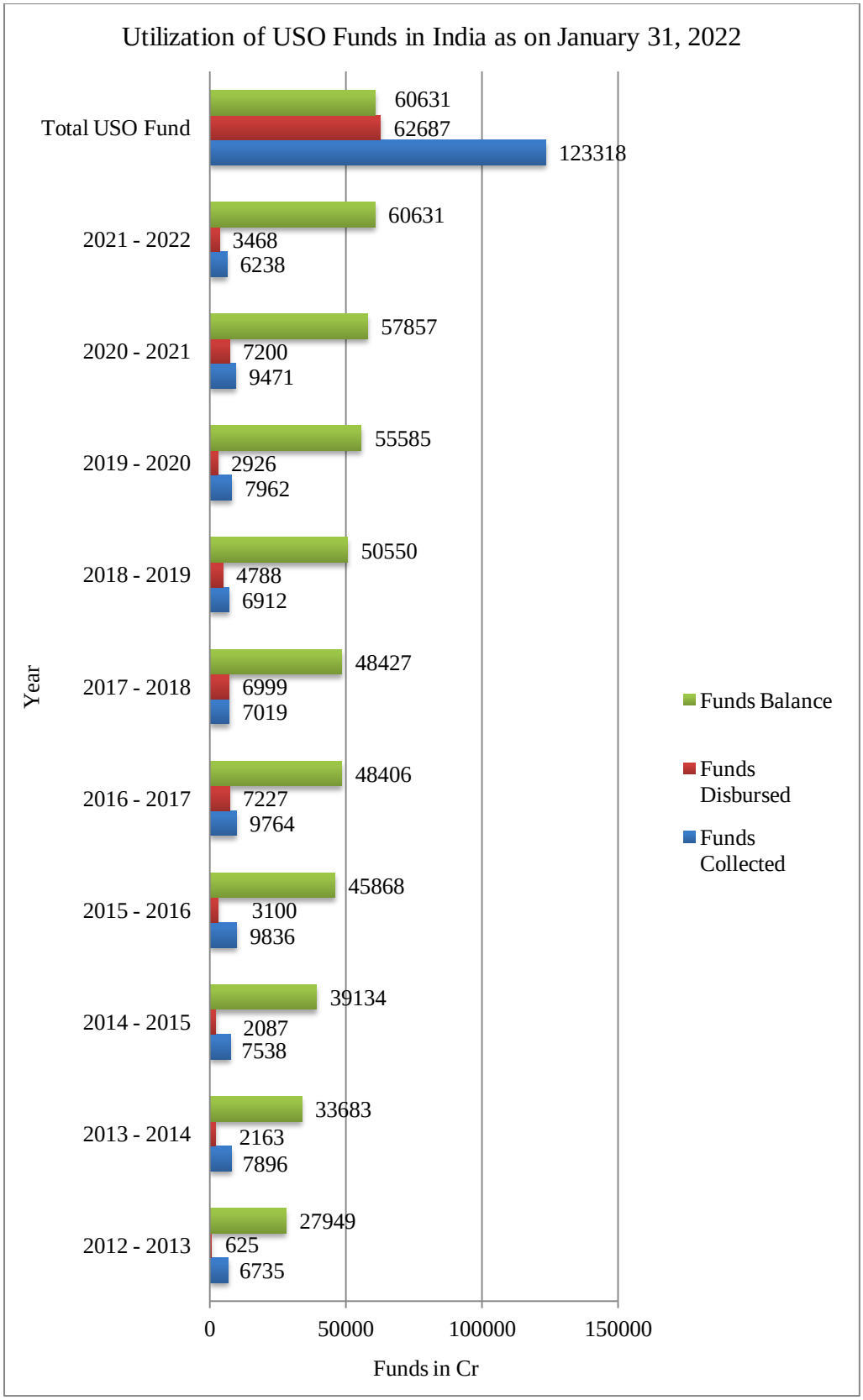
4.6.6.1 The utilization of USOF funds as on January 31, 2022[11] (in crores)

Table 4.1: Utilization of USO Funds in India

Year	Funds Collected	Funds Disbursed	Funds Balance
2002 - 2003	1654	300	1354
2003 - 2004	2143	200	3297
2004 - 2005	3458	1315	5440
2005 - 2006	3215	1767	6888
2006 - 2007	3941	1500	9239
2007 - 2008	5406	1290	13455
2008 - 2009	5515	8549	10411
2009 - 2010	5778	2400	13789
2010 - 2011	6115	3100	16804
2011 - 2012	6724	1688	21839
2012 - 2013	6735	625	27949
2013 - 2014	7896	2163	33683
2014 - 2015	7538	2087	39134
2015 - 2016	9836	3100	45868
2016 - 2017	9764	7227	48406
2017 - 2018	7019	6999	48427
2018 - 2019	6912	4788	50550
2019 - 2020	7962	2926	55585
2020 - 2021	9471	7200	57857
2021 - 2022	6238	3468	60631
Total	123318	62687	60631

Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

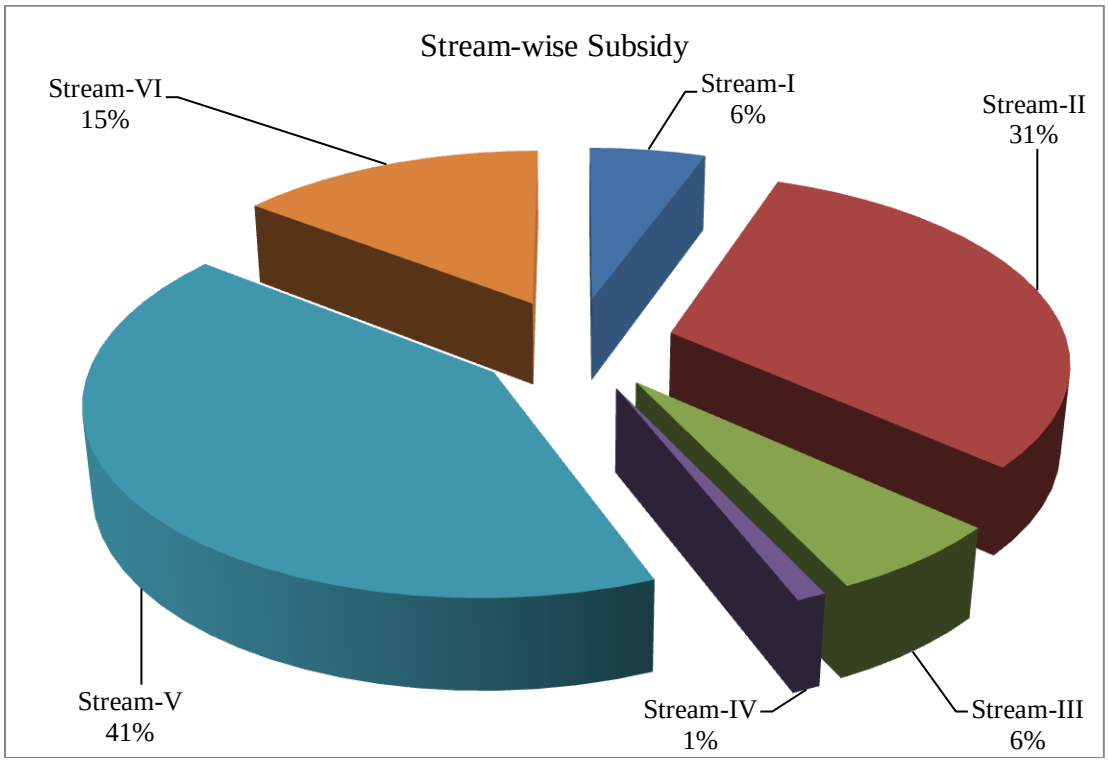
[11] https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.3: Utilization of USO funds in India

4.6.6.2 The stream-wise share in the total subsidy disbursed by USOF is as follows.



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.4: Stream-wise share in the total subsidy disbursed by USOF

4.6.6.3 Activity-wise share in the total subsidy disbursed by USOF (in crores) as on December 31, 2021 is as follows.

Table 4.2: Activity-wise share in the total subsidy disbursed by USOF

Activity	Funds Disbursed	Percentage share
BharatNet Project	30885	49%
Provision of Wi-Fi	605	0.97%
LWE Project	3683	5.89%
MARR Project	1318	2.12%
Impact Assessment of USOF schemes	0.15	0.0002%
VPT Project	1244	1.99%
Provision OFC	70	0.11%
Provision of RCP	111	0.18%
Provision of RDEL	14954	23.9%
Provision of Satellite bandwidth	213	0.34%
Provision of Wireline Broadband	505	0.81%
Provision of Submarine OFC to ANI	925.15	1.48%
Provision of Submarine OFC to LDI	1.51	0.0024%
Amarnath Yatra Project	6.91	0.011%

Sanchar Shakti Project	1.0	0.016%
SMCF Project	6.0	0.0096%
Mobile services in uncovered villages	1088	1.74%
License Fee and Spectrum Charges	6949	11.12%

Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

4.7 Implementation status of the ongoing activities of the USO Fund

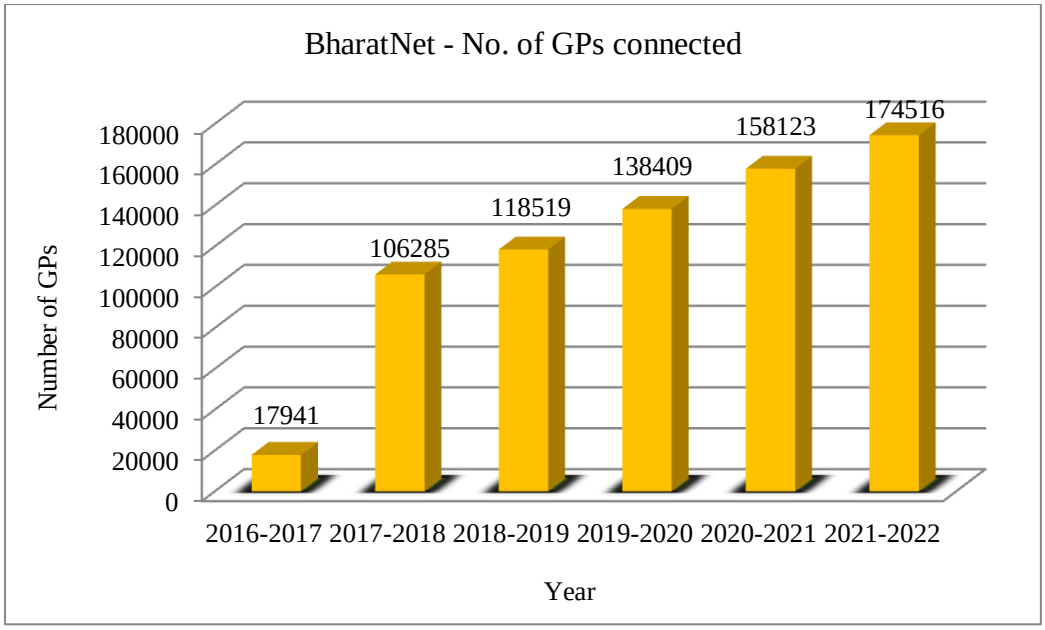
4.7.1 BharatNet:

BharatNet, one of the world's largest rural telecom projects, is being phased in to bring broadband connectivity to all Gram Panchayats (about 2,50,000) across the country. On October 25, 2011, the Union Cabinet approved the creation of the National Optical Fibre Network (NOFN/now BharatNet) to provide Broadband connectivity for connecting Block Headquarters (BHQs) to Gram Panchayats (GPs) by utilising existing fibre from Central Public Sector Undertakings (CPSUs) such as Bharat Sanchar Nigam Limited (BSNL), RailTel Corporation Limited (RailTel), and Power Grid Corporation of India Limited (PGCIL) and the government would own the incremental OFC that was laid, while the existing fibre would remain in the hands of the current owners. Bharat Broadband Network Limited (BBNL) was established on February 25, 2012 as a Special Purpose Vehicle (SPV) for the creation, management, and operation and operations of broadband network in India.

Phase-I of BharatNet was completed in December 2017 with the deployment of over one lakh GPs, and the remaining GPs are being linked under BharatNet Phase-II using a variety of implementation strategies, including state-led model, CPSU-led model, and private-sector-led model for the establishment and administration.

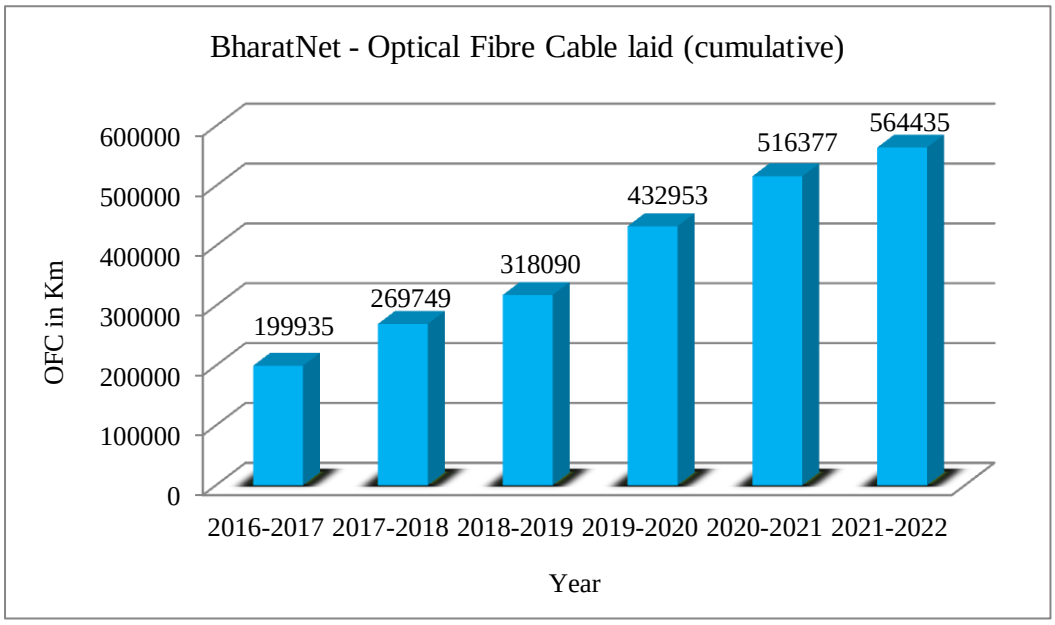
As per DoT Dashboard data for (updated upto January 31, 2022)[12], a total of 1.74 lakh GPs have been connected by laying a total of 5.64 lakh kilometers OFC.

[12] https://dot.dashboard.nic.in/DashboardF.aspx



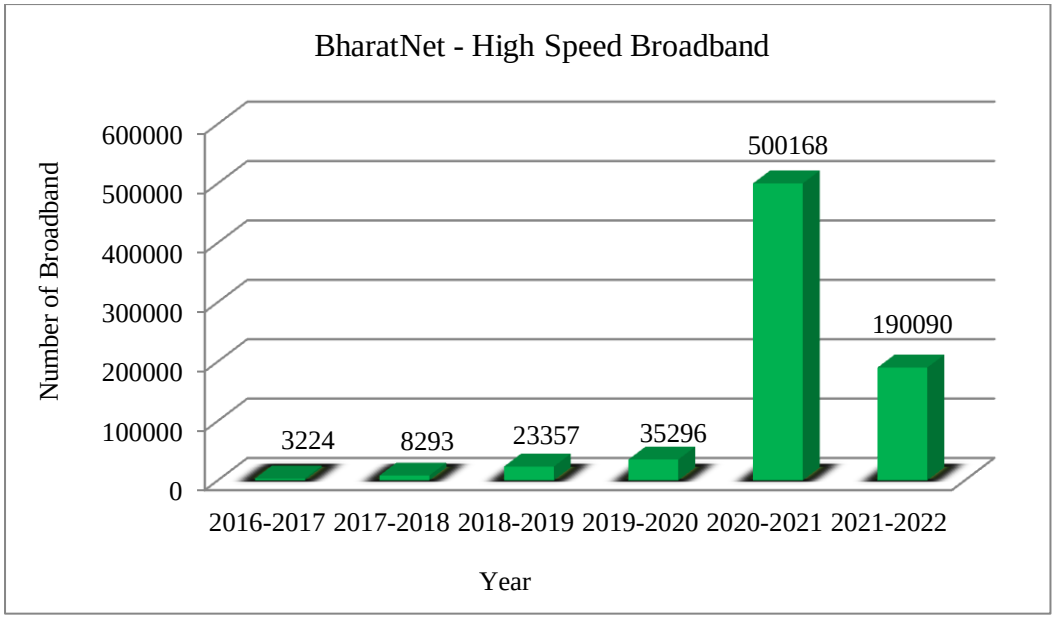
Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.5: Number of GPs connected under BharatNet project



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.6: OFC laid under BharatNet project (cumulative)



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.7: High speed broadband provided under BharatNet project

Wi-Fi or any other acceptable broadband technology, including FTTH, is used to deliver last mile connectivity to public locations and government institutions such as schools, hospitals, post offices, Aanganwadi, customer service centres, police stations, and so on. Wi-Fi hotspots have been established in approximately 1,00,000 GPs, and 5,00,000 FTTH connections have been offered as of December 31, 2020. There is a spike in 2020 - 2021 in provisioning of high speed broadband connections as compared to earlier years. The total data use each month is about 1400 TB.

The BharatNet implementation strategy has been revised in accordance with NITI Aayog's recommendation and the approval of the Digital Communications Commission (DCC) for a Public-Private Partnership (PPP) model using Viability Gap Funding (VGF) for effective network utilisation and induction of private sector efficiency in its operation and maintenance. BharatNet's mandate has also been changed to connect more than 6 lakh inhabited villages across the country via fibre optics, up from 2.5 lakh Gram Panchayats previously. The updated PPP model

approach was subsequently modified, and requisite approval was acquired from the Department of Economic Affairs (DEA) PPP Appraisal Committee on January 12, 2021 for covering up to 3.5 lakh villages using the PPP model across 16 states.

The new BharatNet deployment strategy under PPP mode was approved by the Union Cabinet on June 30, 2021. In the 16 states, BharatNet will now be expanded to all inhabited villages beyond GPs. The updated strategy also calls for the concessionaire to build, upgrade, operate, maintain, and use BharatNet, which would be chosen through a competitive international bidding procedure. On July 20, 2021, a Request for Proposal (RFP) was issued through global bidding. The deadline for giving BharatNet connectivity to all six lakh villages, including all GPs, is August 2023.

4.7.2 Comprehensive Telecom Development Plan (CTDP) for the North-Eastern Region (NER):

On September 10, 2014, the Union Cabinet approved a proposal to implement the North-Eastern Region's Comprehensive Telecom Development Plan. In the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura, the project aimed to provide 2G mobile coverage to 8621 identified uncovered villages, as well as the installation of 321 mobile tower sites along National Highways and the strengthening of transmission networks.

Following that, due to advancements in technology and TSP coverage of villages, updated programmes were approved. The following are the details of the present schemes:

A. Mobile services in uncovered villages in rest of NER and seamless coverage along National Highway:

Mobile coverage will be provided under this programme by erecting 2004 towers in uncovered villages and along National Highways in Assam, Manipur, Mizoram,

Nagaland, Tripura, Sikkim, and Arunachal Pradesh (National Highways only) in the North-East. On December 8, 2017, agreements were inked for the project's implementation. Though the implementation agencies are only responsible for providing 2G services, they have been providing 4G services alongside 2G services at around 90 percent of tower sites on their own. A total of 1,358 sites have been installed and are providing services as of November 30, 2021. For locations that are feasible, the installation work is nearly complete.

B. Mobile services in uncovered villages of Meghalaya and seamless coverage along National Highway:

As per the approval of Union Cabinet, the work was granted on September 4, 2020 for the deployment of 4G mobile services in 1,164 uncovered villages and 11 sites along National Highways in Meghalaya. The survey and installation work is in underway. By June 2022, the project should be completed

C. Mobile services in uncovered villages of Arunachal Pradesh and two districts of Assam:

Provision of 4G mobile services in 2374 uncovered villages in Arunachal Pradesh and two Assam districts (Karbi Anglong and Dima Hasao) has been approved by the Cabinet on December 9, 2020. The tender has already been finalised. Agreements for project implementation were signed. By April 2023, the project should be completed.

D. Hiring of 10 Gbps International Bandwidth for Internet Connectivity to Agartala from BSCCL, Bangladesh via Cox Bazar:

USOF has signed an agreement on August 18, 2021 for the hiring of 10 Gbps international bandwidth for internet connectivity to Agartala from Bangladesh Submarine Cable Company Limited (BSCCL), Bangladesh via Cox Bazar/Kuakata, in order to provide high-quality and high-speed internet access to the states of the

country's North Eastern Region. The project has been commissioned.

4.7.3 Implementation of Comprehensive Telecom Development Plan for Islands:

In accordance with TRAI recommendations dated July 22, for 'Improving Telecom Services in Andaman and Nicobar Islands and Lakshadweep,' the Telecom Commission adopted, in principle, an Integrated and Comprehensive Telecom Development Plan for Islands of Andaman and Nicobar and Lakshadweep on November 7, 2014. The plan consists of the following schemes:

(A) Andaman and Nicobar Islands:

(i) Submarine OFC connectivity between Chennai and Andaman and Nicobar Islands:

The Cabinet approved a dedicated undersea OFC link from Chennai to Port Blair and five other islands, namely Car Nicobar, Little Andaman, Havelock (Swaraj Dweep), Kamorta, and Great Nicobar Island, at its meeting on September 21, 2016. Subsequently, Rangat Island via Long Island from Havelock Island (Swaraj Dweep) was added to the submarine OFC link. A 2313-kilometer four-pair optical fibre cable has been laid, with one pair dedicated to the Ministry of Defense. On August 10, 2020, the Chennai-Andaman Nicobar Islands (CANI) project was inaugurated and dedicated to the country. Between Chennai and Port Blair, 200 Gbps bandwidth is available and 100 Gbps capacity available within the islands under CANI undersea cable project. On November 13, 2020, a tripartite agreement was signed for Operation and Maintenance of CANI. The current bandwidth consumption is 43.09 Gbps.

Source: Information provided by USOF officials

Figure 4.8: Submarine OFC connectivity under CANI project

(ii) Satellite bandwidth augmentation for Andaman and Nicobar Islands:

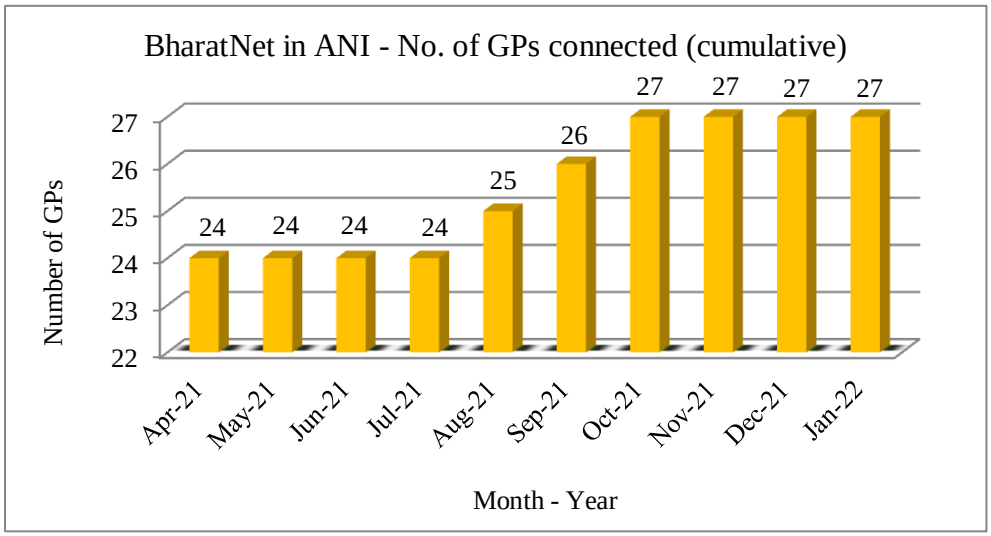
In compliance with DCC clearance, BSNL completed work to increase satellite bandwidth from 2 Gbps to 4 Gbps in the Andaman and Nicobar Islands on a nomination basis. The USOF will fund the CAPEX, while the MHA/UT Administration of the Andaman and Nicobar Islands would fund the OPEX charges. On September 9, 2021, satellite bandwidth was increased to 4 Gbps.

(iii) Provision of 4G mobile coverage in uncovered villages and seamless 4G mobile coverage of NH223 in Andaman and Nicobar Islands:

On March 15, 2021, an agreement has been inked for the construction of 82 towers to provide 4G mobile services in 85 uncovered villages (with a population of 10 or more) and 42 towers to bridge the gaps in mobile connectivity along uncovered NH-4 (earlier NH-223). USOF will fund the CAPEX and OPEX for the next five years using the VGF Model. The project was expected to be completed within twelve months after the agreement's signature, or by March 2022. However, due to extant constraints imposed by the UT Administration pursuant to COVID-19, the implementing agency has been

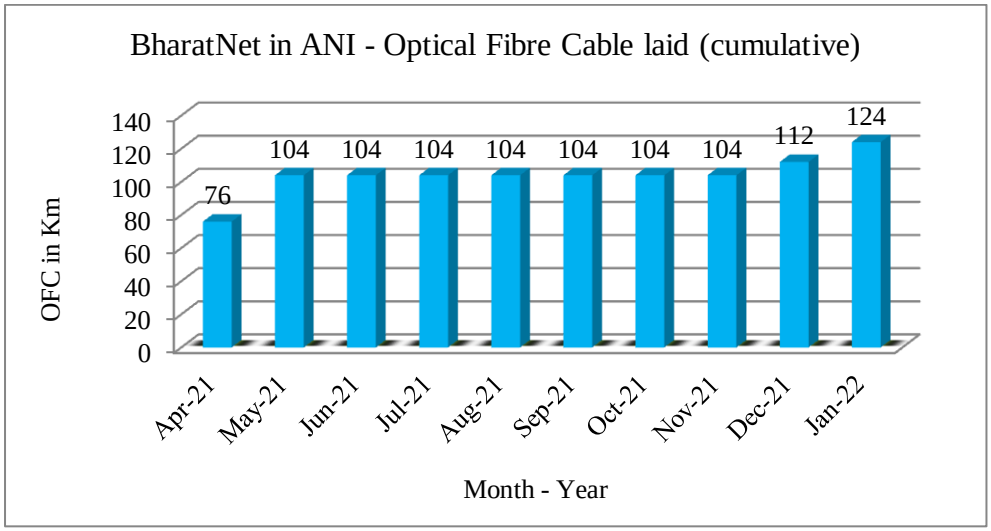
given a three-month extension for field survey/project implementation under Force Majeure condition. Presently the survey and site acquisition process is under progress.

(iv) BharatNet



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.9: Number of GPs connected under BharatNet project in ANI (cumulative)



Source: https://www.usof.gov.in/usof-cms/usof-fund-status-table.jsp

Figure 4.10: OFC laid under BharatNet project in ANI (cumulative)

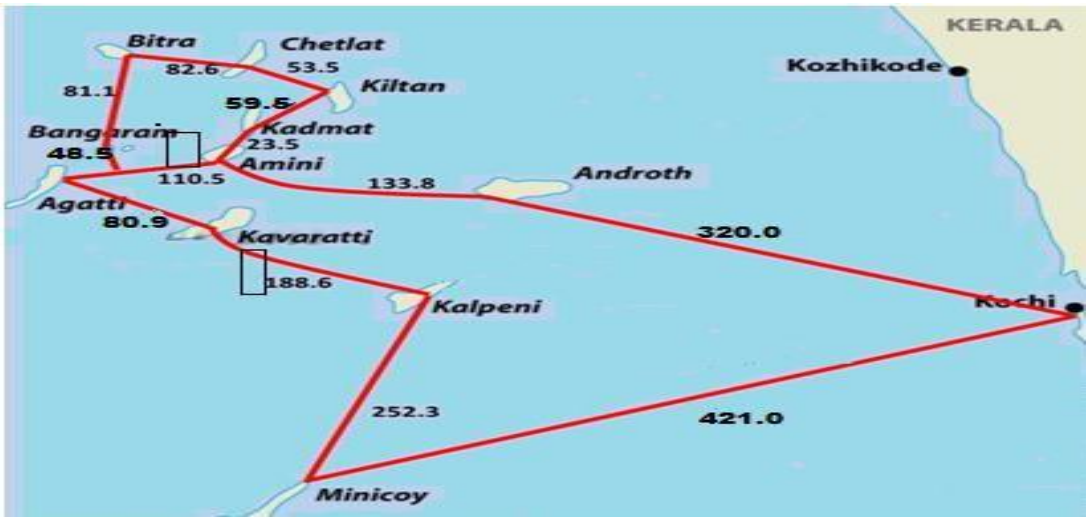
(B) Lakshadweep Islands:

(i) Submarine OFC connectivity between Kochi and Lakshadweep Islands:

Source: http:// www. lakshadweep.gov.in

Figure 4.11: Map of Lakshadweep Islands

The Cabinet approved a proposal for Provision of Submarine Optical Fibre Cable Connectivity between the Mainland (Kochi) and the Lakshadweep Islands (KLI project), which includes Kavarati and ten other islands, including Kalpeni, Agatti, Amini, Androth, Minicoy, Bangaram, Bitra, Chetlat, Kiltan, and Kadmat, at its meeting on December 9, 2020.



Source: Information provided by USOF officials

Figure 4.12: Submarine OFC connectivity under KLI project

The predicted total route length is 1,772 kilometers, with a total financial impact of Rs. 1,072 crore. The project is expected to be completed by May 2023. As a result of the global turnkey tender floated on March 10, 2021, a purchase order has been awarded on September 28, 2021 for the execution of the KLI project. On July 19, 2021 the work order for acquiring statutory permissions like Environmental Impact Assessment/Coastal Regulation Zone (EIA/CRZ), Forest, Wildlife clearance, and so on has been awarded. Further As a result of the tender, purchase order was issued on November 16, 2021 for appointment of Independent Monitoring Agency (IMA) for the project. The work on the marine survey, as well as the land cable survey and securing EIA/CRZ clearance, is now underway.

(ii) Satellite bandwidth augmentation for Lakshadweep Islands:

On August 31, 2018, DCC accepted a proposal to increase satellite bandwidth in the Lakshadweep Islands from 318 Mbps to 1.71 Gbps using GSAT-11 and 19 capacities at a cost of Rs 25.75 crore. The satellite bandwidth in the Lakshadweep Islands was increased by 700 Mbps thanks to ISRO-provided VSAT terminals. The satellite bandwidth is currently 1.15 Gbps, but it is expected to increase to 2 Gbps by March 2021.

BSNL is working on a nomination basis in Lakshadweep Islands to increase satellite bandwidth from 318 Mbps to 1.71 Gbps using GSAT-11 and GSAT-19 capacity, in compliance with DCC approval. The USOF will fund the CAPEX while the MHA/UT Administration of the Lakshadweep Islands would fund the OPEX (Transponder charges). On August 14, 2021, satellite bandwidth has been increased to 1.71 Gbps.

On April 13, 2021, the DCC authorized a new proposal by ISRO/NewSpace India Limited (NSIL) and BSNL to increase satellite capacity from 1.71 Gbps to 3.46 Gbps,

using Ku-Band transponders on the GSAT-31 satellite. By April 2022, the project should be completed.

4.7.4 Re-provisioning of Digital Satellite Phone Terminals (DSPTs) provided to MHA agencies (CAPFs), MoD agencies (Army, BRO) and other agencies using VSAT connectivity under BharatNet project:

These DSPTs are offered in distant, rural, far-flung, and rugged terrain where no other operator can provide coverage. INMARSAT terminals were provided to MHA agencies (CRPF, BSF, ITBP, and SSB) and MoD agencies (Indian Army and BRO) as a short-term remedy to satisfy their vital communication demands. The proposal for provisioning of Digital Satellite Phone Terminals (DSPT) to MHA/MoD agencies as well as Ladakh Autonomous Hill Development Council (LAHDC) using VSAT connectivity under the BharatNet project was approved by the DCC at its meeting on December 20, 2019. At present, 1379 sites had been operationalized out of a total of 1409 VSATs to be provided.

4.7.5 Mobile service in uncovered villages:

In the first phase, the government focused reaching out to remote sections of the country, such as the North-Eastern States, Islands, Himalayan States, Western Border States, and, most crucially, Left-Wing Extremism-affected areas.

4.7.5.1 Scheme for border areas and other priority areas:

On April 28, 2020, an agreement was signed with the implementing agency, for the provision of mobile service in 354 uncovered villages in Jammu and Kashmir, Ladakh, Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Gujarat, Uttarakhand, Border areas, and other priority areas. In addition, fifty-five more villages have been added to provide mobile services. By March 2022, the project should be completed.

4.7.5.2 Aspirational districts scheme

(i) **502 aspirational district villages (MP, UP, Rajasthan, Bihar):**

A scheme to provide 4G-based mobile services to 502 uncovered villages across 112 Aspirational Districts in four states (Uttar Pradesh, Bihar, Madhya Pradesh, and Rajasthan) has been finalised. After a tendering process in March 2021, agreements were signed and work was allocated. Work on the survey and tower installation is currently underway. By March 2022, the project should be completed.

(ii) **Remaining 7287 aspirational district villages (Andhra Pradesh, Chhattisgarh, Jharkhand, Maharashtra and Odisha):**

On November 17, 2021, the Cabinet authorised a scheme for the provision of 4G based Mobile services in 44 Aspirational Districts of the five states of Andhra Pradesh, Chhattisgarh, Jharkhand, Maharashtra, and Odisha. On December 7, 2021, a RFP was issued for the project's implementation.

4.7.5.3 Scheme for mobile communication services in Left Wing Extremism (LWE) affected areas: -

(i) LWE Phase-I:

The Cabinet approved the execution of a project in LWE areas to deliver mobile services on 2G technologies in the ten impacted states of Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Telangana, Uttar Pradesh, and West Bengal on the August 20, 2014. Total 2343 sites in 106 districts are made functional. The proposal for upgrading current LWE-I sites to 4G is under consideration.

(ii) LWE Phase-II:

On May 23, 2018, the Cabinet approved a proposal for Phase II of the project in LWE-affected districts, with a subsidy of Rs. 7330 crore. The project was later

approved for 2,542 towers to deliver 4G mobile services at an estimated cost of Rs. 2,211.17 crore due to revisions in the specifications. On December 1, 2020, the Digital Communications Commission (DCC) approved the project.

A tender has been issued and finalised for the project's implementation. In September/October 2021, the agreements were signed for implementation of the project with 940 mobile towers in Andhra Pradesh, Bihar, Jharkhand, Telangana, Uttar Pradesh, West Bengal and 1603 towers in the states of Chhattisgarh, Madhya Pradesh, Maharashtra, and Odisha. By March 2023, the project should be completed.

4.7.6 USOF scheme for setting up of 25,000 public Wi-Fi hotspots using the infrastructure of BSNL's telephone exchanges in rural areas:

BSNL is installing public Wi-Fi hotspots at its 25,000 telephone exchanges in rural areas, at a cost of Rs. 943 crore, with USOF funding. Each exchange will have one Access Point (AP) with a backhaul bandwidth of 2 Mbps. In 24,330 rural exchanges/BTS, Wi-Fi hotspots have been put up/installed and are now offering services.

5. Digital Divide in India with Special Focus on ANI

5.1 Background

As a result of the COVID-19 pandemic, the government, private businesses, and the general people are increasingly relying on internet connectivity for interaction rather than physical connectivity such as rail, road, or air transportation networks. The ways we live, work, and interact will change in the post-pandemic age. We'd need to live in an environment that encourages socialising and economic activity, while limiting personal interaction. Internet's ubiquitous availability and use has both economic and social implications. Access to internet, like drinkable water and electricity, would become a requirement in the post-pandemic age. It's tough to picture a world without broadband access. Telecom and internet access will play a large role in daily life, and in some ways, broadband will become a basic human right.

Even before the COVID-19 epidemic, communications has emerged as a crucial driver of economic and social progress in an increasingly knowledge-driven globalised world during the last two decades. In today's world, communication services such as voice, video, data, the internet, and wideband multimedia are essential.

5.2 Digital divide in India

5.2.1 In India telecommunications has progressed from being a state-owned public utility to a more liberalised, private-dominated industry. There's no doubt that telecommunications market liberalisation and privatisation resulted in large investments in telecom infrastructure and a spectacular spread of telecommunication networks around the world, not to mention the rise of the internet. Despite this progress, there is still a digital divide between rural and urban areas, as well as poor

and wealthy ones. The urban teledensity is 138.72 percent, whereas the rural teledensity is just 59.33 percent, according to the TRAI's latest Performance Indicator Report (July-Sept 2021)[13] published on January 10, 2022. In the same way, urban internet subscriber density (internet subscribers per 100 people) is 104.75 percent, while rural internet subscriber density is only 37.67 percent. Between rural and urban India, there is a noticeable digital gap.

With the rising importance of "being connected" and slowing expansion in impoverished and rural/remote areas, favourable conditions are needed to incentivize and minimise the cost of connectivity to the unserved and remote areas including islands.

5.2.2 DoT has developed performance dashboard[14] which monitors and provides in-depth information/data on various parameters of Indian telecom sector. It monitors important parameters pertaining to Telephone subscribers, Teledensity, Internet subscribers, Broadband subscribers, Wireless data usage, Telecom usage, Telecom towers, BharatNet, Telecom licenses, Telecom Virtual Network Operator (VNO) licenses, Registration, Public Grievances etc. The dash board; which is being updated regularly, was accessed on February 22, 2022 to get updated information on Telephone subscribers, Teledensity, Internet subscribers and Broadband subscribers. The details are as follows.

[13] https://www.trai.gov.in/sites/default/files/QPIR_10012022_0.pdf
[14] https://dot.dashboard.nic.in/DashboardF.aspx

https://dot.dashboard.nic.in/DashboardF.aspx

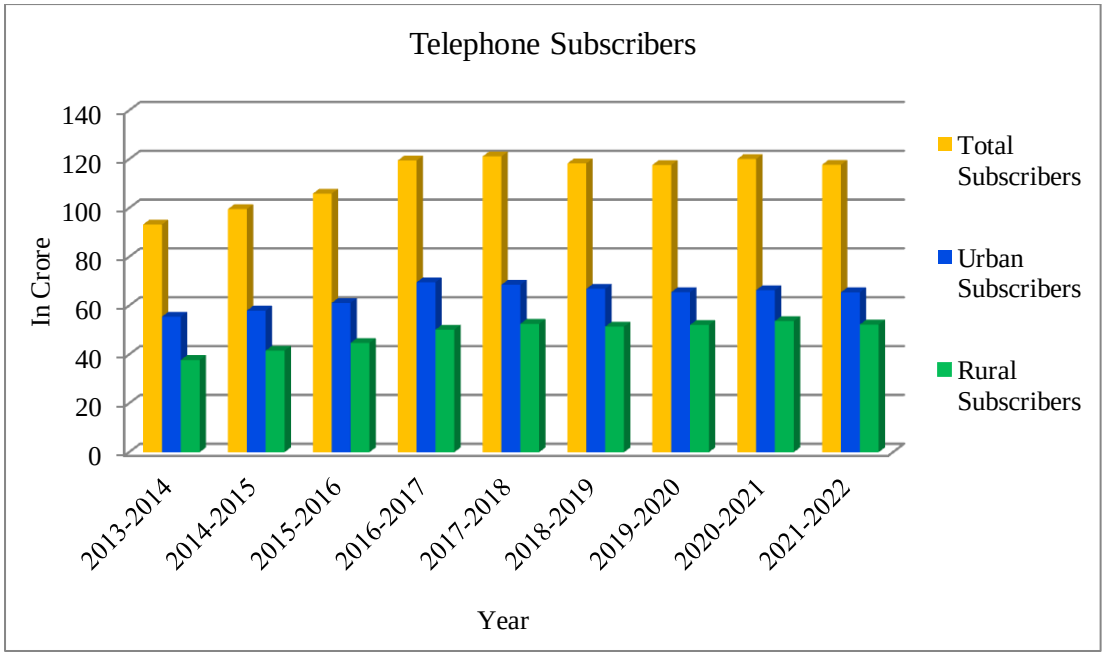
Figure 5.1: Performance dashboard of DoT accessed on February 22, 2022

5.2.2.1 The overall telephone subscribers as on December 31, 2021:

Table 5.1: Overall telephone subscribers in India (nine years)

Year	Total Subscribers	Urban Subscribers	Rural Subscribers
2013-2014	93.302	55.523	37.778
2014-2015	99.613	58.005	41.608
2015-2016	105.933	61.156	44.777
2016-2017	119.499	69.593	50.181
2017-2018	121.18	68.593	52.587
2018-2019	118.341	66.914	51.427
2019-2020	117.679	65.554	52.125
2020-2021	120.088	66.376	53.711
2021-2022	117.782	65.498	52.284

Source: https:// dot.dashboard.nic.in/DashboardF.aspx



Source: https://dot.dashboard.nic.in/DashboardF.aspx

Figure 5.2: Overall telephone subscribers in India (nine years)

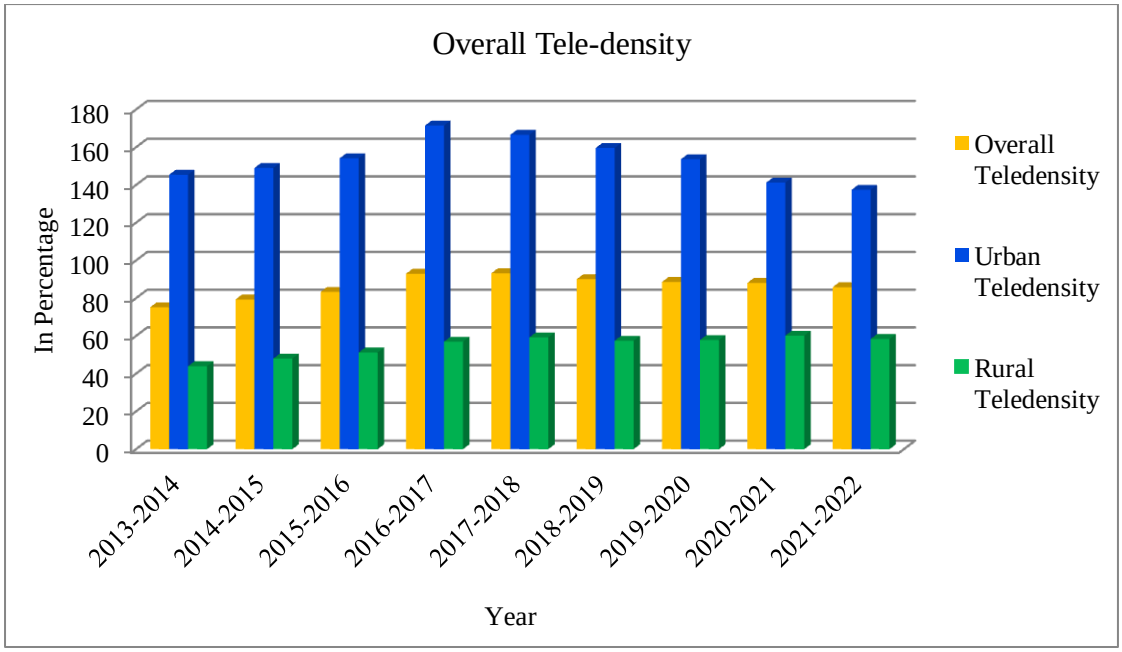
The data as reflected in dashboard pertaining to 2021 - 2022 revealed that majority of telephone subscriber's pertains to urban areas.

5.2.2.2 The overall teledensity as on December 31, 2021:

Table 5.2: Overall teledensity in India (nine years)

Year	Overall Teledensity	Urban Teledensity	Rural Teledensity
2013-2014	75.23	145.46	44.01
2014-2015	79.36	149.04	48.04
2015-2016	83.4	154.18	51.26
2016-2017	93.01	171.52	56.98
2017-2018	93.27	166.64	59.25
2018-2019	90.1	159.66	57.5
2019-2020	88.66	153.68	57.87
2020-2021	88.15	141.29	60.17
2021-2022	85.87	137.48	58.4

Source: https:// dot.dashboard.nic.in/DashboardF.aspx



Source: https://dot.dashboard.nic.in/DashboardF.aspx

Figure 5.3: Overall teledensity in India (nine years)

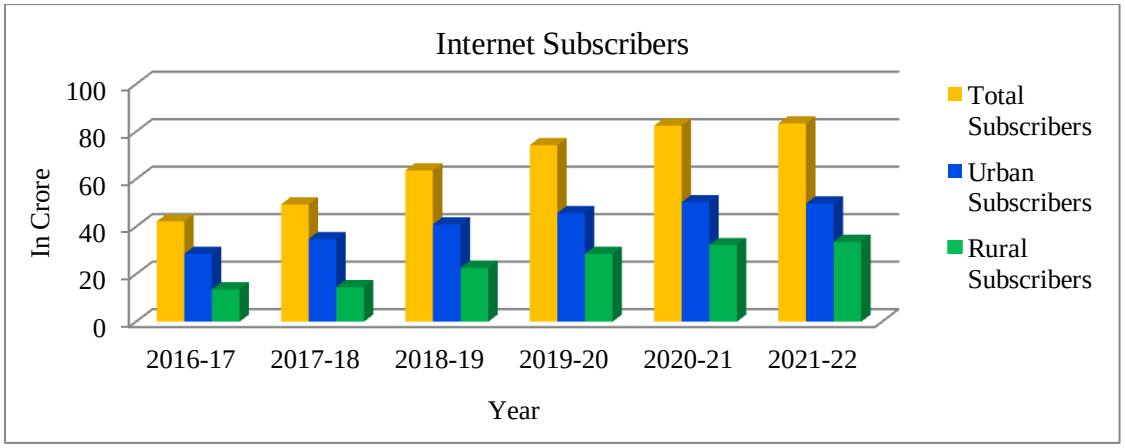
The latest data pertaining to 2021 - 2022 shows rural teledensity at 58.4 percentages which is way behind as compared to urban.

5.2.2.3 Overall internet subscribers as on September 30, 2021:

Table 5.3: Overall internet subscribers (six years)

Year	Total Subscribers	Urban Subscribers	Rural Subscribers
2016-17	42.218	28.568	13.652
2017-18	49.395	34.813	14.583
2018-19	63.673	40.972	22.701
2019-20	74.322	45.724	28.598
2020-21	82.53	50.253	32.277
2021-22	83.429	49.769	33.66

Source: https:// dot.dashboard.nic.in/DashboardF.aspx



Source: https://dot.dashboard.nic.in/DashboardF.aspx

Figure 5.4: Overall internet subscribers in India (six years)

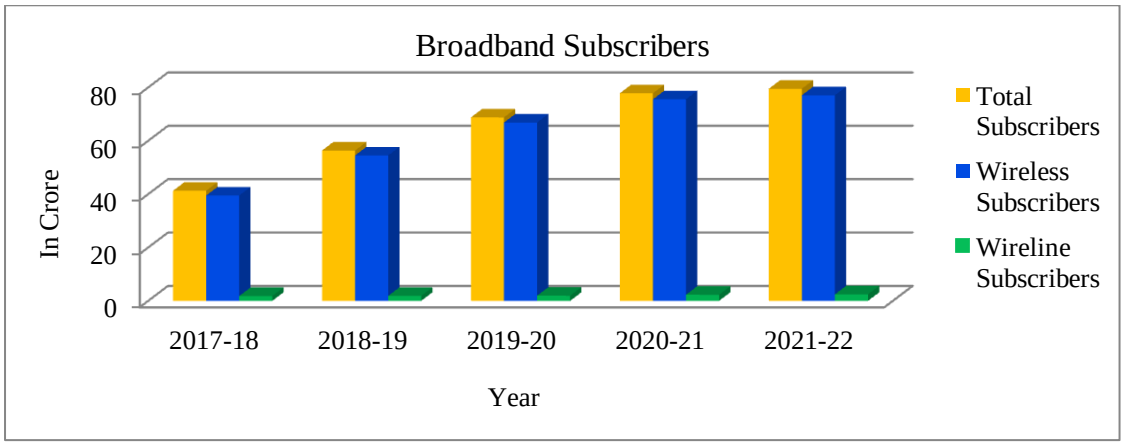
The rural internet subscriber contributes 40 percentages of total subscribers.

5.2.2.4 Overall Broadband subscribers as on September 30, 2021:

Table 5.4: Overall Broadband subscribers (four years)

Year	Total Subscribers	Wireless Subscribers	Wireline Subscribers
2017-18	41.26	39.465	1.795
2018-19	56.331	54.489	1.842
2019-20	68.744	66.826	1.918
2020-21	77.809	75.534	2.275

Source: https:// dot.dashboard.nic.in/DashboardF.aspx



Source: https://dot.dashboard.nic.in/DashboardF.aspx

Figure 5.5: Overall broadband subscribers in India (four years)

The overall broadband subscribers in India are increasing steadily on year to year basis.

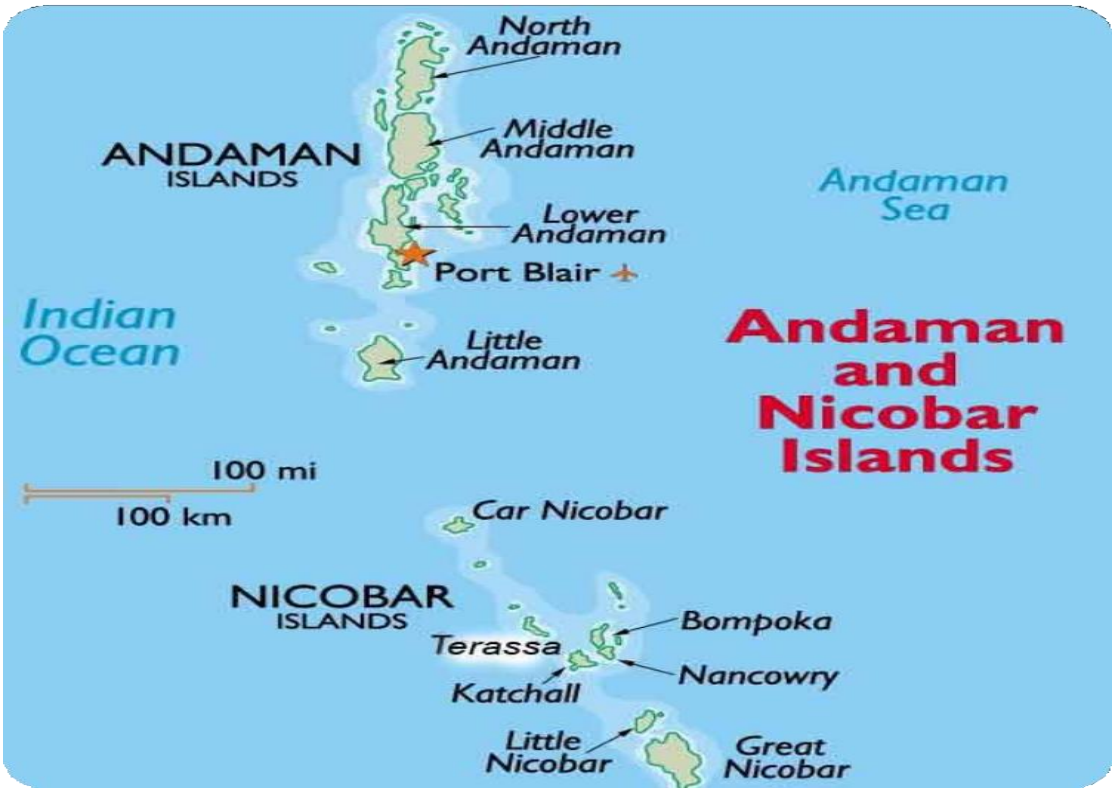
5.2.2.5 The study of above data on Telephone subscribers, Teledensity, Internet subscribers and Broadband subscribers established the fact that digital divide between rural and urban areas still exists.

5.3 About Andaman and Nicobar Islands

5.3.1 For India, the Islands; especially Andaman and Nicobar (ANI) and the Lakshadweep (LDI) are extremely crucial. The ANI and LDI chain protects India's eastern and western seaboards, respectively, due to its geological configuration and location in the Bay of Bengal and Arabian Sea. The provision of secure, dependable, resilient, and inexpensive telecom services in these islands is critical for the people who live there, as well as from a strategic standpoint for the entire country.

5.3.2.1 The Andaman and Nicobar Islands are India's largest Union Territory, spanning 800 kilometers from north to south in the Bay of Bengal's south-eastern corner between longitude 92 and 94 degrees east, latitude 60 and 140 degrees north. ANI is located in the Indian Ocean, near Indonesia and Thailand, in the southern portions of the Bay of Bengal. In the territory, there are 836 Islands/Islets/Rocky Outcrops, although only 38 are permanently inhabited, with ninety percent of the population lives in three islands; the North, Middle, and South Andaman[15].

[15] https://www.andaman.gov.in/



Source: http:// www.andaman.gov.in

Figure 5.6: Map of Andaman and Nicobar Islands

5.3.2.2 The Andaman Islands and the Nicobar Islands are two island groups that separate the Andaman Sea from the Indian Ocean to the east. They are separated by a 150-kilometer-long waterway known as the Ten Degree Channel and are near to the Malacca Strait, which carries one-third of all global sea traffic. When all of the land areas are added together, the total land area of ANI is roughly 8,249 sq. kilometers. The Andaman Islands have a total size of 6,408 sq. kilometers and the Nicobar Islands have a total area of 1,841 sq. kilometers. Natural disasters such as earthquakes and tsunamis are also common on these islands. The Andaman and Nicobar Islands are surrounded by emerald seas, lush green forests, mountains, picturesque splendor, unpolluted corals, quiet white sandy beaches, and a marine national park, all of which have contributed to making these islands one of the most magnificent tourist destinations in the world.

Table 5.5: Profile of ANI

Total Population	4,34,192 (estimated in 2019)
Total Area	8249 Sq. Km
Total Islands/Islets/Rocky Outcrops	836
Inhabited Islands	38
Districts	03
Tehsil	09
Municipal Council	01
Zilla Parishad	02
Gram Panchayat	70
Tribal Council	07
Tribal Village Council	52

Source: http:// www.andaman.gov.in

Table 5.6: Administrative set-up in ANI

No of Districts	**No of Sub-Districts**	**No of towns**		**No. of Villages**	
Urban	Rural	Statutory	Census	Total	Inhabited
3	9	1	4	555	398

Source: http:// www.andaman.gov.in

5.3.2.3 The Andamanese town of Port Blair serves as the territory's capital. Through the water route, Port Blair is roughly 1190 kilometers from Chennai and 1259 kilometers from Kolkata. Indira Point (in Great Nicobar Island) is the island's (and India's) southernmost point, located more than 1700 kilometers south of Chennai. It is here in Port Blair that all trade, commerce, administrative, and tourism activities are administered. Apart from serving as a gateway to the Andaman and Nicobar Islands and providing a visual treat with its natural beauty, Port Blair's particular contribution to the country's freedom movement cannot be overlooked. The capital of the Andaman and Nicobar Islands contains one airport, one large port, and several smaller ports. According to the 2011 census, the population of Port Blair was 108,058.

5.3.2.4 ANI groups of islands are strategically significant in terms of the country's defence. A few of foreign countries are closer to ANI than the Indian mainland. Indira Point, at the southernmost tip, is only 165 kilometers from Indonesia. The islands are

only 40 kilometers from Myanmar on the north. Thailand is only 500 kilometers away to the east. As previously stated, the distance from the mainland (Chennai/Kolkata) is more than 1200 kilometers.

5.3.2.5 Furthermore, according to the 2011 census, ANI has a total population of 380,581, with male and female populations of 202,871 and 177,710. The following table provide urban and rural population in ANI.

Table 5.7: Population profile of ANI

Population		
Urban	**Rural**	**Total**
143488	237093	380581

Source: http:// www.andaman.gov.in

As per 2011 census, the overall number of people residing in urban areas was 143,488 people, with 76,584 men and 66,904 women. Urban areas account for 37.70 percent of the overall population. In ANI, the average literacy rate for urban areas was 90.10 percent, with male literacy at 93.11 percent and female literacy at 74.57 percent. The Port Blair Municipal Council is the civic body for the capital city, providing all essential services such as parks, gardens, lighting, historical place monitoring, and clean environs to both locals and visitors.

5.3.2.6 The study of above data on Telephone subscribers, Teledensity, Internet subscribers and Broadband subscribers established the fact that digital divide still exists in India between rural and urban areas.

5.4 Digital divide in ANI

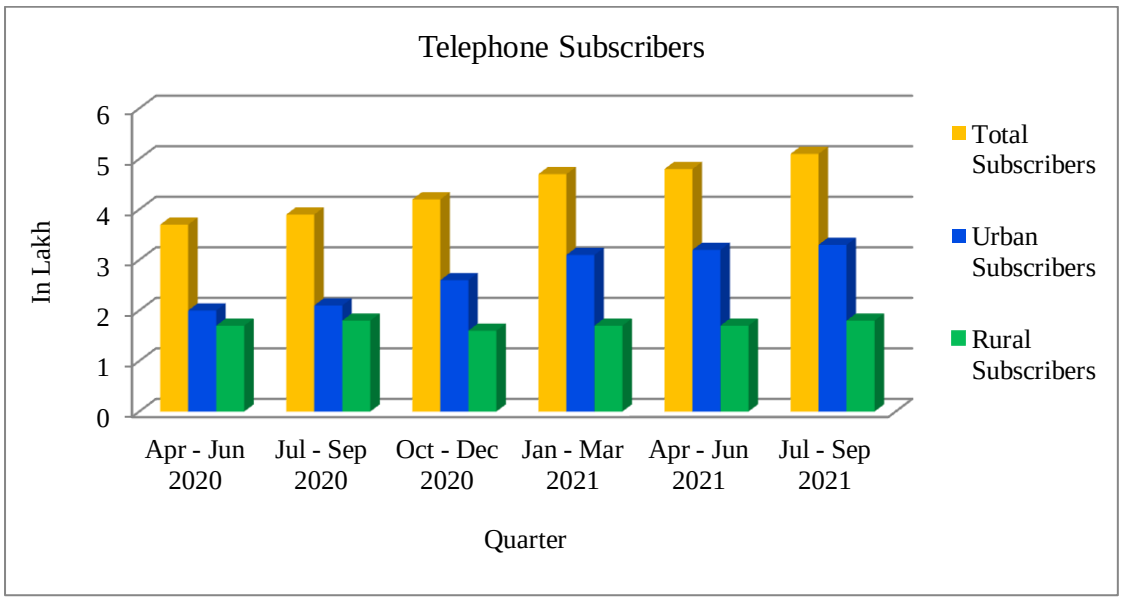
5.4.1 On a quarterly basis, TRAI monitors the Performance Indicator Report (PRI), which gives numerous indicators concerning the telecom sector in states and union territories. Since the CANI project began in August 2020, a comparison of PRI data on telephone subscribers and teledensity in ANI before and after CANI has been carried out.

5.4.2 The overall telephone subscribers in ANI as on September 30, 2021:

Table 5.8: Overall telephone subscribers in ANI (six quarters)

Quarter	Total Subscribers	Urban Subscribers	Rural Subscribers
Apr - Jun 2020	3.7	2.0	1.7
Jul - Sep 2020	3.9	2.1	1.8
Oct - Dec 2020	4.2	2.6	1.6
Jan - Mar 2021	4.7	3.1	1.7
Apr - Jun 2021	4.8	3.2	1.7
Jul - Sep 2021	5.1	3.3	1.8

Source: https://www.trai.gov.in/release-publication/reports/performance-indicators-reports



Source: https://www.trai.gov.in/release-publication/reports/performance-indicators-reports

Figure 5.7: Overall telephone subscribers in ANI (six quarters)

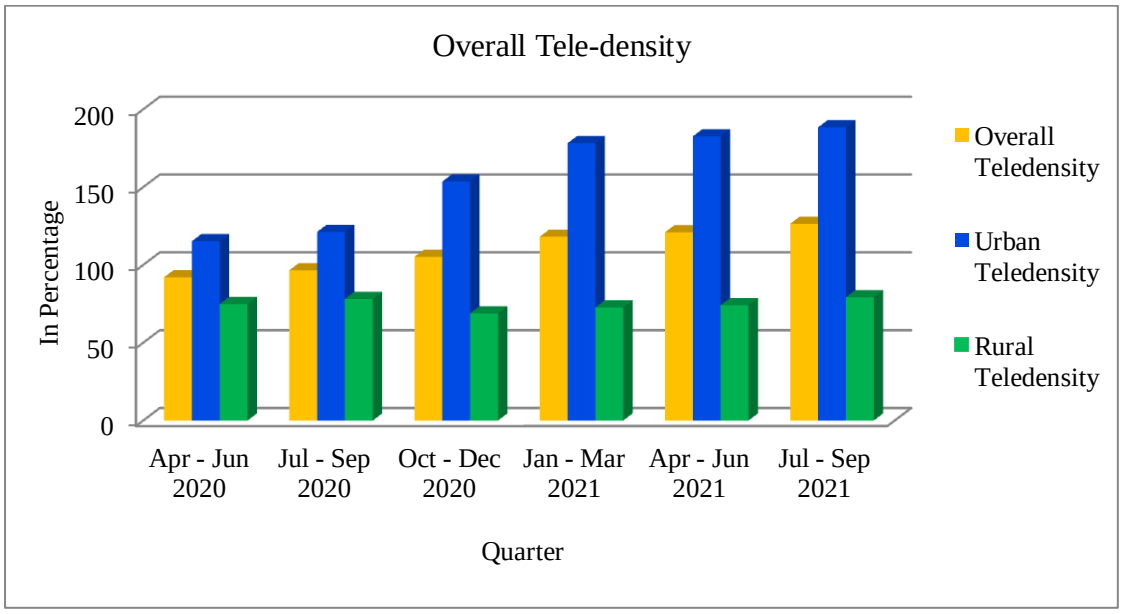
The above data revealed that rate of telephone subscription in ANI has increased after launching of CANI.

5.4.3 The overall teledensity in ANI as on September 30, 2021:

Table 5.9: Overall teledensity in ANI (six quarters)

Quarter	Overall Teledensity	Urban Teledensity	Rural Teledensity
Apr - Jun 2020	92.05	115.27	74.84
Jul - Sep 2020	96.59	121.26	78.18
Oct - Dec 2020	105.27	153.65	68.93
Jan - Mar 2021	118.17	178.29	72.74
Apr - Jun 2021	121.02	182.66	74.18
Jul - Sep 2021	126.51	188.47	79.18

Source: https://www.trai.gov.in/release-publication/reports/performance-indicators-reports



Source: https://www.trai.gov.in/release-publication/reports/performance-indicators-reports

Figure 5.8: Overall teledensity in ANI (six quarters)

The teledensity in ANI is increasing steadily after launching of CANI.

5.5 Major challenges in the development of telecom infrastructure in ANI

On January 7, 2014 DoT asked TRAI to make its recommendations on 'Augmentation/Revamping of Telecom Connectivity and Services in Union Territories of Andaman and Nicobar Islands and Lakshadweep Islands - Study regarding gap and investment required for formulation of a comprehensive telecom plan'. The regulator on July 22, 2014, presented its recommendations on 'Improving

Telecom Services in the Andaman and Nicobar Islands and the Lakshadweep Islands' to DoT. As per the report, the regulator stated following primary challenges in the development of telecom infrastructure in ANI.

5.5.1 Non availability of submarine cable: The lack of a submarine cable connecting these islands to the mainland is a major impediment to people of ANI receiving high-speed broadband and voice services.

5.5.2 High satellite bandwidth cost: Telecom communication with the mainland and between islands is through satellite. The cost of satellite bandwidth being very costly and its limited availability for ANI, makes it commercially unviable solution for delivering communication services on these islands. This is one of the key reasons why data services were only available in a few pockets and at a relatively slow speed.

5.5.3 Topographical challenges: In ANI, there is a coastline that stretches for 1962 kilometers. The islands span about 800 kilometers in length and cover an area of 8249 square kilometers. Only Port Blair has an aviation link with the rest of the country. Due to the restricted availability of means of transportation, getting from one island to another is difficult. Natural disasters such as earthquakes and marine disturbances are also common on these islands. The 2004 tsunami demonstrated the devastation of life and property caused by massive sea waves, particularly in the Nicobar Islands. Movement from the mainland, as well as between islands, is difficult.

5.5.4 Higher cost of infrastructure: Infrastructure development costs are substantially greater on the island than on the mainland. Transportation costs account for a major portion of the total cost of any infrastructure project. The majority of the labourers are transported in from the mainland to work. Material transportation is also difficult and expensive due to significant inter-island distances and the lack of jetty facilities on a few islands.

5.5.5 Lack of availability of power supply: Diesel generators provide the majority of the power. Power fluctuates frequently on several islands, and is only accessible for 12-18 hours. Additionally, there are several islands where diesel is not available. Providing diesel on these islands, where it is not supplied by the administration, is a major difficulty.

5.5.6 Other issues: Apart from the aforementioned difficulties, TSPs also has tough task for obtaining clearance from the Forest Department to conduct any operation on forest land is extremely tough. Obtaining land for the installation of telecom infrastructure is especially tedious because all tribal land is mostly owned by the local people rather than the government. The rates for Right of Way (ROW) in the Andaman and Nicobar Islands are on extremely higher side.

Due to the aforementioned obstacles, the development of telecom services in the islands has lagged behind that of the rest of the country. This is supported by the fact that, many villages lacks telecom service. Furthermore, even at district headquarters (DHQ), adequate bandwidth for high-speed broadband was not available due to a lack of sufficient transmission medium connectivity (OFC, Microwave, and Satellite). As a result, the disparity between the telecom infrastructure and service available on these islands and that available in other regions of the country was wide and obvious. This has resulted in huge digital divide in ANI.

5.6 Gap analysis and plan for improving telecom services and infrastructure

Voice is no longer the exclusive mode of communication. The NTP' 2012 has a vision of providing safe, dependable, cheap, and high-quality integrated communications services anytime, anywhere, for accelerated inclusive socio-economic growth. The regulator's goal, as stated in NTP' 2012, was to construct a robust, secure, and cutting-edge telecommunication network with seamless coverage

in ANI. TRAI therefore was of view that in order to meet the stated goals, the following telecom infrastructure was needed to be planned in these islands:

i. Sufficient bandwidth for broadband and e-governance services.

ii. 2G services in all habitation with population >100

iii. 3G services in all DHQs/SDHQs and towns

iv. Augmentation of 2G and 3G network in the towns/villages to improve coverage and traffic carrying capacity

v. Extending mobile coverage to entire National Highways

1.6.1 Proposed bandwidth:

Regulator was of the view that adequate bandwidth be made available in these islands for connectivity with the rest of the country in order to achieve the goal of 'Broadband on Demand' and ensure equitable and inclusive growth. In order to determine the future bandwidth requirements, the authority referred to its earlier recommendations on the "National Broadband Plan," published December 8, 2010. The authority calculated the amount of backhaul bandwidth required in these recommendations. In the National Broadband Policy, the authority recommended an internet target of 75 million broadband connections by 2012 and 160 million broadband connections by 2014. It predicted that by 2012 and 2014, broadband penetration will be 12 percent and 32 percent in villages, 39 percent and 80 percent in towns, and 64 percent and 130 percent in cities. It was also recommended that, in order to successfully fulfill broadband requirements for heavy bandwidth applications, a minimum of 2 Mbps bandwidth per home would be required by 2012, and 4 Mbps per household would be necessary by 2014.

However broadband penetration was almost non-existent in ANI, owing to a reliance solely on satellite media for outside access. Broadband penetration was well below

projections even in the rest of the country. As a result, projections for ANI bandwidth requirements were based on the earlier recommendation, namely the availability of 2 Mbps bandwidth per household with projected penetration of 12 percent, 39 percent, and 64 percent in villages, towns, and cities, respectively. As a result, the anticipated backhaul requirement of 55.66 Gbps was calculated for ANI.

5.6.2 Reliable mode of connectivity to link ANI with mainland

5.6.2.1 ANI is separated from the mainland by more than 1200 km. As a result, only submarine cable and satellite media were viable for providing telecom access to these islands. The pros and cons of both solutions were discussed by regulator.

5.6.2.2 As there was no submarine cable connection between ANI and mainland, satellite was the only means of communication to these islands. However, because of the high expense of satellite bandwidth charges, there was a practical limit to the amount of bandwidth that can be delivered by satellite. Furthermore, satellites footprints on these islands are in scarce supply. Due to the limited availability and high cost of satellite bandwidth, TSPs were unable to deploy cutting-edge technology that provides high-speed data services on a financially sustainable basis. Although increasing satellite bandwidth would have provided a short-term respite but submarine OFC was the only viable medium-and long-term solution. In light of these events, the regulator was of the opinion that installing submarine cable is the most important component for boosting ANI’s telecom access.

5.6.2.3 Due to their tough geography, ANI was trailing behind in terms of telecom infrastructure development. A fundamental barrier in providing data services was a lack of bandwidth, which is a requirement for providing quality healthcare, education, banking and other host of services to the public, as well as for society's inclusive progress in general. Furthermore, the islands' important geo-position necessitates

reliable telecommunication connectivity. During natural disasters and crises, the lack of a strong and dependable communication network with the mainland has been felt.

5.6.2.4 Providing connectivity to these islands, not only with the mainland but also between islands, was a major problem. With a population of roughly 3.80 lakh distributed across various islands, delivering telecom services to all of them was not a commercially viable proposition for TSPs. This is supported by the fact that not all TSPs with licenses have begun services on these islands. Even the TSPs that have built networks on these islands are focused only around the capitals/district headquarters/larger islands. Even BSNL, which has a presence on a number of islands, is hesitant to expand its network to all of the populated islands/villages because such activities are commercially unviable. The viability of any TSP operations in these islands was previously harmed by high satellite expenses. The problem has been exacerbated by the sharp increase in satellite transponder charges.

5.6.2.5 Given the foregoing, the telecom regulator was of the opinion that the government should intervene and use the USO funds to augment and improve telecom infrastructure and connectivity in the Union Territory of ANI.

5.7 Steps taken by USOF: The government implemented a two-pronged strategy advocated by TRAI in its 2014 recommendations, which included extending undersea cable from the mainland to the islands. On August 10, 2020, the submarine cable connecting the mainland to the Andaman and Nicobar Islands was launched and is now operational. The Union Cabinet also approved the Provision of Submarine Optical Fibre Cable Connectivity between the Mainland (Kochi) and the Lakshadweep Islands (KLI project), which will cover a total of 11 islands at a cost of Rs. 1072 crore (including operational expenses) over five years.

The actual findings of the primary survey are discussed in the following chapter.

6. Findings and Conclusions

6.1 Introduction

The role of the USOF in "Bridging the Digital Divide in India particularly in the ANI" has been validated through primary survey and findings of the same have been presented in this chapter. It contains responses of respondents of Port Blair in understanding the role played by USOF in bridging the digital divide in the ANI. Further it also contains the responses of officials in USOF who are solely responsible for implementation of schemes in ANI in regards to difficulties and challenges. It goes on to make recommendations for improving the USOF's role in bridging the digital divide in India, notably in the ANI.

The goal of this research was to look into the role of the USOF in bridging India's digital divide. Due to a lack of time, the research was confined to the role of the USOF in bridging the digital divide particularly in the ANI. The regulators' recommendations for improving the telecom network in islands were also studied, as were the impediments in improving the telecom network in islands, as well as ways to improve the role of the USOF in bridging the digital divide in India.

6.2 Methodology

Two distinct survey tools were created, one for citizens of Port Blair, ANI and the other for USOF officers who are dealing with implementation of USOF schemes in the ANI.

First set of survey tool was prepared to understand the “Role of USOF in bridging digital divide particularly in ANI”. The primary data has been collected using survey method as follows. The initial survey tool for respondents of Port Blair was prepared

using Google forms, and respondents were asked to fill it out online. In order to improve ANI's telecom connectivity, the USOF funded the CANI submarine optical fibre cable project, which laid an undersea cable connecting Port Blair, Swaraj Dweep, Long Island, Rangat, Little Andaman, Kamorta, Car Nicobar, and Great Nicobar with Chennai. The project was dedicated to the nation in August 10, 2020. The questions were simple statements on whether the CANI project helped ANI improve its broadband connectivity. Participants were asked to express their opinion using a negative or affirmative response or a multiple choice response.

The second survey tool, which focused on the issues and challenges of USOF schemes implementation, was distributed using email to senior USOF officials in charge of policy, planning, and implementation of USOF activities, particularly in ANI. Simple statements were requested about USOF activities, particularly in ANI, and whether they are assisting in bridging the digital divide. Participants were asked to express their thoughts using negative or affirmative responses or multiple choice questions, as well as information about USOF plans.

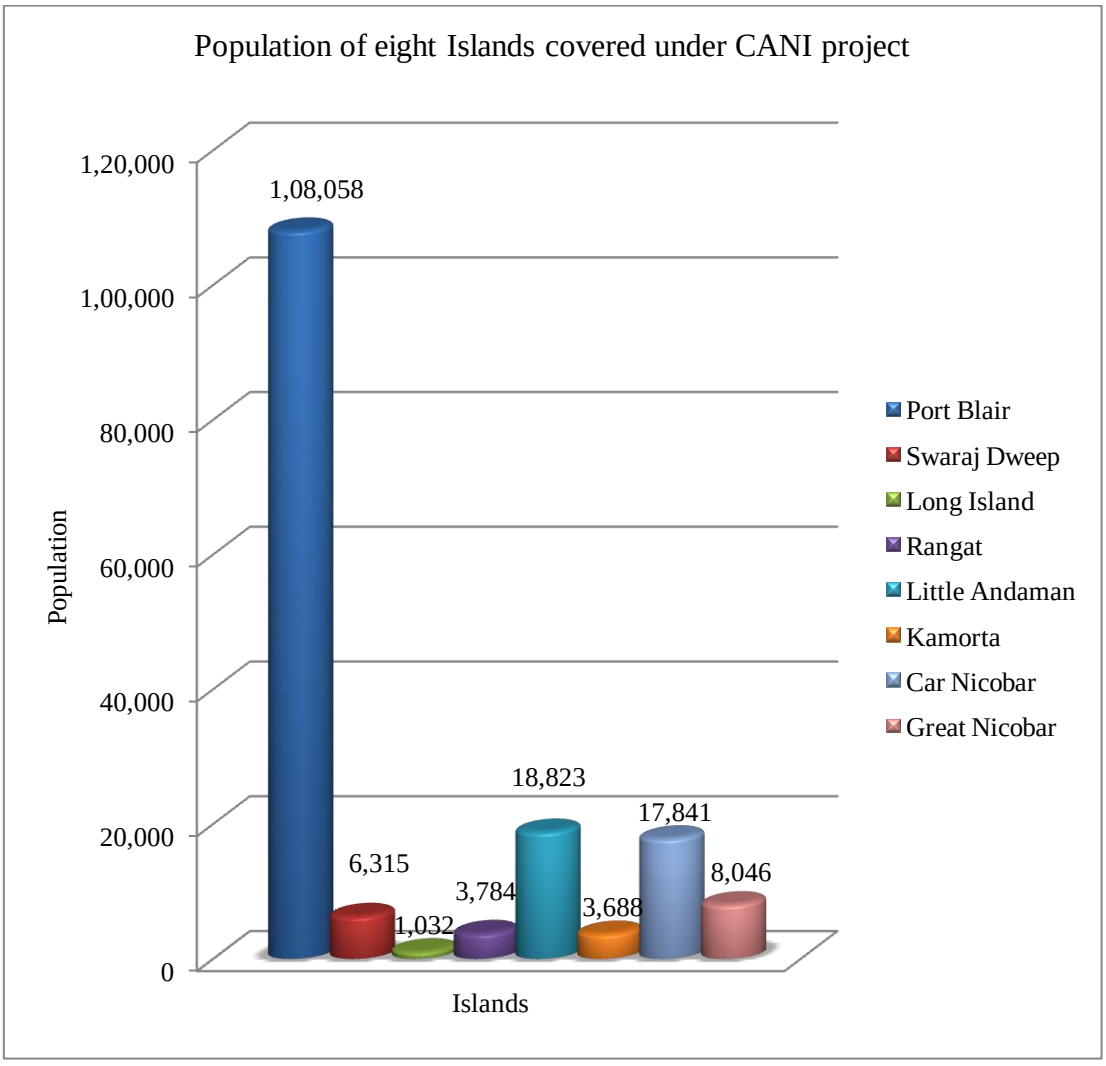
6.3 Choice of Port Blair to study role of USOF in bridging the digital divide in ANI

As can be seen in the schematic of the CANI project (refer figure 3.8), an undersea submarine OFC has been laid from Chennai to Port Blair and further to seven other islands. According to the 2011 census, the population of these eight islands connected by CANI is as follows:

Table 6.1: Population of islands covered under CANI project

Island	Population
Port Blair	108,058
Swaraj Dweep	6,315
Long Island	1,032
Rangat	3,784
Little Andaman	18,823
Kamorta	3,688
Car Nicobar	17,841
Great Nicobar	8,046

Source: http:// www.andaman.gov.in



Source: http:// www.andaman.gov.in

Figure 6.1: Population of Islands covered under CANI project

Even though the submarine optical fibre cable through CANI project has reached over eight islands in ANI, the author chose Port Blair for an online survey as it is the capital of ANI and all trade, commerce, administrative, tourism activities etc. are concentrated here. Further population wise, Port Blair represents around 30 percent of total population of ANI and approximately 65 percent of population out of eight islands where submarine cable has reached.

6.4 Response analysis

6.4.1 Understand the role of USOF in bridging digital divide in ANI

This section examines the reactions of respondents in order to better understand the function of the USOF in bridging the Andaman and Nicobar Islands' digital divide. ANI's internet services were only available through satellite until August 9, 2020, with a total capacity of 3.5 Gbps. However, after the launch of CANI project, 200 Gbps of bandwidth has been made available between Port Blair and Chennai, as well as 100 Gbps between eight islands. This created bandwidth has been provided to DoT licensees such as TSPs and Internet Service Providers (ISPs) which in turn benefit them to improve their network. According to data provide by USOF, CANI's current bandwidth usage is 43 Gbps, representing a tenfold increase in bandwidth availability prior to August 10, 2020. In today’s world, internet services through broadband connectivity are essential for various purposes to citizens. It was attempted to obtain the perspectives of persons who are direct beneficiaries of broadband services which are provided through the USOF’s CANI project.

Therefore a total of 100 identified respondents of Port Blair who use broadband services were asked to give their feedback. The online survey received 89 valid responses out of a total of 100 identified respondents. The study's primary data comes from these 89 valid responses (out of 100 total), or 89 percent of the total respondents

who were asked to comment.

While analyzing replies data obtained through survey questionnaire sent to a targeted community, it was discovered that the majority of the respondents (89 percent) responded in a way that established the USOF's key role in bridging digital divides, both directly and indirectly (*Are you presently using internet?*). There is no reason to infer that individuals who did not participate in the survey instrument are different from those who did, based on the responses of 89 people who took part in the study. The data yielded simple descriptive statistics, which are detailed in the following paragraphs.

In an increasingly knowledge driven globalised society where voice, video, data, internet, and wideband multimedia services are necessary, telecommunication has emerged as a significant engine of economic and social progress over the last two decades.

The COVID-19 epidemic has demonstrated that, as compared to actual travel, the government and private enterprises, including the general public, rely more on the use of broadband connectivity for engagement. It is expected to live in an environment that enables socializing and economic pursuits while minimizing human touch in the post-pandemic period. Broadband's ubiquitous availability and use has both economic and social implications. Indeed telecom and internet connectivity now plays an increasingly significant role in daily life of masses.

Further for successful implementation of the government of India's digital economy goals, a robust, dependable, low latency, and high-speed broadband infrastructure is required. Sensor networks, the Internet of Things, big data, machine learning, automation, Intelligent Transportation Systems, and artificial intelligence all rely

heavily on cloud services and internet connectivity. A high-speed broadband infrastructure establishes an enabling environment and lays the groundwork for the development of new technologies, applications, services, and businesses.

The researcher framed questions covering the areas related to possible improvement in internet services after commissioning of CANI project. The survey tool, in the form of Google form was circulated to the respondents of Port Blair is placed at Appendix C.

The findings of the survey are as follows.

6.4.1.1 Out of the 89 valid respondents, 77 disclosed their identities. Further it was found that 100 percent respondents are presently using the internet out of which 91 percent were using it before to August 2020, i.e. before launch of the submarine cable project.

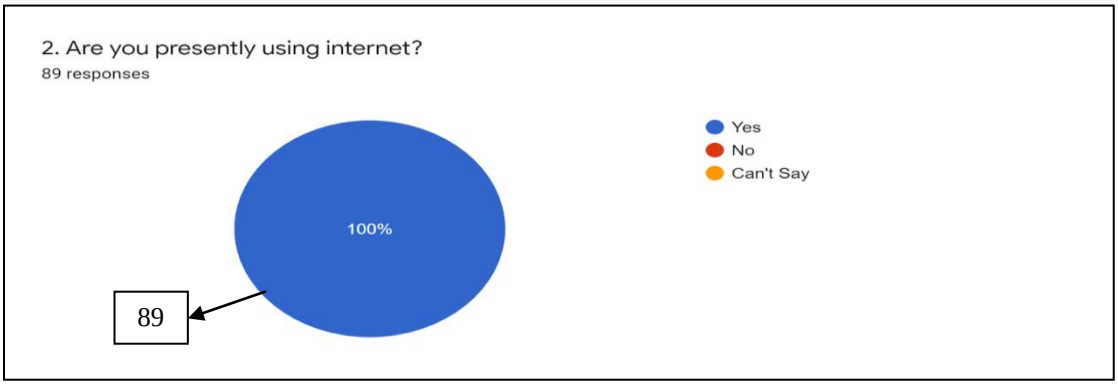


Figure 6.2: Response to whether presently using internet

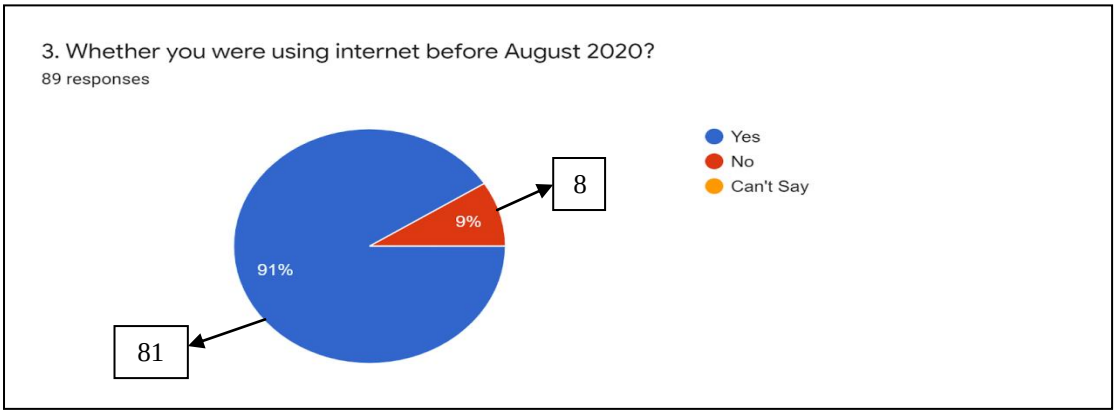


Figure 6.3: Response to whether using internet before August 2020

6.4.1.2 Despite the fact that the USOF funds several projects which ultimately help to bridge the digital divide in India's remote and rural areas, it is usually presumed that most of the grass root beneficiaries are unaware of this. However this primary study reveals to the contrary that majority of valid respondents (88 out of 89) were aware that undersea submarine optical fibre project has been funded by government.

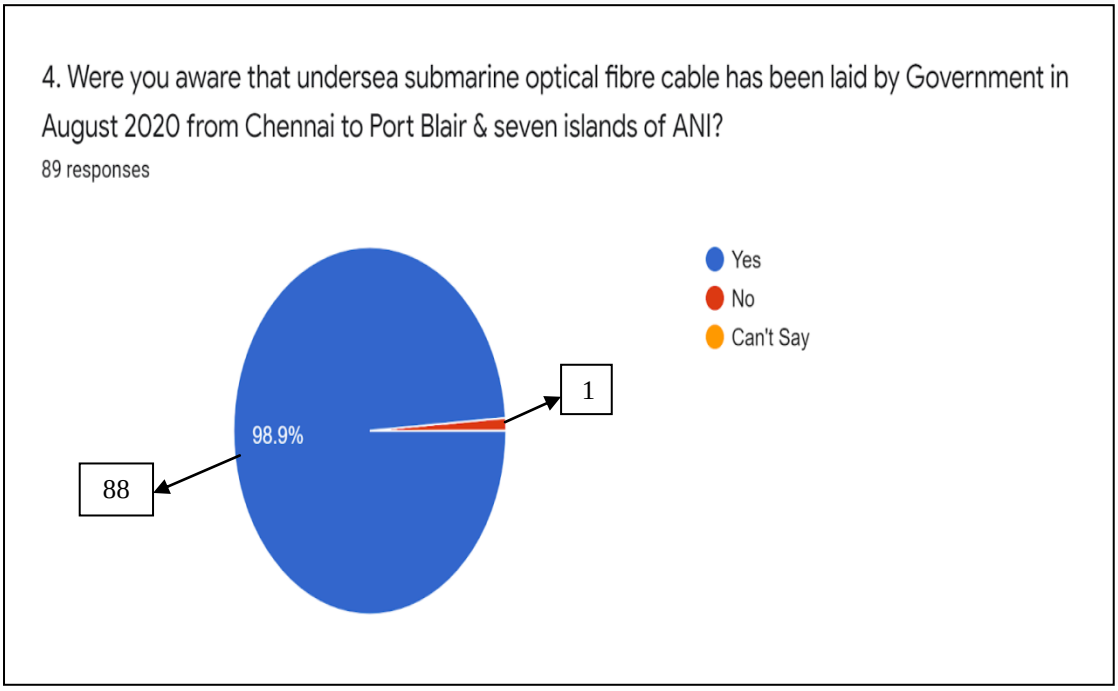


Figure 6.4: Awareness about funding of CANI project by Government

6.4.1.3 ANI's internet services were only available through satellite until August 9, 2020, with a total capacity of 3.5 Gbps. However, after the launch of CANI project, 200 Gbps of bandwidth has been made available between Port Blair and Chennai, as well as 100 Gbps between eight islands. According data provided by USOF, CANI's current bandwidth usage is 43 Gbps, representing a tenfold increase in bandwidth availability. In order to assess the impact of increased bandwidth, respondents have been asked about improvements in internet connectivity after August 2020. Majority of valid respondents (86 out of 89) opined that current internet connectivity has improved since August 2020.

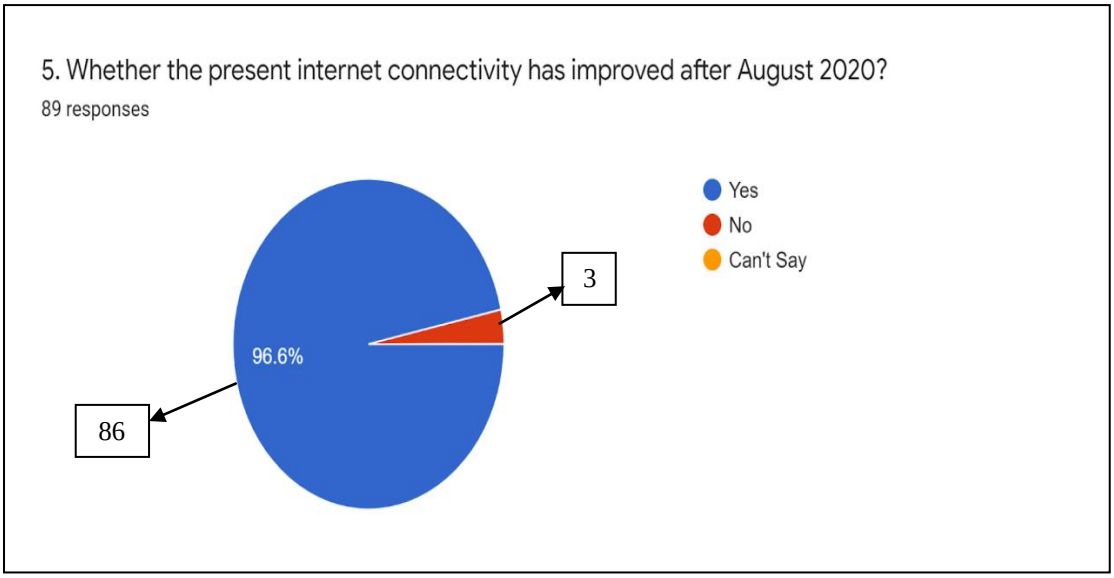


Figure 6.5: Improvement in the internet connectivity after August 2020

6.4.1.4 The main aim of the CANI project is to provide sufficient bandwidth between mainland and ANI to TSPs and ISPs to improve their services. One of the aspects of primary survey has been to get the opinion of respondents' whether improved connectivity actually helped aided/assisted people of ANI. It is evident from the response that majority of valid respondents (81 out of 89) had asserted that that improved connectivity has helped them.

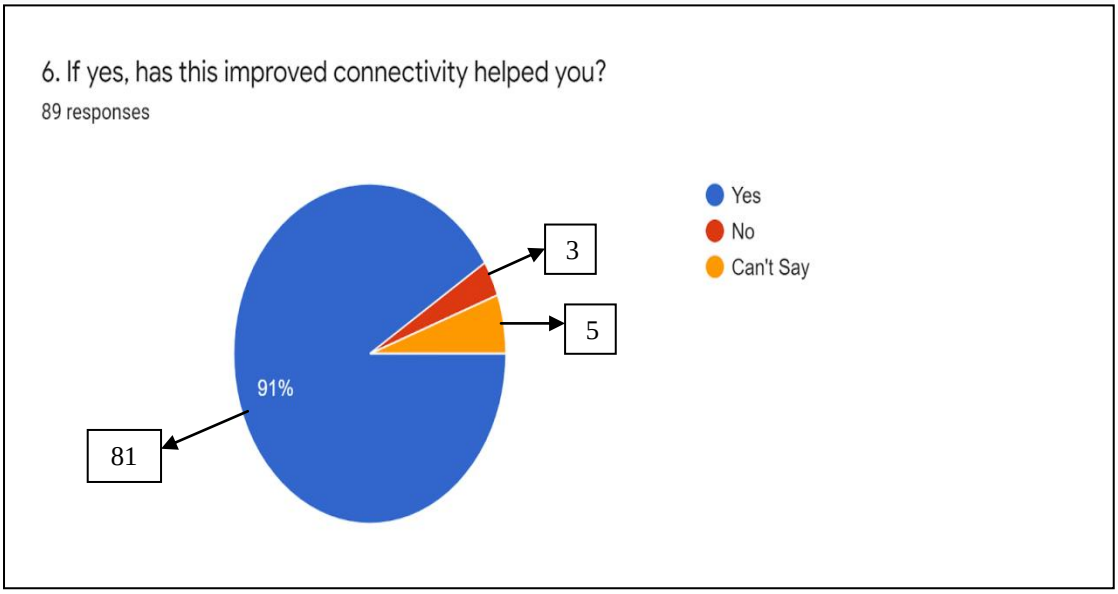


Figure 6.6: Response to whether improved connectivity helped the people of ANI

6.4.1.5 However, to stay neutral in research, it was asked if the target group has no direct benefit from the increased connectivity. The summarised response has been tabulated as below.

Table 6.2: Response analysis of 'Whether the target group has no direct benefit from the increased connectivity'

Response	Number	Percentage
Yes	26	29.2 %
No	31	34.8 %
Can't say	22	24.7 %
Not Applicable	01	1.1 %
Very beneficial to islanders	01	1.1 %
It has helped	01	1.1 %
We are still in 3G	01	1.1 %
Internet speed needs to be increased	01	1.1 %
Need more improvement towards speed	01	1.1 %
Improved and benefitted to the citizens of ANI	01	1.1 %
Not Applicable	01	1.1 %
CANI is game changer project in ANI	01	1.1 %
Still needs lot of improvement	01	1.1 %

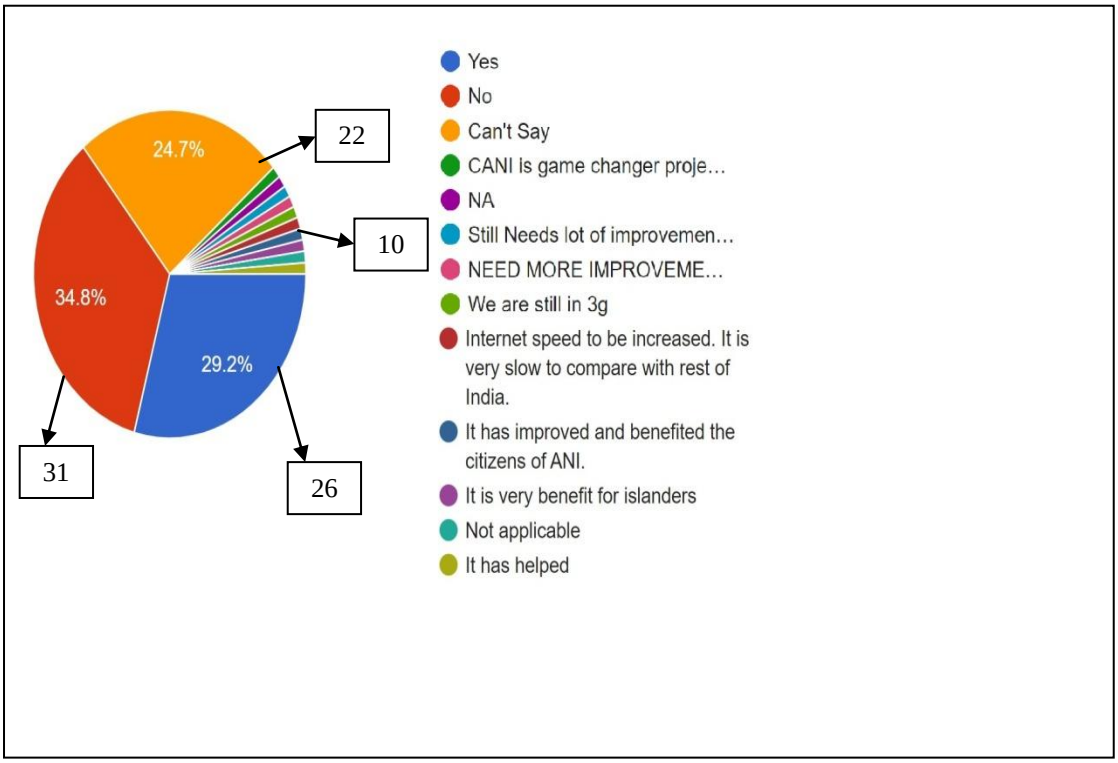


Figure 6.7: Response to whether benefitted from the increased connectivity

As seen from above, the definite responses are Yes (26), No (31) and Can't Say (22). The other responses (8) are summarized in three categories as below.

Table 6.3: Summary of other eight responses

Response	Number	Percentage
Not Applicable	2	2.2 %
Beneficial to islanders	4	4.4 %
Internet speed needs improvement	4	4.4 %

Hence it is evident from the response that majority of valid respondents 37 (31+2+4) out of 89 are of opinion that they are benefited from the increased connectivity.

6.4.1.6 In order to determine how improved internet / broadband connectivity has benefited the residents of ANI, survey was carried out on whether it helped access to global information, local governance, education, health etc, social communication (VC, e-mail, social media) or otherwise. It is evident from the response that majority of valid respondents (83 out of 89) revealed that it has has benefited them.

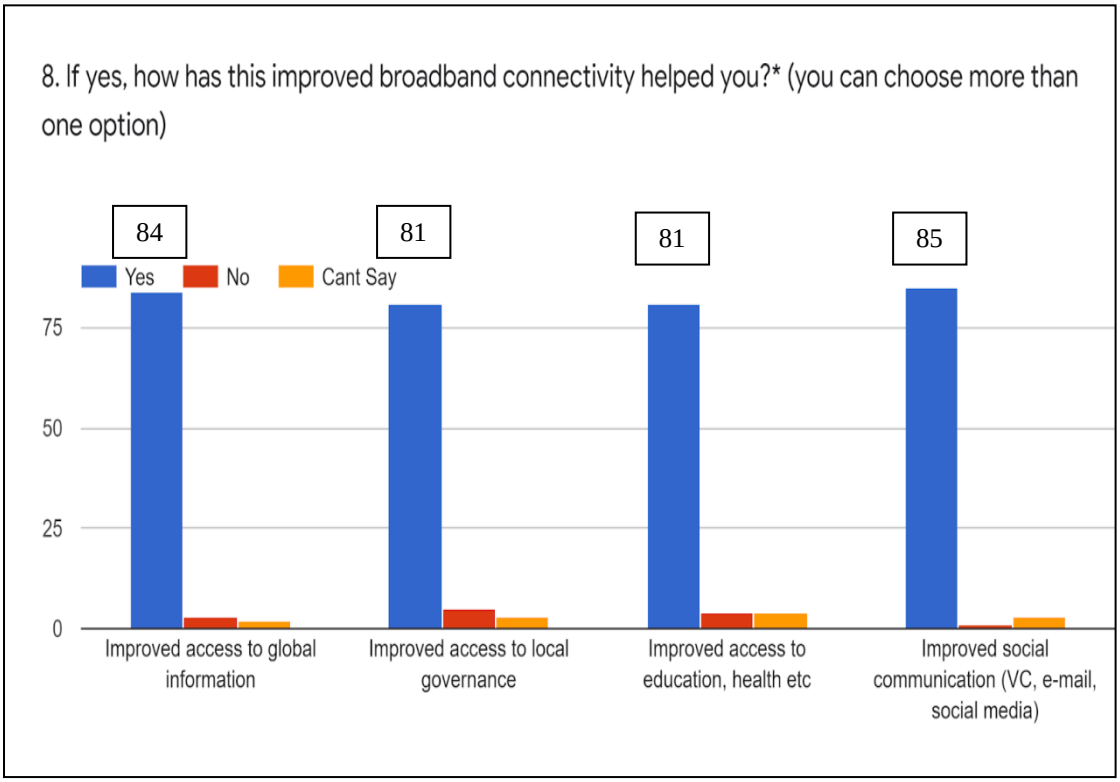


Figure 6.8: Response to benefit of improved broadband connectivity

Apart from framed survey questionnaire, respondents were requested to their give comments, if any (optional).

6.4.1.7 The respondents have given varied remarks which have been broadly categorized below:

a. **Comments on Bridging Digital Divide**: The telecommunication to ANI has been using satellite before commissioning of CANI submarine cable. This move has sufficiently contributed to bridge the digital divide as is clear from the responses listed verbatim herewith:

   i. *Now the internet services are at par with mainland India.*

   ii. *Helped in bridging the digital divide.*

   iii. *Submarine connectivity to remaining islands such as Shaheed Dweep (Neil), Katchal, Teressa Islands may be made. This will further reduce digital divide amongst islanders.*

b. **Comments on effective delivery of e-services**: In today's world most of the customer interaction including governmental are through e-services which requires broadband connection with suitable speed. The availability of bandwidth through CANI has significantly improved internet and broadband services in ANI. The remarks of respondents prove the same.

   i. *Citizens can now apply for any online e-services.*

   ii. *Due to submarine cable network we get stable connection.*

   iii. *Submarine Cable (CANI) project has made a sea change in access to broadband internet and improved voice quality thereby enabled islanders to avail all the benefits of using internet at par with main land public.*

iv. *It is observed that it has contributed in ease of business, GST return filling, email correspondence, online payments, online shopping, conduct of online classes and enhanced entertainment and social interaction among general public.*

v. *This connectivity has also helped Andaman administration to deal with Covid pandemic and vaccination drive effective. In summary, CANI project has proven to be great fortune in the life of islanders.*

c. **Comments on improved accessibility / connectivity**: The CANI submarine has provided connectivity of ANI with mainland with the bandwidth of 200 Gbps between Port Blair to Chennai and 100 Gbps among islands. The respondents also commented on accessibility / connectivity as follows.

i. *The submarine cable project has remarkably improved accessibility to internet.*

ii. *Improved the connectivity.*

iii. *Post undersea cable project, we are now digitally connected and accessed to internet at par with any part of the mainland.*

iv. *The speed is quite appreciable and after laying of submarine under-sea cable, the connectivity has definitely improved and the islanders are beneficial in all ways.*

v. *Improved connectivity helping all.*

vi. *Yes CANI has improved the connectivity of ANI with other areas.*

vii. *Happy with the CANI OFC project.*

viii. *Overall good improvement in connectivity*

d. **Comments on improved lifestyle**: Broadband has major impact on economic and social development, including income growth and community resilience.

Broadband is the enabling force for software development, disseminating e-agriculture and e-health information, distance learning and mobile money and establishing mechanisms to provide early warning of natural and man-made disasters. In nutshell it enhances lifestyle. Some comments of the respondents are listed below.

i. *FTTH connection improved the life style of islanders.*
ii. *Submarine cable has changed our life style in a positive direction.*
iii. *Children are able to attend uninterrupted Online Classes*

e. **Comments on accessibility to internet**: Internet accessibility have the power to accelerate greater inclusion by improving quality and efficiency of services and benefits reaching unto the target beneficiaries of remote villages, transforming communities, delivering healthcare in ways never imagined, opening doors to education, employment and income opportunities, creating smarter cities, empowering people with the tools they need to thrive and driving a more sustainable planet. The respondents also commented on internet after launch of CANI submarine cable.

i. *Now it is good to use internet.*
ii. *After commissioning of CANI, the internet bandwidth is improved.*
iii. *The internet has improved a lot as compared before the CANI.*
iv. *Now the broadband connection has good speed.*

From the replies above, it is clear that the majority respondents (83 out of 89 valid respondents) believe that the commissioning of the undersea cable in August 2020 by USOF has helped in bridging improved connectivity, digital divide, internet accessibility, e-services, lifestyle and more significantly broadband services.

6.4.2 Identify the issues and challenges of USOF implementation in ANI

This section examines the response to survey questionnaire emailed to senior USOF officials in charge of policy, planning, and implementation of USOF activities, particularly in ANI. These experts from USOF were requested to express their thoughts using negative or affirmative responses or multiple choice questions, as well as information about USOF plans. The survey questionnaire was emailed to Director, Dy. Director General and Administrator USOF dealing with the USOF implementation particularly in ANI and placed at Appendix D, Appendix E and Appendix F respectively. Except Administrator, Director and Dy. Director General USOF responded to the survey questionnaire.

The author framed questions covering the areas related to USOF schemes initiated along with status of schemes implemented particularly in ANI and opinion whether these schemes improved broadband connectivity helped in bridging digital divide particularly in ANI.

6.4.2.1 Survey questionnaire for Director, USOF

1. In response to question regarding number of schemes initiated by USOF in ANI, the officer provided following information.

(i) BharatNet : Fiber to the GP's being done by BBNL through ITI.
(ii) CANI Submarine OFC cable project completed. Installed submarine OFC cable between Chennai and Port Blair along with other seven islands of ANI.
(iii) 4G mobile towers for uncovered villages and along the National Highway.
(iv) Increase of satellite bandwidth from 2 Gbps to 4 Gbps.

Apart from above the officer submitted list of schemes as follows which are under consideration

(v) Upgradation of BSNL telecom infrastructure 2G to 4G and new towers, OFC for FTTH.

(vi) Redundancy of submarine cable to ANI

(vii) Inter-island submarine cable connectivity.

(viii) Redistribution of VSAT as per UT requirements.

2. In response question on status of USOF projects in ANI, the officer informed about implementation of CANI submarine cable project and up-gradation of satellite bandwidth. He further informed that BharatNet project for connecting GPs with OFC and provision of 4G mobile services in uncovered villages and along national highway in ANI are under implementation.

3. The officer opined that above schemes have definitely helped in bridging digital divide in ANI.

4. In response another query, the officer reported that improved internet connectivity has benefited the residents of ANI to access to global information and social communication (VC, e-mail, social media).

5. The officer specifically remarked that the bandwidth usage in ANI has increased from 3.5 Gbps to 43 Gbps after launch of CANI submarine cable project.

6.4.2.2 Survey questionnaire for Dy. Director General, USOF

1. In response to question regarding various schemes initiated by USOF for improvements of telecom services in rural and remote parts of India, the officer provided the detailed information as per Appendix G.

2. In query regarding number of schemes initiated by USOF in ANI, the officer provided the officer provided following information.

Andaman and Nicobar Islands:

i. *Provision of Submarine Optical Fibre Connectivity between Mainland India (Chennai) and Andaman and Nicobar Islands (Port Blair and seven other Islands, namely, Swaraj Deep (Havelock), Long Island, Rangat, Little Andaman (Hutbay), Kamorta, Car Nicobar and Great Nicobar (Campbell Bay)*
ii. *Augmentation of Satellite Bandwidth from 260 Mbps to 1 Gbps, 1 Gbps to 2 Gbps and 2 Gbps to 4 Gbps*
iii. *Augmentation of Intra-Island Optical Fibre Network in North, Middle and South Andaman Islands by terrestrial Optical Fibre Cable along NH-4 (Erstwhile NH-223)*
iv. *Provision of 4G Mobile Services in identified 85 uncovered villages by setting up 82 mobile tower sites and seamless mobile coverage along NH-4 (Erstwhile NH-223) by setting up 42 mobile tower sites*

Lakshadweep Islands:

i. *Provision of Submarine Optical Fibre Cable Connectivity between Mainland (Kochi) and Lakshadweep Islands (KLI project) comprising of Kavarati and ten other Islands, namely, Kalpeni, Agatti, Amini, Androth, Minicoy, Bangaram, Bitra, Chetlat, Kiltan and Kadmat.*
ii. *Augmentation of Satellite Bandwidth from 102 Mbps to 318 Mbps and 318 Mbps to 1.71 Gbps*
iii. *Provision of 2G Mobile Services using EDGE Technology by setting up 10 Mobile Tower Sites*

The officer further intimated that in addition to above, the following schemes have also been planned/ are being planned for implementation

i. *Gram Panchayats in these Islands are being provided Broadband Connectivity under BharatNet project through Satellite VSAT and Optical Fibre, wherever feasible.*
ii. *Upgradation of existing 19 Tower Sites for 2G Mobile Services and installation of additional 17 New Mobile Tower Sites for provision of 4G Mobile Services and creation of OFC Network for provision of FTTH in Lakshadweep Islands by BSNL*

iii. *Upgradation of existing BSNL Tower Sites for 2G Mobile Services for provision of 4G Mobile Services in Andaman and Nicobar Islands by BSNL*

iv. *Provision of redundancy for Submarine Optical Fibre Connectivity for Andaman and Nicobar Islands (CANI project) by connecting Andaman and Nicobar Islands with Digha (Kolkata)*

v. *Provision of Submarine Optical Fibre Connectivity for Diglipur, Shaheed Dweep (Erstwhile Neil Island), Katchall, Teressa, Chowra, Nancowary and Little Nicobar Island under CANI project as per request of Andaman and Nicobar UT Administration*

vi. *Extension of Existing Submarine OFC Connectivity between Chennai and Andaman and Nicobar Islands to Singapore*

3. In response to query on current status of schemes implemented by USOF in ANI, the officer provided the current status of various schemes.

4. The officer is of the opinion that these above schemes have definitely helped in bridging digital divide in ANI.

5. In response another query, the officer reported that improved internet connectivity has benefited the residents of ANI to access to global information, local governance, education, health etc and social communication (VC, e-mail, social media).

6.5 Conclusions

The USOF has launched a number of initiatives in India's distant and rural areas that will undoubtedly help in bridging the digital divide. In ANI, adequate bandwidth has been made available following the completion of the CANI submarine optical fibre cable project. In addition, a project to provide 4G mobile service in underserved communities and seamless 4G mobile coverage along National Highway 223 in the Andaman and Nicobar Islands will aid in further bridging the digital gap. Other USOF initiatives in India's remote and rural areas are also in progress. The emergence of COVID-19 pandemic has impacted all corners of the globe, as well as all

demographic groups and economic sectors. The poorest and most vulnerable people in the world are the ones who suffered the most. The pandemic has also hampered the completion of many USOF projects.

In this pandemic era, broadband connectivity has become a need and an equalizer for everyone. Individuals and businesses are becoming increasingly reliant on Work from Home (WFH), video conferencing, social networking, cloud services, and other technologies. From tele-education to tele-health, individuals, institutions, businesses, and governments are increasingly relying on broadband for a variety of services. For routine and 'mission-mode' initiatives, governments and businesses have become more reliant on and require high-quality broadband connections. To bring people together and close the digital divide, a strong internet infrastructure is essential across the country.

As a result of the primary and secondary data analysis, it can be determined that USOF is assisting in bridging the digital divide in India, notably in ANI. The same has been established through a review of the literature. However, simply implementing USOF initiatives will not guarantee that the digital divide will be bridged in its entirety, as there are other aspects in the ecosystem that must be streamlined as well.

6.6 Summary of findings:

Summarizing, primary survey had been administered using two distinct survey questionnaires; one for respondents of Port Blair and the other for USOF officers dealing with implementation of schemes in the ANI. After analyzing the output, it could be affirmed that USOF has not just played a key role in providing telecom services in rural and remote parts of India which in turn has helped in bridging digital divide. These findings of primary survey were in resonance with secondary data.

7. Recommendations

7.1 Based on findings and observations gleaned from both primary and secondary survey, the key recommendations are presented in this section - categorized through a conceptual framework, abbreviated as TELOS framework. It is pertinent to mention here that one set of literature (How to Conduct a TELOS Feasibility Study[16]) has expanded TELOS as Technical, Economical, Legal, Operational/ Organizational and Scheduling. However, there is another set of literature that has represented 'S' as Social'. The former refers to the adherence to project schedules whereas the second refers to the social aspect of the project/ phenomenon under consideration. Since, both have been found relevant in the present study, therefore the researcher is going ahead with both 'S' viz. referring to project schedules as well as the societal impact. Therefore, in this study the convential TELOS gets represented as TELOSS, as detailed with attributes for each of these six factors.

(i) Technical Factors - The study of technical aspects with attributes such as what technology is needed, whether necessary technology is available, and if it will work as expected.

(ii) Economic Factors - The study of economic aspects includes study of existing funding models, financial governance, financial capabilities, expenditure incurred, cost benefits analysis etc.

(iii) Legal Factors - The legal aspects of study encompass analysis of all the regulations/ compliances, policy frameworks, legal infrastructure to resolve the related issues etc.

[16] https://www.mindtools.com/pages/article/telos.htm

(iv) Operational and Organisational Factors - These factors include the functioning of the ecosystem, methodology, organisational structure, right strategy etc.

(v) Scheduling Factors - This essentially includes timelines and whether the implementing team is aware of it.

(vi) Social Factors - This aspect that tries to analyse the socio-cultural context of technology implementation on the society.

7.2 There are various factors which contribute to digital divide which impede the growth of telecom services in rural and remote parts of India. Following recommendations, relating to role of USOF, role of TSPs and more importantly policy interventions, are made to address the impediments in bridging digital divide in India.

1. Technical factor

   (i) In today's world, technology and services evolve at such a rapid pace that no one can accurately predict how and when new technology will evolve. Hence USOF must encourage technology neutral/ agnostic approach in service deployment for bridging digital divide.

   (ii) Accordingly, the USOF must finalize most suitable technology for a particular scheme. Before choosing technology, it must ensure its working in similar ecosystem.

2. Economic factor

   (i) The USOF must continue with its present Viability Gap Funding (VGF) funding model as same is working fine.

   (ii) The USOF must regularly publish data on utilization of funds including collection, disbursal and balance.

(iii) Before preparing the project or scheme, USOF must carry out cost benefit analysis.

(iv) Islands being rural and distant parts of India need special attention in development of basic telecommunications infrastructure such as submarine OFC to connect with mainland, OFC network within islands, provision of mobile services in uncovered villages etc. As these are capital incentive but non-profitable projects, USO funds must be utilized for supporting these projects which in turn will help to bridge digital divide gap.

(v) In order to ensure efficient use of funds, periodic audit of the USOF projects/schemes must be carried out.

3. Legal factor

(i) The Universal Service Obligation Fund was established by an Act of Parliament and hence must follow all the rules and regulations including regulatory framework.

(ii) The USOF projects are generally implemented by TSPs who are bound by conditions of licenses issued by DoT to them. However USOF while entering agreement for implementation of specific projects must ensure that it covers all aspects related to timely completion of the project.

4. Organizational factor

(i) The USO fund founded primarily to connect unconnected need to be utilized to bridge digital divide gap in India

(ii) The Universal Service Obligation Fund is administered by the Administrator appointed by the Central Government. As USOF has undertaken several projects which in turn help in bridging digital divide. Hence these projects

must be monitored regularly by Administrator for completion as per timelines.

(iii) Administrator USOF must look into entire ecosystem to bridge digital divide in India.

(iv) USOF must carry out impact analysis of completed projects/schemes and incorporate recommendations in its future schemes.

(v) USOF must undertake project to connect the remaining left out inhabited islands in ANI on submarine cable to bridge digital divide.

(vi) In CANI project, submarine OFC has been laid in linear mode. Hence in order to provide the redundancy to the existing cable, USOF must fund project/scheme to establish the same on priority basis.

(vii) Projects/schemes need to be rolled out by USOF so as minimize digital divide gap.

(viii) With CANI project, eight islands are now connected with mainland and sufficient bandwidth has been made available for use by TSPs/ISPs. However the TSPs/ISPs have still not augmented their network in these islands to extend benefits to customers. Therefore DoT must ask TSPs / ISPs to take undertake steps to augment their telecom network and services in ANI.

5. Scheduling factor

(i) The USOF must monitor all the ongoing projects for its timely completion. This will definitely help in bridging digital divide.

(ii) The work on of provision 4G mobile services in uncovered villages and

seamless 4G mobile coverage along NH 223 in ANI is under progress. This project is very important as it provides mobile in coverage in uncovered villages and along National Highway. Hence USOF must aim to finish this project as per timelines.

6. Social factor

(i) The USOF must carry out social audit of the implemented schemes periodically to verify whether it has achieved its objective of connecting unconnected. This will definitely help in bridging digital divide in rural and remote parts of India.

(ii) USOF must encourage funding of pilot projects for efficient utilization of created infrastructure for benefit of society at large. The successful projects can be implemented on Pan India basis.

(iii) The BharatNet project connecting 2.5 lakh Gram Panchayats and 6 lakh villages on optical fibre network connectivity is paving way for digital superhighway in rural and remote parts of country. Therefore USOF must complete the project in time bound manner which will eventually help to bridge digital divide.

7.3 Conclusive remarks

Access to the Internet and Broadband has become important, prompting the government and industry to prioritise the development of its infrastructure. To accelerate internet and broadband penetration in rural and remote parts of India, the Department of Telecom (DoT) envisions a state-of-the-art, future-proof fibre optic network in rural India by phasing in BharatNet, the national optical fibre network project that connects all 2,50,000 Gram Panchayats. This has now been expanded to

include 6 lakh villages around the country. Furthermore, the government is taking a number of steps to raise digital awareness, and it is digitising its service offerings to ensure fast, dependable, and effective service delivery, as well as to boost digital literacy to bridge the digital divide.

The USOF is playing a vital role in bridging the digital divide in India, notably in the islands. The islands of Andaman and Nicobar, as well as Lakshadweep, are vital to India's national security. As a result, providing secure, trustworthy, robust, and affordable communication services in these islands is vital for the entire country.

The TELOSS learning's have highlighted a few important points. The USOF and TSPs have a significant role in bridging the digital divide in India, particularly in Andaman and Nicobar Islands. The study also underlines the importance of the USOF in bridging the digital divide gap particularly in islands. As a result, timely completion of USOF projects / schemes is critical for country.

7.4 Limitations of the study

Due to time and scope paucity, the researcher is severely constrained in his effort towards this study. The study, like the tip of an iceberg, can be viewed as an introduction to the topic for those interested in learning more about the role of the USOF in bridging the digital divide gap in India. The research is focused on ANI, which might be expanded to include a number of other missing components in India's broad digital divide scenario.

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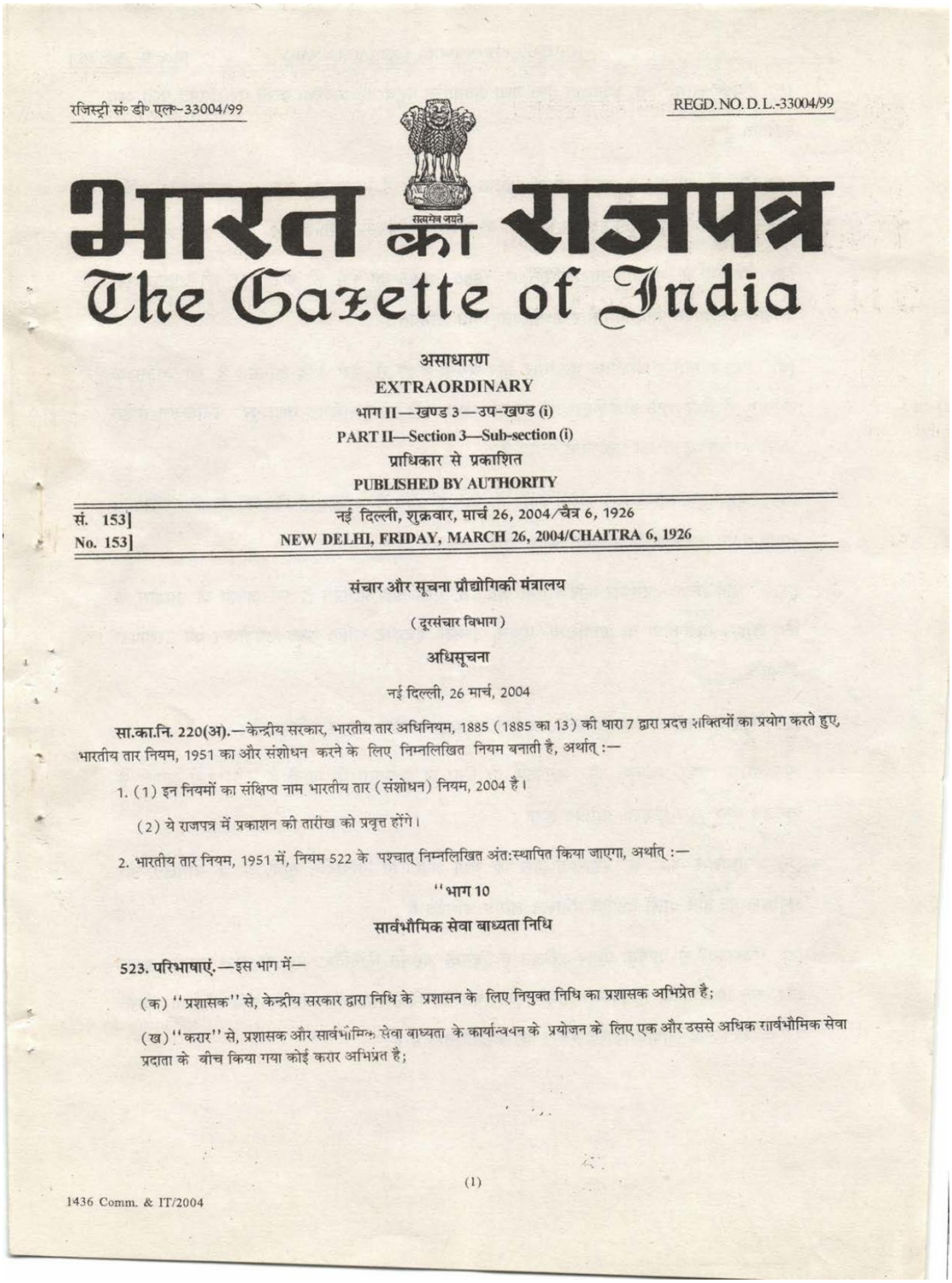
9. APPENDIX

Appendix A

DoT gazette notification regarding Indian Telegraph (Amendment) Rules, published on March 26, 2004



रजिस्ट्री सं० डी० एल०-33004/99 REGD. NO. D. L.-33004/99

सत्यमेव जयते

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II—खण्ड 3—उप-खण्ड (i)
PART II—Section 3—Sub-section (i)
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 153] नई दिल्ली, शुक्रवार, मार्च 26, 2004/चैत्र 6, 1926
No. 153] NEW DELHI, FRIDAY, MARCH 26, 2004/CHAITRA 6, 1926

संचार और सूचना प्रौद्योगिकी मंत्रालय

(दूरसंचार विभाग)

अधिसूचना

नई दिल्ली, 26 मार्च, 2004

सा.का.नि. 220(अ).—केन्द्रीय सरकार, भारतीय तार अधिनियम, 1885 (1885 का 13) की धारा 7 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारतीय तार नियम, 1951 का और संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात् :—

1. (1) इन नियमों का संक्षिप्त नाम भारतीय तार (संशोधन) नियम, 2004 है।

(2) ये राजपत्र में प्रकाशन की तारीख को प्रवृत्त होंगे।

2. भारतीय तार नियम, 1951 में, नियम 522 के पश्चात् निम्नलिखित अंत:स्थापित किया जाएगा, अर्थात् :—

"भाग 10

सार्वभौमिक सेवा बाध्यता निधि

523. परिभाषाएं.—इस भाग में—

(क) "प्रशासक" से, केन्द्रीय सरकार द्वारा निधि के प्रशासन के लिए नियुक्त निधि का प्रशासक अभिप्रेत है;

(ख) "करार" से, प्रशासक और सार्वभौमिक सेवा बाध्यता के कार्यान्वयन के प्रयोजन के लिए एक और उससे अधिक सार्वभौमिक सेवा प्रदाता के बीच किया गया कोई करार अभिप्रेत है;

(1)

1436 Comm. & IT/2004

MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY

(Department of Telecommunications)

NOTIFICATION

New Delhi, the 26th March, 2004

G.S.R. 220(E).— In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (13 of 1885), the Central Government hereby makes the following rules further to amend the Indian Telegraph Rules, 1951, namely:-

1. (1) These rules may be called the Indian Telegraph (Amendment) Rules, 2004.

   (2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Indian Telegraph Rules, 1951, after rule 522, the following shall be inserted, namely;

'PART-X

UNIVERSAL SERVICE OBLIGATION FUND

523. Definitions. – In this part -

(a) "Administrator" means the Administrator of the Fund appointed by the Central Government for the administration of the Fund;

(b) "Agreement" means an agreement made between the Administrator and one and more of the Universal Service Provider for the purpose of implementation of Universal Service Obligation;

(c) "Capital Cost" means the capital expenditure incurred on providing access as may be determined by the Administrator;

(d) "Capital Recovery" means the aggregate of depreciation, interest on debt and return on equity on the capital cost annualized over a period of seven years;

1024 GI/04-3

(e) "Fund" means the Universal Service Obligation Fund established under sub section (1) of section 9A of the Indian Telegraph Act, 1885 (13 of 1885);

(f) "High Speed Public Telecom and Information Centre" means a centre which offers additional facilities including tele-education and tele-medicine at a minimum data speed of 128 Kbps, for use by public;

(g) "Multi Access Radio Relay Technology" means a technology used for providing telephone services;

(h) "Public Telecom and Information Centre" means a centre which offers data applications including FAX, e-mail, internet besides voice telephony, for use by the Public;

(i) "Net Cost" means Operating Expenses plus Capital Recovery minus Revenue;

Explanation.- Where support is to be extended towards Operation and Maintenance only, Net Cost shall mean Operating Expenses minus Revenue;

(j) "Operating Expenses" means the annual Operating Cost incurred on operation and maintenance of the specified facilities as may be determined by the Administrator;

(k) "Revenue" means the annual charges including usage charge and applicable rental from the specified Service, without any deduction of any kind whatsoever except taxes relating to the specified Service, if any, paid to the Government;

(l) "Secondary Switching Area" means the area in which the country is divided by the Telegraph Authority, and is co-terminus with a Long Distance Charging Area;

(m) "Universal Service Obligation" means the obligation to provide access to basic telegraph services to people in the rural and remote areas at affordable and reasonable prices;

(n) "Universal Service Provider" means the person who has entered into an Agreement with the Administrator for the purpose of implementation of Universal Service Obligation;

(o) "Village Public Telephone" means the first public telephone installed in a village.

524. Administration of the Universal Service Obligation Fund. – The Administrator shall have powers to, -

(i) formulate bidding procedures including its terms and conditions for the purposes of implementation of Universal Service Obligation;

(ii) evaluate the bids called for the purposes of implementation of Universal Service Obligation;

(iii) enter into Agreement with the Universal Service Provider for the purposes of implementation of Universal Service Obligation;

(iv) settle the claim of Universal Service Provider after due verification, and make disbursements accordingly from the Fund;

(v) specify relevant formats, procedures and records to be maintained and furnished by the Universal Service Provider;

(vi) monitor the performance of the Universal Service Provider as per the procedure specified by him from time to time.

525. Scope of support from Universal Service Obligation Fund. - (1) Financial Support from the Fund shall be provided to meet the Net Cost of providing the specified Universal Service Obligation as per the procedure specified by the Administrator from time to time, and the period for which such support shall be provided and the services covered shall be governed by an Agreement entered into with the Universal Service Provider.

(2) The following services shall be supported by the Fund, namely:-

(i) **Stream-I: Provision of Public Telecom and Information Services -**

(a) **Operation and Maintenance of Village Public Telephone in the revenue villages identified as per Census 1991 and Installation of Village Public Telephone in the additional revenue villages as per Census 2001.-** For installation of Village Public Telephone in the revenue villages, identified as per 1991 Census, only the Operating Expenses and Revenue shall be taken into account for determining the Net Cost. For the additional revenue villages identified as per 2001 Census, Capital Recovery in addition shall also be taken into account for determining the Net Cost:

Provided that in the case of the Village Public Telephone which are still to be installed in the villages identified as per Census 1991, Capital Recovery shall also be taken into account while determining the Net Cost;

(b) **Provision of additional rural community phones in areas after achieving the target of one Village Public Telephone in every revenue village.-** Where in a village the population is more than 2000 and no public call office is existing, a second public phone shall be installed and for the purposes of determining the Net Cost, Capital Recovery, Operating Expenses and Revenue shall be taken into account;

(c) **Replacement of Multi Access Radio Relay Technology Village Public Telephone installed before 1st day of April 2002.-** Capital Recovery, Operating Expenses and Revenue shall be taken into account for determining the Net Cost.

(d) **Up-gradation of a Public Telephone to Public Tele Information Centres.-** The data transmission facilities shall be provided within 5 Kms. of a village with a population exceeding 2000, preferably in those villages where post offices are

located and the Capital Recovery only towards provision of customer premises equipment; namely, Computer, Uninterrupted Power Supply and Modem, Operating Expenses and Revenue shall be taken into account to determine the Net Cost.

(e) **Installation of High Speed Public Telecom Information Centres** in a public place at Block Headquarters and in villages with a population exceeding 2000 shall be made in a phased manner. Capital Recovery towards customer premises equipment as in the case of Public Telecom Information Centres, and required access as well as Operating Expenses and Revenue shall be taken into account to determine the Net Cost.

Note. - Unless otherwise specified by the Central Government , the Secondary Switching Area shall be taken as a unit for the purpose of arriving at the Net Cost for activities specified in items (a) to (e) of stream I.

(ii) **Stream-II – Provision of household telephones in rural and remote areas as may be determined by the Central Government from time to time:**

(a) For household Direct Exchange Lines installed prior to 1st day of April, 2002, the difference in rental actually charged from rural subscribers and rent prescribed by Telecom Regulatory Authority of India for such subscribers shall be reimbursed until such time the Access Deficit Charges prescribed by Telecom Regulatory Authority of India from time to time take into account such difference.

(b) For household Direct Exchange Lines installed after 1st day of April, 2002, Capital Recovery, Operational Expenses and Revenue shall be taken into account to determine the Net Cost.

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Note. - Unless otherwise specified by the Central Government, the Short Distance Charging Area shall be taken as a unit for the purpose of arriving at the Net Cost for activities specified in item (b) of Stream II.

526. Criteria for selection of Universal Service Provider. – The selection of the Universal Service Provider shall be made by a bidding process from amongst the eligible operators , except for household Direct Exchange Lines referred to in item (a) of clause (ii) of sub-rule (2) of rule 525 and the Agreement signed as a result of the bidding process shall not be treated as grant of fresh license under the Indian Telegraph Act, 1885 (13 of 1885).

Explanation.- For the purposes of this rule, "eligible operators" means the Basic Service Operators, Cellular Mobile Service Providers and Unified Access Services Licencees or any other entities as may be specified in this behalf by the Central Government from time to time.

527. Release of Funds to Universal Service Providers. – Fund shall be released to the Universal Service Provider in a manner and at such intervals as may be specified in the Agreement.'

[No. 30-1/2004-LF]
P. K. SINHA, Director, (LF)

~~Department of Telecommunications~~

FOOTNOTE:— The principal rules have been published in the Post & Telegraph Manual Volume I. Legislative Enactments, Part II, Edition. These have subsequently been amended as under:-

1.GSR 190 dt. 18-2-1984
2.GSR 386(E) dt. 22-5-1984
3.GSR 387 (E) dt. 22-5-1984
4.GSR 679 dt. 30-6-1984
5.GSR 428 dt. 27-4-1985
6.GSR 729 dt. 3-8-1985
28. GSR 606 dt. 14-7-1988
29. GSR 812 (E) dt. 26-7-1988
30. GSR 888 (E) dt. 1-9-1988
31. GSR 907 (E) dt. 7-9-1988
32. GSR 916 (E) dt. 9-9-1988
33. GSR 1054 (E) dt. 2-11-1988

7.GSR 982 dt. 19-10-1985
8.GSR 553 (E) dt. 27-3-1986
9.GSR 314 dt 26-4-1986
10.GSR 566 dt. 26-7-1986
11.GSR 953 (E) dt. 23-7-1986
12.GSR1121 (E) dt. 1-10-1986
13.GSR 1167 (E) dt. 28-10-1986
14. GSR 1237 (E) 28-11-1986
15. GSR 49 dt. 17-1-1987
16. GSR 112(E) dt. 25-2-1987
17. GSR 377 (E) dt. 9-4-1987
18. GSR 674 (E) dt. 27-7-1987
19. GSR 719 (E) dt.18-8-1987
20. GSR 837 (E) dt. 5-10-1987
21. GSR 989 (E) dt. 17-12-1987
22. GSR 337 (E) dt. 11-3-1988
23. GSR 361 (E) dt. 21-3-1988
24. GSR 626 (E) dt. 17-5-1988
25. GSR 660 (E) dt. 31-5-1988
26. GSR 693 (E) dt. 10-6-1988
27. GSR 734 (E) dt. 24-6-1988
34. GSR 179 dt. 18-3-1989
35. GSR 358 (E) dt. 15-3-1989
36. GSR 622 (E) dt. 15-6-1989
37. GSR 865 (E) dt. 29-9-1989
38. GSR 413 (E) dt. 29-3-1990
39. GSR 574 (E) dt. 15-6-1990
40. GSR 933 (E) dt. 3-12-1990
41. GSR 985 (E) dt. 20-12-1990
42. GSR 74 dt. 18-1-1991
43. GSR 237 (E) dt. 25-4-1991
44. GSR 251 (E) dt. 2-5-1991
45. GSR 543 (E) dt. 21-5-1992
46. GSR 560 (E) dt. 26-5-1992
47. GSR 587 (E) dt. 10-6-1992
48. GSR 730 (E) dt. 19-8-1992
49. GSR 830 (E) dt. 28-10-1992
50. GSR 62 (E) dt. 11-2-1993
51. GSR 80 dt. 6-2-1993
52. GSR 384 (E) dt. 27-4-1993
53. GSR 387 (E) dt. 28-4-1993

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and Published by the Controller of Publications, Delhi-110054.

Appendix B

DoT gazette notification regarding Indian Telegraph (Amendment) Rules, published on November 17, 2006

रजिस्ट्री सं० डी० एल०-33004/99

REGD. NO. D.L.-33004/99

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY

भाग II—खण्ड 3—उप-खण्ड (i)
PART II—Section 3—Sub-section (i)

प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं. 560] नई दिल्ली, शुक्रवार, नवम्बर 17, 2006/कार्तिक 26, 1928
No. 560] NEW DELHI, FRIDAY, NOVEMBER 17, 2006/KARTIKA 26, 1928

संचार और सूचना प्रौद्योगिकी मंत्रालय

(दूर संचार विभाग)

अधिसूचना

नई दिल्ली, 17 नवम्बर, 2006

सा.का.नि. 713(अ).– केन्द्रीय सरकार, भारतीय तार अधिनियम, 1885 (1885 का 13) की धारा 7 द्वारा प्रदत्त शक्तियों का प्रयोग करते हुए, भारतीय तार नियम, 1951 का और संशोधन करने के लिए निम्नलिखित नियम बनाती है, अर्थात् :-

1. (1) इन नियमों का संक्षिप्त नाम भारतीय तार (संशोधन) नियम, 2006 है ।

(2) ये राजपत्र में इनके प्रकाशन की तारीख को प्रवृत्त होंगे ।

2. भारतीय तार नियम, 1951 (जिन्हें इसमें इसके पश्चात् उक्त नियम कहा गया है) के नियम 523 में, -

(क) खंड (क) के पश्चात् निम्नलिखित खंड अंतःस्थापित किया जाएगा, अर्थात् :-

' (ख) " ब्रॉड बैंड संयोजन" से ऑलवेज-ऑन डाटा संयोजन अभिप्रेत है जो इंटरनेट पहुंच सहित पारस्परिक प्रभाव रखने वाली सेवाओं की सहायता करने के लिए समर्थ है और केन्द्रीय सरकार द्वारा समय-समय पर यथाविहित न्यूनतम डाउनलोड गति की क्षमता रखता है ;';

(ख) खंड (घ) के स्थान पर निम्नलिखित खंड रखा जाएगा, अर्थात् :-

' (घ) " पूंजी वसूली" से ऐसी अवधि में जिसके लिए निधि से सहायता उपलब्ध कराई

MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY

(Department of Telecommunications)

NOTIFICATION

New Delhi, the 17th November, 2006

G.S.R. 713(E).— In exercise of the powers conferred by section 7 of the Indian Telegraph Act, 1885 (13 of 1885), the Central Government hereby makes the following rules to further amend the Indian Telegraph Rules, 1951, namely:—

1. (1) These rules may be called the Indian Telegraph (Amendment) Rules, 2006.

(2) They shall come into force on the date of their publication in the Official Gazette.

2. In the Indian Telegraph Rules,1951 (hereinafter referred to as the 'said rules'), in rule 523, —

(a) after clause (a), the following clause shall be inserted, namely:—

' (b)(b) "Broadband Connectivity" means an always-on data connection that is able to support interactive services including internet access and has the capability of a minimum download speed as prescribed from time to time by the Central Government;';

(b) for clause (d), the following clause shall be substituted, namely:—

' (d) "Capital Recovery" means the aggregate of depreciation, interest on debt and return on equity on the capital cost as worked out proportionately and annualized over the period for which support is provided from the Fund;';

(c) after clause (d) as so substituted, the following new clause shall be inserted, namely:—

' (d)(a) "District" means the revenue district as identified in Census of India 2001;';

(d) for clause (f), the following clause shall be substituted, namely:—

'(f) "Infrastructure" means such assets as required for Telegraph Services as determined by the Central Government from time to time;';

(e) after clause (f) as so substituted, the following new clause shall be inserted, namely:—

' (f)(a) "Mobile Services" means telegraph services provided by means of wireless telecommunication system which ensures use while in motion anywhere in the Service Area;';

(f) clause (h) shall be omitted.;

(g) in clause (i),—

3649 GI/06-2

(i) the Explanation shall be numbered as *Explanation 1* thereof;

(ii) after the *Explanation 1* as so numbered, the following *Explanation* shall be inserted, namely:—

"*Explanation 2.*— Where support is extended towards general infrastructure, infrastructure for provision of mobile services and broadband connectivity, Net Cost shall mean a percentage of Capital Recovery, as determined by the Administrator from time to time.";

(h) in clause (m), the word "basic" shall be omitted.

3. In rule 525 of the said rules, in sub-rule (2),—

(a) in clause (i), sub-clauses (d) and (e) shall be omitted;

(b) after clause (ii) the following clauses shall be inserted, namely:—

"(iii) Stream-III - Creation of infrastructure for provision of Mobile Services in rural and remote areas:

(a) The assets constituting the infrastructure for provision of mobile services shall be determined by the Central Government from time to time.

(b) A percentage of the Capital Recovery for the infrastructure for provision of mobile services shall be taken into account to determine the Net Cost.

(iv) Stream-IV - Provision of Broadband connectivity to villages in a phased manner: A percentage of the Capital Recovery for the infrastructure for broadband connectivity shall be taken into account to determine the Net Cost.

(v) Stream-V - Creation of general infrastructure in rural and remote areas for development of telecommunication facilities:

(a) The items of general infrastructure to be taken up for development shall be determined by the Central Government from time to time.

(b) A percentage of the Capital Recovery for the development of general infrastructure shall be taken into account to determine the Net Cost.

Note.— Unless otherwise specified by the Central Government, the revenue district/ group of revenue districts shall be taken as a unit for the purpose of arriving at the Net Cost for the activities specified in Streams III, IV and V.

(vi) Stream-VI - Induction of new technological developments in the telecom sector in rural and remote areas: Pilot projects to establish new technological developments in the telecom sector, which can be deployed in the rural and remote areas, may be supported with the approval of the Central Government.".

4. In rule 526 of the said rules, after the words, brackets and letters "Direct Exchange Lines referred in item (a) of clause (ii)", the words, brackets and letters "and clause (vi)"shall be inserted.

5. In rule 526 of the said rules, for the *Explanation*, the following *Explanation* shall be substituted, Namely:—

"*Explanation.*— For the purposes of this rule, "eligible operators" means the Basic Service Operators, Cellular Mobile Service Providers, Unified Access Services Licensees and Infrastructure Providers (IP-I) or any other entities as may be specified in this behalf by the Central Government from time to time.".

[F. No. 30-1/2004-LF]

SHANTANU CONSUL, Addl. Secy.

FOOT NOTE:— The principal rules have been published in the Post & Telegraph Manual Volume I. Legislative Enactments, Part II, Edition. These have subsequently been amended as under:-

1. GSR 190 dt. 18-2-1984
2. GSR 386 (E) dt. 22-5-1984
3. GSR 387 (E) dt. 22-5-1984
4. GSR 679 dt. 30-6-1984
5. GSR 428 dt. 27-4-1985
6. GSR 729 dt. 3-8-1985
7. GSR 982 dt. 19-10-1986
8. GSR 553 (E) dt. 27-3-1986
9. GSR 314 dt. 26-4-1986
10. GSR 566 dt. 26-7-1986
11. GSR 953 (E) dt. 23-7-1986
12. GSR 1121 (E) dt. 1-10-1986
13. GSR 1167 (E) dt. 28-10-1986
14. GSR 1237 (E) dt. 28-11-1986
15. GSR 49 dt. 17-1-1987
16. GSR 112 (E) dt. 25-2-1987
17. GSR 377 (E) dt. 9-4-1987
18. GSR 674 (E) dt. 27-7-1987
19. GSR 719 (E) 18-8-1987
20. GSR 837 (E) dt. 5-10-1987
21. GSR 989 (E) dt. 17-12-1987
22. GSR 337 (E) dt. 11-3-1988
23. GSR 361 (E) dt. 21-3-1988
24. GSR 626 (E) dt. 17-5-1988
25. GSR 660 (E) dt. 31-5-1988
26. GSR 693 (E) dt. 10-6-1988
27. GSR 734 (E) dt. 24-6-1988
28. GSR 606 dt. 14-7-1988
29. GSR 812 (E) dt. 26-7-198
30. GSR 888 (E) dt. 1-9-1988
31. GSR 907 (E) dt. 7-9-1988
32. GSR 916 (E) dt. 9-9-1988
33. GSR 1054 (E) dt. 2-11-1988
34. GSR 179 dt. 18-3-1989
35. GSR 358 (E) dt. 15-3-1989
36. GSR 622 (E) dt. 15-6-1989
37. GSR 865 (E) dt. 29-9-1989
38. GSR 413 (E) dt. 29-3-1990
39. GSR 574 (E) dt. 15-6-1990
40. GSR 933 (E) dt. 3-12-1990
41. GSR 985 (E) dt. 20-12-1990
42. GSR 74 (E) dt. 18-1-1991
43. GSR 237 (E) dt. 25-4-1991
44. GSR 251 (E) dt. 2-5-1991
45. GSR 543 (E) dt. 21-5-1992
46. GSR 560 (E) dt. 26-5-1992
47. GSR 587 (E) dt. 10-6-1992
48. GSR 730 (E) dt. 19-8-1992
49. GSR 830 (E) dt. 28-10-1992
50. GSR 62 (E) dt. 11-2-1993
51. GSR 80 dt. 6-2-1993
52. GSR 384 (E) dt. 27-4-1993
53. GSR 387 (E) dt. 28-4-1993
54. GSR 220(E) dt. 26-3-2004.

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Appendix C

Survey Questionnaire for citizens of Port Blair, ANI on the "Role of the USOF in Bridging the Digital Divide"

Q1. Your Name (optional) _____

Q2. Are you presently using internet?*

- Yes ☐
- No ☐
- Can't say ☐

Q3. Whether you were using internet before August 2020?*

- Yes ☐
- No ☐
- Can't say ☐

Q4. Were you aware that undersea submarine optical fibre cable has been laid by Government in August 2020 from Chennai to Port Blair and seven islands of ANI?*

- Yes ☐
- No ☐
- Can't say ☐

Q5. Whether the present internet connectivity has improved after August 2020?*

- Yes ☐
- No ☐
- Can't say ☐

Q6. If yes, has this improved connectivity helped you?*

- Yes ☐
- No ☐
- Can't say ☐

Q7. If no, do you think improved connectivity has no direct benefit for citizens of ANI?*

- Yes ☐
- No ☐
- Can't say ☐

Q8. If yes, how has this improved broadband connectivity helped you?* (you can choose more than one option)

(iv) Improved access to global information ☐
(v) Improved access to local governance ☐
(vi) Improved access to education, health etc ☐
(vii) Improved social communication (VC, e-mail, social media) ☐
(viii) None of the above ☐

Q9. Any other remarks _____

Appendix D

Survey Questionnaire for Director, USOF to get feedback on the issues and challenges of USOF implementation, particularly in ANI

Q1. Your Name (optional)

_____

Q2. Your Designation

_____

Q3. How many schemes are initiated by USOF in ANI?* (request for the list and details)

_____

Q4. What is the present status of schemes implemented by USOF in ANI?*

Sr.	Name of scheme	Status (write Yes / No in any one of the options)				
		Implemented	Under Implementation	Work yet to be started	Under Consideration	Can't say
1						
2						
3						
4						
5						

Q5. Whether these schemes have helped in bridging digital divide in ANI?*

Yes ☐
No ☐
Can't say ☐

Q6. If yes, how has this improved broadband connectivity helped ANI?* (you can choose more than one option)

(i) Improved access to global information ☐
(ii) Improved access to local governance ☐
(iii) Improved access to education, health etc ☐
(iv) Improved social communication (VC, e-mail, social media) ☐
(v) None of the above ☐

Q7. Any other remarks _____

Appendix E

Survey Questionnaire for Dy. Director General, USOF to get feedback on the issues and challenges of USOF implementation, particularly in ANI

Q1. Your Name (optional)

_____

Q2. Your Designation

_____

Q3. What are various schemes initiated by USOF for improvements of telecom services in rural and remote parts of India? (request for the list and details)

_____

Q4. How many schemes are initiated by USOF in ANI?* (request for the list and details)

_____

Q5. What is the present status of schemes implemented by USOF in ANI?*

Sr.	Name of scheme	Status (write Yes / No in any one of the options)				
		Implemented	Under Implementation	Work yet to be started	Under Consideration	Can't say
1						
2						
3						
4						
5						

Q6. Whether these schemes have helped in bridging digital divide in ANI?*

Yes ☐
No ☐
Can't say ☐

Q7. If yes, how has this improved broadband connectivity helped ANI?* (you can choose more than one option)

(vi) Improved access to global information ☐
(vii) Improved access to local governance ☐
(viii) Improved access to education, health etc ☐
(ix) Improved social communication (VC, e-mail, social media) ☐
(x) None of the above ☐

Q8. Any other remarks _____

Appendix F

Survey Questionnaire to Administrator, USOF to get opinion on whether USOF schemes helped in bridging digital divide particularly in ANI

Q1. Your Name (optional)

_____

Q2. Your Designation

_____

Q3. Whether USOF schemes have helped in bridging digital divide in India, particularly in ANI?*

Yes ☐
No ☐
Can't say ☐

Q4. If yes, how has this improved broadband connectivity helped ANI?* (you can choose more than one option)

(i) Improved access to global information ☐
(ii) Improved access to local governance ☐
(iii) Improved access to education, health etc ☐
(iv) Improved social communication (VC, e-mail, social media) ☐
(v) None of the above ☐

Q5. Any other remarks _____

Appendix G

Schemes initiated by USOF for improvements of telecom services in rural and remote parts of India

1. BharatNet Project

For providing high bandwidth capacity, expansion of mobile services and broadband connectivity in rural and remote areas, a number of schemes have been taken up with funding from USOF. BharatNet, one of the biggest rural telecom projects of the world, is being implemented in a phased manner to provide broadband connectivity to all Gram Panchayats (approx. 2.6 lakh) in the country. Now, the scope of the project has been expanded up to all inhabited villages.

1.1 BharatNet Phase-I:

(i) The Union Cabinet on 25.10.2011 approved the project for creation of National Optical Fibre Network (NOFN/now BharatNet) to provide Broadband connectivity for connecting Block Headquarters (BHQs) to Gram Panchayats (GPs) by using existing fibre of Central Public Sector Undertakings (CPSUs) - Bharat Sanchar Nigam Limited (BSNL), RailTel Corporation of India Limited (RailTel) and Power Grid Corporation of India Limited (PGCIL) and laying incremental fibre to bridge the connectivity gap up to the GPs. The incremental Optical Fibre Cable (OFC) so laid was to be owned by the Government and the ownership of the existing fibre was to be continued to be vested with the existing owners. Bharat Broadband Network Limited (BBNL) was incorporated on February 25, 2012 as a Special Purpose Vehicle for the execution, management and operations of NOFN. This was considered as Phase-I of BharatNet.

(ii) The Phase-I was completed in December 2017 with the implementation of over 1 lakh GPs. Subsequently, the scope of Phase-I was expanded to 1.25 lakh GPs (Revised Work-front Phase-I) as per the Cabinet approval of July 19, 2017.

(iii) Implementation and Status of the BharatNet Phase-I:

The work of 1,25,000 GPs (revised work front) under Phase-I had been allocated to 3 CPSUs: BSNL, RailTel and PGCIL for implementation. The work front for Phase-I was revised to 1,20,314 as about 3,000 GPs of North East, which were earlier being implemented by RailTel have been proposed under PPP model and in some GPs work is in progress. As on 30.11.2021, by laying 3,08,638 km underground OFC, total 1,18,885 GPs have been made Service Ready. The detail of progress is given below:

Table: Status of the BharatNet Phase-I (as on 30.11.2021)

CPSU	GPs planned in Phase-I	OFC laid (km)	GPs for which Cable laid	Service Ready GPs
BSNL	101780	250511	103523	100840
RailTel	8002	26451	9572	7763
PGCIL	10407	31628	10821	10268
BBNL (diverted from BSNL)	125	48	16	14
Total	120314	308638	123932	118885

1.2 BharatNet Phase-II:

The Cabinet approved a modified strategy for BharatNet on July 19, 2017, which integrates the implementation experience of Phase-I of the project and aligns it with the vision of Digital India. The Cabinet approved a modified strategy for BharatNet on 19 July 2017, which integrates the implementation experience of Phase-I of the project and aligns it with the vision of Digital India. The modified strategy provides an optimal mix of media (OFC/Radio/satellite) to connect Gram Panchayats (GPs), each GP to be provided with up to 1 Gbps bandwidth (on wired media), laying of fresh fibre between GPs and Block, multiple implementing Models-State-led Model, Private Sector and CPSU Model.

The total funding of the BharatNet (Phase-I + Phase-II), approved by the Cabinet, is Rs. 42,068 crore (exclusive of GST, Octroi and local taxes).

The comparative chart of salient features of Phase-I vs Phase-II, are as follows:

Table: Comparison between BharatNet Phase-I and Phase-II

Sr.	Item	Phase-I	Phase-II
1	No. of GPs	1,00,000 (Work front increased to about 1,25,000 GPs by Telecom Commission on 30.04.2017)	1,50,000
2	Implementing Agencies	Three CPSUs (BSNL, RailTel & PGCIL)	BBNL, States and States' agencies, CPSUs and Private Sector
3	Media	Underground OFC	Underground OFC, Aerial OFC on existing electricity poles and Radio & Satellite
4	Fiber used in Network	BSNL Fibre upto FPOI and fresh OFC thereafter	Fresh OFC from Block to GP
5	No. of Fibres (Core)	24	48 & above (underground), 24 & above (Aerial)
6	Last Mile Architecture	Not envisaged	Yes, for all 2.5 lakh GPs, Wi-Fi hotspot or any other suitable broadband technology
7	Network technology	GPON Linear Architecture	GPON Linear Architecture except for Chhattisgarh on IP MPLS/Ring, States under State-led model given flexibility of enhanced architecture using their own funds.

The progress of implementation of Phase-II is as under:

- State-led model**:** 8 State are being implemented under this model. Chhattisgarh, Gujarat, Jharkhand, Andhra Pradesh, Maharashtra, Odisha and Telangana are at various stages of implementation. In Andhra Pradesh, the work was stopped for about two years due to request of State for change of technology but now the work has been resumed as per the original sanction. In Tamil Nadu, the work of 6429 GPs has been awarded in October 2021 for implementation and for the remaining GPs, the award of work is under process.
- BBNL led Private Model: Two States namely Punjab and Bihar have been implemented through private sector model directly by BBNL. Work has been almost completed in both the States.
- CPSU: Under this model, BSNL is executing works in 4 States/UTs. Madhya Pradesh, Uttar Pradesh and Sikkim are at various stages of implementation. For Jammu & Kashmir, BSNL has been asked to submit a revised DPR of phase-II for IP-MPLS with connectivity up to villages (including GPs).
- Satellite: The satellite component of the Phase-II is being implemented by BBNL & BSNL. BSNL is implementing 1408 GPs and BBNL is implementing 4167 GPs (including 422 GPs proposed of Jammu & Kashmir) on satellite.

The Phase-II is under implementation and the details are as follows:

Table: Status of BharatNet Phase-II Project (as on 30.11.2021)

Implementation Model	GPs planned	OFC laid (km)	GPs where Cable laid	Service Ready GPs
State Led model	65559	159256	33081	26319
BSNL	27025	64661	15663	10347
Private Led model	7382	22733	7585	7357
Satellite	5575	-	-	4248
PPP	35477	-	-	-
Newly created GPs in State Led model	2844	-	-	-
Total	143862	246650	56329	48271

1.3 Overall achievement of BharatNet Project:

BharatNet Project Physical Performance Status as on 30.11.2021 is as follows:

Sr.	Phase	OFC laid (km)	GPs where Cable laid	Service Ready GPs
1.	Phase-I	308638	123932	118885
2.	Phase-II	246650	56329	44023
3.	Phase-II (on Satellite)	-	-	4248
	Total	555288	180261	167156

The State/UT-wise details of progress are in Annexure-I.

Since, March, 2020 pursuant to lockdown and movement restrictions due to COVID-19 in the country, the progress of project is adversely affected, but, with phased unlock all efforts are being made to speed up the project implementation.

1.4 Utilisation of BharatNet network:

The utilisation of network is through leasing of bandwidth and dark fibre, Wi-Fi to access broadband /internet services at Public places, and Fibre to the Home (FTTH) to provide broadband connectivity Government Institutions such as school, hospital, post offices, Aanganwadi, customer service centres, police station, etc. The details are as follows:

- In the 1.20 lakh GPs (approx.) of BharatNet Phase-I, the provisioning of Wi-Fi Services in about 1.10 lakh GPs has been assigned to CSC e-Governance Services India Limited (a Special Purpose Vehicle under Ministry of Electronics & Information Technology), and in about 10, 000 GPs to Government of Rajasthan/Raj COMP Info Services Ltd. (RISL), etc.
- Out of around 1.10 lakh GPs assigned to CSC e-Governance Services Limited (CSC-SPV) for providing Wi-Fi services across India, it is also providing FTTH connections to 5 Government Institutions in 77,000 (approx.) GPs. With the involvement of Village Level Entrepreneurs (VLEs) through CSC-SPV at about 1.10 lakh GPs, huge employment is expected to be generated at village level. So far, the utilization is as follows:

The present model for Wi-Fi implementation is as follows: -

- Wi-Fi installed GPs: 1,04,257
- FTTH Connections:1,95,054
- Dark Fibre leased: 33,699 Km
- Leasing of BharatNet Bandwidth: 4,098 Gbps
- Data consumption: 4,929 TB data per month.
- State Wide Area Networks (SWAN) : 16,284 GPs

1.5 Challenges in BharatNet Project:

BharatNet is a challenging project of mega nature and the Gram Panchayats (GPs) are widely dispersed across the country in rural and remote areas. The implementation of Phase-II is being done under State-led and CPSU-led model. The delay in the implementation of the BharatNet phase-II is mainly on account of:

(i) Slow progress being made by State Governments under State-led model. About 65,000 GPs in 8 States are under implementation under State-led model.

(ii) Under CPSU-led model, BSNL's work was also delayed due to its precarious financial condition.

(iii) In March 2020, pursuant to Lockdown and movement restrictions due to COVID-19 in the country, the project progress is affected. However, with the beginning of unlock phase, all efforts are being made to expedite the project implementation.

1.6 Revised implementation strategy of BharatNet to connect 6 lakh villages:

A Committee (chaired by CEO, NITI Aayog and comprising Secretaries of Department of Economic Affairs, MeitY and DoT) in its report on 06.05.2019 identified the following key challenges in BharatNet:

i. Poor maintenance of infrastructure due to which network uptime is not guaranteed / upto the levels as desired for a telecom network

ii. Extremely low utilisation by service providers and State Governments

iii. Poor progress of Phase-II

iv. Lack of clarity on business / utilisation model

The recommendations of the said Committee inter alia, included assigning the work of creating, maintaining and utilising the BharatNet network on a long-term basis to a single entity (Private Sector Partners - PSPs) under Public-Private Partnership (PPP) Model through Concession Fee/ Viability Gap Funding (VGF). The DCC approved the recommendations of the said Committee on 13.06.2019 and a detailed State-wise PPP strategy for BharatNet on 20.12.2019.

i. As announced by the Hon'ble Prime Minister on 15th August 2020, the mandate of BharatNet has also been expanded to connect about 6 lakh inhabited villages on optical fiber across the country, expanding the scope from 2.5 lakh Gram Panchayats. On 30.06.2021, Union Cabinet accorded approval for revised implementation strategy of BharatNet through Public Private Partnership mode in 16 States of the country. BharatNet will now be extended upto all inhabited villages beyond GPs in the said States. The revised strategy also includes creation, upgradation, operation, maintenance and utilization of BharatNet by the concessionaire, who will be selected by a competitive international bidding process. The estimated maximum viability gap funding approved for the above PPP model is Rs. 19,041 crores.

ii. The States covered under the Cabinet approval are Kerala, Karnataka, Rajasthan, Himachal Pradesh, Punjab, Haryana, Uttar Pradesh, Madhya Pradesh, West Bengal, Assam, Meghalaya, Manipur, Mizoram, Tripura, Nagaland and Arunachal Pradesh. An estimated 3.61 lakh villages including GPs will be covered. For implementation of the PPP model in 16 States, the Request for Proposal (RFP) has been floated on 20.07.2021 through global biding for selection of the Private Sector Partner.

iii. The Cabinet also accorded in principle approval for extending BharatNet to cover all inhabited villages in the remaining States and UTs.

iv. The target for completion of BharatNet project for providing connectivity to all the six Lakh villages (approx.) including all Gram Panchayats is August, 2023.

For connecting village in other States/UTs, the following actions have been taken:

i. PPP model in states being implemented through State led model

The progress of work under the State led model (8 States) is in different stages of implementation for BharatNet Phase-II. Contracts have been awarded in most of these States. DoT is pursuing with these 8 States for accelerating the pace of work and for the best way to achieve connectivity to all inhabited villages on similar assumptions and principles which have been approved under PPP model for 16 States. Necessary approval for the incremental fund requirement for reaching upto all inhabited villages in the said eight States under the State led model will be sought separately.

ii. Goa and Uttarakhand

Goa and Uttarakhand are to be included in the PPP model as per consent received from the respective States. The proposal has been approved in DoT for inclusion of these two States for submission to the PPPAC.

iii. GPs/ Village connectivity in Bihar

A model for extending broadband connectivity from GPs to all villages in the State, including provision of a Wi-Fi Access Point and 5 FTTH connections to the Public Institutions through CSC-SPV is under implementation. The VGF in this case is payable for initial 5 years only.

iv. Village connectivity in UTs

The execution of broadband connectivity from GP up to the Village level is under consideration for entrusting to BSNL/BBNL in the UTs of Jammu & Kashmir, Ladakh, Andaman & Nicobar Islands, Lakshadweep Islands, Dadra & Nagar Haveli and Daman & Diu, Puducherry and the State of Sikkim. This has been done keeping in view various considerations including security, strategic location, size, viability and administrative expediency.

2. USOF Schemes for expansion of Telecom Services in the North-Eastern Region

2.1 Comprehensive Telecom Development Plan (CTDP) for the North-Eastern Region

On 10.09.2014, the Union Cabinet approved a proposal to implement Comprehensive Telecom Development Plan for the North-Eastern Region. The Project envisaged to provide 2G mobile coverage to 8621 identified uncovered villages, installation of 321 mobile tower sites along National Highways and strengthening of transmission network in the States of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. Subsequently, due to change in technology and coverage of villages by the TSPs, approval has been taken for revised schemes. The current schemes details are as follows:

(i) Mobile Services in Uncovered villages in Assam, Manipur, Mizoram, Nagaland, Tripura, Sikkim, and Arunachal Pradesh (National Highways only) of NER and seamless coverage along National Highway:

Under this scheme, Mobile connectivity is to be provided by setting up 2004 towers in the uncovered villages and along National Highways of Assam, Manipur, Mizoram, Nagaland, Tripura, Sikkim, and Arunachal Pradesh (National Highways only) of North-East region. The Agreements were signed with Bharti Airtel Ltd. and Bharti Hexacom Ltd. on 08.12.2017 for implementation of the project. Though the Agreement with the Implementation Agencies (Bharti Airtel Ltd./Bharti Hexacom Ltd.) is for providing 2G services, the Implementation Agencies, on their own, have been providing 4G services, along with 2G services, at about 90% tower sites. As on 30.11.2021, a total of 1,358 sites have been installed and are providing services. The installation work is almost complete for feasible sites. The State-wise details are as follows:

Table: State wise Progress of the scheme

Sr.	State	No. of Towers (as per Agreement)	Towers installed and providing services	Coverage provided by towers	
				Villages covered	NH covered
1	Assam	983	439	530	25
2	Sikkim	20	8	9	0
3	Manipur	437	404	382	55
4	Mizoram	246	214	213	17
5	Nagaland	160	152	112	45
6	Tripura	9	3	-	3
7	Arunachal Pradesh	149	138	-	138
Total		2004	1358	1246	283

Note: A number of villages and NH Sites could not be covered due to various reasons, for example (i) 127 villages and 19 NH sites due to forest clearance, (ii) 7 villages due to Defence clearance, (iii) 64 villages due to accessibility issues, (iv) 52 villages due to land record issues, (v) 150 villages washed out, 56 villages not found and 11 villages State mismatch (vi) About 332 villages due pre-existence of mobile coverage

(ii) Mobile Services in Uncovered villages of Meghalaya and seamless coverage along National Highway:

The project was approved by the Cabinet on 23.05.2018 and as per approval of Digital Communications Commission (DCC), the work has been awarded to M/s Bharti Hexacom Ltd for 1,164 uncovered villages and 11 sites along National Highways in Meghalaya on 04.09.2020 for provisioning of 4G mobile services. Project is targeted to be completed by June 2022. The survey & installation work is under progress.

(iii) Mobile Services in Uncovered Villages of Arunachal Pradesh and 2 Districts of Assam:

As per the Cabinet approval of 09.12.2020, provision of 4G mobile services in 2374 uncovered villages in Arunachal Pradesh and two Districts of Assam (Karbi Anglong &

Dima Hasao) has been approved at an estimated cost of Rs. 2028.80 Cr. The tender has been floated and opened on 02.06.2021 and it is finalised. Agreements signed with M/s Bharti Hexacom Limited for Arunachal Pradesh on 29.10.2021 and to M/s Reliance Jio Infocomm Limited for 2 Districts of Assam on 01.11.2021 for project implementation. The project is targeted to be completed by April 2023.

2.2 Hiring of 10 Gbps International Bandwidth for Internet Connectivity to Agartala from BSCCL, Bangladesh via Cox Bazar

For making available high quality and high speed internet access to the States of North Eastern Region of the country, Universal Service Obligation Fund (USOF) has signed an Agreement with Bharat Sanchar Nigam Limited (BSNL) on 18.08.2021 for hiring of 10 Gbps International Bandwidth for Internet Connectivity to Agartala from Bangladesh Submarine Cable Company Limited (BSCCL), Bangladesh via Cox Bazar/Kuakata. Under the Agreement, USOF shall provide financial support of Rs. 9.4 crore to BSNL over a period of three years for hiring the aforesaid International Bandwidth. The project has been commissioned.

3. Implementation of Comprehensive Telecom Development Plan for Islands

Telecom Commission in its meeting held on 07.11.2014 approved, in principle, an Integrated and Comprehensive Telecom Development Plan for Andaman & Nicobar Islands and Lakshadweep in accordance with TRAI recommendations dated 22.07.2014 for 'Improving Telecom Services in Andaman & Nicobar Islands and Lakshadweep'. The plan consists of the following schemes:

3.1 Andaman & Nicobar Islands: -

(i) Submarine OFC Connectivity between Mainland India (Chennai) and Andaman & Nicobar Islands:

Cabinet in its meeting held on 21.09.2016 approved a dedicated submarine OFC link from Mainland India [Chennai] to Port Blair & 5 other Islands viz. Car Nicobar, Little Andaman, Havelock (Swaraj Dweep), Kamorta and Great Nicobar Island. Subsequently submarine OFC connectivity of Rangat Island via Long Island from Havelock Island (Swaraj Dweep) was approved in addition to 6 Islands. 2313 km four pair Submarine Optical Fibre Cable has been laid, out of which one fibre pair has been shared with Ministry of Defence exclusively. Hon'ble Prime Minister inaugurated and dedicated to nation the Chennai -Andaman Nicobar Islands (CANI) Project on 10.08.2020 at a cost of Rs. 1,224 Crore. All segments of CANI submarine cable project are commissioned. 200 Gbps Bandwidth is available between Chennai to Port Blair while 100 Gbps bandwidth is available within Islands. A Tripartite Agreement for Operation & Maintenance has also been signed between USOF, BSNL & U.T. Administration of Andaman & Nicobar Islands on 13.11.2020. Present utilization of bandwidth is 43.09 Gbps.

(ii) Satellite Bandwidth Augmentation for Andaman & Nicobar Islands:

Work of augmentation of satellite bandwidth from 2 Gbps to 4 Gbps in Andaman & Nicobar Islands has been executed by BSNL on nomination basis in accordance with DCC approval. The CAPEX of Rs. 36.39 Crore plus applicable taxes is being funded by USO Fund while OPEX (Transponder charges) is to be funded by MHA / UT Administration of Andaman & Nicobar Islands. Satellite bandwidth has been augmented to 4 Gbps on 09.09.2021.

(iii) Provision of 4G Mobile Coverage in Uncovered Villages and seamless 4G Mobile coverage of National Highway in Andaman & Nicobar Islands:

Agreement was signed between USOF and M/s RJIL on 15.03.2021 for setting up of 82 towers to provide mobile services on 4G Technology in identified 85 uncovered villages (with population of 10 or more), and 42 towers for providing 4G mobile services to bridge the gaps in mobile connectivity along uncovered NH-4 (earlier NH-223). The CAPEX & OPEX for 5 years are to be funded by USOF through VGF Model [Total: Rs 129.58 Crore (excluding taxes)]. The target for completion of project is twelve (12) months from the date of signing of the agreement, i.e. by March 2022. However, as per request of M/s RJIL, extension of three months (i.e. up to June 2022) has been granted for field survey/ implementation of the project under Force Majeure situation due to prevailing restrictions imposed by Andaman & Nicobar UT Administration owing to 2nd wave of COVID-19. The RF survey and acquisition of sites is under progress by M/s RJIL.

3.2 Lakshadweep Islands:

(i) Submarine OFC Connectivity between Mainland India (Kochi) and Lakshadweep Islands:

Cabinet in its meeting held on 09.12.2020 approved a proposal for Provision of Submarine Optical Fibre Cable Connectivity between Mainland (Kochi) and Lakshadweep Islands (KLI Project) comprising of Kavarati and ten other Islands, namely, Kalpeni, Agatti, Amini, Androth, Minicoy, Bangaram, Bitra, Chetlat, Kiltan and Kadmat. The total estimated Route length is about 1,772 km and the total Financial Implication is about Rs. 1,072 Crore (excluding taxes). The project is targeted to be implemented within 1000 days from the date of announcement by Hon'ble Prime Minister on 15th August 2020.

BSNL has issued the Purchase Order to M/s M/s NEC Corporation India Private Limited on 28.09.2021 for implementation of Submarine Network as an outcome of the global turnkey tender floated on 10.03.2021.

Work has been awarded by TCIL on 19.07.2021 for obtaining Statutory clearances including Environmental Impact Assessment/ Coastal Regulation Zone (EIA/CRZ), Forest, Wildlife clearance etc. to M/s EQMS India Private Limited as an outcome of the tender floated by TCIL, the Technical Consultant for the project.

TCIL has issued the Purchase Order on 16.11.2021 to M/s Tata Communications Transformation Services Ltd. in consortium with M/s OSS for appointment as Independent Monitoring Agency (IMA) for the project as an outcome of the tender floated by TCIL.

Work of marine survey along with land cable survey and obtaining EIA/ CRZ clearance is under progress.

(ii) Satellite Bandwidth Augmentation for Lakshadweep Islands:

Work of augmentation of satellite bandwidth from 318 Mbps to 1.71 Gbps utilizing GSAT-11 & 19 capacities in Lakshadweep Islands is being executed by BSNL on nomination basis in accordance with DCC approval. The CAPEX of Rs. 28.26 Crore plus applicable taxes is being funded by USO Fund while OPEX (Transponder charges) is to be funded by MHA/UT Administration of Lakshadweep Islands. Satellite bandwidth has been augmented to 1.71 Gbps by BSNL on 14.08.2021.

DCC has approved another proposal on 13.04.2021 for further enhancement of satellite bandwidth from 1.71 Gbps to 3.46 Gbps i.e. by 1.75 Gbps through ISRO/NewSpace India Limited (NSIL) and BSNL on nomination basis using Ku-Band transponders of GSAT-31 satellite. CAPEX of Rs. 30.75 Crore (excluding taxes) is being funded by USO Fund while OPEX of Rs. 98.75 Crore per annum (excluding taxes) is being funded by MHA. The project is expected to be completed by April 2022.

4. Re-provisioning of Digital Satellite Phone Terminals (DSPTs) provided to MHA agencies (CAPFs), MoD agencies (Army, BRO) and other agencies using VSAT connectivity under BharatNet Project

BSNL was providing DSPTs services to MHA agencies (CAPFs), MoD agencies (Army, BRO) and other agencies. These DSPTs were provided in remote, rural, far-flung, difficult terrain areas where no coverage from any other operator is available. The DSPTs were working on NSS-6 satellite. However, due to closure of NSS-6 satellite, the services of all the 1409 DSPTs provided to MHA Agency/ Armed/ Paramilitary Forces etc. under subsidy support from USO Fund were disrupted with effect from 13.05.2019.

As a short-term measure, INMARSAT terminals were provided to MHA agencies (CRPF, BSF, ITBP and SSB) and MoD agencies (Indian Army and BRO) to meet their critical communication need. DCC in its meeting held on 20.12.2019 approved the proposal for re-provisioning of Digital Satellite Phone Terminals (DSPT) provided to MHA agencies (CAPFs), MoD agencies (Army, BRO) and other agencies through the ongoing tender of VSAT connectivity under BharatNet Project. Further, approval was also accorded for providing VSATs in Ladakh Autonomous Hill Development Council (LAHDC). The approval was conveyed to BBNL for provision of DSPTs. As of now, 1379 sites have been operationalized. The details are as follows:

Table: Agency Wise Status of DSPT re-provisioning (as on 22.11.2021)

Agency	Total Sites	Delivered		Installed
		VSAT	SPV	
ARMY	207	207	207	198
BRO	75	75	75	72
BSF	336	336	336	336
CRPF	326	326	326	325
ITBP	207	207	207	207
SSB	103	103	103	103
LAHDC	18	18	18	18
Ladakh DSPT	124	120	124	120
Total	1396	1392	1396	1379

5. Mobile Service in Uncovered Villages:

Government has prioritized to reach remote areas of the country such as North-Eastern States, Islands, Himalayan States, Western Border States and more importantly the Left Wing Extremism affected areas in the first phase.

5.1 Scheme for Border areas and other priority areas:

An Agreement has been signed on 28.04.2020 with the Implementing Agency i.e. M/s Reliance Jio Infocomm Ltd. for provision of mobile service in 354 uncovered villages of Jammu & Kashmir, Ladakh, Himachal Pradesh, Uttar Pradesh, Bihar, Rajasthan, Gujarat, Uttarakhand, Border areas and other priority areas at a cost of Rs. 337 Crore. The project progress is as follows:

Table: State-wise progress of Border areas and other priority areas scheme

Sr.	State Name	No. of targeted villages	No. of villages where mobile services provided
1	Bihar	8	8
2	West Bengal	1	1
3	Karnataka	3	3
4	Madhya Pradesh	1	0
5	Rajasthan	31	26
6	Uttar Pradesh	9	8
7	Uttarakhand	28	20
8	Gujarat	70	38
9	Himachal Pradesh	59	19
10	Jammu & Kashmir and Ladakh	144	87
Total		354	210

Further, 55 additional villages have been included for providing mobile services. The project is targeted to be completed by March 2022.

5.2 Aspirational Districts Scheme:

(i) 502 Aspirational District villages (MP, UP, Rajasthan, Bihar):

A Scheme for 502 uncovered villages across 112 Aspirational District over four States (namely Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan) for provisioning of 4G based Mobile services has been finalized. Agreements has been signed and work has been awarded to M/s Reliance Jio Infocomm Ltd for UP and MP States, M/s Bharti Hexacom Ltd for Rajasthan and M/s Bharti Airtel Ltd for Bihar after tendering process in March, 2021. The project is targeted to be completed by March 2022. Survey work and installation of tower is under progress. State wise list of uncovered villages is as follows:

Sr.	State Name	No. of Aspirational Districts	No. of villages to be covered
1	Bihar	5	80
2	Madhya Pradesh	8	205
3	Rajasthan	5	195
4	Uttar Pradesh	6	22
Total		24	502

(ii) Remaining 7,287 Aspirational District villages (Andhra Pradesh, Chhattisgarh, Jharkhand, Maharashtra and Odisha):

A scheme for 7,287 uncovered villages is approved by Cabinet on 17.11.2021 for provisioning of 4G based Mobile services in 44 Aspirational Districts of 5 States of Andhra Pradesh, Chhattisgarh, Jharkhand, Maharashtra and Odisha at an estimated cost of Rs. 6,466 Crore. Request for Proposal (RFP) has been floated for implementing the project on 07.12.2021. The State-wise list of uncovered villages is as follows:

Sr.	State Name	No. of Aspirational districts	No. of villages to be covered
1	Andhra Pradesh	3	1218
2	Chhattisgarh	8	699
3	Jharkhand	19	827
4	Maharashtra	4	610
5	Odisha	10	3933
	Total	44	7287

6. Scheme for Mobile Communication Services in Left Wing Extremism (LWE) Affected Areas:

6.1 LWE Phase-I:

On 20.08.2014, the Cabinet approved the implementation of a project in LWE areas to provide Mobile Services on 2G technology in the 10 affected States of Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Maharashtra, Madhya Pradesh, Odisha, Telangana, Uttar Pradesh and West Bengal. The approved cost of the project is Rs. 4214.28 crore. The project has been completed and the State-wise details are as follows:

Tower Sites in LWE Phase-I

Sr.	Name of the State	LWE Phase-I	
		Total LWE Districts	Towers functional
1	Andhra Pradesh	8	62
2	Bihar	22	250
3	Chhattisgarh	16	525
4	Jharkhand	21	816
5	Madhya Pradesh	1	22
6	Maharashtra	4	65
7	Odisha	19	256
8	Telangana	8	173
9	Uttar Pradesh	3	78
10	West Bengal	4	96
	Total	106	2343

The 4G Upgradation of the existing LWE-I sites is under consideration at an estimated cost of Rs. 2,285 Crore.

6.2 LWE Phase II:

The Cabinet approved on 23.05.2018 a proposal for Phase II of the project in LWE affected areas with a subsidy support of Rs. 7330 Crore. Due to revision in the requirements, the project has been subsequently approved for 2,542 towers to provide 4G mobile services at an estimated cost of Rs. 2,211.17 Crore. The Digital Communications Commission (DCC) approval for the same has been obtained on 01.12.2020.

Table: State-wise list of mobile towers in LWE Phase II:

Sr.	State	No of Districts	No. of Mobile Towers
1	Andhra Pradesh	9	346
2	Bihar	7	16
3	Chhattisgarh	15	971
4	Jharkhand	21	450
5	Madhya Pradesh	2	23
6	Maharashtra	3	125
7	Odisha	5	483
8	Telangana	12	53
9	Uttar Pradesh	1	42
10	West Bengal	5	33
Total		80	2542

For implementation of the project, tender has been floated and finalized. Agreements have been signed with Reliance Jio Infocomm Ltd and Bharti Airtel Ltd in Sept/Oct 2021. Reliance Jio Infocomm Ltd is to implement the project in Chhattisgarh, Madhya Pradesh,

Maharashtra and Odisha (1602 towers) and Bharti Airtel Ltd in Andhra Pradesh, Bihar, Jharkhand, Telangana, Uttar Pradesh and West Bengal (940 towers). The project is targeted to be completed by March 2023.

7. USOF scheme for setting up of 25,000 public Wi-Fi hotspots using the infrastructure of BSNL's telephone exchanges in rural areas

Public Wi-Fi hotspots are being set up by BSNL at its 25,000 telephone exchanges in rural areas at an estimated cost of Rs. 943 Crore, funded by USOF. At each exchange, one Access Point (AP) with backhaul bandwidth of 2 Mbps is to be provided. Wi-Fi hotspots have been set up /installed and providing services in 24,330 rural exchanges/BTS.

Sr.	BSNL Circle	Total No. of Exchanges/ BTS sites	No. of Wi-Fi hotspots providing service
1	Andhra Pradesh	1492	1492
2	Assam	395	409
3	Bihar	895	895
4	Chhattisgarh	310	410
5	Gujarat	1881	1833
6	Haryana	779	773
7	Himachal Pradesh	647	647
8	Jammu & Kashmir	201	201
9	Jharkhand	199	183
10	Karnataka	2111	2037
11	Kerala	1066	1066
12	Madhya Pradesh	1778	1675
13	Maharashtra (including Goa)	3800	3567
14	NE-I (Meghalaya, Mizoram & Tripura)	129	82
15	NE-II (Arunachal Pradesh, Manipur & Nagaland)	141	112
16	Odisha	752	752
17	Punjab	1195	1188
18	Rajasthan	1645	1589
19	Tamil Nadu	1276	1276
20	Telangana	910	910
21	Uttar Pradesh	1982	1964
22	Uttarakhand	427	282
23	West Bengal	989	987
Total		**25000**	**24330**

Annexure-I

Status of BharatNet project (as on 30.11.2021)

Sr.	State/UT	No. of GPs planned	No. of GPs made Service Ready
1	Andaman & Nicobar Islands	70	24
2	Andhra Pradesh*	13426	1706
3	Arunachal Pradesh	1796	756
4	Assam	2664	1501
5	Bihar	8405	8299
6	Chandigarh	12	12
7	Chhattisgarh*	11682	8496
8	Daman & Diu and Dadra & Nagar Haveli	38	36
9	Goa#	191	0
10	Gujarat*	14287	13955
11	Haryana	6259	6082
12	Himachal Pradesh	3226	406
13	Jammu & Kashmir	4281	1055
14	Jharkhand*	4395	4112
15	Karnataka	6086	6083
16	Kerala	978	978
17	Ladakh	193	188
18	Lakshadweep	10	9
19	Madhya Pradesh	22841	16719
20	Maharashtra*	28237	21519
21	Manipur	2785	1436
22	Meghalaya	1791	625
23	Mizoram	763	452
24	Nagaland	994	230
25	Odisha*	6799	6313
26	Puducherry	108	98
27	Punjab	13337	12668
28	Rajasthan	11352	8769
29	Sikkim	185	23
30	Tamil Nadu*$	12520	0
31	Telangana*	12769	5880
32	Tripura	1021	712
33	Uttar Pradesh	59365	34083
34	Uttarakhand	7962	1633
35	West Bengal	3348	2298
	Total	264176	167156

*The Phase-II is being implemented under State-Led model in these States.

$Tamil Nadu State Government signed the MoU with Universal Service Obligation Fund (USOF) on 31.03.2017 for implementation of BharatNet project. Phase-I of BharatNet was accordingly not taken up in Tamil Nadu and the State's GPs are being implemented in Phase-II under State-Led model.

Goa had its own similar broadband network and thus not taken up under Ph-I & Phase-II of BharatNet Project.

Note: Delhi has no GPs and thus not taken up under BharatNet Project.