The London School of Economics and Political Science

The politics of internet infrastructure: Communication policy, governmentality and subjectivation in Chhattisgarh, India

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Declaration

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Abstract

This thesis examines the role of internet infrastructure and its associated discourses in processes of governmentality and subject formation in low and middle-income countries of the global South. Using data collected in the central Indian state of Chhattisgarh as its core case, it asks questions about the interrelationship between policy and political discourse, new information and communications infrastructure, private capital, and how citizens come to know and/or experience internet infrastructure in their everyday lives. Since 2014, The National Optical Fibre Network (NOFN, which began in 2011 under the then UPA government) has been reshaped and rebranded as part of 'Digital India' by Prime Minister Narendra Modi and his far-right Hindutva Bharatiya Janata Party (BJP). Alongside the cables and connectivity, the BJP and allied Hindu extremist organisations have targeted minorities and women through mob violence and (on and offline) hate speech, while a small number of crony capitalist corporations have seen immense profits. Unpicking the links between these processes, the thesis argues that internet infrastructure has become crucial to expanding a particular unregulated brand of capitalism and to narrowing civic subjectivities.

Infrastructures constellate and circulate material and symbolic goods in an institutionalised manner to produce collectivities. Using discourse analysis shows that since the late 1980s, in a context of increasing neoliberalism, internet infrastructure emerged within a discursive regime marked by the fetishisation of systems rationality, enumeration, scientism and economism to produce what can be called digital governmentality. Digital governmentality enables and reinforces a centralised Hindu nationalism mediated by digital technologies and networks. Using semi-structured interviews and participant observation in the city of Ambikapur, and close to 50 villages in Surguja district of Chhattisgarh, data chapters describe a wide range of 'infrastructural practices.' The analysis centres on how subjects imagine, frame and experience these practices. Dominant caste groups in Ambikapur seek to subvert governmentality in practice but also uphold and reproduce the rationalities that drive governmental authority – such as efficiency and transparency. Adivasis (indigenous groups) who reside in surrounding rural areas are subject to a political economic regime overdetermined by coal mining and destruction of their land, forests and water resources.

Internet infrastructure is non-existent or broken, along with other missing infrastructural substrates such as electricity and water. Adivasis face infrastructural control as a specific mode of governmentality where power is exerted not from the top in directly coercive ways but rather through mundane infrastructural practices, thereby exerting authority in procedural ways. In other instances, Adivasis' processes of subject formation are entangled with (the reality and promise of) internet infrastructure in complex ways – ranging from cruel optimism to social haunting.

The thesis makes an original contribution to the emerging sub-field of infrastructure studies by providing a new way of studying communicative infrastructures involving: a renewed emphasis on relationality (infrastructures, governmentality and subjectivation as relational processes and practices); situating internet infrastructures within broader infrastructures; and a historical analysis of how infrastructure is caught up in exercise of power relations. With significant emphasis on the concerns and interests of indigenous peoples in India, the final chapters of the thesis also contribute to a decolonisation of media and communications as a field, and to avoiding orientalist essentialism.

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Table of Contents

List of abbreviations

ADSL – Asymmetric Digital Subscriber Line
AGR – Aggregate Gross Revenue
AIR – All India Radio
ANT – Actor Network Theory
BBNL – Bharat Broadband National Limited
BJP – Bharatiya Janata Party
BPL – Below Poverty Line
BSNL – Bharat Sanchar Nigam Limited
BTEF – Bharatiya Telecom Employees Federation
CAG – Comptroller Auditor General
C-DOT – Centre for Development of Telematics
CHIPS – Chhattisgarh Infotech Promotion Society
CNLTA – Chota Nagpur Land Tenancy Act
COSMOS – Chhattisgarh Online School Monitoring System
CPI – Communist Party of India
CPI(M) – Communist Party of India (Marxist)
CSR – Corporate Social Responsibility
DBT – Direct Benefit Transfer
DoT – Department of Telecommunications
FAC – Forest Advisory Committee
FDI – Foreign Direct Investment
FSR – Farmers Suicide Rate
GATT – General Agreement on Tariffs and Trade
GDP – Gross Domestic Product
GIS – Geographical Information System
HRD – Human Resource Development
IMF – International Monetary Fund
INC – Indian National Congress
ITU – International Telecommunications Union
LMIC – Low and Middle Income Countries
LPG – Liquefied Petroleum Gas
MDO – Mine-Developer-cum-Operator
MIS – Management Information System
MTNL – Mahanagar Telecom Nigam Limited
NCRB – National Crime Records Bureau
NDA – National Democratic Alliance
NEP – New Economic Policy
NFTE – National Federation of Telecom Employees
NGT – National Green Tribunal
NIC – National Informatics Centre
NOFN – National Optical Fibre Network
NREGS – National Rural Employment Guarantee Scheme
NTP – National Telecom Policy
PDS – Public Distribution System
PEKB – Parsa East Kenta Basen

PESA – Panchayat Extension of Scheduled Areas
PFMS – Public Financial Management System
PMAY-G – Pradhan Mantri Awas Yojana - Grameen
RSEB – Rajasthan State Electricity Board
RSS – Rashtriya Swayamsevak Sangh
SKY – Sanchar Kranti Yojana
STS – Science and Technology Studies
TDSAT – Telecom Dispute Settlement and Appellate Tribunal
TRAI – Telecom Regulatory Authority of India
UIDAI – Unique Identification Authority of India
UPA – United Progressive Alliance
USOF – Universal Service Obligation Fund
URL – Uniform Resource Locators
VLE – Village Level Entrepreneur
VSNL – Videsh Sanchar Nigam Limited
WTO – World Trade Organisation

Introduction

The 6th of December 1992 was a watershed moment for Indian democracy. On that fateful day, thousands of far-right Hindu *kar sevaks* (volunteers) demolished the centuries-old Babri mosque in the state of Uttar Pradesh – in full public view with frenzied press and television coverage. That act of vandalism was a brazen attempt by the religious far-right Hindutva movement (both cultural and political) and the ideologues of the Bharatiya Janata Party (BJP) to claim Hindu identity and consolidate a Hindu chauvinist vote-base by establishing rights over the mosque site as the birthplace of the Hindu god *Ram.* Twenty-five years later, on the same day, (with the BJP's Narendra Modi as current prime minister of India) in the state of Rajasthan, a man named Shambhulal Regar hacked an old Muslim labourer, Afrazul, to death with an axe and then burnt his body. Regar claimed that this was necessary to prevent *love jihad*, i.e. the claim that Muslim men 'entrap' young Hindu girls – a way of converting Hindus to Muslims. Regar's fourteen-year old nephew was asked to shoot the whole grisly incident with a mobile phone[1].

Figure 1: Regar looking at the camera after lynching Afrazul. Screenshot from Youtube

The video clip of this murder went viral on social media, including on WhatsApp where many individuals and groups advocated Regar's defence in the name of religion and politics.

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[1] Suhas Munshi. 'A murder that every Indian saw' (29th December, 2017). Retrieved from:
https://www.news18.com/news/immersive/a-murder-that-every-indian-saw.html

The destruction of the Babri mosque required a huge mob of 'volunteers' to be physically present while in Regar's case, an individual act of cold-blooded lynching became *mediated* (through WhatsApp and news television) into national significance for Hindu extremism. This Hindu chauvinist's murder of an innocent Muslim citizen and its subsequent distribution on the internet perfectly capture the tendency towards an intersection of new media infrastructures and political processes in contemporary Indian society. More than two decades of widening inequality are matched by increasing polarisation along caste, gender and religious lines. Nationalism, or more precisely, the question of who or what is 'anti-national' has come to dominate both media and everyday discourse. Those who question the government and its far-right Hindu extremist ideology are branded as 'anti-national' by party officials, mainstream media, and a large organised army of social media users supporting the government line. It is in this context that the Indian government is undertaking what is perhaps the country's largest internet infrastructure project – a national fibre optic network to connect all of India's 625,000 villages. Large-scale investments in internet infrastructures (whether by governments or by the private sector) are widely accepted, especially in the global south, as a safe route to economic growth (Qiang, Rossotto, & Kimura, 2009). My research aims to provide a nuanced and in-depth understanding of this large-scale internet infrastructure project, specifically in terms of the role played by internet infrastructure in the processes of governmentality and subjectivation in low- and middle-income countries (LMICs). As one of the largest connectivity and communicative infrastructure projects in the world, the Indian National Optical Fibre Network has significant implications for the politics, economics and culture of not only India, but many other LMICs.

My doctoral research will make a significant addition to the literature on infrastructure from a Global South perspective. There is a tendency in the field of decolonial studies (Mignolo, 2011) to attempt theorisation that is somehow 'uncontaminated' by ideas from the West. In my view, while an important push-back against racist knowledge production, this kind of differentiation problematically reifies the South and obscures the historical and contemporary connections crisscrossing the globe (Mbembe & Nuttall, 2004). In reality, the local, even in the Global South, becomes a 'constellation of processes rather than a thing' (Massey, 2005, p. 141). Globalisation however relies on 'infinite instantaneity of

dematerialised mobility' (ibid., p.97) and my research provides a corrective to this frame of reference. As media anthropologist Brian Larkin remarked in his study of Nigerian urban cinema, it is 'a study of cinema *in* Africa rather than one *of* African cinema' (2008, p. 254). Similarly, this study of infrastructure *in* India is not an attempt to create a separate uncontaminated theoretical framework, but rather to arrive at generalisation from a different empirical starting point in the hope that the universal assumptions about infrastructures and societies are enriched or complicated through such complex and subaltern perspectives.

Saliently, my doctoral research investigates the inherent tensions that intersect the *modernising* 'outbound' tendencies of digital technologies (specifically internet infrastructure) and the *regressive* 'inbound' pursuit of Hindu nationalism as the normative frame for individual and group subjectivity. I situate this analysis by investigating internet infrastructure in India, specifically the National Optical Fibre Network. The network aims to cover 625,000 villages across India before 2020[2], and is managed by a public corporation, Bharat Broadband National Limited (BBNL).

Socio-political contexts

India is the world's most populous democracy. Its economy is increasingly on par with those of Western capitalist countries[3]. For at least 2000 years, the Indian subcontinent has been a federation of caste-structured societies where all aspects of life, including communicative practices are inflected by caste-structured power relations. These systems and relations structured by caste have both survived and been transformed by colonialism. Politically

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[2] Details of the project are available on BBNL's website. Retrieved from: www.bbnl.nic.in.

[3] Although many economists have pointed out that demonetisation of currency in late 2016 and the new Goods and Services Tax (GST) in mid-2017 have had disastrous effects on the economy (since both these affect micro, small and medium enterprises and un-organised labour). However, through manipulation of statistics (on GDP, unemployment, consumption and so on) the central government has largely concealed the decline of economic growth. India's economic growth however is still considerable relative to growth in Western countries since the latter countries have only been able to register growth around 1-2% of GDP after the economic recession of 2008-09. See Rohan Venkataramakrishnan, 'Is Modi government manipulating the data to show GDP growth above 5%?' (03 March, 2020) *Scroll.in*. Retrieved from: https://scroll.in/article/954986/the-daily-fix-is-modi-government-fudging-the-data-to-show-gdp-growth-above-5

independent since 1947, India initially was a centrally planned welfare state with a socialist orientation. The post-colonial independent Indian government has had a complex relationship to investment and development of science and technology – including media and communications technologies. Modern technological innovation in media and communications – notably the electric domestic and international telegraph system, printing press, cinema, radio and telephone were legacies of British colonial rule that began in the 17th century and formally ended in 1947. The penetration of technological and/or communicative infrastructure did not fundamentally alter precolonial caste-structured, patriarchy-structured and class-structured social relations, but rather intensified and exacerbated them. Dominant caste men from wealthy families were able to monopolise the resources, opportunities and benefits of a country on its path towards industrialised modernity. Science and technology played a crucial role as factors that helped elite Indians to imagine a way to overcome the debilitating effects of colonialism and to usher in a new age of modernity and progress without necessarily having to grapple with millennia-old oppression and inequality related to caste, gender and class.

Independent India's first prime minister, Jawaharlal Nehru called scientific and technological infrastructures and projects 'temples of modern India'[4]. The post-independence years were marked by the fully government-controlled media and communication infrastructure as mandated by the Indian constitution. This central government control was intended to achieve two objectives: coordinated and centralised development of a new nation-state and maintain law and order across the country. Even today, the 1885 India Telegraph Act enables the central government to have full control over licensing powers, right of way to install communication infrastructure over any part of Indian territory and punish those who damage or tamper with this infrastructure. The development of media and communications infrastructure was part and parcel of centrally coordinated Five Year Plans – a hallmark of what has been called the Nehru-Mahalanobis regime. For example, the public service broadcasting system consisting of All India Radio (AIR) and the television network Doordarshan (DD) were directly under the control of the Ministry for Information and Broadcasting (I&B). Technologically, these were and continue to be terrestrial analogue

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[4] 'Temples of Modern India'. *Financial Express*. (16th August 2003). Retrieved from: http://www.financialexpress.com/archive/temples-of-modern-india/90143/.

networks – i.e. free to air and broadcast without encryption or paid subscription. The objective of centralised national development was accompanied by a strong state suppressing many forms of dissent – whether expressed in ideological terms or whether in terms of seeking territorial autonomy from the Indian nation-state. In other words, a centralised communicative infrastructure aimed to produce rather than to reflect an idealised national 'imagined community' (Anderson, 1983).

In 1975, the then prime minister, and daughter of Jawaharlal Nehru, Indira Gandhi imposed Emergency[5] – including restrictions on freedom of press and civil liberties. The Emergency lasted for 21 months and damaged the notion of the State as a trustee of media and communication in India. During the Emergency, Indira Gandhi controlled newspapers through threats of withdrawing funding, forcibly merged news agencies, threatened editors to fall in line and the public service broadcasting system became the mouthpiece of the government, singing the praise of government policies without mentioning the damage done to public trust by the Emergency (Singh, 1980). The opposition parties made it a point to make media independence as a key campaign issue, mainly by pushing for an autonomous public service broadcaster with arms-length distance from the State – a project that finally achieved fruition (at least on paper) in 1997 with the establishment of India's public service broadcaster as a public corporation Prasar Bharti.

Since the late 1980s, the State increasingly withdrew its funding from the media and communications economy and sought to centre private businesses and the market in its stead. State withdrawal was enabled through increase in foreign direct investment, and took place across television, print, cinema and telecoms industries. Radio, because of its analogue terrestrial transmission, was denied foreign investment (restricted to 26% foreign investment). In response to these funding changes, the media and communications landscape has transformed irrevocably since the 1990s (Banaji, 2020; Mehta, 2008; Thomas, 2010). There are now more than 800 television channels cutting across a wide variety of genres and languages, about 500 FM radio stations broadcasting in various languages and dialects, and more than 10 telecom service providers that cover almost the entire Indian

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[5] The official period of the Emergency was from 25 June 1975 to 21 March 1977.

territory. Most of this infrastructure is now owned by private investors – both Indian and foreign. The slow erosion of policy and political action at the expense of strengthening market forces, just like the presence of colonial technologies, has intensified inequalities in terms of caste, class and gender.

The policies of privatisation and foreign direct investment in media and communications has quantitatively increased media and communications infrastructure in India. However, this infrastructure is skewed in different ways towards the dominant caste groups, middle and upper classes, towards men and towards urban areas. Skewing of infrastructural resources both produces and is produced by an older problem – the increasing caste, gender and economic inequality and growth of Hindu fundamentalism that now dominates mainstream politics and public life. According to the Credit Suisse Research Institute, the richest one percent controlled nearly 60 percent of India's wealth in 2016[6]. In spite of such drastic inequality, it is reported that nearly 70% of Indian households[7] have a mobile phone – even if many of them don't have electricity in their homes, almost half the population don't have access to toilets and nearly half of India's children are malnourished.

It is this historical inequality which the BJP has made *inflammable* through its emphasis on politics and governance from the perspective of a masculinist dominant-caste Hindu subject position[8]. The far-right wing Hindu chauvinist Bharatiya Janata Party (henceforth, the BJP) gained a major electoral victory in 2014. Political discourse, media reportage and interpersonal interactions are marked with references to nationalism, caste, religion and gender. Serious instances of violence against Christian and Muslim communities have

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[6] Global Wealth Report, 2016. *Credit Suisse Research Institute*. Retrieved from: https://www.credit-suisse.com/about-us/en/reports-research/global-wealth-report.html

[7] This access is largely restricted to men, and is heavily skewed towards urban areas. Further, telecom providers report to the regulator on subscriptions rather than subscribers. Due to these reasons, precise numbers are hard to obtain.

[8] For work on Hindutva and masculinity, see Anand (2007) and Subramanian (2019). For work on Hindutva's link with dominant castes, see Aloysius (1994b), Jean Dreze, 'The Revolt of the Upper Castes' (20 February, 2020). *The India Forum.* Retrieved from: https://www.theindiaforum.in/article/revolt-upper-castes. Chistophe Jaffrelot and Gilles Verniers, 'Explained: In Hindi heartland, upper castes dominate new Lok Sabha'. (27 May, 2019). *The Indian Express.* Retrieved from: https://indianexpress.com/article/explained/in-hindi-heartland-upper-castes-dominate-new-house-5747511/

sharpened discourses around a strong Hindu national identity. Top BJP leaders, while rarely involved *directly* in instances of physical violence against minorities, articulate this nationalism while responding to concerns about secularism, maintenance of law and order, protection of minorities and vision of national development. The BJP's unabashed support for neoliberal capitalism has opened up India to the needs of global and domestic capital without considering the rights of indigenous peoples, workers, landless labourers or small businesses. The complementary tendency towards fascism seeks to narrow India to a rigid Hindu nationalist identity. In other words, India is heading towards a profound transformation of its social base (technological modernisation) while at the same time undergoing spasms of authoritarian populism and fascism through the territorialising logics of nationalism and the reduction of its ethnic and cultural diversity to a Hindu subjectivity.

Infrastructural development has not escaped this tension. When the BJP demonetised 86% of Indian currency in an economy that relies almost entirely on cash transactions, Modi conducted an opinion poll exclusively available on the 'Modi' app. Then, ignoring the circularity of consulting only the already-digitally included, he and his supporters widely cited the findings of this app-based poll as evidence of grassroots support for his demonetisation policy (Shrinivasan, 2016). His speeches, in public and in Parliament, are rife with references to the internet, mobile phones, drones, biometrics and other kinds of technologies that are either currently argued to, or supposedly will be used to, improve governance. The digital communicative infrastructure of the Modi-led BJP government is called the 'Digital India' programme. The backbone of the Digital India programme is the National Optical Fibre Network (NOFN) – a central government initiative that will wire up all 625,000 villages across India. A historical understanding of political and economic contexts will provide a better understanding of the material and discursive conditions in which the National Optical Fibre Network has been developed and operationalised.

The National Optical Fibre Network

Like the telegraph and radio broadcasting, telecommunication too is controlled by the India Telegraph Act 1885 – a colonial inheritance designed to position control of communication

infrastructure[9] in the hands of government. This Act was the British Empire's response to the first major revolt for independence by Indians in 1857. Although the Telegraph Act, 1885, was initially designed to protect telegraph infrastructure after the revolt and to ensure the continuance of imperial rule, the British government and subsequently the independent Indian government subsequently merely amended the Telegraph Act every time a new communication technology needed to be regulated. Despite amendments, post-independence governments have retained the basic architecture of the Act itself – total control by government over licensing and infrastructure. Thus, even in the 21st century, this colonial era Act continues to provide the legislative umbrella under which all Indian communication technologies operate.

In 1947, the independent central government of India inherited a basic telecommunications service which consisted of 82,000 subscribers on 321 switching exchanges with a maximum capacity to connect 100,000 subscribers (Sridhar, 2012a, p. 21). From 1947 to about 1985, telecommunications grew at a slow pace. On the subscription side, it was a personal/household communication service that was too expensive for a majority of the population. From the government's perspective, investment mostly went into agriculture and industrial development, while telecommunications was seen as a luxury that could wait until crushing poverty had been alleviated (Doron & Jeffrey, 2013).

By the mid-1980s, India was approaching a financial crisis while the World Trade Organisation (WTO), born out of the Uruguay round of discussions of General Agreement on Tariffs and Trade (GATT) opened up the services sector (including telecommunications) in India to foreign investment. Simultaneously, the International Telecommunications Union (ITU) published the Maitland Commission Report that highlighted the disparity of telecommunications access between the first and third world, arguing for a greater emphasis on connectivity in the latter regions – a recommendation that the World Bank started taking up through various financing schemes (Chakravartty, 2004). In response to these shifts, by the early 1990s, the Indian government took a series of steps to liberalise the economy, including the privatisation of nationalised sectors. The central government

reorganised the telecommunications sector through a series of strategic changes – carving out autonomous public corporations from existing ministries, increasing the allocation of funds, publishing national telecom policies in sync with Five-Year Plans and allowing private operators into the market.

In the 1990s, these changes were in line with other cultural and political changes in the country. Satellites beamed western television soap operas and the first Gulf War was watched live by many Indians who had televisions. In cities like Bombay, small time independent neighbourhood cable operations sprung up overnight, downlinking videos from a satellite and redistributing to individual homes through cable connections. Cinema halls, meanwhile, were screening films about preserving traditional family values[10]. The central government brought in 27% reservation of seats in public institutions for dominated caste communities[11] – a move that sparked riots and protests from furious dominant-caste students. Alongside a range of chauvinist movements based on caste status and/or regional and linguistic identity, a militant far-right Hindu-chauvinist mass movement began to assert itself politically through the Bharatiya Janata Party (BJP) – the current ruling party of India.

The 1990s were thus the beginning of a new era in Indian politics that moved away from state-backed, welfarist policies to untrammelled competition and market-driven growth. In the mediated public sphere controlled by large capitalists with dominant caste elites as gatekeepers, the oppressed were airbrushed out of discourse while the middle classes gained greater prominence. The push for greater telecommunications and internet access was expedited to a great extent because of this middle class – both for economic and cultural reasons.

These changes were concomitant with corresponding infrastructural development in urban areas since the early 2000s. Telecom penetration rapidly increased even though it was

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[10] These films indicate dominant caste anxiety about unpredictable effects of economic liberalisation while at the same time, a nostalgic nationalism oriented towards the Indian diaspora markets, especially in the US and UK.
[11] Officially, these groups are clubbed under the category of Other Backward Classes (OBCs), this group comprises approximately 52-54% of the population, making it the single largest social group in the population simultaneously marked by 'lower' caste (for identification) and backward class (official classification).

largely skewed towards urban areas. The size of the telecommunications market increased which resulted in tariff decrease for subscribers and increased revenue[12] for the central government. Over the last two decades, the privatisation of telecommunications has been marked by two trends: saturation in urban areas and a lack of ubiquitous telecom and internet service in rural areas. Policy discourses, political and financial developments from the late 1990s help explain the skew towards urban areas to a large extent and these developments are explained in more detail in Chapter 2, Section 2.5 and Chapter 4, Section 4.4. National telecom policies have increasingly sought to position telecommunication and subsequently, internet access, as a universal service for better quality of life, improved governance and increased job opportunities. However, the central government has not been able to ensure satisfactory levels of private sector investment in infrastructure (especially internet infrastructure via wireless telecommunications) in rural areas. As a result, although rural areas are marked by ubiquitous access to 2G spectrum – i.e. the ability to make voice calls; 3G and 4G spectrum or broadband access is sparsely available. The birth of the National Optical Fibre Network (NOFN) can be traced to this gap. In other words, the NOFN has emerged in spite of and partly because of the structural tensions in the wireless telecommunications sector.

Theorising internet infrastructure

In media and communications, the role of communicative infrastructure has been relatively understudied since in a 'transmission view' of communications (Carey, 1989), infrastructures would be seen as part of media distribution whereas the focus of the discipline has historically been on media content and media industries – producers, consumers and political economy (Parks & Starosielski, 2015). Partly, the discipline could be seen to be exhausted by discursive modes of analysis, and scholarship on infrastructures could potentially mitigate this exhaustion as relatively flexible but nonetheless new objects of research. Situated within the infrastructural turn, my research provides original contributions by studying internet infrastructure at the intersection of two interlinked processes: governmentality and subjectivation.

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[12] Increase in revenues (for the government) came from spectrum auctions and revenue sharing agreements apart from tax revenues.

The term 'internet infrastructure' could be used to cover a wide range of materials, discourses, symbols and practices that span the globe. Physical infrastructure such as routers, towers, computers, mobile phones, fibre optic cables; virtual infrastructure such as access points, internet protocol addresses, domain name system, numbered ports, Uniform Resource Locators (URLs); other *substrates* such as electricity lines, power backup systems, batteries; institutional arrangements addressing quality of service standards or speed of internet standards, administration of internet provision (public and/or commercial), financial arrangements and labour – these all are perfectly valid objects of study under the category of 'internet infrastructure'. Further, internet infrastructure can no longer be narrowly compartmentalised. As Paul Edwards has put it, 'to be modern is to live within and by means of infrastructures' (Misa, Brey, & Feenberg, 2003, p. 186), or in even broader terms, they have been called 'mechanisms to control time, instigating waves of social progress' (Marvin & Graham, 2001, p. 42).

The challenge lies in where and how to draw boundaries that provide a stable conceptual and analytical category. Rather than attempt to incorporate an ever expanding universe of objects and socio-cultural constructs, I argue that study of infrastructure is a categorical act, a conscious system of classification that highlights the historical, epistemological and political commitments involved in the analysis (Bowker & Star, 1999). In terms of the political and epistemological commitments involved, I view infrastructure neither as purely physical-material objects nor entirely as embodiment of political values. When I use the term 'infrastructure', I refer to '…a totality of both technical and cultural systems that create institutionalised structures whereby goods of all sorts circulate, connecting and binding people into collectivities' (Larkin, 2008, p. 6). In order to operationalise this broad definition effectively for my research, I undertake a relational view of internet infrastructure, situated within broader infrastructures and entangled in historical relations of power. These perspectives are crucial since they enable me to theorise infrastructures critically and fully embedded in social action.

Take for instance the challenge of historically situating infrastructure:

> …we hold that infrastructure is a fundamentally relational concept. It becomes infrastructure in relation to organized practices. Within a given cultural context, the cook considers the water system a piece of working infrastructure integral to making dinner; for the city planner, it becomes a variable in a complex equation. Thus, we ask, *when* – not *what* – is an infrastructure (Star & Ruhleder, 1996, p. 113; emphasis in original)

Here, infrastructure becomes *meaningful* only when considered in relation to a set of organised practices. However, this kind of relational view also invites a further task of locating a starting point – which set of organised practices should be considered and beginning from when? In my research, I seek to unpack the set of political, economic and cultural dynamics within which communicative infrastructures have emerged in the Indian sub-continent from the mid-19th century onwards.

Role of internet infrastructure in processes of governmentality and subjectivation

Media and communications has always been an interdisciplinary 'field' approaching its objects of study with a 'determined eclecticism' (Herbst, 2008). This eclecticism has become a necessity since digital information produced, distributed and received through networked infrastructures play a crucial role in many aspects of social life cutting across political, cultural and economic domains. From the relatively banal practice of good morning greetings on WhatsApp as constructions of everyday sociality to direct cash transfers by the state to millions of people, the processes of technological mediation have proliferated and have become entangled with processes of governmentality and subjectivation.

Since the early 20th century, there has been a tension in the social sciences around how to theorise the production of individuals and groups and indeed society. There are epistemic positions available that range from an unchanging individual self to a complete negation of the subject. On the one hand, we have very broad implications in terms of societal changes. Raymond Williams (1974) analysed television both as technology and a cultural form. In a capitalist society, Williams argues that television reconciled two paradoxical tendencies: increasing mobility and the self-sufficient home – what he called mobile privatisation (ibid.

p.6). This type of scholarship theorises a very broad dialectical relationship between a particular media and communications technology and society. They relate to societies at large without commenting on a particular group or individual, and the changes described are profound and long-lasting. On the other hand, we have literature that investigates the relationship between media and communications and individuals to build a theoretical framework on how humans and media and communications technologies influence each other. For example, it has been argued in a book titled *The Second Self: Computers and the Human Spirit* that 'behind increasing interest in computational interpretations of mind is an equally nervous preoccupation with the idea of self as a machine' (Turkle, 1984, p. 29).

I argue that internet infrastructure, in and through infrastructural practices, produces subject positions but it is not always necessary that subjects *articulate* themselves into these subject positions. By articulate, I mean a 'way of understanding how ideological elements cohere within a discourse, and a way of asking whether how they do or do not become articulated, at specific conjunctures to certain political subjects' (Hall & Grossberg, 1986, p. 53; Laclau, 1977).

The challenge is to incorporate within a coherent theoretical framework, two phenomena that are seemingly contradictory. On the one hand, how specific subject positions are created in a given time and place; and on the other hand, provide room for subjects, who through a range of practices, *correspond* with these subject positions (through technologies of the self) with varying results depending on power relations. In order to incorporate both these aspects, my research uses Foucault's concept of governmentality to investigate 'the conduct of conduct' (Foucault, 1982, 2007; Gordon, 1991). This notion accounts for and incorporates the double meaning of conduct – as action (free/voluntary or directed) and moral behaviour. The concept implicated here is that of 'govern-ment' – that refers to 'how we exercise authority over others, or how we govern abstract entities such as states and populations, but also how we govern ourselves' (Dean, 2014, p. 19).

The concept of governmentality is particularly relevant for my research for three reasons. First, it enables theorising of how authority is exercised over others and between ourselves, thereby accounting for broader flows of power without negating the possibility of an agentic

role for the subject. Second, governmentality emphasises an organised set of practices that direct the flow of power in a given society or in a given epoch. The notion of practice encompasses both discursive and material contexts including the interaction between the two – a crucial element while researching infrastructure. Third, governmentality is attentive to the production of truth, or in Foucault's words 'episteme' – a particular configuration of knowledge and power.

Having outlined my conceptual tools and theoretical frameworks, I reiterate my research questions, to which the methodological discussions below speak:

1) Under what political, economic and discursive formations has internet infrastructure emerged in India?
2) How and to what extent does the case of India shed light on how internet infrastructure is imbricated in processes of governmentality?
3) In contemporary India, how and to what extent does internet infrastructure play a role in processes of individual and group subjectivation?

To answer the first research question requires an analysis of social, cultural, political and economic contexts, i.e. the interplay between material and discursive contexts within which the NOFN has emerged historically and is currently operationalised. To answer the second and third research questions, requires an empirical investigation of the range of practices and discourses within which individuals and groups interact and use internet infrastructure, with a focus on processes of governmentality and subjectivation.

Although the research questions emphasise different aspects of infrastructure, governmentality and their shaping of individual and collective subjectivation, cross-cut and overlap with each other. For example, infrastructural practices take place within a broader material and discursive contexts – such as specific policy environment and institutional arrangements. Equally, caste class and gender hierarchies influence the interaction with and usage of infrastructure in ways that are not only relevant to my field site of Surguja district

in Chhattisgarh, India but also may be observed in other districts in India and in other low- and middle-income countries.

In order to answer these research questions, I use the methods of discourse analysis, participant observation and semi-structured interviews. I use discourse analysis to investigate the broader discursive contexts and policy formations within which the National Optical Fibre Network is situated. My research on secondary textual sources – policies, institutionalisation of internet delivery, economic trends in the telecommunication and internet sector (including industry) allow me to theorise the various subject positions that are produced by such policies. My primary source of data is the participant observation (field notes) and semi-structured interviews generated during seven months of fieldwork. It is this data that enables me to theorise how individuals and groups[13] negotiate the process of articulating themselves into various subject positions.

Chapter outline

In **Chapter 1**, I argue that media and communications scholarship while strong on content (production and audiences) and ownership, has relatively under-theorised media and communications infrastructure as a conceptual and material site of analysis. I take a temporal view of infrastructure to emphasise specific sets of *organised* relations, practices and processes that become crucial to how infrastructures play a role in both governmentality and subjectivation. In this chapter, I review and build upon insights from outside the discipline of media and communications, such as Science and Technology Studies (STS), post-humanist philosophy, anthropology and cultural studies to form an original theoretical framework. These insights include the value of historically situating internet infrastructure in broader socio-political contexts; exceeding discursive modes of analysis to include the materiality, relationality and processual aspects of infrastructure; and finally applying these insights to questions of governmentality and subjectivation – both themes that have been relatively under-theorised with respect to infrastructure studies, within and beyond media and communications scholarship.

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[13] I refer to individuals and groups in Surguja district, state of Chhattisgarh – comprising of dominant castes, intermediary castes, oppressed castes, Adivasis.

In **Chapter 2**, I investigate specific conjunctural moments in the history of India that have played a decisive role in shaping contemporary communicative infrastructure. Pre-colonial and early colonial histories had communicative practices that were caste-structured. Early colonialist intervention took the form of mercantilism mediated by the East India Company during which individuals were produced as *administrative subjects* – facing the law, paying taxes and so on. In the 19th century, infrastructures such as the railway network were crucial towards inaugurating the colonial project of modernity, and thus the *colonial modern subject* in the affective sense, for instance providing subjects with a new perception of interiority. In the latter half of the 20th century, which is the post-colonial period, the relation between industry and the state (at least with respect to the role of media and communication) was primarily one of 'nation-building' and thus producing *nationalist subjects*. After the 1980s, the proliferation of privately owned commercial communicative infrastructure was accompanied by the morphological transformation of the state and with the production of new subject positions – such as a desiring subject celebrating global modernity and personal freedoms. I argue that current internet infrastructure does not substitute as much as reveals palimpsestic traces of both pre-colonial (caste-structured) and colonial architecture and institutional logics. These palimpsestic traces and logics of older communicative infrastructure persist and wield influence over the production of authority and subject positions in contemporary society.

In **Chapter 3**, I give a detailed account of my research methodologies, namely discourse analysis, participant observation ethnography and semi-structured interviews and how they were operationalised in Surguja district in Chhattisgarh, India. After providing an audit-trail of how these methods were used to generate and analyse different kinds of data, I argue that these methods are most appropriately suited to answer my research questions in conjunction with my theoretical framework. The latter part of this chapter attempts an exercise in self-reflexivity relating to different aspects of my research design. I address the implication of my own identity as a dominant-caste Hindu male investigating research subjects who are significantly less privileged and less safe than me. Here I discuss the politics of epistemology and the extent to which even modern global south knowledge production is imbricated in coloniality. I draw upon theoretical and methodological

frameworks that have been influenced by post-structural theories developed in France since the 1960s. Post-structural epistemologies while perhaps adequate to critique the production of a western (posing as a universal) subject (let us call him Man with a capital M), struggle to grapple with the fundamental role of historical forms of subjectivity formed by race, caste, gender and sexuality. Finally, I discuss the implications of theorisation if one starts from the global South. Here I apply decolonial perspectives on epistemology to theorise new ways of critiquing and interpreting knowledge production.

Chapter 4 offers a historically situated discourse analysis of policy and regulation on telecommunications and internet access in India. The contemporary political and aesthetic logics of modern communicative infrastructure is radically different from the colonial sublime that characterised communication (and other) infrastructure since the late 19th century. Rather than sublime infrastructure (i.e. awe-inducing and terrifying, yet seductive) in the physical sense, current discourse indicates the hegemony of a *discursive sublime* to compensate for the fragmentation of the physical infrastructure –privatised, no longer directly connected to the political authority of the state and increasingly with invisible ties to the state. In this chapter, I argue that since the mid-1980s, governmentality became linked to discourses of systems rationality, enumeration, scientism, economism culminating in to contemporary 'digital governmentality' as an integral part of populist authoritarian politics of BJP's Modi government. Digital governmentality (through strategies of enumeration and other such rationalities) has irreversibly spilled outside the formal policy domain and now includes a range of communicative strategies – from social media, to customised applications, hologram virtual meetings and so on. In other words, digital governmentality has seeped into everyday life and political *culture*. As such digital governmentality is intimately linked not only to contemporary internet infrastructure and infrastructural practices, but also to the production of subject positions.

In Chapters **5** and **6**, I provide the findings and analysis of my field work in Chhattisgarh over a period of six months. My field work cuts across government offices, homes, tea shops, schools and various other public spaces – frequented by all people across a wide demographic base interacting with and/or using internet infrastructure in varying contexts. I also focus on a diverse range of infrastructural practices to emphasise how various subjects

negotiate these practices depending on their social position in terms of class, caste, gender and indigeneity. I argue that middle classes and dominant castes working in local government as administrators of infrastructure uphold and reproduce national-level policy discourses, ambiguously producing the 'other' as beneficiaries, simultaneously constituting themselves as nationalist subjects doing their duty. Other dominant caste and middle-class groups accept the telos of governmentality in principle while they seek to subvert these processes in practice. In Adivasi-inhabited areas, other broader infrastructural projects – such as mining, overdetermine internet infrastructure, producing *infrastructural control* as a mode of governmentality where power relations are exercised not from the top but through seemingly mundane infrastructural procedures and practices. Further, I argue that in some instances, this overdetermination of broader infrastructures that renders the familiar unfamiliar, produces a dynamic of social haunting. There are different registers of violence implicit in the dynamics of social haunting, but it would be a mistake to stop with the empirical fact of violence. Instead, such 'incomprehensibility' signifies an urgent call for transforming the material and epistemological conditions of social reproduction.

In Chapter **7**, I draw from my empirical evidence in the previous three chapters to argue that there is a strong case to be made in media and communications to look at infrastructures anew. I claim that media and communications scholarship can move away from its legacy of media effects or other theories attempting to theorise influence by placing media at the centre of social analysis. Instead I argue that infrastructures are significant conceptual *vantage points* from where social science scholarship can discover news ways of seeing the social, in terms of how internet infrastructures and infrastructural practices are imbricated in the processes of governmentality and subjectivation. My contributions to infrastructure studies are in incorporating relational approaches to practices and processes of infrastructure, governmentality and subjectivation; situating internet infrastructure within broader infrastructures (depending on empirical contexts); historical analysis of how infrastructure is caught up in exercise of power relations.

I emphasise the role of knowledge production in contributing towards changing material relations in societies where research and subsequent knowledge was and is produced. In this way, the research process is not merely extractive but ultimately generative.

Chapter 1 A theoretical framework for internet infrastructure, governmentality and subjectivation

Infrastructure has received due attention across a range of disciplines, especially over the last decade; some of the attempts to encapsulate this tendency include, 'infrastructural disposition' (Parks & Starosielski, 2015), 'infrastructural inversion' (Bowker, 1994), 'infrastructuralism' (Peters, 2015), and 'new materialism' (Sandvig, 2013). In large part, these terms reflect a broad tendency to focus on media infrastructures as objects of research albeit with diverse theoretical and methodological approaches. Larkin (2013) argues that the sheer diversity of theoretical and methodological approaches to infrastructure suggests that the term 'infrastructure' is an unstable unit of research. For media and communication scholars, media infrastructures are difficult to 'stabilise'.

In this chapter I emphasise the significance of relational approaches to understanding and theorising infrastructure to overcome the dualisms in media and communications literature such as technological determinism and social constructionism or continuities and discontinuities perspectives. I also build on insights from the fields and disciplines of media and communications, STS and anthropology to bring attention to materiality and relationality (with users) in analyses of media and communications. Using these approaches, I shift attention away from politics as a primarily discursive activity, and focus instead on processes and relations that exceed these descriptive concepts.

Finally, building on work by scholars of critical race studies and decolonisation, I interrogate the entanglement of technological systems (and infrastructures) with social relations to centre the hitherto unaddressed questions of subject construction and historical socio-political contexts in which the technologies become available in the first place. I conclude the chapter by proposing a theoretical framework with *infrastructural practices* as the key object of my research, as the locus point of two interrelated processes: *governmentality* and *subjectivation*.

1.1 Relationality of infrastructure

The first step towards reimagining infrastructures in broader terms is to see infrastructures as essentially relational in nature. The advantage of this view is to decentre any narrow conception of infrastructures as comprising physical objects only. Infrastructures come into being only in relation to other infrastructures and systems. The complication arises in the details of how these relations are formed, the causal logic implicit in these relations and which relations are more influential than others. In this section, I discuss representative literature to highlight the tensions between technological determinism and social constructionism when incorporating relationality into media and communications scholarship. Further, I show how the cultural materialist work of Raymond Williams can be a useful corrective to balance and recast the tensions between determinism and constructionism through the notions of limits, pressures, unpredictability and contingency.

Although there is no explicit use of relationality in their scholarship, there are at least two representative accounts of media infrastructures discussed below that present an essentially relational view but fail to comment on these complications. Yochai Benkler (1997) argues that in 1920s US business competition changed radio from a two-way broadcasting system into a one-way system, crucially through the monopolisation of standardised radio sets. This is one version of relationality where changes in policy or business within an emerging capitalist system have concrete effects on a media system – in this case radio broadcasting. However, the limits of Benkler's view are that the relationality is one-directional, i.e. big business is seen as having a direct influence on spectrum allocation for radio broadcasting and subsequently on telephony. James Carey (1983) argues that the introduction of telegraphy enabled *time to colonise space*, thus introducing speculative arbitrage economies into late 19th century America; reorganisation of commodity markets and enabling imperialism as a system in which the centre of an empire could dictate directly to rather than merely respond to these governors on the margins. In other words, in contrast to Benkler's argument, Carey suggests that technologies of cables, telegraphs and sea power effected profound changes in a political system.

Although they come at the issue (of the relationship between infrastructure and society) from opposite directions, there are undoubtedly valuable insights in both Benkler's and Carey's arguments. Their two studies are representative of a now classic debate on the broader theorising of the role of media technologies (and we can include infrastructure understood as part of media technology as it has been conventionally used) and society. The debate oscillates between *technological determinism* and *social construction of technology*. Carey's arguments can be seen as technologically deterministic in that he simplifies and overestimates the influence of the telegraph in the transition from colonialism to imperialism, and underplays other socio-political factors. Benkler's account fits a social construction of technology model, with attention to the changes in business and regulations that have transformed broadcasting and spectrum allocation. Both accounts, although extremely insightful, remain incomplete, and reductive.

Such debates have enormous implications for real world problems – in fact today these debates are more relevant than ever. In the US and the UK, for example, the mainstream press and regulators regularly investigate whether Facebook manipulated the 2016 US elections and the 2016 UK referendum on Brexit. There is already substantial literature that attributes the Arab Spring revolutions, or the Iran uprising in 2009 to the ability of citizens to foment discontent on Twitter and Facebook (c.f. Breuer, Landman, & Farquhar, 2015; Harlow & Johnson, 2011; Khondker, 2011). Such accounts simply fail to consider how economic inequality, unemployment rates, foreign policy (sanctions, import and export conditions, currency valuation) and domestic politics – including ethnic and religious negotiations - are implicated within a particular society and set of social changes. By linking huge shifts or events directly and mostly only to media and communication infrastructures (including platforms such as Twitter), there is a risk of reducing the complex process of mediation to one of narrow causal determination.

In reality, media infrastructure and societies are interrelated in more complex ways. Raymond Williams (1974) analysed television as both a technology and a cultural form which emerged in Western Europe and the US as a key proponent of 'mobile privatisation' linked to the dominance of 20th century capitalism. Williams groups broadcasting as a part of consumer durables that include the motorcycle, motorcar, box camera and home

electrical appliances. He argues that socially, this category of consumer durables is characterised by and is, in fact, the product of:

> …two apparently paradoxical yet deeply connected tendencies of modern urban industrial living: on the one hand mobility, on the other hand the more apparently self-sufficient family home. The earlier period of public technology, best exemplified by the railways and city lighting, was being replaced by a kind of technology for which no satisfactory name has yet been found: that which served at-once mobile and home-centred way of living: a form of *mobile privatisation* (ibid. p. 19; emphasis in original)

In the mid-1970s, when Williams was writing on television, the Keynesian welfare state (adopted by many Western European countries after the second World War) was coming under pressure and soon to be followed by the introduction of a period of privatisation and neoliberalism. In this sense, Williams presciently argues that the contradictory pressures of industrial capitalism created the inevitable conditions for the arrival of broadcasting technology – where the means of production and transmission preceded the content and became a popular consumer durable in spite of technically superior visual technology (cinema). Williams was able to escape the binary of technological determinism versus social construction of technology by commenting on television both as technology *and* a cultural form – thus showing how both aspects are interrelated.

The theoretical context for Williams' provision of a new and nuanced analysis of relations between media and communication technologies and social structures goes back to his literary training and Marxist inclinations. Developing a way of thinking called 'cultural materialism' the basic thrust of his work was to restore centrality to considerations of culture without losing the enormous importance of the economic 'base'. Thus Williams (1973) was able to rework Marx's base-superstructure thesis as follows:

> We have to revalue determination towards the setting of limits and exertion of pressure, and away from a predicted, prefigured and controlled content. We have to revalue superstructure towards a related range of cultural practices, and away from

a reflected, reproduced or specifically dependent content. And crucially, we have to revalue the base away from the notion of a fixed economic or technological abstraction, and towards the specific activities of men [sic] in real social and economic relationships, containing fundamental contradictions and variations and therefore always in a state of dynamic process (ibid. p.6)

In Williams' framework, 'determination' is recast as the setting of limits and pressures. The base is acknowledged as possibly containing fundamental contradictions and the superstructure gets some independence as a related range of cultural activities. Through this reworking of a core aspect of Marxist philosophy, Williams provides space for contingency and unpredictability, the extent of which can only be gauged through empirical work ('specific activities') that investigates specific contexts. Simultaneously, the political and economic systems that dictate material relations in societies are acknowledged to provide limits and pressures to cultural systems.

Although Williams was explicitly trying to rework some of the gaps in orthodox Marxism, in his later work (including *Television*), he has used this perspective to balance technological determinism and social constructivism which is of direct relevance to the analysis of infrastructures in general, including internet infrastructure. Even though Williams' work is useful in developing a sophisticated approach to incorporate the notion of relationality into theories of infrastructure, there still remain significant questions about the materiality of infrastructure as physical objects with inherent and independent technical properties. Over the last three to four decades, Science and Technology Studies (STS), anthropology and media and communications as fields and/or disciplines in their own right have all similarly tried to theorise the technological-social relationship in adequately complex ways, especially in terms of innovative ways of incorporating and theorising materiality without losing sight of social complexity. The following section reviews these attempts and identifies insights that can contribute to the theoretical framework of this thesis.

1.2 Questions of scale and power: Engaging with infrastructure in STS, anthropology and media and communications

In this sub-section, I begin by reviewing the literature from Science and Technology Studies (STS) and anthropology, specifically in terms of how technological-social relations, including infrastructures, have been theorised. I draw parallels to similar tendencies and divergences in media and communications scholarship, and conclude by identifying a few theoretical concepts that can be retrieved and used in the ongoing theoretical framework of this thesis.

1.2.1 STS and the ontological turn

STS scholarship has acknowledged that society and technologies mutually shape each other. One of the earliest debates around the specific relationship between politics and technology was raised by the eminent STS scholar, Langdon Winner (1980) in his article, '*Do Artifacts Have Politics?*' He argues that 'the intractable properties of certain kinds of technologies are strongly, perhaps unavoidably, linked to particular institutionalised patterns of power and authority' (ibid., p.134). Winner's work is representative of the politicisation of technologies and a concern for whether technologies can in fact be democratically designed, deployed and regulated (c.f Morone & Woodhouse, 1989; Ravetz, 1971; Sclove, 1995). STS scholarship, keeping in mind a systems view of technology, has asserted that small technologies with varying standards or other idiosyncrasies slowly become infrastructures that have a decisive impact on shaping modern life (Bijker, Hughes, & Pinch, 1987; Edwards, 2003; Hughes, 1993). In general, the social constructivist view of science and technology has been a major part of the STS scholarship since the 1980s (MacKenzie & Wajcman, 1985). Overall, while the literature has been insightful in theorising the technological-social relation in complex ways, there are nonetheless some concerns when it comes to the epistemological foundations of STS.

Since at least the 1980s, the theoretical and methodological frameworks for STS scholarship have been driven by symbolic interactionism (Star & Clarke, 2003) (c.f. Katz, Rice, & Aspden, 2001; Katz & Rice, 2002; Robinson, 2007). This theoretical framework was derived initially by the Chicago school of anthropology in the 1950s, especially by George Herbert Mead and John Dewey. Their pragmatic approach argued that the meaning of any particular

phenomenon depended upon how this phenomenon was embedded in relationships that Mead called 'universes of discourse' (Mead, [1938] 1972, p. 518). These universes have also been called social worlds that generate shared perspectives; whereas individual and/or collective identities are formed by the acts of participating in these social worlds (Strauss, 1959, 1978, 1982, 1984). Symbolic interactionism provides a framework that accounts for both collective perspectives as well as identity construction through interactions that are deeply situated within a particular social world. For instance, Clarke and Star (2008, p. 115) argue that 'infrastructures can be understood, in a sense, as frozen discourses that form avenues between social worlds and into arenas and larger structures'. An explicit and historical theorisation of power seems to be missing from symbolic interactionism. The key question for my research is how does STS (inspired by symbolic interactionism) locate *intentionality* and *flows of power*? Such a question becomes crucial since actual society is marked by historically situated subject positions inflected by race, caste, gender and sexuality, class and so on. Such subject positions are necessarily involved in interactions exercised in and through power relations. However, since it incorporates both interactions of individuals and groups with infrastructures while at the same time providing a way to theorise how identities are constructed through and within spatially and discursively located social worlds, this framework of symbolic interactionism is useful and I build on it.

Symbolic interactionism relies on concepts of perspective and commitment where actors have their own perspectives that are articulated through discourses defined as 'assemblages of language, motive and meaning, moving toward mutually understood *modus vivendi* – ways of (inter) acting. Perspectives, as defined by Mead to include commitments that stem from work and material contingencies, are *discourses in collective, material action*' (Clarke & Star, 2008, p. 116). This use of the term discourse is very different from that developed by the European tradition, epitomised by Michel Foucault. Even if power does somehow enter the discussion, the *flows* of power seem to start from individual actions (individuals who seemingly have pre-existing motives assembled via language) and flows outward towards infrastructures and indeed, social worlds. This perspective assumes at some level that subjects are constituted through interactions with social worlds that are collectively generated.

An expansion of the 'social construction of technology' perspective came in the late 1980s with Bruno Latour and colleagues who argued for the role of non-human 'actants' whose importance or weightage is taken *on par* with humans in the analysis of complex networks or technologies (Callon, 1986; Latour, 1987; Law, 1987). Just as symbolic interactionism provided a way to account for the social without power relations being constitutive of the social, similarly, Bruno Latour and colleagues expanded the framework to included non-human objects. Calling technologies 'lieutenants', Latour (1988, p. 310) argues that '[i]f, in our societies, there are thousands of such lieutenants to which we have delegated competences, it means that what defines social relations is, for the most part, prescribed back to us by nonhumans'. In this dialectical account, we design for instance, automated doors to which we designate certain functions, and that in turn then 'return' to prescribe our behaviours, so we behave to accommodate the automated door (Latour, 1988). Actor Network Theory (ANT) has remained influential in acknowledging non-human agency (c.f. Bennett, 2010) and continues to generate contemporary scholarship on infrastructure[14], although its insights derived from a post-humanist perspective have been critiqued from a decolonial perspective.

For instance one of the important consequences of ANT is the recent 'ontological turn' in infrastructure studies: 'ontological politics covers more than the question of how politics is *embedded* in technological devices, for it concerns the emergence of potentially novel forms *out of* infrastructural arrangements' (Jensen & Morita, 2015, p. 85; Woolgar & Cooper, 1999; Woolgar & Lezaun, 2013). The post-humanist perspective implicit in such a position has in fact been a significant and historical aspect of indigenous peoples' cosmology and subjectivity in many parts of the world (Strehlow, 1971; Todd, 2016), although acknowledging indigeneity in post-humanism would inevitably foreground the colonial relations that underlie the hegemony of Western dualist thought (Holbraad, Pedersen, & de Castro, 2014; Sundberg, 2014; Watts, 2013). The erasure of the indigenous subject and knowledge from the 'mainstream' points to the dangers of post -humanism without sensitivity and attention to historical contexts and alternative epistemologies (Grosfoguel, 2012; Santos, 2016). Through my research, I build on the contributions of the ontological

[14] For example see interviews with John Durham Peters in Chapter 1 and Katherine N Hyles in Chapter 2 (Packer & Wiley, 2012)

turn: 'In shifting attention away from politics as a primarily discursive activity, these new materialist reworkings have distanced themselves from conventional political categories in order to focus instead on processes and relations that exceed these descriptive concepts' (Braun & Whatmore, 2010; Knox, 2017, p. 365; Marres & Lezaun, 2011; Whatmore & Landström, 2011). Theorising internet infrastructure as a specific constellation of material and discursive arrangements enables me to foreground precisely those 'processes and relations' in correspondence with indigenous subjects (see Chapter 6). Further, I argue that social anthropology has useful contributions to make on theorising infrastructure especially on themes that are relevant to my research – governmentality and subjectivation.

Anthropology has typically stayed away from infrastructure since it understood its own role primarily as that of studying people and societies. Take for example this quote, 'The development of the study of infrastructures proper is a task which must be left to history – with the aid of demography, technology, historical geography and ethnography. It is not principally the ethnologist's concern' (Lévi-Strauss, 1966, p. 130). More recently, there is a history of anthropological research on infrastructure, understood as a specific technology with specific influence on groups of people (Larkin, 2013). A good example of such an approach is the literature on roads, in terms of how roads shape a given society, for instance, in the Peruvian Andes (Harvey & Knox, 2015) or Niger (Masquelier, 2002), Pakistan (Khan, 2006) or Greece (Dalakoglou, 2010). There is similar literature on cars (Verrips & Meyer, 2001) and on dams (Ghosh, 2006; Mains, 2012).

In the Peruvian region surrounding Ocongate, Penny Harvey and Hannah Knox (2015) deconstruct the infrastructural technologies of roads to argue that they '…as infrastructural forms manifest the political, not just through the transformations that they promise but also by arranging and rearranging the mundane spaces of everyday life' (ibid. p.7). Using a relational approach and drawing upon the work of Foucault, Deleuze and Guattari, Harvey and Knox unpack the notion of *expertise* as a specific subject position occupied by civil engineers who are involved in planning the development of roads. It is precisely this kind of attention to infrastructural practices that I draw upon, for instance in section 5.2, where I examine how engineers and bureaucrats involved in the planning and administration of the

National Optical Fibre Network (NOFN) discuss their anxieties and panics about *the other* underlying the developmentalist discourses around connectivity and nation-building.

Infrastructure, is now seen as a concept, or as a system within a wider social, political and economic system, what has been called a 'system of substrates' (Star, 1999, p. 380). In other words, anthropologists have now begun to take seriously, precisely the domains that Levi-Strauss once opined were outside the ethnologist's concerns. Anthropological work on large scale infrastructure particularly the intersection of infrastructures with social aspects (including state and subject formation) have been tremendously useful and have served to inspire the theoretical and methodological design for my doctoral research. In the later sub-sections in this chapter addressing issues of governmentality and subjectivation, I engage with the literature on anthropology of infrastructures in a more detail. For the time being, suffice it to say that drawing upon the relational nature of the social, anthropological approaches are crucial to ground theorisation of communicative infrastructures as socially embedded, implicated in flows of power and processes of constructing the state and subject.

1.2.2 Trends in media and communications

In this section I review how media and communication scholars have theorised the relationship between technology and society (broadly speaking) and build on useful contributions while noting weaknesses with respect to needs of my theoretical framework. It has been argued that media and communication technologies create profound ruptures in a given political, economic and cultural system –a view which has come to be called the 'discontinuities' perspective (Schement & Curtis, 1995; Shields & Samarajiva, 1993; Webster, 1995). John Durham Peters (1999), for instance, argues for the *erotics* of communication derived from orality and the subsequent anxiety felt even by the Greeks as the alienating technology of writing was introduced. Walter J Ong (1982) has similarly argued that the shift from orality to literacy via writing technologies had a profound impact on how human societies think. Marshall McLuhan (1964) argued that media and communication technologies were to be understood as extensions of the human body itself leading to profound changes in human society – bringing humans closer as a global village.

Contrary to the discontinuities perspective, it has also been argued that media and communication technologies are very much part of a political and economic system that persists and in fact outlives any particular (media) technology that emerges from the system. Unsurprisingly, critical political economy scholars have been an integral part of this 'continuity' perspective (Garnham, 1990; Robins & Webster, 1999; Slack & Fejes, 1987; Traber, 1986). These perspectives are a useful reminder about how much autonomy and weight one could accord to media and communication technologies to effect changes in social relations vis-à-vis economic and political systems. However, the utility of such perspectives is limited since implicit in such a distinction (continuity/discontinuity) is a question about the causal power of media and communications. In other words, this perspective risks returning us (albeit obliquely) to older assumptions and debates about base and superstructure.

Aside from the discontinuity and continuity perspectives, there is also a section of media and communication scholarship that privileges the *materiality* of media. As the German media theorist Friedrich Kittler (1999) puts it (perhaps too polemically) in the opening lines of his book *Gramophone*, *Film, Typewriter*, 'media determine our situation'. For Kittler, discursive formations and cultures are necessarily stored, processed and transmitted by media technologies, and these technologies 'culturalise the natives of that society' (Kittler, 1986, p. 159). For example, the media form of loudspeakers compel attention by disbursing religious messages and in response, urban Nigerians cultivate 'practices of inattention' to mitigate chances of religious violence breaking out (Larkin, 2015). Jonathan Beller (2006) provides a similar argument on a wider scale when he invokes the linkage between cinema and the emergence of the 'attention' economy:

> Rather than requiring a State to build the roads that enable the circulation of its commodities, as did Ford, the cinema builds its pathways of circulation directly into the eyes and sensorium of its viewers. It is the viewers who perform the labour that opens the pathways for new commodities. (p. 209)

The literature in media and communication with emphasis on materiality is useful for its attention to the technical properties of objects while retaining their signifying capacity. For

instance, media and communications technologies have been considered 'doubly articulated' – as both commodities in themselves as well as conduits for promoting specific types of content (Haddon & Silverstone, 1996; Hirsch, Morley, & Silverstone, 1992). For instance, in discussing the 'moral economy of households' Hirsch, Morley and Silverstone (1992, p.15) argue that 'information and communication technologies define both some of the main routes along which the biographies of ideas and meanings, information and pleasures, are constructed, but also, they themselves as objects and as things, have their own biographies as they too become domesticated into the distinct cultures of families and households'. As this work has demonstrated, it is valuable to investigate both the materiality as well as the signification of infrastructure.

The work on 'double articulation' has strong similarities to work on the notion of *affordances* – i.e. what an object can afford to the observer (Gibson, 1982, p. 403). The claim is that the concept of affordances can overcome dualisms in media and communications studies and instead be used for 'investigating the empirical question of embodied human practices in real time situated interaction involving technologies' (Hutchby, 2003, p. 582). Faraj and Azad (2012, p. 239) define technological affordances as 'action possibilities and opportunities that *emerge from actors* engaging with a focal technology. Affordances are rooted in a relational ontology which gives equal play to the material as well as to the social'. In both 'double articulation' and 'affordances' perspectives, the overarching and valuable contribution is the attention to materiality and relationality (with users) in analyses of media and communications. While such contributions help overcome dualisms and broaden the horizon of our understanding of infrastructure and technologies, there are important questions of subject construction (who is the abstract actor using technologies?), and contexts in which the technologies become available to the user in the first place (thus limiting the ways in which the technology and its usage can be imagined) that remain unaddressed. Further, the relatively narrow focus on the object in terms of its materiality and its usage by an actor misses out on how and to what extent such objects are caught up in the exercise of power relations in constructing a given subject or in exercises of authority by or over that subject.

Boczkowski & Leivrouw (2008, p. 967) make a case for three bridges that can be built between media and communication studies and STS:

> …[we] must also account for the tightly interwoven relationship between the material and the symbolic, which, as we noted earlier, distinguishes media and information technologies from other types of sociotechnical infrastructures. Although it is tempting to classify and analyse these two dimensions of media and information technologies as distinct phenomena, they are in fact inextricably bound together. Future studies must confront the ways that meaning and forms of content contribute to influence material alternatives, and by the same token, how the physical materiality, durability, and format of specific technological devices and systems help shape content and meaning. This fundamental dialectic is at the heart of the interplay of determination and contingency, production and consumption, and continuity and discontinuity.

The infrastructural turn in media and communication studies is a useful conceptual category to address the issues raised by Boczkowski & Leivrouw. In *Signal Traffic: Critical Studies of Media Infrastructure* (Parks, 2015, pp. 5–6), the editors argue that infrastructural disposition enables focus on processes of *distribution* and *materialities* of media distribution including resources, labour, technologies and relations. For example, the internet as a network of networks is founded upon a set of protocols like domain names and addresses which in turn invisibly shape power relations that inform the operations of these networks (Galloway, 2004). Galloway's point is important because it counters the rhetoric of decentralisation (which in turn is linked to increased democratisation of society or increase in public participation) by showing that power flows are at play in the protocols of networks.

In designing the research discussed in this thesis, I drew upon insights from STS literature, anthropology as well as previous work in media and communication (on affordances, mediality and so on), with especially close attention paid to communicative practices. I have drawn upon these approaches to overcome the tendency to reproduce the artificial distinctions between materiality and discourse, structure and agency, contingency and control, subjective and objective and so on. However, the epistemological foundations of these perspectives are inadequate – especially they fail to acknowledge the historical

situatedness of technological and communicative systems, the historical contexts in which subject positions are produced (as mentioned in the previous section 1.2.1 with the contributions of decolonial critiques of post-humanist ontological turn), and therefore we are not able to grasp the political significance when subjects engage in certain communicative and infrastructural practices.

Media and Communications scholarship, especially in relation to infrastructure, has paid scant attention to the link between *infrastructural practices* and *processes of subjectivation*. There are a few exceptions to the general tendency in the literature. A famous example is the role played by the *act of reading* daily newspapers and modern novels in the development of the deep horizontal comradeship of nationalism in the context of print capitalism (Anderson, 1983). The daily habits of reading newspapers/novels enabled the reader to become the bearer of empty homogenous time (ibid, p.26) in which characters act simultaneously – thus calendrical time becomes the basis to 'imagine' their fellow citizens. Media infrastructures as signifiers of modernity have similarly been theorised with radio broadcasting (both the radio set as well as the programming) in Zambia,

> …a more general sociotechnical frame was emerging, which placed electronic media in the company of a whole host of new technologies and constructed them as powerful, exciting, fast and full of vitality…this understanding of electronic media figures in as a central component of what could be called a distinctively Zambian experience of modernity, one which emphasizes high action, affluence, newness, speed and the importance of links to a wider cosmopolitan world. (Spitulnik, 1998, p. 76).

Such arguments, while promising insights into relationships between material and symbolic forms of media infrastructures to broader forms of subjectivity (e.g. modernity) do not produce systematic accounts of how and why a media infrastructure (radio in Zambia, film in India, a loud speaker system in Sri Lanka) should encourage neoliberal affluence or authoritarianism or complicity with caste practices in a postcolonial context. This linkage is crucial since it encapsulates the specific ways in which infrastructural practices are

constitutive elements in processes of subjectivation. As a researcher from India, as I have noted in the Introduction, internet infrastructure is increasingly at the heart of growing inequality, discrimination and Hindu extremism in India. Further, in the 21st century, right wing extremism is sweeping many countries across the world including Brazil, the Philippines, Turkey, the UK, the US, France, Germany, Hungary and Italy. Internet infrastructures and technological systems, then, cannot be theorised in the abstract, removed from socio-political developments. The emergence of right-wing populist leaders who enjoy mass support from significant sections of society demand a historically situated theorisation of communicative technologies in terms of the role such technologies play in processes of governmentality and subjectivation.

In light of the foregoing discussion, my first research question seeks to theorise the genealogy of internet infrastructure in India. It initiates an investigation into the material and discursive conditions under which the term internet infrastructure was produced and subsequently operationalised. Such an investigation must necessarily be historical and attentive to political, economic and cultural contexts. My second and third research question pertain to the role of internet infrastructures in two interrelated *social* processes – governmentality and subjectivation. Both of these processes interrogate social action and social reproduction in specific ways: under what conditions and how are subject positions produced; and what are the various (infrastructural) practices where individuals and social groups negotiate (accept, subvert, reject, counter-produce and so on) these subject positions.

1.3 Infrastructure, subjectivity and subjectivation

As some of the literature cited in the previous sub-section makes clear, any analysis of infrastructures cannot avoid the questions of who is doing the conducting and who is being conducted? Such a line of enquiry completes the claims made on behalf of infrastructures (ontological and/or political) by showing exactly *how* power (embedded 'in' infrastructure or power flowing 'out' of infrastructure) affects social relations, because it redirects us to pay attention to the ways in which individuals and/or groups' conduct is being directed. In

this section, I provide a genealogy of the subject from a post-structuralist perspective to arrive at the significance of 'subjectivation' – attention to processes and practices through which subjects experience the self and knowledge of the self (subjectivity) as well as socially constitute themselves individually and collectively. Subjectivation allows for incorporation of both infrastructures as material objects and the entanglement of such objects in specific social processes and practices while remaining attentive to the exercise of power relations in such entanglements.

In order to analyse how people, think about themselves in the context of internet infrastructure, or how people are invited to think about themselves by others – there is at least one other route available for analysis which I do not use but nonetheless must acknowledge briefly – the notion of *imaginaries*. Social imaginaries is a very useful concept because it refers to the 'ways people imagine their social existence, how they fit together with others, how things go on between them and their fellows, the expectations that are normally met, and the deeper normative notions and images that underlie these expectations' (Taylor, 2004, p. 23). Although this is a rich notion that could be used quite productively to *access* the subject, it offers little scope for investigating the *processes* through which subjects relate to others and to themselves, i.e. subjectivation. The other problem with the concept of imaginaries is that while it digs deeper into the normative notions that underlie people's imaginations of their social existence, it places no emphasis on the conditions of existence of these normative notions. Further it offers no scope for an analysis of the range of interdependencies between different normative notions which would have allowed one to identify the broad pressures and limits within which imaginaries even become possible. For instance, in Chapter 2, using three 'moments' I show the tension between the dispersal and limits of colonial discourse about the colonised in the context of (communicative) infrastructure: the inventor of the telegraph William O'Shaughnessy's setting up the telegraph to 'tame the savages'; the benevolent speech of Queen Victoria in 1858 promising the 'welfare of all subjects' after the great revolt of 1857; and finally the draconian Indian Telegraph Act of 1885 that centralised control over all communicative infrastructure with the coloniser. The development of communicative infrastructure in colonial India emerged within a discursive formation and civilisation, welfare and control

being the limits of the discourse – each normative notion interdependent and applying its own pressures.

The word *subject* has a complex genealogy with multiple shifts in meaning, especially in contrast to *object* (see Williams, 1983, p. 309). It is commonly assumed that the notion of the modern knowing subject began with Descartes' famous injunction, but it is in fact Kant who inaugurated this project[15] of calling 'that universal aspect of human consciousness and conscience which provides any philosophy with its foundation and measure' and since then philosophical discourse has retroactively projected it back to Descartes (Balibar, 1994, p. 6). Against this backdrop, Balibar asks: 'why is it that the very *name* which allows modern philosophy to think and designate the *originary freedom* of the human being – the name of subject – is precisely the name which *historically* meant suppression of freedom, or at least an intrinsic limitation of freedom, i.e. *subjection* (ibid. p.9; emphasis in original).

For instance, by the mid-20th century, the idea of structuralism had become influential in anthropology through Claude Levi Strauss (Moore, 2009). Structuralism, in essence, had come to mean[16] the idea that 'there exist, in the social world itself, and not merely in symbolic systems, language, myth etc., objective structures which are independent of the consciousness and desires of agents and are capable of guiding or constraining their practices or their representations' (Bourdieu, 1989, p. 14). Structuralist theories had thus little or no place for the subject[17], since individuals and therefore groups were produced, always by something else (relations, language, myths, family structures and so on).

The decades after the second world war introduced a break in structuralist thinking due to several reasons – the Soviet occupation of 1956, Kruschev's denunciation of Stalin in a 'secret speech' in 1956 after Stalin's death in 1953, the protests of May 1968 and so on[18].

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[15] I refer specifically to Kant's writings from 1781 to 1790, *Critique of Pure Reason*, *Critique of Practical Reason* and *Critique of Judgment*

[16] Building on the insights from linguistics in the early 20th century, especially Ferdinand Saussure.

[17] Orthodox Marxism too leaves little place for the autonomy of the subject since the individual is subject to 'underlying' economic relations.

[18] It is roughly in this period that previously unavailable knowledge became translated and available for western knowledge production, especially Antonio Gramsci's *Quaderni del carcere (Prison Notebooks)* and Marx's *Grundrisse* both of which were influential in breaking the hegemonic hold of orthodox Marxism in western critical academia.

From the 1970s onwards, there have been creative attempts to theorise the question of the subject in different ways. Althusser for instance, brings in two important elements to the subject. The first is the constitution of the subject in terms of ritualised practices produced by ideological apparatuses:

> '…the "ideas" of a human subject exist in his actions…I shall talk of actions inserted into *practices*. *And* I shall point out that these practices are governed by the *rituals* in which these practices are inscribed, within the *material existence of an ideological apparatus,* be it only a small part of that apparatus: a small mass in a small church, a funeral, a minor match at a sports club, a school day, a political party meeting, etc.' (Althusser, 1971, p. 169).

The process through which the human subject comes to 'exist' for Althusser is through a process he calls interpellation. It is, in brief, the process of an individual being 'hailed' into the position of a subject. In fact Althusser makes a 4-point formula for this process: first, the interpellation of individuals as subjects (with a small s); secondly, their subjection to the Subject (with capital S); third, the mutual recognition of subjects and Subject, the subjects' recognition of each other, and the subjects' recognition of himself; and finally, the absolute guarantee that everything is really so, and on the condition that subjects behave appropriately, everything will be all right (ibid. p. 181). The Subject (with the capital S) is what Lacan would call the Big Other to which the individual-turned subject must now submit. The Kantian idea of a knowing subject is thus reintroduced into critical scholarship via psychoanalytic scholarship of Sigmund Freud and Jacques Lacan (Eagleton, 1991).

Although the 'mirror-recognition' aspect of Lacan's work (1978) is central for Althusser's notion of the subject, it is important to remember two points that further circumscribe the subject. First is that there is no pre-existing subject before the subject is 'recruited' by the acts, rituals and practices that interpellates the subject. 'Individuals are always-already subjects' (Althusser, 1971, p. 164). Secondly, (and this is where Althusser leans towards subjection or domination), this act of recognition by the subject is actually a mis-recognition since 'there are no subjects except by and for their subjection' (ibid. p.169). What then of autonomy and freedom of the subject as in the capacity or potential to act? For Althusser,

the subject freely submits up, *inside* subjection, "the individual is interpellated as a (free) subject in order that he shall submit freely to the commandments of the Subject…in order that he shall make the gestures and actions of his subjection 'all by himself'" (ibid. p. 169).

Foucault retains[19] the Althusserian moments of constituting the subject in terms of practices (although going beyond Althusser's insistence on 'material' practices to include discourse) and the act of recognition (again going beyond Althusser's bleak scenario of recognition and autonomy eternally inside subjection). The question of the subject is central to Foucault, and it is in the course of theorising the constitution of the subject that Foucault innovates with concepts of power relations, truth effects, governmentality, *dispositif*, and so on. In 1982, two years before he died, Foucault states this clearly, 'the goal of my work during the last twenty years…has not been to analyse the phenomena of power…my objective instead has been to create a history of the different modes by which, in our culture, human beings are made subjects' (Foucault, 1982, p. 777). My third research question asks: In contemporary India, how and to what extent does internet infrastructure play a role in processes of individual and group subjectivation? Media and communications scholarship is split between two broad conceptualisations of the subject – a positivist and empiricist notion of subject as a rational and individual agent, the basic unit at the heart of society; and a subject that is socially constructed. The former subject is agentic and has free will, enters into social contracts with various kinds of institutions and structures with diverse outcomes. This kind of subject (let us call him Man with a capital M), has been critiqued during the poststructuralist wave of theorising since the 1960s through critical work in linguistics, hermeneutics, psychoanalysis, semiosis and history (Copjec, 1994; Davis, 2012; Rebughini, 2014). Following such critique, my doctoral research is firmly situated within post-structuralist perspectives.

Foucault displaces the 'subject' as the original *source*, or as Nietzsche put it, the fiction of the 'doer' behind the doing (Schrift, 1997). He instead unbundles the subject itself: '…there

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[19] Althusser was a senior student of Foucault at the École Normale Supérieure in the 1940s and later Althusser taught Foucault, along with several others who later became influential such as Pierre Bourdieu, Etienne Balibar and Jacques Ranciere. Interestingly, all of these well-known scholars deviated from the brand of 'scientific Marxism' advocated by Althusser.

is no sovereign, founding subject…I believe, on the contrary, that the subject is constituted through practices of subjection, or in a more autonomous way, through practices of liberation…a number of rules, styles, inventions to be found in the cultural environment' (Foucault, 1988a, p. 51). Thus, as Deleuze (1997, p. 92) has noted, "Foucault does not use the word subject as person or form of identity, but the words 'subjectivation' as process and 'Self' as relation (i.e. relation to itself)". What is this relation of this subject to itself? Foucault (1997, p. 290) is remarkably clear on this point:

> It [the subject] is not a substance. It is a form, and this form is not primarily or always identical to itself. You do not have towards yourself the same kind of relationships when you constitute yourself as a political subject who goes and votes or speaks up in a meeting, and when you try to fulfil your desires in a sexual relationship. There are, no doubt, some relationships and some interferences between these different kinds of subject but we are not in the presence of the same kind of subject.

The compulsory subjection in Althusser becomes only a particular possibility in Foucault. The moment of experience (recognition) is itself conditioned by various procedures and practices. Foucault thus provides a slightly different twist on Balibar's dilemma – of subject as having opposite meanings of freedom and domination. For Foucault, there are two meanings of subject – subject to (domination) and self-knowledge, since self-knowledge involves the self-tying of oneself to an identity, conscience or knowledge. What is important for Foucault is the *historicisation* of how the subject is constituted as mediated by *power relations* (although in each epoch, power relations manifest differently).

As per Foucault's example, in feudal societies the subject was constituted in terms of struggle against ethnic or social domination, in the 19th century the struggle was against economic exploitation while in the 20th century, 'the struggle against the forms of subjection – against the submission of subjectivity – is becoming more and more important, even though the struggles against forms of domination and exploitation have not disappeared' (Foucault, 1982, p. 782). Although Foucault does not directly define what exactly is meant by the term 'subjectivation' and 'subjectivity', one can reasonably infer

from his writings that **subjectivation refers to the process whereby the subject is engaging in different forms of subjection through the exercise of power relations that are historically situated. Subjectivity thus, names the consciousness (of the subject) that is historically situated and caught up in power relations**, although the subject may or may not be conscious of the process of subjectivation. The crucial difference (compared to earlier bleaker interpretations of subjection, for instance in Althusser) is that for Foucault, subjection is *not* necessarily oppressive. Following this understanding of subjectivation, it becomes possible to argue that 'techniques of subjectivation enable specific transformations to occur. They affect a turn from a (passively) subjected subject to an (active) individual who accedes to a constructed individuality by gradually assuming a set of practices which are interiorised through their very act of being chosen' (Bonnafous-Boucher, 2009, p. 85)

In proceeding, I draw upon Foucault's conceptualisation of subjectivation because Foucault's framework allows two crucial requirements for my research: a theoretical design to investigate the *politics* involved in arrangements and relations between humans and things (c.f. Lemke, 2015, 2018); and theoretical flexibility to conceptualise a non-metaphysical subject that is constituted through the practices of 'suturing' itself to various subject positions. Foucault's socially situated and socially constituted relational view of the subject neither writes off the subject as in structuralism, nor does it assume that the flows of power have emancipatory or oppressive effects guaranteed in advance or in other words, there is no 'final suture' (Mouffe & Laclau, 1985). The emphasis here is on the open-ended arena of social action, wherein infrastructural practices 'compose the spaces of which they are a part' (Allen, 2011). It is in such a 'space' where individuals and groups negotiate with subject positions through a wide range of practices. In this sense, theorising the subject in terms of subjectivation is indissociably and irreducibly linked to questions of how individuals 'constitute themselves through an act of empowerment affected through the government of the self, the outcome of which is always uncertain' (Bonnafous-Boucher, 2009, p. 76).

There have been various other ways to theorise the subject and to undertake subsequent empirical research; for instance, the rational intersubjective dialogic approach of Habermas (1986, 1987) or Bourdieu's concepts of field, habitus, dispositions and doxa wherein

empirical investigation of practices-as-activities are the prime objects of research (Bourdieu, 1990b; 1992). While these are useful theoretical frameworks, they fail to show how to demonstrate the connections between the micro-dynamics of intimate infrastructural practices and macro political systems and discourses. They do not provide adequate theoretical space to account for: 1) a theorisation of human-objects-human interactions or 2) to allow for inter-scalar work on infrastructures and processes of state and subject formation. Retaining an empirical focus on infrastructural practices as a specific member in the family of 'technologies of the self', my doctoral research expands on how infrastructures are fundamentally implicated in certain moments in the life of a given society, enchained to strategies of governing (exercising authority) and constructing the self. The next section on governmentality will explore the linkages between the constitution of the subject and governing of the self (and others) through a set of practices.

1.4 Infrastructures and governmentality

For those who have to engage with (communication) infrastructures on a regular basis, why should it matter whether the 'politics' is located in the materiality or in the design or elsewhere, for that matter? In my view, it matters only in so far as they can use this knowledge to transform this politics to better their lives. The Foucauldian view of government is a productive way to theorise the workings of modern political society, in a way that can incorporate insights into the materiality of internet infrastructure, but also see a path beyond materiality. In a complex technological project such as the internet infrastructure built in India, there are a diverse range of individuals and institutions who act upon the infrastructure. Governmentality, as an analytic concept, allows me to *bridge* three aspects of internet infrastructure: 1) the political, the economic and the discursive (contexts) within which internet infrastructures emerge; 2) how infrastructures as a set of material and discursive practices are closely involved in exercise of authority; and 3) the ways in which these practices feed into processes of subjectivation.

Succinctly put, governmentality refers to 'the conduct of conduct' (Foucault, 1982; Gordon, 1991) wherein the double meaning of conduct – as *action* (free/voluntary or directed) and *moral behaviour* are both incorporated. The concept implicated here is that of 'government'

– that refers to 'how we exercise authority over others, or how we govern abstract entities such as states and populations, but also how we govern ourselves' (Dean, 2014). While there are numerous ways of imagining and analysing government, Foucault himself is concerned with action, i.e. how thought operates within an organised *regime of practices* (Foucault, 1991b). When we discuss how we are governed by authority or how we govern ourselves, there are different kinds of rationalities or a-rationalities at play which form the reservoirs which are drawn upon in order to frame and operationalise regimes of practices. This does not mean that there is one Reason that is hegemonic (in the Gramscian sense) over others. It merely means that there are simply systematic ways of thinking that present themselves to individuals, groups and institutions at a given time – what has been called 'mentalities of government' (Miller & Rose, 1990; Rose & Miller, 1992).

The four aspects of governmentality are ontology, ascetics, deontology and telos (Foucault, 1985, 1986, pp. 352–357). The ontology of governmentality is concerned with what is it that we seek to govern. For example, in his study of criminal reforms, Foucault argued that it was the 'soul' of the criminal that was being governed (1979a, pp. 16–31). The ascetics of governmentality is concerned with a description of how we govern including the procedures and rituals involved in governing. The deontology of governmentality can be called *a mode of subjectivation*, i.e. who we are when we are governed. Every procedure of government has a specific type of subject in mind when that procedure is devised and operationalised. For instance, in the case of Indian telecom and internet policies (as I show in Chapter 4), the emphasis on infrastructure expansion is often closely associated with the target of such expansion - the 'poor, rural masses' or those living in 'remote, hilly and rural areas'. Finally, the telos of governmentality, the lofty goals that are always implicitly or explicitly present in governmental practices. The goals of 'Safe Britain', 'national security', 'integration' and 'secular Europe' are linked to the often-invisible practices of monitoring and surveillance of immigrants in the UK.

In late feudal and modern societies, there are three different forms of exercising authority that can be traced. 'Sovereignty' is about the exercise of authority over subjects while 'discipline' is about the regulation and ordering of the population. Contrasting theories (and societies) of sovereignty with those of discipline, Foucault held that 'governmentality'

retains elements of both while simultaneously re-inscribing both. In more formal terms, the *art* of governmentality involves the acknowledgement that first of all the government has as its object of concern the production and reproduction of a particular type of general population – which it must do by ensuring strategic use of not just fiscal resources but also in its application of power. Secondly, sovereignty and discipline as forms of power are recast by Foucault as governmentality that results in the 'fostering' of a population through optimal utilisation of available resources. Third, the actual allocation and deployment of these resources are filtered through what Foucault, following Althusser, calls *apparatuses* of security. The utilisation of these resources in order to ensure efficient economic and social reproduction of society, is called bio-politics. It is usually held, and mistakenly so, that biopower in relation to governmentality is always coercive or disciplinary in nature (c.f. Sarkar, 2014; Thomas, 2014). Doubtless, the functioning of bio-politics involves the use of apparatuses of security – drones, armies, police, cyber-crime cells, intelligence agencies – but it is also concerned with 'welfare mechanisms', healthcare and education (Foucault, 2007). For Foucault, the architecture of governmentality is a triangle: sovereignty, discipline and governmental management – the population being the target and the apparatuses of security being the mechanism (ibid. p. 107-8). Dean (2014, p. 30) argues, 'Rather than replacing discipline or sovereignty, the modern art of government recasts them within this concern for the population and its optimisation...and the forms of knowledge and technical means appropriate to it'. The case of biometric identification initiated by a previous Congress ruled government and subsequently altered, deepened and widened by the Modi-led BJP government is relevant for thinking through the complexity of bio-politics.

In India, much recent literature related to technology/infrastructure (Hönke, Müller, & Jacobsen, 2012; Jacobsen, 2015; Sarkar, 2014) has been restrained to a fairly obvious target – the Unique Identification Authority of India (UIDAI) and its biometric identification scheme (involving retinal scan and thumbprints) called *Aadhaar* (literally translated as foundation)*.* In keeping with the name, the biometric card is required for all citizens whether they wish to pay tax or to avail of any government welfare scheme. While not mandatory in theory, in practice any engagement with the state (and increasingly the private sector) the Aadhaar card has become indispensable for Indians. The literature links such technologies to the Foucauldian notion of bio-power, as a part of a wider apparatus of security and surveillance

(Abraham & Rajadhyaksha, 2015; Thomas, 2014). Such scholarship no doubt has some truth to it, but I claim that there are at least two problematic underlying assumptions– that biopower is always coercive with negative effects, and that somehow the State as a stable and identifiable entity is intimately and eternally linked with governmentality. In the securitisation of infrastructure, Lundborg and Williams (2011) argue that technologies are vulnerable and open, while 'excess of life' in biopolitics always somehow evades capture. Lakkimsetti (2014) argues convincingly that it is precisely governmentality and biopolitics that has enabled oppressed Indian HIV+ sex workers to become 'visible' and assert their rights in a way previously not possible. As I show in section 2.4, the census as an administrative infrastructure was profoundly implicated in the struggle to assert the right of political representation by oppressed castes in an entirely new way; and throughout Chapter 6, how specific Adivasi groups are asserting Adivasi subjectivity precisely by differentiating themselves from a quantitatively defined 'data subject' for receiving welfare from the state.

As Foucault (1982, p. 221) argues, '[p]ower is less a confrontation between two adversaries or the linking of one to the other than a question of government…[which] did not refer only to political structures or to the management of states; rather it is designated in the way in which the conduct of individuals or groups might be directed'. The objective of my framework is not to conduct an empirical investigation into *who* is ruling whom at any given moment; nor is to assign a singular source of power that needs to be resisted. The objective is to provide a detailed description of *how* we are being governed and how we govern ourselves. The descriptive task is meant to emphasise a set of organised practices and indeed how specific limits can be identified within which these practices are both constituted and employed.

Dean (2014, p. 33) identifies four dimensions to *how* these regimes of practices can be analysed: (i) characteristic ways of visibility, ways of seeing and perceiving; (ii) distinctive ways of thinking and questioning, relying on definite vocabularies and procedures for the production of truth; (iii) specific ways of acting, intervening and directing, made up of particular types of practical rationality ('expertise' and 'know-how'), and relying upon

definite mechanisms, techniques and technologies and (iv) characteristic ways of forming subjects, selves, persons, actors or agents.

The first dimension relates to ways of seeing who and what is to be governed through which strategies. Here, the *ways* of seeing are more important than what is being seen itself. For example, in the case of NOFN, the regulators, public corporations and other governmental agencies, private telecom players have employed a range of maps that represent the population in different ways – distribution of telecom towers, or states that have fibre optic access at different stages of development, or 'heat' maps that show 2G, 3G and 4G access that are not only available for internal planning but increasingly made public so that the governed can begin to think of themselves as belonging to a particular category (e.g. a tribal person might see themselves as belonging to a region with 20% fibre optic access) with inevitable ideas on what is supposed to come next. These ways of seeing (by those who do the governing and those who are governed) are in turn connected to other strategies of government.

The second dimension relates to the *production of truth* or what Foucault would call *techne.* This dimension is concerned with what means, instruments, procedures etc. are used to establish authority and rule. These could be the setting up of payment systems or the setting up of local, regional or national level institutions that are given authority by legislative writ. In the case of NOFN, the architecture of NOFN partly achieves authority by plugging the last mile of the NOFN network into a pre-existing local government office that already holds some authority.

The third dimension relates to production and establishment of *truth*, or what can be called *episteme.* This dimension is concerned with asking: what are the forms of knowledge and expertise or forms of rationality that are employed within specific practices of government? The forms of knowledge, expertise and rationality can be inferred across different set of practices across different players and different space. For example, it is possible to ascertain across government agencies, non-profit organisations and private or commercial service providers of internet and telecommunications an implicit rationality that guides practices – an increase in provision of broadband internet access will lead to proportionate increase in

Gross Domestic Product (GDP). With the State, there is a clear episteme of internet access facilitating 'less government and more governance'.

The fourth dimension relates to *ethos*, i.e. characteristic ways of doing things that indicate pre-supposed identities that are operationalised through expected conducts, behaviours, enticements, punitive measures etc. It must be clarified that this dimension is not about the actual processes of subjectivation nor does it refer to a structuralist position where subjects are produced by discursive or ideological forces. Rather it is a *descriptive* account of the ways in which those who govern elicit, encourage or discourage particular attributes to either the general population or to specific groups.

Take, for example, the case of water supply in a large city like Mumbai in India. Nikhil Anand (2011) brings together on the one hand, the technical specifications that dictate technological aspects of how water is supplied (along with the practice and discourse of engineers) and on the other hand, the social and political practices that settlers use to operationalise supply. For Anand, the concept of 'pressure' is a useful analytic that brings both worlds together. He argues,

> To get water, settlers and engineers need to *make different kinds of pressure*. Pressure can be mobilised by using pumps or politicians, and *access to the technologies of pressure is mediated as much by capital as by social connections*. To understand the importance of pressure is to recognize that water is accessed by enabling both physical and social relations, and water supply can be curtailed as much by politics as by topography (ibid. p. 543; emphasis added).

Here, although governmentality is not used explicitly as a framework, one can see how 'pressure' emerges as a technique of exerting power that is productive (of the population's subjectivity) in the Foucauldian sense. I cite this example to illustrate how water pipes as infrastructures can be fruitfully analysed to incorporate 'physical and social' relations through the lens of practices. I use governmentality to incorporate physical characteristics of objects used in internet infrastructures and the processes that shape individual and group subjectivities.

When I use the term practices, I refer to habitualised ways of doing things, that are connected temporally and spatially, and in doing which people come to act symbolically and materially, either individually or together (c.f. Mouzelis, 1990). For example, consider a government administrative office hosting a weekly video conference meeting where citizens can come with complaints that are directly heard and hopefully addressed by the administrator of the district. Such infrastructural practices (of hosting and attending) not only produce what have been called *state effects* (Mitchell, 1999)*,* but also produce the subject positions of a model citizen and a model government official. Paradoxically, it is this very mediation that signifies immediacy (since it is precisely the conferencing infrastructure that connects citizens 'directly' to the top administrator – an impossibility within the old ways of government). Within a Foucauldian framework of governmentality and subjectivation, these habitualised ways of doing things assume increased significance in two ways. First, my framework will enable me to contextualise the ways in which these practices are framed within broader regimes of practice that are encapsulated by efforts at producing truth, authority, knowledge and behaviours and attributes for a pre-supposed subject in mind. Second, these habitualised ways of doing things also become sites for describing ways in which individuals and groups negotiate with (through the empirical description of these practices) the efforts of those who are governing them from any position of power.

In contemporary Global South societies, the relevant literature (Anand, 2011; Barker, 2005; Lea & Pholeros, 2010; Von Schnitzler, 2008) has helped scholars see the effort invested by governments in practices of calculative rationality. Their insight is that government involves 'turning the objects of government into numericised inscriptions' (Rose, 1991). Thus the Indian government has long used 'slum surveys' in Delhi to better (i.e. statistically) 'manage' the welfare of slum dwellers – all in the context of an emergent aesthetic of slum-free cities (Ghertner, 2010, 2012). However, this numericisation is not a reification. On the contrary, it is a process of *translation*, the attempt to produce *a new kind of (ac)countable citizen*.

Consider, further, the case of prepaid water meters in South Africa that seeks to instil a calculative rationality – itself comprised of various practices and rituals that subtly change the way South Africans use water on a daily basis. A council-imposed cap on 'free' water

allowed per day brings about the subject's calculation of how much water is used for each activity in the house. This new kind of citizenship coincides with a shift in the neoliberalisation of the South African state as well as global business interests seeking to monetise water for a city council verging on bankruptcy (Von Schnitzler, 2008). This example shows that infrastructures, in the context of people using them daily in their practices, are caught up in shaping subjectivities – in the South African case, the calculating rational neoliberal subject. In the same vein, I have already discussed the work of anthropologists Harvey and Knox (2015) in terms of their work around the processes of subjectivation involved in performing 'expertise' by civil engineers involved in planning and building of roads in Peru. In a similar vein, my thesis uses the analytic *governmentality* to link infrastructures to processes of individual and group subjectivation.

Having discussed theorisations of governmentality and subjectivation, I explicate my own theoretical framework briefly as follows: the triptych of 'infrastructure', 'governmentality' and 'subjectivation' are material and discursive, are relational, subject to the 'logic of contingency' (Mouffe & Laclau, 1985) and are firmly embedded in social action and reproduction. Following Larkin's broad definition of infrastructure as the material and symbolic goods circulating to create institutionalised structures that bind people into collectivities, I focus on practice-oriented 'moments' in infrastructures: the *circulation* of material and symbolic goods, the *creation* of institutional structures (and institutional logics), as well as the *binding* of people into collectivities and to themselves. Each of these moments have infrastructural practices as the nucleus of my research design. I argue that rather than a universal ontological or metaphysical subject, it is more useful to theorise subjects that are constituted through social relations and relate differently to themselves and others based on the different contexts of social relations which constitute them (c.f. Chandra, 2017). I argue that communicative infrastructures, including internet infrastructure, *mediate* social relations through the production of infrastructural practices. These infrastructural practices are produced discursively in and through political, economic and cultural contexts (the 'history' of infrastructure), and produce a wide range of subject positions.

Infrastructural practices are thus simultaneously technologies of the self, as well as technologies of correspondence (between individuals/groups and subject positions). Subjectivation is the process where subjectivity is constructed relationally. Always-already present and yet always-unfinished infrastructural practices are crucial sites for subjectivation. For instance, an electronic touchpad with biometric recognition software and its operationalisation in a school produces a corresponding infrastructural practice – that of the teacher providing their thumbprint to the infrastructure every day, or an officer in the education department verifying the biometric database to process teachers' salaries. It is in such mundane practices that the subject positions of an ideal teacher or an efficient bureaucrat are produced, the moral objective of education is implied, and that individuals experience themselves as teachers. Individuals (as teachers) and groups (as part of teachers' unions) negotiate these subject positions through these infrastructural practices (e.g. hacking the tablet, or duly submitting fingerprints) supplemented by other conventional practices (strike action, speeches, pamphleteering and so on). As I analyse and demonstrate in Chapters 5 and 6, the object of my research is *not* the final outcome of naming subjects but rather a critical interrogation of the infrastructural *processes* of subjectivation.

1.5 Conclusion

In this chapter I emphasise the significance of relational approaches to understanding and theorising infrastructure while remaining attentive to the limits, pressures and contingency implicit in such relations through the cultural materialist approach of Raymond Williams. Further, I have drawn upon the theory of symbolic interactionism since it incorporates both the interactions of individuals and groups with infrastructures while at the same time providing a way to theorise how identities are constructed through and within spatially and discursively located social worlds. Building on 'double articulation' and 'affordances' perspectives, the overarching and valuable contribution is their attention to materiality and relationality (with users) in analyses of media and communications. The STS and ANT-inspired ontological turn is helpful in shifting attention away from politics as a primarily discursive activity, since these new materialist reworkings have distanced themselves from conventional political categories in order to focus instead on processes and relations that exceed these descriptive concepts. The social anthropology approach brings us back to the

everyday-nature of social reproduction as infrastructural forms manifest the political by arranging and rearranging the mundane spaces of everyday life.

While such contributions help overcome dualisms and broaden the horizon of our understanding of infrastructure and technologies, critical race studies and decolonisation scholarship is useful in order to interrogate the entanglement of technological systems (and infrastructures) with social relations in other ways. Critical race studies centre the unaddressed question of subject construction (who is the abstract actor using technologies?) while decolonisation scholarship emphasises the unaddressed historical socio-political contexts in which the technologies become available to the user in the first place (thus limiting the ways in which the technology and its usage can be imagined). As a response to the general tendencies in media and communication studies and STS towards theorising infrastructures too narrowly as merely or only implicated in processes of distribution (for instance), I have proposed *infrastructural practices* as the key object of my research, as the locus point of two interrelated processes: *governmentality* and *subjectivation*. This theoretical framework is drawn upon the post-structuralist work of late Foucault reconciling aspects that were considered hitherto incompatible or contradictory: attention to power as productive, rooted in social processes, relations and practices, and the subject engaged in technologies of the self that have unpredictable outcomes.

An examination of subjectivation thus enables me to investigate the *politics* involved in arrangements and relations between humans and things *and* provides sufficient theoretical flexibility to conceptualise a non-metaphysical subject that is constituted through the practices of 'suturing' itself to various subject positions. The concept of governmentality allows me to contextualise the ways in which these practices are framed within broader regimes of practice that are encapsulated by efforts at producing truth, authority, knowledge, behaviours and attributes for a pre-supposed subject in mind. Second, these habitualised ways of doing things also become sites for describing ways in which individuals and groups correspond with (through the empirical description of these practices) the efforts of those who are governing them from any position of power. The next chapter provides a historical perspective to better understand the socio-political contexts within which the emergence of internet infrastructure can be traced.

Chapter 2 Historical perspectives on communicative infrastructures in India

2.1 Introduction

In providing historical perspectives on infrastructure in India, I avoid metaphysical transcendental history, which is 'an attempt to find, beyond all historical manifestation and birth, an original foundation, the opening of an inexhaustible horizon, a project which would recede beyond every event, and maintain throughout history the constantly unwinding sketch of a never accomplished unity' (Foucault, 1991a, p. 9). Instead, I offer a critical communicative and infrastructural history of India. Given my theoretical framework, this communicative history is necessarily situated within – and over the decades increasingly constitutive of – political, economic and cultural contexts and transformations. In writing a communicative history, my attempt has been to remain attentive to concomitance in the development of communicative infrastructure and the production of subject positions and/or processes of subject construction: subjectivation.

My first research question seeks to situate internet infrastructure within political, economic and discursive contexts that are both specific to and go beyond India. In this chapter I highlight how each historical socio-political and economic form (mercantilism, colonialism, liberalisation) co-produced associated communicative infrastructure and subject positions. Beginning with communicative practices inscribed in ancient so-called Vedic texts, I discuss the colonial transnational telegraph system in the mid-19th century, the centralised colonial and subsequently post-colonial broadcasting system from the early 20th century onwards and finally the globalised private sector and foreign-investment funded television from the 1980s onwards. In each of these instances, I discuss the socio-political contexts within which these infrastructures emerged and the associated subject positions these infrastructures brought about. I argue that in analysing the current internet infrastructure (such as the National Optical Fibre Network) in subsequent chapters of this thesis, traces of older infrastructures and subject positions can be seen palimpsestically.

2.2 Mercantilism and the becoming of a population

The region that is now called India, and 'Indian' society, both pre and post colonisation has been marked, since at least the 4th century, by sharp, visceral inequality on the basis of caste and class (Habib, 2011, 2013; Thapar, 2010). While there is scant evidence on the matter, it is reasonable to state that culture and communication have mirrored hierarchies in society (Banaji, 2017; Sainath, 1996). Writing a history of media and communications cannot elide and in fact must begin with the historical conditions under which a vast majority of oppressed castes and indigenous peoples have been kept out of those information and knowledge making systems that were linked to the dominant institutions of society.

The practice of writing history must also inevitably grapple with the politics of historiography as a reflexive attempt to unpack the presuppositions that go into what gets included and what gets excluded from the supposedly scientific enterprise of knowledge production, including the production of history (de Certeau, 1988). One way of reflecting on historiography is by tracing the genealogy of Indian history which has 'spoken' under varying conditions of production – always privileging some narratives while yet others are consigned to the 'waiting room of history' (Chakrabarty, 2000). The acknowledgement of epistemic violence (Spivak, 1988) and its intimate linkages with historiography provides a sobering caution to not treat 'the archive' as the sole repository of known knowledge about society. There have been attempts to address this epistemic violence by writing histories from below, or subaltern studies (Guha & Spivak, 1988). Even as critical historiography has been around for several decades now, it is also true that such scholarship is unfortunately primarily oriented towards provincialising Europe rather than speak on its own terms or to the structures and forms of violence 'back home'. The latter task requires the recognition that the subcontinent had a pre-colonial existence with its own archives, its own silences and forms of violence. This pre-colonial space is structured by violent caste-based hierarchy and discrimination which are necessarily intertwined with the production of vicious hierarchies and discrimination in terms of gender and class (since caste as a durable system of social reproduction depends on endogamy and is based not only on unequal division of labour but also on the division of labourers as Dr. Ambedkar has pointed out). Coloniality

and post-colonial societies have only transformed how caste works. Given the durability of the caste system in the face of drastically different political, economic and cultural contexts, the structuring work of the caste system is indispensable to the analysis of every institution and every type of knowledge production including history.

For over 2000 years, the caste system has been a system of punishment and penalties with legal and social sanction. The ancient repositories of knowledge and tradition for the Hindus are full of references to explicit violence to be perpetrated against the castes lowest in the hierarchy – the 'Shudras'[20]. Dr. Ambedkar (1990 [1947], pp. 49–50) painstakingly collected evidence; striking examples include:

> According to the *Brihaspati Smriti* (Chapter XII, Verse 12): A Shudra teaching the precepts of religion or uttering the words of the Veda, or insulting a Brahmin shall be punished by cutting out his tongue
>
> According to the *Gautama Dharma Sutra* (Chapter XX, *sutras* 4-6): Now if he [Shudra] listens intentionally to (a recitation of) the Veda, his ears shall be filled with (molten) tin or lac. If he recites (Vedic texts), his tongue shall be cut out. If he remembers them, his body shall be split in twain
>
> According to the *Manu Smriti* (Chapter III, Verse 156): One may not teach him [Shudra] the law or enjoin upon him religious observances

As Dr. Ambedkar succinctly argues, these 'Vedic' texts are cosmogonies but absolutely unique compared to other cosmogonies, in the sense that the 'Vedic' texts not only imagine a caste-based social formation not just as an ideal but rather as a diktat – an immutable set of injunctions for the constitution of the social. Within the constitution of the social, the texts prescribe permanent punishment for one class of people – the 'Shudras' – without any social, legal or economic route for overcoming this punishment. Within the general matrix

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[20] The caste system has four major divisions ranked hierarchically: the priestly class (Brahmins) at the top; the warrior class (Kshatriyas); the trader class (Vaishyas); and the menial class (Shudras) at the bottom. There is a fifth group known as *Ati-Shudra* or the Untouchables who are considered out of the caste system. More details on the caste system is provided in Chapter 3.

of punishment and penalties, participation in communicative practices[21] such as the ones mentioned above – learning, reading, teaching knowledge – were to be met with swift and brutal violence, meted directly upon the body of the 'Shudra'. The oppressed castes have consistently waged a determined struggle to end the caste system through alternative cosmogonies, myths, songs and various other cultural forms. Many of these counter-hegemonic forms survive in the popular imagination, in memory, in song and verse, although the anti-caste perspectives and struggles have not entered academic or mainstream historiography. This is unsurprising because the practitioners of theoretical knowledge, including historical knowledge, like any other position of power in modern India, are overwhelmingly from the dominant castes (Guru, 2002; Pathania & Tierney, 2018).

With the entry of Islam from the seventh century onwards, there were large scale conversions by oppressed castes to Islam. Until then the only mainstream mode of the social was structured by the injunctions of the caste system. Power was centralised and in the hands of various kings. Thus, news carriers and spies reported to the king, and information was conveyed by people on horses or on foot. Written information was for the elite and usually stored at places of worship or with the rulers. Information was usually about political or military intelligence concerned with maintaining power and/or gaining an upper hand against another kingdom (Deloche, 1993; Fisher, 1993; Manucci, 2010; Schimmel & Waghmar, 2004). So-called 'sacred' or 'Vedic' texts since the fourth century have played a role in documenting detailed rituals of worship but more importantly, identifying the nuanced caste hierarchies, how they should be maintained, occupations for each caste, and punishments to be handed out against oppressed castes if they tried to break these boundaries (Habib, 2011, 2013; Kosambi, 1985; Thapar, 2010).

Mongol rulers (they were subsequently called *Mughal*) invaded the Indian subcontinent[22] in the late 13th and 14th centuries and brought with them a range of new technologies – notably the spinning wheel, paper, iron horse-shoes and use of lime cement (Kosambi, 1985). These technologies created the need for a new population of artisans who could

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[21] I owe thanks to Dr. Murali Shanmughavelan for pointing out (private conversation) that violence in Vedic texts includes punishments related to communicative practices.
[22] Currently comprising the countries of India, Pakistan, Bangladesh, Nepal and Bhutan

undertake specialised labour for specific tasks. It is interesting to note that this new artisanal population laboured as slaves to the Islamic rulers but the rulers did not disturb existing caste hierarchies. Since the Arab conquest of *Sind* region in North India in 711-14, the Islamic rulers' opposition to Hinduism was focused on opposition to polytheism and idol worship. While Islamic culture and governance failed to remove caste, eventually, it was the caste system that seeped into Islamic culture and society (Teltumbde, 2017). In his essay on technology in the Mughal period (from the mid-16th century onwards), Habib (1980) notes that the printing press failed to take off at a mass scale in spite of the availability of the technology. He speculates that the prosperity of the merchant class deterred them from investments in capital expenditure and, in the absence of competition or challenge in the printing industry, this lack of capital might have contributed to the failure of mass-scale printing in India. In Europe, however, by the 15th century, the printing press (starting with Gutenberg's press) made available millions of copies of religious literature that was widely circulated, read and subsequently paved the way for print capitalism (Anderson, 1983), thus contributing towards a nascent 'public sphere' (Bürger, Lawrence & Habermas, 1992) .

Until colonial rule technological innovation did not bring about or correspond to drastic societal change – especially in terms of class and caste. Mukhia (1985, pp. 181–182) while challenging the 'Asiatic' mode of production[23], argues:

> Changes in India are long drawn and gradual; they have the effect of modifying the existing production techniques and social organisation of production; but they rarely overthrow an existing social and economic structure and replace it by a new one, by a new mode of production…It was thus that even when crises created by such momentous events, as the collapse of the Mughal empire, occurred during the early eighteenth century, the empire was succeeded by the resurgence of the class of zamindars [landlords] everywhere; the crisis in other words, led to the resurgence of an old property form rather than the emergence of a new one

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[23] The Asiatic Mode of Production refers to a specific mode of production developed by Karl Marx during his writings on India (based on secondary colonial resources) between 1852 to 1858. This mode of production is based on some peculiar features such as the absence of private ownership of land, absence of commodity exchange and the stable or durable social structure that has withstood the test of time.

However, it appears to me that Mukhia glosses over the transition from Mughal rule to British rule too quickly. The emergence of a landlord class did not just happen thaumaturgically with the disappearance of the Mughal empire. From the 1600s until the mid-1700s, the British East India Company was involved in a complex set of relationships with the British government 'back home' (the Company was in debt to the British government), maintaining business competition with other international trading companies – notably French and Dutch – and finally establishing military dominance in multiple Indian kingdoms (Markovits, 2004). Through a series of strategic battles in the middle and late 1700s the East India Company gained political control over much of what is today north Indian territory. Even though the East India Company gained political control over Mughal territory, the problem was it had no institutional infrastructure to ensure the continuation of revenue efficiently. Thus, initially, the East India company sought to collect revenues through the old Mughal system of rent extraction, which deprived Indian populations of food grains while ensuring that individuals within the East India Company became rich at the expense of the mostly poor, mostly rural, Indian population.

In 1773, Pitt the Younger, the then Prime Minister of Britain, initiated the Regulating Act. This Act laid the foundations for a centralised administration of India and placed British government officials on the board of the East India Company, along with an obligation to limit company dividends to 6% until a loan of 1.5 million pounds was repaid by the Company to the British government (Muir, 2010; Wolpert, 2009).

In 1776, the *Wealth of Nations* by Adam Smith was eventually published, to great acclaim, especially by the British government and press. Notably a few years later, William Pitt the Prime Minister, remarked in Parliament, '...[Smith's] extensive knowledge of detail, and depth of philosophical research will, I believe, furnish the best solution to every question connected with the history of commerce, or with the systems of political economy' (Ehrman, 1996, p. 267). This shift is indicative of a change in the power relations between industry and government. Until the late 1700s the East India Company had practiced a form of mercantilism where bullion (gold and silver) were exported to India for commodities like silks and tea which in turn were exported from Britain to other countries in Europe at a much higher price, thereby in net terms, increasing the stock of gold and silver in Britain.

From Britain's perspective, a government with a mercantilist orientation was running the state like a set of enterprises (Weber, 1927). The political economy of Adam Smith signified a change of relations between knowledge and government, anticipated by the Regulating Act of 1773. The invisible hand of the market – i.e. invisible both to Man and to the State, worked precisely because it was invisible (Smith, 1976, p. 477), thereby setting limits to what the State could know and not know about those it governed. By 1784, the East India Company and large parts of the Indian sub-continent, now controlled indirectly by the British government, was subject to the India Act of 1784 (Travers, 2007).

By 1793, the Permanent Settlement or the more commonly known 'Cornwallis Code' was in effect – a system that *transformed* the old sovereign system's tax collectors as government agents of tax collection - *zameendars* (landlords), land owners in perpetuity (Peers, 2006; Wolpert, 2009). The creation of a new landed class loyal to the colonial government was accompanied by the creation of judicial, revenue and commercial services as part of the East India Company operations (Cohn, 1960; Guha, 1981). The period, approximately from the end of the 18th century to the early 19th century marked a radical shift in governmentality for both coloniser and the colonised – and although each experienced the shifts differently, they were materially, discursively and ideologically intertwined. Spurred by the Industrial Revolution which began in the late 1700s (Hobsbawm, 1962), Britain transformed from a mercantilist economy to an industrial capitalist one. It was precisely this transformation that was financed by revenues extracted from India – although the ways in which revenue was collected and Indians were governed had changed dramatically by the beginning of the 19th century. By then, India had ceased to be an exporter of commodities and an importer of gold; it had become an exporter of raw commodities (for the factories of industrial Britain) and had become an importer of British manufactured goods (Chandra, 1987; Habib, 1975).

Foucault has theorised the emergence of the modern state in the West with the emergence of Adam Smith's political economy that provides the invisible hand of the market. In Foucault's argument, we see that the Christian 'pastoral' form of government that was concerned with the 'flock' as a whole, transformed into a modern secular state that at once practiced both individualisation and totalisation of the governed (Burchell, Gordon, Miller, & Foucault, 1991; Foucault, 1988b, 2008). Foucault's theorisation of how regimes of governing

changed have fundamental implications for the ways in which subject positions were produced as well. However, what Foucault has illustrated may adequately account for Europe whereas in the countries of the global South or the tri-continents of Asia, Africa and Latin America, Foucault's timeline did not correspond to the empirical reality.

Partha Chatterjee (2004, p. 36) has correctly observed that, in the colonies, the bio-political connection, i.e. the basis of an emergent 'population', came *before* political representation. The bio-political connection can be imagined as a sort of state penetration into areas of life that had previously been private or addressed singularly by monarchs. From the late 1700s onwards, the colonised were administratively reorganised – for instance as taxable and juridical subjects. The word 'India' then, was not just a physical territory for the British – it became a domain where a range of interests converged and clashed. India was a captive buyers-market for British manufacturers, a source of labour, a seller of 'cheap' raw materials, a source of fixed land revenue and yet having a 'population' whose welfare was now the moral responsibility of the British government. The bio-political connection that Chatterjee refers to contained contradictions – of colonialist extraction to fund industrial capitalism in Britain, and yet the beginnings of a new governmentality that hinted at welfare and the well-being of the 'natives'. It is no coincidence that a number of prominent Orientalists began scholarly work on India and ancient Indian culture at the beginning of the 19th century – a strategy that once elevated a caricature of pure ancient civilisation at the same time as power was exerted over Indians through various veridical forms (Said, 1978; Banaji, 2018).

By the early 1800s, the East India Company had lost its monopoly in trading rights which decreased its political influence both in Britain and in India. The institutional remunerations for British military 'protection' provided to Indian princely states and kingdoms, revenue, commercial and juridical services, and the more mundane localised strategies to extract revenues from poor Indians on a continuing basis were the primary source of revenue to a company on the verge of closure and an empire struggling to maintain its hegemony across the globe.

Why is this important for a history of internet infrastructure? Consider for example, the debate that has emerged in critical political economy of media and communications,

specifically regarding the role of communications in building empire. Jill Hills (2002, 2007) emphasises the nationalities of private firms that nonetheless furthered strategic interests of their respective nation-states towards empire building. Winseck and Pike (2007, p. 6) argue that multinational cartels were well entrenched well before the economic recessions and pressures of the early 20th century and that their role goes beyond foreign policy objectives of nation-states. An understanding of the complex relations between private companies (such as the East India Company) and nation-states (such as Britain) enables us to appreciate the shifts of power and subsequent change of governmentality for the colonised – regardless of which entity (cartels or nation-states) occupies 'centre stage' at a given time and place. The focus changes from who occupies power in empire to how power is applied and how power flows through which mechanisms in the context of empire building.

Without commenting on the intentions of specific actors, it is possible to argue that the pre-colonial and early colonial phases consisted of communicative practices in the context of *caste-structured* subjectivation. Early colonialist intervention took the form of mercantilism mediated by the East India Company where individuals were produced as *administrative subjects* – facing the law, paying taxes and so on. In this period, infrastructural relations were primarily extractive and wealth was drained from the subcontinent, indirectly producing the conditions within which the industrial revolution began, thenceforth further transforming the development of infrastructure.

2.3 Colonial governmentality and infrastructure

By the mid-19th century, colonialist extraction of commodities and land revenue were in full flow. Writing for the New York Tribune in 1853[24], a mere four years before the so-called 'Great Indian Mutiny' of 1857, Marx noted that:

> From 1818 to 1836 the export of twist from Great Britain to India rose in the
> proportion of 1 to 5,200. In 1824 the export of British muslins to India hardly

[24] 'The British Rule in India', by Karl Marx, for the New York Tribune, published June 25, 1853. Retrieved from: https://www.marxists.org/archive/marx/works/1853/06/25.htm.

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amounted to 1,000,000 yards, while in 1837 it surpassed 64,000,000 of yards. But at the same time the population of Dacca decreased from 150,000 inhabitants to 20,000. This decline of Indian towns celebrated for their fabrics was by no means the worst consequence. *British steam and science* uprooted, over the whole surface of Hindostan [sic], the union between agriculture and manufacturing industry…these small stereotype forms of social organism [Indian village societies] have been to the greater part dissolved, and are disappearing, not so much through the brutal interference of the British tax gatherer and the British soldier, as to the working of *English steam and English free trade* (emphasis added)

Marx was correct in pointing out that technologies such as the steam engine had played a crucial role in the transformation of social space by early to mid-19th century, although as I have pointed out, the foundations – both moral and rational, for British intervention and government were stabilised during the late 18th century. It is also true that steam and free trade needed territory for capital to circulate, and for surplus value to manifest itself on an on-going basis. The link between colonialism and capitalism was truly global:

The problem of the material elements of capitalist accumulation, far from being solved by the material form of the surplus value that has been produced, takes on quite a different aspect. It becomes necessary for capital progressively to dispose ever more fully of the whole globe, to acquire an unlimited choice of means of production, with regard to both quality and quantity, so as to find productive employment for the surplus value it has realised[25] (Luxemburg, 1951 [1913], p. 358)

However, along with drastic exploitation, there came no social revolution in India as Marx had hoped. He had argued that brutal colonisation and the formal subsumption of labour would bring about an alienation amongst the colonised, leading them to revolt against feudalism (Marx, 1979 [1858]). The reality of India in the 1800s unfolded in more complex ways. For instance, the Railway network began in the 1830s as a project jointly financed by public and private capital from Britain. On the one hand, the railway network was crucial to the exploitation of Indian natural resources and raw materials that were then exported to

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[25] Luxemburg anticipates almost by a century, Harvey's (2006) formulation of the need for capitalism's 'spatial fix' and accumulation by dispossession.

Britain. Further, the railway network also supported the movement of British troops for military operations and the maintenance of colonial domination over the colonised. However, at the same time the Railways also became the material expression of secular infrastructure – willing to transport men and women, lower and upper castes, from one location to the other, at the same time and on the same routes. Although early design efforts in carriage cars did their best to 'entrench' class, caste and race differences, the railways, once established, became crucial infrastructures for fashioning a new self where people of different castes, genders and even nationalities could, indeed were forced to travel in the same temporal and physical space (Bear, 2007). Thus, infrastructures such as the railway network were also crucial in inaugurating the colonial project of modernity in the affective sense. As moving physical carriages that sped past familiar landscapes, the possibilities of discovering a sense of interiority emerged for the average passenger. In other words, the railway project not only extracted the raw materials for trade, but also participated in the movement of people and thereby industrialised time and space (Schivelbusch, 1986). Large scale communicative infrastructure until this point remained 'communicative' in the old sense – the transport of people *and* information (Carey, 1989).

In the 1850s, the United States and India accounted for most of Britain's annual foreign investment of 22 million pounds (Foreman-Peck, 1995). The laying of electric telegraph lines in India until then had been almost entirely a domestic exercise, especially with the influential role played by the Irish innovator, William O Shaughnessy[26]. He piloted the system in 1854 and within five months, supervised the laying of 800 miles of electric telegraph in India. These were primarily linked to colonial military and commercial centres – Calcutta, Agra, Bombay, Madras and Peshawar. As O' Shaughnessy put it, 'our tracks will run through a howling wilderness tenanted only by wild beasts or mere savages in human form' (Choudhury, 2000, p. 357). In the 1850s, as now, the basic labour dynamics remained the same. The dominant primarily high caste elites (in the 19th century it would have been British and Indian high caste Hindus, experts led by O'Shaughnessy) are in charge of planning and envisioning whereas the oppressed castes do the actual labour. The equivalence between animals and savages is a stark reminder of how the population in the

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[26] For a more detailed account on William O'Shaughnessy, see *Telegraphic Imperialism* (Choudhury, 2010)*.*

Indian 'wilderness' was seen and depicted by British technologists and industrialists. Clearly, for O'Shaughnessy as for many in the East India Company, communicative infrastructure signified a civilising mission (Hawn, 2020) which would transform 'the wilderness'. Apart from the civilisational aspect, the telegraph infrastructure played a direct role in crushing the rebellion that rose from within the armed forces of the British. Over a century of oppressive extractive processes, violence against Indian producers of raw materials and commodities had taken its toll and by 1857 many of the Indian soldiers rose up in revolt.

The telegraph infrastructure played a crucial role in coordinating the logistical endeavour of producing the colonial nation (in this instance, colonial India) in terms of strategic points where the military and commercial enterprises would overlap (Thorat, 2019). The materiality of the railway and telegraph networks criss-crossed the 'wilderness' based on a logic of strategic control over the territory held by the East India company, valuable natural resources, mobility of troops and so on. These logics of strategic control were stabilised over successive regimes of rule using the same spaces. For example, ports functioned as key conduit points for importing foreign goods and shipping domestic goods for sale abroad. Similarly, urban centres such as Calcutta and Madras (Chennai) were already the administrative, commercial and military centres with barracks situated in smaller towns close by. The logic of communicative infrastructure – in this case the railways and the telegraph seamlessly merged into the overall colonial project of infrastructural production of the nation, both because it made commercial sense to invest in places that already had other material and institutional infrastructures and because communicative infrastructure strengthened existing infrastructure. Infrastructures can be read as palimpsests because the material conditions of production, specifically the logic of production provides a strong incentive for new infrastructure to overlay older infrastructures. The palimpsest metaphor is not a textual or discursive view alone, it is backed by the material overlay of resources, institutional design, and concentration of investments that are often crucial nodes for military, commercial and political control. This is why the current National Optical Fibre Network (NOFN) managed by Bharat Broadband National Limited (BBNL) has allocated around 70 percent of rural roll out to the public telecom corporation Bharath Sanchar

Nigam Limited (BSNL) and 15 percent each to Railtel and Powergrid each (both public sector corporations related to the Railways and electricity provision)[27].

The British needed this infrastructure to retain control over the 'native' population. Gorman (1971) suggests that the rebels of the 1857 revolt cut telegraph cables precisely to prevent rapid mobilisation of British armed forces to whom they eventually succumbed. One Indian soldier is said to have referred to the telegraph as 'that accursed string that strangles us' (ibid. p. 599). In the end, it is no wonder that it was commonly held that 'the electric telegraph saved India' (Clarke, 1927, pp. 85–86). The British government immediately made efforts to lay out a transatlantic cable to gain greater access over colonies like India. The first post-revolt attempt to lay a cable was made by the Gisborne brothers with the British government providing an unconditional guarantee of four and a half percent upon the whole capital required. When the cable failed to deliver its promise for technical reasons, the British and Indian governments ended up paying about 36,000 pounds per year for fifty years to shareholders (Hills, 2002, p. 41). It is worth reading that figure again, just to get a stronger sense of the connection between capitalism and communication technologies.

Subsequent British India government efforts were made to build a line running through Iran, Iraq and Turkey (through the Indo-European Telegraph Department) but political sentiments in England, both from the Treasury as well as from the political class leaned towards investments in infrastructure completely under government control (Peel, 1905). Two private companies were able to successfully lay lines – Julius Reuter's line from Britain to Germany, across Russia, Iran and Tehran from where the line connected to India; and John Pender's line from Suez through the Red Sea to India. These two lines competed directly and were undergoing losses when finally Pender initiated a joint enterprise between the Indo-European Telegraph Department's line, Reuter's line and Pender's own line (Hills, 2002, pp. 42–43). Such business arrangements strengthened and reconfirmed the political shift of power, from the East India company to the British government. This is because once this public-private cartel was in place, 'the Secretary of State exercised far more effective

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27 PTI. 'BBNL wants to take over operations, maintenance work of BharatNet infra'. *Economic Times* (03 June, 2019). Retrieved from: https://telecom.economictimes.indiatimes.com/news/bbnl-plans-to-take-over-operations-maintenance-work-of-bharatnet-infra/69626671

control over the administration of India than was the case before, and the Viceroy really tended be a mere 'agent' of the state' (Barty-King, 1979, p. 33). The consolidation also had important business implications in the East, for the line to India soon enabled further expansion of telegraphy directly to Singapore and Hong Kong but also through Dutch-owned Java, to Australia (Fieldhouse, 1965).

As the leading global capitalist power, Britain had a current account deficit with most of the other capitalist rivals and emerging economies of the world, such as the United States of America. However, it had a surplus with colonies like India. Conversely, India had an export surplus with the rest of the world, but a deficit with Britain. Indian commodity manufacturers were 'paid' out of their own taxes, while export surplus earnings were debited in London on mysterious budget items like 'Home Charges' (Habib, 1975; Pandit, 1937; Patnaik, 2006). These complex transnational transactions imply that on the one hand, colonial coercion while enormous could not be carried out transparently for fear of revolt, i.e. transparent to coloniser and/or the colonised – an outcome of the contradictions in government rationalities that I have pointed out earlier; and on the other hand, the telegraph (and postal) infrastructure became crucial carriers in negotiating the complex flows of capital and maintaining balance of payments across the globe even as profits eventually ended up in Whitehall.

One year after the brutal crushing of the rebellion, Queen Victoria's addressed the people of India in 1858 – marking the formal closure of Company rule and the inauguration of direct rule under the British empire. She concluded her short speech with: 'it is our earnest desire to stimulate the peaceful industry of India, to promote *works of public utility* and improvement, and to administer the government for the benefit of *all our subjects* resident therein' (Keith, 1922, p. 382; emphasis added). The rhetoric of this speech marked a crucial shift in future infrastructural development in India – from this point onwards, all infrastructures would be oriented towards public utility. The unsaid part here was that hitherto infrastructural development in India was explicitly oriented towards the profits of the East India Company and British citizen-shareholders. Communicative infrastructure such as the telegraph played a crucial role in crushing the rebellion but was also to be reoriented

after 1858 towards public utility. It was precisely through infrastructural practices that *a new, loyal Indian subject* would be *produced*.

Further, the case of telegraph infrastructure provides a clue as to how internet infrastructure would emerge more than 150 years later, in two aspects – the financial arrangements of infrastructure involve the close cooperation of public and private capital underpinned by conflicting governmentalities of coercion and consent or extraction and welfare. Further, the physical route of infrastructure, even at global levels, retraces the routes of colonial geopolitical interests that converge with interests of transnational private firms (Aouragh & Chakravartty, 2016; Zhao, 2015). The next section addresses the subject position produced by infrastructures as colonial public utilities.

2.4 Colonial subjectivation

By the 1880s, the Indian Revolt of 1857 had transformed public relations between the coloniser and the colonised. The retired British officer A.O. Hume founded the Indian National Congress (INC) in 1885 to advocate for political reform in India – and advocacy was carried out primarily to influence the British government in Britain, and to a lesser extent in India. By that time there were more than about 475 newspapers – mostly in regional languages. Hume feared the revolt going underground, led by unruly mobs and organised along religious lines. Hume, in order to avoid a rerun of the 1857 revolt, was able to tap into the elite Indian's discontent about British bureaucracy. In his letter to the then lieutenant-governor of the north-west provinces, Auckland Colvin, Hume wrote about 'notorious practical grievances' such as '(a) costly and unsuitable Civil Courts (b) corrupt and oppressive police (c) rigid Revenue system (d) galling administration of Arms Act and Forest Act' (Sitaramayya, 1935, p. 7). For the Indian dominant Hindu castes, the complaints were mostly about access to the privileges that the British enjoyed, for example, a key demand was lowering the age for Indians applying to the civil service examinations (ibid. p. 6). On all sides, the demands were about transformations in colonial governmentality.

The birth of the Indian National Congress as a political entity emerged because of a need to reorient governmentality and retain power when faced with the prospect of uncontrollable

anger and chaos from the native masses. In the same year, 1885, the British government introduced a series of legislations, including the 1885 India Telegraph Act, announcing that the central government has 'exclusive privilege' to establish, maintain and license telegraph infrastructure and operations. This Act also was at least in part a way of synchronising different infrastructures – for example laying telegraph lines and poles along railway tracks. Not only was such synchronisation cost efficient, but it also reinforced the seeming effectiveness of colonial communication – for military and commercial purposes. Notice the tension between Queen Victoria's speech on public utilities for *all subjects*; and the 1885 Indian Telegraph Act which grants *only the government* exclusive privilege to establish telegraph systems. These two statements – a political speech and a legislative document, roughly 30 years apart, signify the *dispersions and limits* of the discursive formations within which infrastructure such as the telegraph and railways emerge. It is precisely through the contradictions and dispersions that a field was set up, a discursive field that had material effects. This is what I understand by Gyan Prakash's (1999, p. 161) argument that 'the operation of the colonial state became deeply enmeshed in a network of technological apparatuses, institutions and practices'. By the 1850s, infrastructures were imbricated in a profound tension between conflicting rationalities and contingencies of government – a modern government that sought the pastoral care of its population in and through a strong state that 'looks after' each and all (the benign aspect of biopolitics); and a colonial government that needed to finance an industrial revolution through the exploitation of raw materials and suppression of labour power in the colonies.

One of the fragmenting effects of such contradictions and tensions in colonial (and to an extent postcolonial) modernity is what Chatterjee (1993, p. 18) has called the 'rule of colonial difference'. On the one hand, the colonial attempts at building a modern state with liberal governance clashes with the need to maintain control and domination of the colonial state over its subjects. The imposition of colonial rule was brutal in its extractive logic, even as that rule imposed changing forms of governmentality on the people – in an attempt to transform them into a (quiescent) population. This latter tendency of colonial rule is better understood as a *grid* rather than a flattening or a demolition of pre-existing ways of political and cultural life. The imposition of a grid suppresses some aspects of life and at the same time imposes its will on what emerges. Thus, the new ways of life that emerged during the

late 19th century in India are not so much caused by new colonial governmentality as much as transformed by it.

There is an additional element that must not be elided in the analysis of colonial difference. The changing forms of governmentality in the form of new practices and experiences was refracted through a historically formed caste-structured society. The lack of attention given to the caste-structured history in most postcolonial scholarship is baffling and deeply problematic since attention to caste makes a rather fundamental different to how one can historicise the global south as well as the conditions of coloniality. Thus, if seen from a caste perspective, opposed to the colonisers, there were in fact two separate social groups with two contrary sets of interests. The dominant caste elites sought to gain control over these new forms of governmentality – including and especially access to the new institutions of science and technology, bureaucracy and administration. The oppressed castes saw in these changing forms of governmentality a unique opportunity to wage a double struggle – against the British colonisers *and* the Indian dominant caste colonisers.

I provide a brief example of the census as a form of enumerative infrastructure that transformed how caste was perceived and acted upon both socially and politically during the beginning of the 20th century in India. Amidst opposition by upper caste Hindus, the 1901 Commissioner for the third general census carried out in India gave the following argument, '…where in censuses of Western countries, an economic or occupational grouping of the population affords a basis for the combination of demographic statistics, the corresponding basis in the case of the Indian population is the distinction of religion and caste' (Quoted in Ambedkar, 1989, p. 230). The essay by Dr. Ambedkar I have cited is titled *From Millions to Fractions* – in itself a suggestive title in so far as it refers to the politics of colonial governmentality as it intersects with a caste-structured society. Dr. Ambedkar argues that in 1911, the census provided a ten-step test to identify the so-called 'Depressed Classes' or in other words, the Untouchables. These ten steps sought to identify those who: (i) denied the supremacy of the Brahmins (ii) did not receive the Mantra from Brahmana or other recognised Hindu guru (iii) denied the authority of the Vedas (iv) did not worship the great Hindu gods (v) were not served by the good Brahmanas (vi) have no Brahman priests at all (vii) have no access to the interior of the ordinary Hindu temple (viii) cause pollution

(ix) bury their dead and (x) eat beef and do not revere the cow (ibid. p. 232). The enumerative exercise to identify the 'Depressed Classes' consolidated over the next two decades when it was apparent that the total number of 'Depressed Classes' was close to 55-60 million or roughly 19% of the total Hindu and indigenous population. From 1912 to 1932, the growing demographic strength of the 'Depressed Classes' not only became apparent and public knowledge through the Census but the very category of 'Depressed Classes' as a separate category, and as a subject position, was in some sense produced by the Census. The rule of colonial difference is more akin to colonial governmentality getting entangled and as a result producing new relations between different caste groups across Hindus *and* Muslims.

The census, above all, is the crucial infrastructural device that generates the matrix of possibilities of political *representation.* I emphasise representation because the censuses of 1911 onwards had two objectives – enumerating the population and enumerating the number of 'Depressed Classes' (the so-called Untouchables) – so the representation of people as distinct categories of 'citizen' and as applicable, 'Depressed Class'. Further, the ratio of 'Depressed Classes' to the general population would have a direct bearing on how many electoral seats are reserved for the 'Depressed Classes'. Thus, the shift in numbers in the census are related to political power, and the problem of reducing the number of 'Depressed Classes' became the priority of the dominant caste groups and other interest groups, including Muslims, whose chances of increasing political representation came at the cost of decreasing representation of the 'Depressed Classes' (Datta, 1999; Menon, 2019). This is how I interpret the claim that the dominant castes as '[Hindu] nationalists left intact colonially derived distinctions between the social and the political, even as they asserted their right to define the *content* of those categories' (Rao, 2009, pp. 5–6; emphasis in original). The purpose of getting into the details of the 1911 census is not so much the outcome of such negotiations as it is to highlight that the infrastructural intervention of the census (as part of colonial governmentality) was not just about political representation but rather transformed the very terrain on which political battles were contested.

In broad terms, the census system involved a set of practices that concomitantly produced subject positions. The terrain of this particular form of caste-struggle was formed by

producing the modern categories or subject positions that in turn modified the possibilities of what can be said and done. Such are the transformations brought about by technologies of government. First because of the enumeration and weightage given to caste as a category, colonial governmentality inadvertently facilitated a new politics *of* caste. I have included this rather detailed illustration of the census even though it is not strictly speaking a communicative infrastructure, rather an enumerative one. The practice of being accounted for in census-categories meant that social struggles especially around caste were *materialised* in terms of political representation. In this, the census as a device of colonial governmentality is similar to communicative infrastructures, although there are some differences. Enumerative exercises and systems set up a terrain where social struggles are fought with different groups mobilising support in different ways. Communicative infrastructures while controlled by the colonial state or by private enterprises – controlled by and mostly for the wealthy, were also invested with subject positions that go beyond political representation.

It is a commonly held and cited view that infrastructures are invisible until they break down (Marvin & Graham, 2001; Star, 1999). However, infrastructures also serve as manifest representations of authority (Apter, 1999; Cohn, 1983) and as such they offer the promise of a modern subjectivity. Larkin (2008, p. 21) gives us a vivid sense of this subject position:

> Technologically adept, forward thinking, mutable, this subject was formed by the crisscrossing of communication networks…well educated, speaking English, working in a modern technological office, and spending his leisure time at the cinema or in private clubs. In a sense, it is this imagined subject that is immanent in the building of new infrastructures, the fantasy to which those structures are addressed.

I add here, that the contradictions of colonial governmentality also unfold in unpredictable ways, for infrastructures are appropriated as opportunities by subjugated populations to reimagine their own political status, as Chatterjee (2004) puts it – from subjects to citizens (c.f. Mamdani, 1996; Mbembe, 2001). In the early and mid-19th century, both the French working class and the bourgeoisie underwent a shift in their relationship with public lighting infrastructure (public lanterns and street lights). In the 3-day French revolution of 1830, the

primary mode of resistance against the monarchy was to smash the lanterns to enhance the anarchy of darkness and the safety of protestors, while in 1848, the revolutionaries forced people to light their lanterns to symbolise the victory of light against darkness (Schivelbusch, 1987, 1988). This is precisely the case with the census. The oppressed castes, especially the Dalits (then classified as Untouchables), were able to assert their right to political representation precisely by being counted within the census. Colonial governmentality regardless of intentions, presents opportunities for the subjugated to fight back since the exercise of power is productive, put into play through procedures and practices.

The case of cinema in India exhibits similar patterns. The British cinema industry at the turn of the 20th century was competing against American cinema for global markets as well as ideological hegemony. India, as a large colony, was an ideal overseas market and Indian audiences were audiences to cinema from both Britain and America. However, during this phase, many Indian filmmakers also used cinema as a tool to mobilise the anti-colonial struggle for independence. Initially shunned as a colonial vulgarity, film 'pioneers', who would go on to play an important role in 'Indian' cinema, had learned the tricks of the trade by visiting Britain. Cinema as a medium, and the apparatus of cinema, or more broadly cinema 'infrastructure' thus became a site for colonial dominance and attempts at ideological hegemony as well as a site of British anxiety about decolonial struggle (Bromley, 1922; Chowdhry, 2000; Mazzarella, 2009b; Srinivas, 1999). Similarly, in 1942, the Indian National Congress started a pirate radio station called *Azad Hind Radio* (Free India Radio) transmitting Gandhi's messages of peace and non-violent revolution throughout the country (Chatterji, 1989; Thomas, 2010). In these accounts of appropriation and resistance of media infrastructure, what is needed is a greater acknowledgment of the underlying colonially derived distinctions, categories and relations between 'population' and infrastructure.

I would like to conclude this section by arguing that there are two issues here that must be treated with caution. First, there is a need to question the tendency of writing media and communication history during colonial rule as heroic resistance by freedom fighters. There is no doubt that infrastructures were appropriated by activists who were fighting colonialism in all its brutality. However, media and communication systems including the

physical infrastructure, means of production, content, ownership, distribution networks and audiences were so much more than tools of resistance (Bonea, 2014). In this case, I have pointed out the complexities inherent in precolonial and colonial governmentalities that inform and imbricate the development of media and communication infrastructures. The complexity comes from the unpacking the coloniser/colonised binary and instead acknowledging the period as one in which there were several groups who fought for power (through political representation) but in terms of caste. The second issue is that of how we process and utilise the heuristic of the 'colonial sublime'. As has been correctly pointed out by Larkin, there is little doubt that infrastructures during colonial rule represented both coercion and consent. However, with a view of infrastructures as sublime, they appear 'as frozen discourses that form avenues between social worlds and into arenas and larger structures' (Star & Clarke, 2003, p. 115). I argue that rather than a frozen discourse, there is a need to unsettle the temporality of infrastructures, so that the underlying sets of relations (including the contradictions, dispersions and transformations of those relations) become clear as traces in the palimpsest that survive in the current milieu. The telegraph and the census were never *already finished* systems that acted upon the social. Rather these infrastructures opened up new ways and practices and new subject positions – and the infrastructures evolved and corresponded to these power struggles implicit in the relations. It is only in *movement* that one can meaningfully describe changes in and to infrastructures.

2.5 Post-independence interregnum

Anti-colonial resistance as a mass movement was not just against the British but in fact against the landed class by landless farmers and tribal populations at least since the early 1800s, and against the Hindu Brahmin upper castes by lower castes that date even earlier. The entry of the British, first as mercantilists and then as colonialists, gave rise to conflicting forms of governmentality. Since the mid-1800s, India represented both a market to be exploited and a population to be improved. Media and communication infrastructures were naturally imbricated within these conflicting rationalities. The resulting communicative landscape in pre-independent India had created not just an 'imagined community'

(Anderson, 1983) but in fact threatened to transform the very nature of the nation to be formed (c.f. Chatterjee, 1999, 2004).

Although there were many states, each with their own languages and dialects, castes and religions, the postcolonial government was keen to utilise media and communication for nation-building and development purposes. They well understood (from the colonial experience), that control over infrastructure also meant control over content. Thus, the 1885 Indian Telegraph Act (devised by the British after their experience with the Indian revolt of 1857), and subsequently the Wireless Telegraph Act of 1933 were retained by the Indian leadership without any substantive change. In 1947, Indian independence was haunted by the Partition, leading to the creation of Pakistan. In the last few years leading to Independence, the Indian sub-continent was marked by large scale ethnic cleansing and communal violence, leading to an estimated displacement of approximately 14 million people and a death toll of approximately 1 million people (Butalia, 1998; Pandey, 2001). Moreover, the independent government of India wanted to transform their relationship with the population.

The dominant political opinion in the early 1950s believed that the best way to modernise the nation was through a strong state, thus paving the way for a centralised communication infrastructure. In effect the colonial-rule architecture was retained, virtually unchanged as far as media and communication infrastructures are concerned. What did change was that nationalists infused new meaning in to the architecture. The role of media and communications was central to communicating the need to modernise as a nation, i.e. building an 'imagined community'. In other words, the media and communication systems in the early years of independent India were instrumental in providing what Anderson has called 'unbound serialities' (1998), i.e. universal modes of address for modern social thought – including 'citizen' and 'nation'.

Such an infusion of meaning had practical policy implications. For example, Article 19 (1) A of the Indian constitution provides the fundamental right of freedom of speech and expression to every citizen, while Article 19 (2) provides the list of 'reasonable restrictions' includes maintenance of public order and incitement to offence. These restrictions in fact

were the first amendment to the Indian constitution in 1951[28]. The entire broadcasting infrastructure of radio, and later television, was centralised and directly under the control of the Ministry of Information and Communication. From the first three 'Five Year Plans', investment was as follows: 'agriculture, including irrigation accounted for 22.7 percent, economic infrastructure like transport and communications, and power, accounted for 37.7 percent and social services for 18.1 percent. Industry accounted for only 17.2 percent' (Rao, 1972, p. 72). The period from the 1950s to the 1980s characterise the steady average growth of around three percent (Hatekar & Dongre, 2005). The planned supply side economy provided huge emphasis on the agricultural sector and it was precisely to support the agricultural sector that the industrial sector and its linked infrastructure was crucial:

> The technical linkages between agriculture and industry are such that even a 4 percent growth in agriculture is not possible with a high rate of growth in industries which supply the input requirements of a growing agriculture in the form of cement, bricks, pipes, pumps, electric power generation and transmission equipment, agricultural implements, diesel oil, fertiliser, pesticides, roads, vehicles etc. (Krishna Raj (1982) cited in Balakrishnan, 2007, p. 56)

This general tendency towards consolidations in agriculture and industry corresponded to the interpenetration of media and industrial interests (c.f. Adorno, 1997; Herman & Chomsky, 1988). The Indian Institute of Public Administration reported for the Second Press Commission that more than half of the press was controlled by monopoly houses and/or business, including cement, jute, steel, shipping, textiles, transport, electronics and processed food (Sainath, 1997). The central government maintained a very specific role in relation to industry (national industry had been an ally of nationalist forces since they realised colonialism was against their interests) in terms of industrial consolidation of profitable sectors while public sector took up manufacturing in sectors or products that were not profitable but obligatory nonetheless (Bagchi, Ghosh, & Dasgupta, 1985; Bardhan, 1984; Chenoy, 1985). The relation between industry and the state, at least with respect to the role of media and communication, in this stage was primarily one of 'nation-building',

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[28] See Page 9 of the Indian Constitution. Retrieved from: http://lawmin.nic.in/olwing/coi/coi-english/coi-4March2016.pdf.

On the one hand, infrastructure enabled a centrally commanded economic, scientific and modern vision to be communicated to the citizenry, while on the other hand, communication infrastructures could be used as extension services of the government – especially in rural areas where farmers could access agricultural advice complementing the local agricultural extension officer's work. It was public service media used for development work – fuelled by the idealism of a country fresh from an anti-colonial struggle (Bardhan, 1984; McDowell, 1997; Melkote, 1991; Rajagopal, 2016; Wyatt, 2005).

The postcolonial period was tinged with the optimism of a global anticolonial resurgence that would develop their countries in a new way so that historically oppressed groups could recover from the centuries of colonial extraction. Such nationalist hopes were manifest in the way nations were produced and imagined through large infrastructural projects, institutions, pedagogies and included centralised communicative networks. Accordingly, the subject position provided was one of a *nationalist subject* – participating in the rituals of creating the nation through everyday practices of receiving and engaging with public broadcasting owned by the state. Cinema and the press were privately owned but in the hands of large (domestic) business interests that were allowed to monopolise profits as long as they did not seriously challenge or subvert the nationalist secular project. Largescale communicative networks in a sense *constituted* the nation psychologically, spatially, temporally and economically.

In parallel, there were tectonic shifts in capital flows at a global level. The Bretton-Woods system in 1944, established the U.S dollar as the reserve currency pegged to gold (at 35$) and the interconversion of currency through the centralised International Monetary Fund (IMF). It marked a formal shift of power from a colonial Britain to the United States of America. For approximately the next thirty years, a surplus of US dollars that flowed from the USA to the rest of the world, creating an imbalance of payments. US military expenditure increased in the 1960s – most notably in Vietnam but also in a series of covert and overt operations in Latin America (Chomsky, Clark, & Said, 1999; Galeano, 1973; Mamdani, 2004). By the late 60s the US shifted to a current account deficit rather than a surplus. Since the Bretton-Woods system pegged the dollar to gold, the US increased the supply of dollars. As a result, other countries held on to the dollar under increasingly

difficult conditions. Ultimately, France, under the leadership of Charles De Gaulle pulled out of the international monetary system in 1967 and subsequently the British Sterling was devalued by more than 14% - a world-wide economic crisis both in terms of the dollar as well as fixed currencies like the Sterling. It was only a matter of time before the Nixon-shock doctrine came into place when the link between the dollar and gold was severed in 1971 (Amin, 1976; Emmanuel, 1972; Frank, 1971; Patnaik & Patnaik, 2017). This crisis was almost immediately compounded by the so-called 'oil shocks' – first in 1973 and then in 1979. The price of oil in 1979 rose from 3$ to 12$ and reached almost 40$ for a barrel of crude oil. Oil importing countries in the West were forced to slash interest rates but failed to contain inflation. Oil importing countries, including India suffered during this crisis due to the 'petrodollar' phenomenon, wherein OPEC members' surplus was re-exported to developing countries whereby countries like India increased their debt and faced severe shortage of foreign exchange (Masouros, 2013). By the late 1980s, with foreign exchange reserves running out, India was in a severe crisis.

Until the early 1980s, the Indian National Congress, although fundamentally coalitional in nature at the ground level (Kaviraj, 1986) had achieved complete domination of the political landscape, virtually winning all elections at the national and state levels. The international tectonic shifts of capital flows created new kinds of limits and set pressures on the central government. Domestically, the leadership credentials of the then prime minister Mrs. Indira Gandhi[29] was challenged both from within the Indian National Congress and from other political parties, while the agriculture sector had failed to perform and was in stagnation. Faced with the prospect of losing political control, Mrs. Gandhi imposed a political Emergency Rule in 1975 which involved the suspension of individual civil liberties. While many individuals were jailed for dissent, the press was controlled indirectly, marking a new shift in relations between the state and media and communication systems in India. For example, Mrs. Gandhi forced four national news agencies to merge, selectively allocated government advertisements (one of the largest source of revenues for newspapers), newspaper editors were threatened and coerced to censor information critical of government while government-controlled radio and television became channels for overt

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[29] Indira Gandhi was the daughter of India's first prime minister Jawaharlal Nehru, whose legacy as a nationalist still loomed large in a country that worshipped its 'freedom fighters'.

propaganda (Singh, 1980). Even as Mrs. Gandhi lifted the Emergency 21 months later, the independence of government-controlled broadcasting had become a political reform issue both inside and outside the Parliament. More importantly, regardless of coalitional politics on the ground, at the national level the Indian National Congress had lost its hegemonic control. As far as the aesthetics of politics is concerned, the decade marked publicly visible dissatisfaction and fatigue with an aggressive and authoritarian state (c.f. Dhar, 2001; Mathur, 2013; Nayar, 1977; Tarlo, 2003).

It was at this juncture, from the late 1970s to the mid-1980s that a sharp shift can be discerned in terms of the state-subject relations, the production of subject positions as well as the concomitant communicative infrastructures that emerged. Until this point, the project of producing the modern but obedient nationalist subject was the sole objective of the state, and communicative infrastructures were more or less subservient to this objective. From the late 1970s onwards, the Emergency and the decline of the Indian National Congress along with global shifts in the economy resulted in a new set of possibilities. The shift was marked by some drastic changes in the national economic situation.

The gross fiscal deficit of the Indian government (central and state government together) was 9 per cent of GDP in 1980-81 and had risen to 12.7 per cent by 1990-91. Correspondingly, the borrowings of the Indian government also rose rapidly, from 35 percent of the GDP in 1980-91 to 54 per cent in 1990-91. The US-led war against Iraq in 1990 made matters worse due to rising oil import bills. In 1989-90, India's oil import bill was 6,273 crore rupees while in 1990-91 it rose to 10,820 crore rupees – an increase of 72 per cent. Due to the conflict in Iraq, foreign remittances from West Asia (from Indians working in the Gulf region) also dropped sharply. By late 1991, India had a foreign reserve of 1.2 billion dollars, barely enough for two weeks of subsistence and was staring at the option of defaulting on payments. Left with no choice, the Indian government agreed to a New Economic Policy (NEP) as proposed by the International Monetary Fund and the World Bank – then leading the so-called structural adjustment of the third world. As part of the New Economic Policies, India agreed to devalue the rupee. By July 1991, the Reserve Bank of India adjusted downwards the value of the rupee to about 11 percent in relation to the

Pound Sterling, US Dollar, Deutsche Mark and Japanese Yen. As a result, these four currencies witnessed an overall appreciation of 23 percent in relation to the Indian rupee[30].

The 1980s was an extremely significant decade because it reorganised relations between populations and the state with the added element of global shifts becoming increasingly relevant to political and social life in India (Appadurai, 1996). The media and communication infrastructure were also transformed in ways that corresponded to the broader political, cultural and economic shifts in India and beyond. By the mid-1980s, the Indian government, keen to attract greater capital investment, became a signatory to the 'Uruguay round' of discussions of the General Agreements on Tariffs and Trade (GATT) held between 1986 to 1994. A major objective and indeed outcome of these discussions was to 'open' up the global South countries to capital investments from global North countries – in other words, expansion of the free market system in major sectors including services such as telecommunications. Simultaneously, the International Telecommunications Union (ITU) published the Maitland Commission report that highlighted the disparity of telecommunications access between the first and third world, arguing for greater emphasis on connectivity in the latter regions – a recommendation that the World Bank started taking up through its financing schemes (Chakravartty, 2004; Wellenius, 1993). These domestic and international events had concrete policy outcomes. The central government of India responded by hacking away at the centralised institutional architecture of media and communication production and distribution systems in India. In the telecom sector, the central government ministries led to formation of departments which in turn led to the formation of autonomous public corporations. Such devolution and hiving became necessary to avoid conflict of interest, which would inevitably arise when non-government players entered the market (see Chapter 4, Section 4.4 for more details).

The emergence of foreign investment required a morphological transformation of the state – from a pastoral provider of services to a supposedly neutral arbiter of private service providers. The proliferation of privately owned commercial communicative infrastructures went hand in hand with the production of new subject positions (c.f. Appadurai, 2015) –

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[30] All figures in this paragraph are from Indian budget figures for 1990-91. Retrieved from: http://indiabudget.nic.in/es1990-91/1%20The%20Economic%20Situation%20in%201990-91.pdf.

individuated citizens, consumers differentiated on the basis of their capacity to consume (material and symbolic) commodities generating demand in the economy, desiring subjects that celebrated the advent of a global modernity and personal freedoms. The emergence of new middle class subject positions were sustained through the proliferation of commercial television networks and Bollywood focused on urban consumption (Banaji, 2011 & 2020; Mehta, 2008). However, public broadcasting networks were involved in the production of other subject positions that went beyond urban regions. These subject positions were more directly about harvesting the potential benefits from the decline of the Indian National Congress, the hegemonic party in Indian politics until that period.

The production of a Hindu nationalist subject position became necessary in order to compensate for and co-opt the backlash to the dominant caste groups. After affirmative action for oppressed caste groups (called Other Backward Classes) by a coalition government in the early 1990s, the wealthy dominant castes became eager to associate themselves with a unified 'Hindu nationalism'. This subject position is an ideological position in the sense that the subject position of 'Hindu' is in reality fractured into thousands of sub-castes with extremely complicated inter-caste dynamics (mostly antagonistic). However, the only way to arrest the annihilation of caste was to unify Hindus against an external subject position created just for this purpose – that of the Muslim other. Thus the threat of the 'Muslim' became the 'constitutive outside' (Hall, 1996) that was deployed by upper caste Hindu chauvinists to unify the groups structured and fractured by caste society posing as Hindu (c.f. Aloysius, 1997).

The emergence of an *authoritarian, patriarchal, casteist, Hindu nationalist* subject position was in fact traced to the failure of the anticolonial moment to truly revolutionise or change older inner hierarchies and inequalities. It has been argued:

> Hindutva as a communalism of vertically constructed communities is the dominant castes' response to the emergence of the Indian version of 'class struggle'. Setting up of the two religious monoliths [Hindu and Muslim] thus, is intended to cover up and suppress the growth of the class-like formations that have threatened the traditional solidarity time and again in modern history…the real contest is between the economic and political interests of the lower caste-tribal-Muslim masses on the one

hand and the traditional elite-the upper caste combine on the other (Aloysius, 1994a, p. 1452)

From the late 1980s, the Congress party, through the bureaucracy in the Information and Broadcasting Ministry, broke with previous secular broadcasting traditions and allowed the telecasting of Hindu epics on the national broadcaster on a weekly basis. These television serials effectively brought to life Hindu myths and injected religion into the mediated public sphere – an attempt by the Congress alliance under Rajiv Gandhi to reach out to what they assumed were the majority of the voters by appealing to religious sentiments (Mankekar, 1999; Rajagopal, 2001). Viewership at the beginning of the telecast has been estimated at around 40 million and it rose steadily over the years.

Rather than the content or audience reactions to the telecast, I emphasise that the project of 'Hindu nationalism' could not have been invoked without a corresponding centralised terrestrial analogue (i.e. free to air and unencrypted) television broadcasting system completely under the control of the government. The census mechanism created not only subject positions ('depressed classes') but also had direct implications for political representation. In contrast, communicative infrastructures created subject positions in ambiguous ways – a mix of anxiety, fear and contempt towards the constitutive outside (the Muslim) and pride and pleasure towards the idealised nationalist Hindu.

2.7 Conclusion

My first research question asks about the political, economic and discursive formations under which internet infrastructure has emerged in India. In this chapter, I have written a condensed communicative history of India with respect to infrastructure and the concomitant subject positions produced with the operationalisation of such infrastructure from the millennia-old caste system to the late 1980s period. The pre-colonial and early colonial histories consisted of communicative practices in the context of *caste-structured* subjectivation where dominant castes controlled communicative practices through threats of physical and symbolic violence. Early colonialist interventions took the form of mercantilism mediated by the East India Company during which individuals were produced as *administrative subjects* – facing the law, paying taxes and so on. In this period,

infrastructural relations were primarily extractive and wealth was drained from the subcontinent, indirectly producing the conditions within which the industrial revolution began, thenceforth further transforming the development of infrastructure in Britain which was subsequently used in the Indian sub-continent.

In the 19th century, infrastructures such as the railway network were crucial in inaugurating the colonial project of modernity, and thus the *colonial modern subject* in the affective sense, for instance providing subjects with a new perception of interiority. Infrastructures were imbricated in a profound tension between conflicting rationalities and contingencies of government – a modern government that sought the pastoral care of its population and a colonial government that needed to finance an industrial revolution through the exploitation of raw materials and the suppression of labour power in the colonies.

In the latter half of the 20th century, which is the post-colonial period, the relation between industry and the state, (at least with respect to the role of media and communication) was primarily one of 'nation-building' and thus of producing *nationalist subjects*. By the 1980s, reliance on foreign investment in communications required a morphological transformation of the state – from a pastoral provider of services to a supposedly neutral arbiter of private service providers. The proliferation of privately-owned commercial communicative infrastructures went hand in hand with the production of *new subject positions* – individuated citizens, consumers differentiated on the basis of their capacity to consume (material and symbolic) commodities generating demand in the economy and desiring subjects who celebrated the advent of a global modernity and personal freedoms. From the late 1980s onwards, the transformations of communicative infrastructure and the processes of subjectivation have both inclined towards deepening economic inequality and oppression by dominant caste Hindus of other religious and caste groups (also referred to in the literature as minorities).

Many of the financial, political, discursive and technological transformations that I have highlighted in this communicative history of India, have played a role in shaping the National Optical Fibre Network as it is designed and planned. The 'deep time' of internet infrastructure (Rajagopal, 2016; Zielinski, 2008) will remain incomplete unless scholarship is

accompanied by empirical investigation into the ways in which infrastructures are interpreted, used and imagined. After a discussion of methodology in the next chapter, the following three chapters will focus on precisely these empirical aspects of my research.

Chapter 3 Reassembling the social from the global south: Methodological perspectives and challenges

3.1 Introduction

The aim of my thesis is to investigate the role played by internet infrastructure in processes of governmentality and subjectivation in Surguja district, northern Chhattisgarh, India. In order to operationalise my project, I decided to focus on infrastructural practices as the object of my research. Since infrastructures can be difficult conceptual categories, in my field work, I followed, for the sake of analytical convenience, the objects, institutions and practices related to the National Optical Fibre Network (NOFN) – a nationwide initiative by the central government of India to provide high-speed broadband internet connectivity, with a special emphasis on coverage for rural parts of India. The observation of infrastructural practices across different sites (government offices, schools, e-government centres and so on) required participant observation and semi-structured interviews. These infrastructural practices, which spread across different sites, and by individuals who occupied different subject positions (in terms of caste, gender, class and religion among others), are both highly contextual and reflexive; and required correspondingly reflexive research methods in order to engage with this complexity.

My decision to undertake fieldwork in Chhattisgarh required specific methodological and ethical inflections. My lack of familiarity with the terrain and the language, developing relationships of trust with informants while coming from vastly unequal social positions, negotiating the intricacies of pre-existing agonisms between different individuals and social groups all required constant self-reflexivity. In this chapter, I begin with unpacking my decision to choose northern Chhattisgarh as my field site by retracing some of the underlying conflicts and questions I had to struggle with before narrowing down on Surguja district in Chhattisgarh.

In the remainder of this chapter I discuss how I operationalised and implemented six months of participant observation and ethnography alongside semi-structured interviews. I

draw on the established conventions and traditions as well as some of the debates in the literature on ethnography and interviews which in turn have provided me with resources to adopt a continually self-reflexive research process. In the final sections of the chapter, I discuss some of the struggles I faced with epistemology and the politics of representation in terms of indigeneity and caste privilege that necessarily inflected my fieldwork.

3.2 Why Chhattisgarh?

Until I arrived for fieldwork, I had never visited Chhattisgarh. Northern Chhattisgarh, ironically, was completely unknown to me even as an Indian and even though I was quite aware of the contexts in Southern Chhattisgarh and Varanasi in Uttar Pradesh, which shares a border with northern Chhattisgarh. I had personally visited Varanasi and it is over-represented in popular and academic work on India given its claim to be an ancient and spiritual city symbolic of our 'traditional' heritage (c.f. Eck, 1999). In my previous work in a non-profit, I was part of several protests against what was informally called "Operation Greenhunt" – a government sponsored military offensive against the Maoist rebels in Chhattisgarh (Shah, 2010; Sundar, 2016). Part of this work involved compiling research, speaking to journalists working on this issue, organising exhibitions of photojournalists working in that area, and also as I seem to remember, talking about the region and its crisis incessantly.

Since the late 1990s, the region of Chhattisgarh (then still part of Madhya Pradesh) had been identified through surveying and research, as one of the country's most valuable reserves of natural mineral resources, including bauxite, coal, iron, dolomite and quartz. The only problem for the State is that the region is inhabited by Adivasis- literally meaning first or original inhabitants. Unlike the colonialists, the Indian state could not pretend that the land was *terra nullius*. Further, the land rights of the Adivasis enjoyed protection under the Panchayat (Extensions to Scheduled Areas) Act, 1996 - commonly called as PESA. Scheduled Areas are outlined in the fifth schedule of the Indian Constitution and recognise areas which have a predominantly tribal population. The PESA 1996 extended to Adivasis, the moral, legal and constitutional right to self-governance through the institution of the Panchayat.

Compared to all other states in India, Chhattisgarh has the lowest tele-density and is often considered one of the most 'backward' states because of its highly concentrated Adivasi population. The 2011 census records household assets including computer/laptop, mobile phone, landline phone and internet. Chhattisgarh is the state with the least household assets for computer, mobile phone and landline phone[31]. Given that the National Optical Fibre Network (NOFN) is funded by public money with the objective of development and growth, Chhattisgarh could be seen as an ideal site to investigate whether the claims of 'development' even by the standards of the State had achieved fruition. However, I also want to clarify here that it is perhaps for this very reason that I was also initially sceptical of approaching Chhattisgarh from this perspective. My research is not to do with investigating the development discourse or to prove, in an investigative manner, that the asserted development has or has not happened. Justifying the choice of Chhattisgarh from the analytical perspective of measuring and verifying connectivity would further reproduce the problematic discourse of connectivity and development (Ferguson, 1999) whereas my research design moved away from the moral blackmail implied with the necessary and inherently positive outcomes associated with connectivity. In other words, my objective was to provide a descriptive account of how internet infrastructures are increasingly imbricated in daily practices and processes of governmentality and subjectivation.

The state of Chhattisgarh has been and continues to be in the mainstream news only as a hotbed of left-wing extremism by the Maoists. In the progressive and left-wing discourse, Chhattisgarh is only represented as a site of state oppression on behalf of large corporations who are exploiting the land for mining natural resources. In such a scenario, my main concern was not to find the exercise of authority but rather that I would find too much of it – most of it in a very direct and violent manner (which was and continues to be extensively covered at least in alternative and critical writing). The representational logic (Hall, 1997) towards the people of Chhattisgarh (mostly indigenous groups) oscillates between dangerous Maoists (security threats, terrorists) and hapless victims of capitalist and State tyranny. Rather than reproduce representational knowledge within this binary, which Uday

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[31] Household assets from Census 2011. Retrieved from: https://www.census2011.co.in/hhassets.php

Chandra (2017) has called the *resistant subject*, I wanted to produce research that would intervene and complicate the stereotyping of Adivasis.

3.3. Arriving at the field

In this section, I problematise the notion of the field as I grapple with operationalising the concept in my doctoral research. I discuss three methodological strategies that enabled me to approach the field and begin research and finally reflect on the conditions under which the field becomes legible for the production of knowledge.

The notion of 'field' entered anthropology from the natural sciences, including but not limited to zoology and biology. Like the natural sciences, anthropology too saw field work as the detailed study of primitive humanity in its primitive stage, just as the naturalists studied flora and fauna (Stocking, 1992). Inevitably, given the framing of field-work as the acquisition of the other, anthropology as a discipline has a strong foundation in the broader extractive logics of colonialism and imperialism. Contemporary academic knowledge production is no longer limited to the study of the other in far-away places - a result of the so-called 'cultural' turn in social science disciplines after the late 1960s (Asad, 1973). However, 'field' and 'fieldwork' are traces - they remind us of the difficulties and complexities involved in the conditions of knowledge production.

Fieldwork implies that the researcher goes *elsewhere* to conduct research, which must mean that after conducting research, one comes back *home* to reconstruct research into knowledge. The field is where data is raw, complex, dangerous and unprocessed. Home is where one can gain some distance from the field, and in a calm and safe environment, 'process' the data to produce knowledge. The territorial logic is unmistakable but not entirely useful today, given the complexity of digital networks (Coleman, 2010; Slater & Miller, 2000) and in general, globalisation:

> The landscapes of group identity - the ethnoscapes - around the world are no longer
> familiar anthropological objects, insofar as groups are no longer tightly
> territorialised, spatially bounded, historically self-conscious or culturally

homogeneous...The task of ethnography now becomes the unravelling of a conundrum: what is the nature of locality, as a lived experience, in a globalised de-territorialised world? (Appadurai, 1991, p. 191)

This de-territorialisation is not restricted to ethnoscapes but extends to technoscapes as is clearly evident in the case of internet infrastructures. From undersea cables to standards and protocols, the local is constantly marked by the national and the international (Easterling, 2016; Starosielski, 2015). The separation of field and home is further complicated for 'halfies'[32] like me. As a postcolonial subject, it is not always clear what is home and what is the field. There is also the double-bind that researchers like us face: readers from the Global North expect us to translate the strange events 'out there' in the field while subjects and readers in the Global South expect an impossibly authentic representation of their (our?) lived experience as well as the bringing of insights that come from the privilege of academic environments (Gupta & Ferguson, 1997). I experienced similar complications when it came to my field work, since the contexts of Chhattisgarh were at once familiar as an Indian (translating to a Western/international audience) and yet completely unfamiliar to me as a dominant caste non-indigenous south Indian.

For social science researchers, it is impossible to collect data without some assumptions. We already have some preliminary ideas about the 'field' and the kind of data we can extract from it. Inevitably, such assumptions come with epistemological and indeed, political acts of classification that orders our investigations at different levels – from the phenomenological to the logistical (Becker, 1998; Bowker & Star, 1999). In my research, I narrowed down internet infrastructure into three methodological strategies to begin my research, since I was fairly sure that once on the field, my informants would provide me with access to a wide range of infrastructural practices that would go well beyond my initial assumptions and strategies. First, I focused on the National Optical Fibre Network (NOFN) as the main object of 'internet infrastructure' since the NOFN was routed through a single institution (BBNL), had a clear set of objects (cables, power systems and so on) and locations (Panchayats for instance) which could be observed and analysed. Second, I distinguished

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[32] A term coined by Kiri Narayan (quoted in Abu-Lughod, 1991) for postcolonials who do their research from the West

between government and citizens where the former group would be engaging with internet infrastructure in terms of administration, financial planning, technical maintenance and so on whereas the latter group would engage with internet infrastructure as citizens, users, consumers and so on. Third, I distinguished between Adivasi and non-Adivasi groups. These were initial strategies for approaching and managing field work, but not only would these strategies give way to complexities on the field, but even on paper, such strategies have inherent ambiguities and complications.

For instance, take the distinction between Adivasi and non-Adivasi groups. Implicit in the research process (in terms of the inherent divisions between who gets to be the researcher and the researched) is a 'metanarrative' of globalisation that pre-supposes the transition from pre-modern to modern, from provincial to regional to national and de-territorialised globalisation and so on (Trouillot, 1991). Contrary to the productive view of globalisation espoused by Appadurai above, it is worth remembering that if processes of producing knowledge are caught up in a totality where some people are fixed locally while others enjoy the pleasures and comforts of globally circulating capital and culture then it is a sign of social deprivation and degradation (Bauman, 1988). Although there is no geographical space that has only one or the other group, the distinction is useful since indigeneity is a historical marker of alternative cosmology and social structures compared to other ethnic, religious or caste-based subjectivity that have integrated more or less with modern life with clock time, wage labour, modes of consumption and so on (c.f. Thompson, 1967). I return to this question of a distinct Adivasi subjectivity in Chapter 6, Section 6.2.

Each of these methodological strategies enabled me to begin fieldwork without much prior knowledge about the region or access to social networks. As I began following up the NOFN apparatus in terms of institutions, specific types of users or administrators in Adivasi and non-Adivasi areas, the 'field' began to appear more accessible. I refer not to the stabilisation of my research object (since various individuals and groups I interacted with constantly disturbed the distinctions I began with and mentioned above) but rather a preliminary *sense* of how power relations are exercised in the field – who were the caste groups that controlled the government jobs, the land market, specific castes controlling specific industries (retail, or cloth markets), a sense of who was respected for which reasons, and so

on. I also got a sense of daily *rhythms*, how different subjects navigated their respective environments in terms of family and professional obligations, which public spaces were used by whom at which times, but also a collective sense of daily life and its pace.

3.4 The audit trail

In this section, I provide a snapshot of my empirical research conducted with the methods of discourse analysis, participant observation ethnography and semi-structured interviews. Apart from providing the scope of my field work, I also discuss some of the challenges I faced in the operationalisation of my research.

In the latter half of May 2018, after managing to finalise northern Chhattisgarh as my field site, I took a three-hour flight from my home town Bangalore, to the Chhattisgarh's capital city Raipur, and from Raipur, I boarded an overnight train to reach Ambikapur the next morning. I had managed to arrange my accommodation through a mutual friend, C.S, a teacher in a private school in Ambikapur and in his spare time, a cinephile and poet. He very kindly offered his house for me to stay in Ambikapur. Ambikapur as mentioned above is the administrative capital and the biggest city in Surguja district of Chhattisgarh.

My focus was to study the role played by the National Optical Fibre Network or NOFN (a central government funded infrastructural project) in governmentality and subjectivation following the work of Michel Foucault. My research is ordered by three key research questions:

- Under what political, economic and discursive formations have internet infrastructures emerged in India?
- How and to what extent does the case of India shed light on how internet infrastructure is imbricated in governmentality?
- In contemporary India, how and to what extent does internet infrastructure play a role in processes of individual and group subjectivation?

It is the latter two questions that I investigated through my field work and analysis of policy and political discourse. In order to investigate the role of infrastructure in governmentality and processes of subjectivation, I planned to observe as many kinds of infrastructural practices as I could access. These included observation and interaction with bureaucrats, technicians and other workers who planned, designed and operationalised the invisible part of the infrastructure - such as the fibre optic cables, the power systems, the network architecture, the security protocols, the pricing of bandwidth, the spatial planning, the accountants who paid for the equipment, labour and so on. I also paid attention to infrastructural practices by individuals and groups as 'users' of infrastructure - government agencies like the Panchayats (see Section 3.7), government schools, government health centres and individuals accessing the internet either on their mobile phones or families accessing the internet through a cable laid to their home. I faced two major challenges: the dysfunctionality or even complete absence of the National Optical Fibre Network in Adivasi areas; and a rumour circulating on social media that made it impossible to conduct fieldwork without putting my own and my informants lives at risk.

As I soon realised, I had assumed (mistakenly) that the internet infrastructure was operational. Upon my arrival, my host CS introduced me to AK a part-time computer teacher at a local school and a private contractor for the National Optical Fibre Network (NOFN). AK informed that the first phase had already been completed and second phase of laying the cables for the NOFN had not yet been started. The tender for the second phase would be issued by BBNL in November or December 2018. Apparently, my timing was unlucky, especially with regards to meeting the daily wage labourers who were involved in laying the fibre across the state and the technicians who installed the routers and solar power system in each of the Panchayats. I enquired whether it would still be possible to meet the labourers even if not 'on the job'. Even this was not possible since the contractors, like AK, usually hired labour from other contractors – who specialised in providing labour from other states. Contractors preferred hiring labour from 'outside' because they could be paid less, would have little or no social networks to leverage for rights, and contractors could cut costs on overtime. The surplus reserve army (Sanyal, 2007) of 'footloose' undocumented and untraceable labour is important in the story of internet infrastructure, because it signals the decline of agriculture as the main occupation in rural India. The policies of the Indian State

that have rendered agriculture unsustainable, are now employing these very farmers to lay the fibre optic cables for a new digital economy. Such structural dynamics point out to the complexities of who is even available to 'speak' as a subject (to researchers) in the first place.

Early in my fieldwork, I realised there were rumours circulating on WhatsApp and other social media platforms about a stranger on the prowl kidnapping children and/or harvesting their organs as part of a organs racket and in the course of visiting a village, I nearly got lynched by a mob (see Appendix 5 for more details). It had become dangerous for me to spend even half a day in any village in most parts of India, much less in Chhattisgarh. Further, I would put my informants in danger since they too would be associated with me as kidnappers or criminals. I had to adapt my fieldwork to conduct short visits and interactions, and continue my residence in the city of Ambikapur rather than live in the Adivasi areas. Given these challenges, I wrote to my supervisors with an update and to seek advice on how I should proceed. After consulting with my supervisors and with contacts in Chhattisgarh and with other networks in other states, I decided that the best way to utilise my time would be to restrict myself to the city of Ambikapur. Intermittently, I would undertake rapid and brief field visits to various villages always accompanied by people who lived in those villages and were well known. I could not stay in any village but only interact with people in public spaces or government institutions (Panchayat offices, schools, health centres).

As a result of these challenges, I spoke to various government officials working with the National Optical Fibre Network (NOFN) and interacted with well-known individuals in Ambikapur (bankers, artists, teachers). I also visited approximately 50 villages Surguja district. Unsurprisingly, while the cables for the NOFN were already laid, not a single Panchayat was functioning as far as internet infrastructure was concerned (more on the reasons for this in Chapters 5 and 6). In total, I conducted 25 semi-structured interviews with a wide and diverse range of people in Surguja District (see Appendix 3B), most of them in Ambikapur, and observed the functioning of the Panchayats in Ambikapur and nearby towns and villages through periodic visits and brief interactions with close to a 100 people. I have attached an information sheet and a consent form in Appendix 6A to 6D. Although most of the people I spoke to refused to sign any paper, these were translated into Hindi.

They readily gave me verbal consent. Only government officials and other professionals in Ambikapur were ready to sign consent forms.

In addition to collecting primary data, I also conducted a discourse analysis of political and policy discourse on the National Optical Fibre Network (NOFN) and internet infrastructure in general. My primary focus in the discourse analysis is the policy and political discourse from the mid-1980s to the current period and includes policy documents from 1994 onwards titled National Telecom Policies. In the last decade, the central government has separate policy documents on broadband and internet provision. In addition to this, I have also reviewed documents (recommendations and consultation papers) by the regulatory agency, Telecom Regulatory Authority of India (TRAI) on the NOFN. Finally, I have also reviewed statements by politicians and technocrats who have been crucial to the development of internet infrastructure in India – both in terms of political imagination and implementation. (See Appendix 2A for list of documents considered for discourse analysis; Appendices 2B, 2C and 2D for three full-length texts included in my corpus of texts)

3.5 Ethics and reflexivity

In this section, I reflect on how my own social position inflects the methodological and theoretical choices for research. In such a process of reflection, I describe the various ways in which the different aspects of my privilege (caste position, languages, cultural capital, gender, class) inflect questions of access, understanding, and theorisation. Finally, I also reflect on the ethical implications around speaking when there are coercive power relations at play – whether it is a government official speaking critically about their bosses or an Adivasi speaking about mining.

Fundamental in this research design is the theoretical position of the observer, detached from the regularity of infrastructural practices as they are practiced in the field, yet capable of observing such practices and theorising with these practices as the object of research. This position needs to be unpacked, without which social science research falls into a classical problem, to assume that 'things of logic are the logic of things' (Bourdieu, 1990a, p.

61). My choices and consequences cannot be separated from my own position in society – a combination of various subject positions all of which influence both the way I construct and do my research, as well as how subjects in the field see and interact with me. There are markers of caste that come from a set of regularised social practices in a society structured by caste. This social understanding of caste has been argued elegantly: '…there is no legal definition of untouchability and there cannot be any. Untouchability does not express itself through the hair of the head or the colour of the skin. It is not a matter of blood. Untouchability expresses itself in modes of treatment and observances of certain practices' (Ambedkar, 1989, p. 233). As a dominant caste man growing up in different cities, my social position is indissociably linked to the minority elite that has historically oppressed the vast majority in the subcontinent over nearly 2000 years if not more. This is not simply a case of how I perceive and produce knowledge about the world, but also relevant to how caste, gender and class privileges accumulate in the body as habitus – style of walking, knowledge of languages, accents, the softness of hands unused to doing manual labour.

As a dominant caste scholar, it follows that my construction of my research design and the object of my research will be guided by my position in social space:

> …having constructed social space, we know that these points of view, as the word itself suggests, are views taken from a certain point, that is, from a determinate position within social space. And we also know that there will be different or even antagonistic points of view, since points of view depend on the point from which they are taken, since the vision that every agent has of the space depends on his or her position in that space (Bourdieu, 1989, p. 18)

These are not problems to be solved but the facts as they irreducibly underlie my research. In the course of my field work, as Chapters 5 and 6 will show, these facts come into play. During my interactions with individuals from dominant castes and classes my research methodology yields 'data' in sync with my theoretical framework. However, as I stray away from my own position in the social space, the research design comes under pressure and I grapple with silences, non-recognition and social haunting as provisional heuristic categories

to process that which I cannot perhaps theorise beyond a point. I comment on the full implications of adopting a reflexive sociological approach in Chapter 7.

As an Indian researcher from London coming to India to do research meant that I was able to get access especially to dominant castes and professionals in cities who were aware of the cultural capital that I carried with me. Many asked me about how one could get admission to elite colleges in the West and whether I could give some tips to their sons and daughters. My name immediately confirmed my dominant caste Hindu identity and this identity provided a certain sense of comfort and frankness from dominant caste Hindu subjects who felt that I was 'one of them'. My position as a city dweller from Bangalore meant that I was able to 'enter' Chhattisgarh through a fairly affluent and mostly dominant caste set of networks as I snowballed my way through various individuals and groups. Most people in Chhattisgarh speak *Chhattisgarhi*, a version of Hindi that was initially difficult for me to understand. Most of my informants, at least those in Ambikapur city, would instantly switch to Hindi when speaking to me – including translating what they had just said to someone else in Chhattisgarhi. I instantly knew that the Hindi translation was a much poorer one – more formal, deliberately addressed to me as an outsider, and completely shorn of the idioms, humour, subtlety and the relaxed spontaneity of speaking in the local language. It took me almost a month and a half to completely understand Chhattisgarhi, but I was still unable to speak it fluently. As a South Indian from Bangalore, they saw me outside the caste and therefore cultural associations they were familiar with. In affective terms, I was a stranger even though I was an 'Indian' and could speak fluent Hindi (c.f. Spitulnik, 2002).

As a male researcher, I could not access women subjects either in rural areas or even in Ambikapur. Men freely interacted with me but they discouraged women from their families talking to me. If I could talk to women, it would be in the presence of their male family members. This dynamic inevitably meant that they would only say the 'right' things. It became difficult if not impossible to observe women's daily lives since both urban and rural society was tightly segregated by gender and there is no doubt that my research too is a highly gendered account. These limitations pertaining to language, gender, caste and other indices of social position are irreducible and can be overcome when the source of

knowledge production itself is open to scholars from social positions hitherto excluded from production of scholarship.

As I have mentioned earlier, the ethical implications of doing fieldwork were brought into high relief when rumours about child kidnappers started doing the rounds on social media. I had to take difficult decisions about visiting informants knowing it could be risky for both of us. However, at the same time, many of my other informants in Ambikapur were quick to point out that the incident was in fact highly appropriate to my research, and that it was precisely the 'ignorance, backwardness and illiteracy' of Adivasis that were giving rise to rumours. Driven by such orientalist accounts, I decided to dig deeper into the rumours while minimising risk to my informants. Further, given that many of the Adivasi areas faced the effects of large-scale mining through environmental pollution, eviction, loss of drinking water and so on, their speaking about this to me posed a risk to their safety and possible harassment from the State and/or the mining companies. Similarly, government officials were wary of critiquing the imaginaries and institutional logics of internet infrastructure since their job could be at risk. Accordingly, through this thesis, I have abbreviated the names of my informants to protect their identity in accordance with the terms of their consent. In many parts, even revealing their profession or the title of their post would reveal their identity. Hence, I have described some informants in aggregate terms (officials, higher or lower position in the bureaucracy; competence rather than post and so on). Further, I have refrained from mentioning the names of the villages I visited since this would risk the safety of my informants. Instead I have referred broadly to the region in terms of the nearest town, or close to the mining areas and so on.

3.6 Caste-structured society, Dalit and Adivasi subjectivities

I frequently use terms Dalit, Adivasi, Bahujan and in this section, I briefly unpack the genealogy of these subject positions to provide a sense of how I have operationalised their use throughout my research. India with a population of 1.3 billion people has a majority of Hindus. As per the last census undertaken in 2011, roughly 80 percent of the population is Hindu. Roughly 14 percent is Muslim, three percent is Christian and other religions comprise the remaining six percent. The Hindu religion is materialised in daily life through the

existence of a caste system that is at least two thousand years old. Essentially, the caste system is one of graded hierarchy. There are four main castes – the *brahmin* (priest) caste at the top, followed by *kshatriya* (warrior) caste, *vaishya* (business/trading) caste and *shudra* (labour) caste. Then there are the so-called untouchables who are constituted from the outside as a fifth (non) caste. More recently, the so-called untouchables have asserted themselves as *Dalits*, literally oppressed or crushed. As per the caste system, each of the castes are bound to certain occupations. Most of the economic productive labour is done by the 'Shudras' and the Dalits while the surplus value of their labour is appropriated by the three other castes. The Brahmins form a numerically tiny part of the population (roughly three to five percent). However, they have disproportionate influence in positions of power and control in all spheres of modern Indian system – including but not limited to politics, education, judiciary, executive, media, cinema, privately owned industry and so on. The 'Shudras' and Dalits, historically and even to the present date, are forced to do manual labour including the most back-breaking and degrading labour, such as the skinning of animal carcasses for leather, burning of dead bodies, cleaning sewers and drains, cleaning the streets, toilets and domestic work.

Given the unequal division of labour and the kind of labour, it is not surprising that caste inequality sharply coincides with class inequality. 'Shudras' and Dalits are also the poorest (along with Muslims and Adivasis) sections of Indian society. It should be noted that caste-based discrimination and oppression was sought to be erased through constitutional, legal and political reform since India gained Independence in 1947, not least through the pioneering efforts of Dr. Babasaheb Ambedkar, widely hailed as the father of the Indian Constitution and the most iconic symbol for the Dalit and other progressive people's movements in India today. However, as Dr. Ambedkar himself had noted, reform on paper does not mean much until economic and social equality is achieved in society, in reality. Even today, caste-based violence is much too common a reality across the length and breadth of the country. Any resistance by Dalits is immediately and violently crushed by dominant caste vigilante mobs. Dalit leaders and intellectuals are often harassed and arrested thereby showing full complicity of the state and state apparatuses. The persistence of caste discrimination can be observed in the fact that not even the Communist political

parties have had a single Dalit leader in their central leadership since these parties were founded.

The indigenous or *Adivasis* (first or original inhabitants) comprise nearly nine percent of the Indian population, i.e. more than a 100 million people, although they are not spread evenly across the country. Some states of South India, central Indian states like Madhya Pradesh, Orissa, Jharkhand and Chhattisgarh, and the seven north eastern states host most of the Adivasi population. Most of the Adivasi population follow either Hinduism, Christianity or their own traditional rituals of worshipping nature. Although many are engaged in agriculture and/or daily wage labour, a significant part of Adivasi population lives in forests, depending on the forest for their livelihood. Adivasis have suffered heavily during the time of British colonial expansion in the 18th and 19th century. Even after Independence, the Indian government has been brutally suppressing the Adivasi population since most of them reside on lands rich in mineral and other valuable natural resources. The oppression of Adivasis continues to this day, especially in the states of Orissa, Jharkhand and Chhattisgarh. All three states have a very high quantity of minerals like iron ore and coal, which have been allotted to large mining companies – companies that have other interests in oil and gas, textiles, shipping, arms manufacturing and communicative technologies. These companies also have powerful influence and control through ownership of media outlets and universities and maintain close ties with politicians from all major political parties. Adivasis have mobilised themselves in different ways, the most noticeable of which is the formation of the Communist Party of India (Maoist) in the state of Chhattisgarh. As the State increases its violent oppression on Adivasis through the use of armed forces and vigilante groups, the Adivasis battling for survival, through the Maoist party, have become more determined to fight back through increasingly subversive and violent tactics.

At this juncture it is useful to revisit the terminology used to describe what are in fact highly differentiated groups – Dalits, Bahujan and Adivasis. There have been different names used in the past which are not just labels but are politically used in specific ways and therefore constitute groups differently. The subject position of Dalit for example used to be referred

to in the past as 'Harijan'[33], 'Depressed Classes' and 'Untouchables'. The terms Dalit, Bahujan and Adivasi are terms that the dominated castes and indigenous peoples have come to use for themselves as modes of self-assertion. These terms are highly political and continue to be key markers of political struggle. For example, the term Adivasi literally translates to first or original inhabitant. This self-assertion implies a narrative and embodied sense of subjectivity, that indigenous peoples were the original occupants of the land in the sub-continent until foreigners (Aryans) arrived and began to oppress the indigenous societies through the caste divisions, changes in livelihood from forest subsistence to agriculture, appropriated forest lands and so on.

Liberal and conservative representation of indigenous peoples have been hesitant to accept the full implications of this narrativised sense of self by focusing of the scientific facts about history of the sub-continent (or lack of evidence). Today there exists scientific evidence from genetics to corroborate that Indo-European language speakers who called themselves Aryans came to the sub-continent somewhere between 2000 BC – 1500 BC, coinciding with the end of the Indus Valley civilisation, bringing with them a distinctive set of practices (including language, livelihood and of course, the formation of the caste system)[34]. Nonetheless, the significance of the subject position is *not* to be assessed in terms of the scientific credentials and objectivity, but rather the extent to which this subject position resonates with those who use it to refer to their own life worlds. In other words, the question is not whether the Adivasi is *really* the original inhabitant but rather remain attentive to the fact that it is *this* subject position that has been successful in mobilising differentiated indigenous groups against non-indigenous peoples. This subject position is strongly indicative of the embodied experience and memory of historical exclusion and discrimination – most of it undocumented before the 19th century.

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[33] Harijan means the people of Hari, a Hindu god. It was popularized by M.K Gandhi in line with his vision of retaining the caste structure in its hierarchy but removing the discrimination against those positioned at the lowest levels.
[34] Tony Joseph, 'How genetics is settling the Aryan migration debate' (16 June, 2017). *The Hindu*. Retrieved from: https://www.thehindu.com/sci-tech/science/how-genetics-is-settling-the-aryan-migration-debate/article19090301.ece

The political formation of India as a nation-state in 1947 after decades of anticolonial struggle fought by nationalists against the British empire has become a globally accepted narrative about the sub-continent. The pre-colonial history of the subcontinent has been actively suppressed due to the capture of the means of production of knowledge and representation by the dominant castes. The disavowal of caste and indigeneity as structuring forces in the precolonial sub-continent is an indicator that the experiment of nationalist anti-colonial modernity resembles colonialism more than the earlier secular nationalists may care to admit. If one is to contemplate on 'India' as a federation of caste-structured groupings, then the temporal and spatial narratives of the subcontinent begin to look quite different from what is available as mainstream historical knowledge today (as it is taught in schools for instance). The stability of the nation-state begins to dissolve under caste-specific genealogies that do not cluster around states, districts, and other such political taxonomies.

Since the caste system innovates constantly, to understand that India would require an extremely detailed set of *histories* that pay attention to the rise and fall of specific sub-castes and sub-caste clusters (Manor, 2010). For instance, the *Jats* were initially a pastoral tribe in the eighth century but had become peasants with Vaishya (trader) caste status by the seventeenth century (Chandra, 2003; Habib, 1999; Kela, 2006). There are several such caste-structured genealogies that explain histories of specific regions far more than methodological nationalism. The focus of my research is however not on tracing such a genealogy of indigeneity and caste in the northern region of Chhattisgarh. My interests are to do with the practices of internet infrastructure. A more conventional social anthropological approach to this region would provide a deeper insight into the various cultural, political and economic processes that structure processes of subjectivation.

3.7 Panchayat

The institution of the Panchayat is a crucial part of the architecture of the National Optical Fibre Network (NOFN) where broadband internet connectivity is sought to be provided to every village in India. The word Panchayat translates to the council of five and refers to a form of self-governance at the village level. It is a decentralised unit of government, and

Indian states with a population of more than 2,000,000 people are mandated to have a three-tiered system of governance terminating with the Panchayat at the bottom level. As a unit of local government at the grassroots, the institution of the Panchayat as a termination of the optical fibre network represents digitalisation of grassroots democracy and yet at the same time, an extension of the State down to the last mile. Further, the physical building of the Panchayat becomes a significant space where the materiality of the network terminates and subsequently is supposed to 'branch out' to all citizens and households. As a result, the 'Panchayat' appears frequently in my research and deserves to be unpacked.

Although the Panchayat, as an informal institution, has existed for centuries, it received moral and political strengthen in Gandhian political discourse in the early 20th century. Gandhi pushed for decentralised village government through Panchayats as a counter to the centralised colonial rule by the British empire. Post-independence, the Indian central government passed the 73rd Amendment to the Indian Constitution in 1992 formalising Panchayat rule. The Indian Constitution mentions a 'Union list' that specifies issues like communication and taxation of income (for instance) that will be continue to be controlled through the Central government but other issues such as public health and agriculture that fall under a 'State list'.

The devolution of politics through Panchayat comes under the State list and typically State governments, like the state of Chhattisgarh, have a three-tiered structure. Each state is divided into a number of districts, an administrative geographical unit headed by an official appointed from the Indian Administrative Service (a colonial institution retained after Independence). Each district is divided into sub-districts, often called blocks or *taluks*. Each sub-district then has a number of Panchayats. Urban bodies have a parallel structure called municipalities. The distinction between an urban local body (municipality) and a Panchayat is based on the population of the area, the agricultural income and the amount of land used for agricultural purposes. However, the state government makes these decisions with inputs from the governor - appointed by the Central government.

Panchayat members are elected every five years by residents of villages. Each candidate is assigned a political symbol and the election is fought by individuals, not by political parties.

In practice, political parties spend large amounts and carefully nominate candidates in order to control Panchayats. Once members are elected, the members elect the President of the Panchayat. The state government appoints an official to collect local taxes and fees and maintain records. As per the 2011 Census, India has just above 650,000 villages but 250,000 Panchayats[35]. A Panchayat usually covers a few nearby villages, so every individual village is assigned to one Panchayat.

The Chhattisgarh Panchayat Act was passed in 1993 and the state currently has 10,976 village Panchayats (also called Gram Panchayats), 27 district Panchayats (one for each of the 27 districts) and 146 block Panchayats (also called Janpad Panchayats) across the state[36]. My field work is based in Surguja District, in the northern border of Chhattisgarh and has 7 block Panchayats and 400 village Panchayats. Most of my work was based in Ambikapur Block Panchayat (it is also the administrative capital of Surguja District), villages close to the Ambikapur Block (which has 86 village Panchayats) and Udaipur Block (which has 53 village Panchayats). In Chhattisgarh, the post of the Panchayat President is reserved for representatives from the Adivasis. Often during my interactions with both city and non-Adivasi village residents, this was a common complaint – that even if a village had four or five Adivasi households, they were forced to only choose a President from those households because of the reservation policy. Such complaints were usually followed up by other more common stereotypes - that the Adivasis are illiterate, uninterested in governance, and were too often drunk to be able to perform their duties.

By the early 2000s, many of the higher tiers of the Central and State governments were connected through fibre optic lines and/or satellite networks provided by National Informatics Centre (NIC), a public body also responsible for government email accounts, websites and online security of information. The NIC also ensured that other important public institutions such as High Courts and large public hospitals were connected – meaning that their records were digitised and connected to the local administration, supposedly for

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[35] Ministry of Panchayati Raj report, based on Census Report of 2011. Retrieved from: https://www.panchayat.gov.in/documents/10198/456811/MoPR%20at%20a%20Glance_English%20%2820.09.2016%29.pdf.
[36] As per figures from https://dpcg.cgstate.gov.in/English/cg-panchayat.aspx

transparency. By 2010-12, most of the Block level institutions were connected but the last mile - Panchayats remained offline. A crucial part of the NOFN infrastructure that seeks to wire up all 250,000 Panchayats across India, aimed to fill this gap of connectivity. Many of my informants, especially working in the block level government institutions pointed this out as a key objective of the NOFN.

3.8 Discourse analysis

In this section I reflect on the method of discourse analysis used to analyse political and policy discourse on internet infrastructure in India. I provide the rationale for selecting policy discourse on internet infrastructure (as compared to other kinds of discourses) and its relevance for my research questions, especially connected to the notion of exercising authority. I reflect on how discourse analysis as a method is aligned with my theoretical framework pertaining to governmentality as 'ways of seeing'.

Drawing on insights from Saussure, the theorisation of discourse has developed in diverse ways such as those advocated by linguistics (Halliday, 1978, 1985) or social psychology (Potter & Weatherall, 1987). Halliday (1978) had a view of language that is multimodal in its ideational, interpersonal and textual functions. The ideational aspect generates representation whereas interpersonal constitutes relations and identities. It is within this tradition that Norman Fairclough (1995, p. 17) argues, 'the value of such a view of texts is that it makes it easier to connect the analysis of language with fundamental concerns of social analysis: questions of knowledge, belief and ideology (representations – the ideational function), questions of social relationships and power, and questions of identity (relations and identities – the interpersonal function)'.

While these methods are useful, their emphasis is on individual agency to create meaning or interaction between individual utterances and social structures (Deacon, Pickering, Golding, & Murdock, 2010; Potter & Edwards, 1992). I use discourse in a much broader sense, to refer to 'a group of statements which provide a language for talking about – a way of representing the knowledge about – a particular topic at a particular historical moment…Discourse is about the production of knowledge through language' (Gieben &

Hall, 1992, p. 291). In line with my theoretical framework located in post-structuralism (especially the work of Foucault, Laclau and Mouffe), my approach to discourse goes beyond the microscopic attention to lexical and grammatical aspects of discourse. In line with Foucault's archaeological methods, I argue that naturalised discourse in fact is ahistorical and highly contextualised (Foucault, 1991a; van Dijk & Wodak, 2011). Thus, discourse analysis emphasises that social relations are infused with power, and especially relevant for my research questions, highlights the discursive nature of these power relations, through policy discourse.

Discourse analysis emphasises the space where the role of the subject is diminished in the sense that the subject is no longer the 'origin' of discourse. Rather attention is paid to the historical conditions that make one particular set of statements possible and correct, whereas other statements gradually become false or not possible to say (Foucault, 1997). This methodological approach to discourse is crucially connected to my theoretical framework since processes of governmentality and subjectivation are both intimately connected to practices and rituals with *legitimacy* of some kind.

Repeated immersion in the data reveals trajectories that have evolved through the comparison of policies. For instance, the question of connectivity is quantified suggesting the ever-increasing interrelation between the flow of capital and communicative infrastructure (both in terms of quantifying internet penetration and its proportional relation with GDP growth). I have also briefly highlighted some commonalities and differences in the policy texts to show how meaning is caught up in a wider set of discourses that are deeply involved in power relations and the exercise of authority – of one set of people over others.

The very term 'policy document' has come under scrutiny in regard to what exactly constitutes a valid document for analysis (Puppis, 2012). My corpus of texts comprises three policy statements, one report, one recommendation by a regulatory agency, two speeches by prime ministers, one manifesto, and one article as the main set of texts for analysis (see Appendix 2A for list of documents analysed). These texts do not lend themselves to quantitative approaches to analysis of discourse. Quantitative content analysis would come

in useful for data that is large in volume – for instance, the hundreds of consultation and recommendation papers churned out the Indian regulatory agency over the last ten years (Gaskell, Bauer & Gaskell, 2000). I have selected policy documents that are publicly available. These policies in turn shape regulations, rules, recommendations, judgments, appeals, press coverage on the subject. Policy documents are authored and authorised by elected representatives and provide the frameworks for regulation, law and industry. Further, because these are 'official' documents, they are widely covered in the press and thus multiplies the scope and reach of this discourse. I chose these documents because they are at once rational scientific documents that frame and represent the proliferation of digital technologies in a systematic way and, at the same time, are political documents when they pay attention to the issues of equitable and inclusive growth, digital divide and access to rural and remote areas, or providing affordable access to all citizens. It is this combination present in policy documents that guided the rationale for analysis (see Appendices 2B to 2D for full texts of three documents from the corpus I considered for discourse analysis).

My second research question asks, how and to what extent does the case of India shed light on how internet infrastructure is imbricated in governmentality? Policy discourse is a crucial site for the exercise of authority since policy documents have several addressees and seek to persuade as well as legitimise several decisions of the executive that are officially enshrined and become 'active' once published as government orders or legislative instruments as published in the official government gazette. Policy documents have a meta-status where the 'reasoning' behind the official decisions is laid out. It is the space where the state discloses itself in different ways – from justifying why a particular direction in policy is necessary (economic growth, national pride, global competitiveness and so on), to framing and clarifying (the production of moral, cultural, economic and political problems, along with the necessary evidence and proposals to solve these problems) why some decisions need to be taken at all. Further, policy documents must be considered alongside the conditions under which these documents were produced. At specific junctures, the 'reasoning' or other suasive strategies of discourse spill outside policy, including niche articles for the global elite audience, or political speeches for the public at large. In other instances, regulatory documents in the form of 'recommendations' employ the discourse of

empirical scientism and expertise. In each of these instances, when I have found a particular non-policy discourse relevant to the discursive production of internet infrastructure in India, I have included it in my corpus.

In each of these texts, internet infrastructure assumes social meaning. I do not assume that they reflect the sole will of the executive or the authors who produced them. Rather these texts are locus points where multiple interests are entangled and seek to be resolved. For instance, policy discourse itself does not in actuality solve the entanglement of different and often conflicting interests – the real disentanglement takes place in much more complex ways (behind closed-door meetings, specific cabinet level decisions that are often not officially enshrined in legislature or policy, through innovative approaches by local government and so on). I would go so far as to argue that such disentanglements are processual – they take decades to be fully resolved if at all. However, the significance of such texts is to emphasise the legitimating and suasive logics provided through specific discourses. There are no fixed addressees, such discourses simultaneously address global markets, international regulatory bodies, citizens, lobby groups and industry bodies among others. In addressing each of these individuals/groups and institutions, these texts inevitably privilege some ways of seeing, some truths and some form of knowledge while disavowing others.

In carrying forward this analysis, I rely on Mitchell Dean's (2014, p. 33) theoretical matrix[37] that disaggregates practices of governmentality into four dimensions for the purpose of analysis: (i) characteristic ways of visibility, ways of seeing and perceiving; (ii) distinctive ways of thinking and questioning, relying on definite vocabularies and procedures for the production of truth; (iii) specific ways of acting, intervening and directing, made up of particular types of practical rationality ('expertise' and 'know-how'), and relying upon definite mechanisms, techniques and technologies and (iv) characteristic ways of forming subjects, selves, persons, actors or agents. The texts in my corpus revealed patterns that are in line with specific 'ways of seeing' and 'producing truth' that become relevant for the role

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[37] This matrix closely corresponds to the four aspects of governmentality: ontology (what is being governed); ascetics (procedures and rituals of governing); deontology (mode of subjectification or who we are when we are being governed) and telos (the lofty goals invoked while governing) (Foucault, 1979b)

of internet infrastructure as I show in Chapter 5. For instance, the policy discourse since 2012 has consistently reproduced territorial spatiality as instances of connected and yet-to-be-connected which in turn is associated with economic growth.

My overarching emphasis in Chapter 4 is on opening up policy discourse as a set of *relations* that cut across and beyond speech. A mapping of the discursive field shows interactions with other texts that spill beyond policy but also interactions with political and economic processes. I argue that it is only through mapping the range of transformations and relations that one is able to describe the discursive field within which the practices of governmentality can be theorised.

3.9 Semi-structured interviews and multi-sited ethnography

In this section, I reflect on the conventions and traditions of participant observation ethnography and use of semi-structured interviews. Both of these methods have been considered a staple of anthropological research (Kvale, 1996; Rubin & Rubin, 1995; Warren, 2002). Infrastructural practices are interwoven into the lives of those who engage with it, and thus any study of infrastructural practices has to necessarily come embedded in a wider context of daily flows of life and ongoing social action. Given the emphasis on infrastructural practices and both practices and processes of governmentality and subjectivation, the choice of ethnographic participant observation was natural. However, it is also true that such practices are fleeting and sometimes in private, inaccessible for observation, and at the same time, individuals and groups talk about these practices in ways that are distinct from the practices themselves. In this context, I combined multi-sited ethnographic observation with semi-structured interviews. In this section, I discuss some of the practical and theoretical implications involved in using the methods of interviews and ethnography.

For the purposes of my research, each individual's infrastructure-related practice was contingent upon their position in the network of social relations in my field site. Rather than frame the interview as a 'speech event', I instead see interviews as an attempt to 'understand the meanings of respondents' experiences and life worlds' (Warren, 2002, p. 83). My interviews and conversations with informants, who were permanent employees in

local government were very different from government school teachers who were employed on contract. I could not have the same set of questions for different kinds of social actors. Further, interviews as social interactions are marked by power relations in terms of unequal social positions characterised by race, sexuality and indigeneity marked by the status of the researcher and researched as insiders or outsiders depending on the contexts (Zinn, 1979) and further interviews could validate problematic ways of representing minority communities reproducing the logics of racism, sexism, casteism and so on (Foster, 1994; Stanfield, 1993). Keeping these precautions in mind, I devised what Jack Douglas (1985) has called 'creative interviewing' – an attempt founded on empathy and understanding, an attempt to forge common ground and provide space for the informant to speak at length by creating a shared (even if uncomfortable) narrative space. (See Appendix 3A topic guide with typical questions used in semi-structured interviews).

As Briggs (1986) notes, for informants and for interviewers, interviews are saturated with images of the social dynamics of the interview, the dynamics between the interviewer and the interviewee, the social contexts in which the interview takes place (in an office or a home), and finally, the imagined texts that *will* be created with interview data. Accordingly, and in line with my theoretical framework, I did not assume that people spoke the truth as a rational agent in control over their social relations but as carriers of discourse that both reflected and reproduced their position in the overall architecture of social relations. In this way, local government employees, informants who were bureaucrats in charge of administrative aspects of operationalising the National Optical Fibre Network upheld and reproduced the national policy discourse of bridging the digital divide, empowerment of rural subjects, nationalism and more (as discussed in Chapter 4 and 5). At the same time, their dominant caste position in the field helped them embody and assume the discourse of development without any apparent political or social complications or contradictions. They spoke about the intended outcomes but were uninterested in how infrastructures were practiced in actuality.

Qualitative researchers coming from the Chicago School in the 1950s made a tall claim about participant observation as a 'complete' research method, '[a]n observation of some social event, the events which precede and follow it, and explanations of its meaning by

participants and spectators, before, during and after its occurrence. Such a datum gives us more information about the event under study than data gathered by any sociological method' (Becker & Geer, 1957, p. 28). This illusion of 'completeness' became unsettled fairly quickly in the field since both my theoretical framework and my choice of methods to some extent were constitutive of the social reality they were trying to describe (Gubrium & Holstein, 1997; Hammersley & Atkinson, 2007). Outside the confines of government offices, I frequented the places where individuals belong to different social groups would need to interact with internet infrastructure – for accessing subsidised food from the government, accessing free smartphones from the government, accessing government services from the village government or *Panchayat* office and so on (see Appendices 3C to 3E for transcripts of three interviews).

I was well aware that living in the field and coming to observe such infrastructural practices was not the same as being a resident. Although interviews are seen as providing suitably etic and participant observation as suitably emic perspectives for researchers (Jorion, 1983), these distinctions too blurred on the field. Through participant observation, even though I could get a sense of daily rhythms and patterns of usage by different social groups, I had no history that allowed me to noiselessly enter the complex web of social relations in the field. As a researcher, I believe that "we should recognise that we are part of the social events and processes we observe *and* help to narrate. To overemphasise our potential to change things artificially swells our own importance. To deny our being 'there' misunderstands the inherent qualities of both methods – in terms of documenting and making sense of social worlds of which we are a part of" (Atkinson & Coffey, 2003, p. 427; emphasis in original).

I complemented semi-structured interviews with ethnographic participant observation, a method that 'finds its orienting purpose in an underlying concern with cultural interpretation' (Wolcott, 2008, p. 72). With a broad understanding of culture as acquired social behaviour, ethnography requires a 'thick description' (Geertz, 1973) to translate individual and collective experiences, practices and relations into text (c.f. Marcus & Fischer, 1986). The contextual information about the architecture of social relations – who was in charge, who had access to what kinds of cultural, economic and political capital - I could only gain accumulatively over time spent in the field. This contextual knowledge was akin to

instinct since much of the knowledge was absorbed informally rather than formally learned. Body posture, gestures, silences, deference in tone of voice, off-the-cuff remarks – all these were valuable indicators of power (apart from the obvious indicator of caste status). It was not always possible to record and document such subtle micro-dynamics of power. This is where ethnography comes into its own distinct from other qualitative approaches such as interviewing since the effort in ethnography is to account for social action in actuality (Jerolmack & Khan, 2014). In the established conventions of ethnographic observation, I kept a diary and pen with me at all times and I would frequently note down observations as they would occur to me (c.f. Given, 2008). These would be about things my informants spoke about, my observations about infrastructural practices, my own instinctive interpretations of their practices, my intuitions about what I was sensing by being present in that moment as a researcher-observer (see Appendix 4 for an extract from my field notes). Rather than a 'god's eye view' or a mere 'data-collection' approach, my entire approach was ethnographic in its imagination even if it was often what Slater (2013) has called an impure or 'quick and dirty' ethnography – an often messy but determined approach seeking to understand the complexity of lived life and practices including my informants' own understandings and explanations; while (building on insights by feminist ethnographers) being aware of my own subject position's influence on how I perceived the field and subsequently theorised it for my research (Haraway, 1988; Visveshwaran, 1996).

After finishing my field work I returned to London and started going over my field notes, separating the data into four broad categories – conversations, observation, interviews and images. I started highlighting words, phrases or sections if they seemed related to my theoretical framework, in other words a direct or indirect reference to governmentality and subjectivation. In the second stage, I tried to organise the highlighted portions of text into coherent themes and sub-themes in line with key concepts in my theoretical framework (see Appendices 1A to 1C for broad conceptual maps of the coding frames I used for analysis of my data). In the process of translating the rich texture of experiences and fragmented notes from the field into empirical chapters of my doctoral research, I acknowledge that 'culture is always an inscription of communicative processes that exist historically *between* subjects in relations of power' (Clifford, 1986, p. 15). In such a process I have retained a polyphonic sense of my data where the researched can speak with as much space as my

own voice in keeping with the dialogic nature (Holquist & Bakhtin, 1981) of discourse and knowledge production.

3.10 Conclusion

I have used discourse analysis, multi-sited ethnography and semi-structured interviews to situate the discursive policy contexts within which internet infrastructures are infused with meaning, authority and legitimacy. I subsequently observe and interpret infrastructural practices of individuals and groups to analyse the interlinked processes of governmentality and subjectivation.

The problem of 'fixing' - in place and in time, internet infrastructure is a risky enterprise. As my research shows, infrastructure is local, national, global and refers to the past and invokes the future - all at once. My empirical investigations were carried out between March and September of 2018, a year in which the Chhattisgarh state elections were held and several months before the national elections, due in mid-2019. Adivasi groups were becoming restless and agitated because of a number of developments: their homes would be ransacked regularly by elephants who in turn had lost much of their natural habitat; entire villages had been given away to mining companies while local government officials were either bribed or intimidated; infrastructure appeared in their midst shorn of context and meaning. Given that the National Optical Fibre Network and the biometric identification card are both central government initiatives, would a change of regime in Delhi mean a change in how the entire infrastructure would be imagined and used? In essence, internet infrastructure is a label that conceals a lot of moving parts. My field is a snapshot in time. Even if I were to visit the very same field site in five years from now, there is little doubt that new infrastructural practices could be observed, with corresponding practices of governmentality and subjectivation.

My emphasis therefore is not on the specificity of a particular place or a particular practice since these are constantly changing, mutating and evolving due to different pressures and flows of power. Rather, I argue that the analysis of infrastructural practices (and how they are spoken about or remembered) and their 'articulation' into social (and power) relations

provides a valuable way of studying broad processes of mediation as scholars developing or using feminist approaches to ethnography have showed. (De Laine, 2000; Gajjala, 2004; Grewal & Kaplan, 1997; Haraway, 1988). This level of infrastructural mediation is typically constellated in different ways depending on the disciplinary affiliations of the researcher. Thus, my field data would be theorised differently by political sociologists, social anthropologists and by STS theorists. Rather than adopting a narrow focus on the materiality or a purely discursive approach to infrastructural mediation, I have chosen diverse methods such as discourse analysis, ethnographic participant observation and semi-structured interviews. These methods allow for incorporating the production of subject positions, the various statements that individuals and groups make indicating relations, processes and practices relating to infrastructure and finally observation of the practices themselves. Regardless of disciplinary interests, flexible interpretive research methods are well suited to investigating questions of subjectivation and governmentality as processes that are contingent on both the objective situations (practices) that individuals and groups find themselves in as well as the subjective interpretations of how subjects make meanings about such practices.

Finally, my research is based in northern Chhattisgarh in India. This is different from research that is based merely in India. The latter usually connotes research done in non-indigenous societies. The overwhelming literature on the societies of Chhattisgarh is about the Adivasis labelled as Maoists (as victims of mining and State oppression or villains opposing development), or about the environmental issues of Chhattisgarh. Adivasi society and small cities like Ambikapur are rarely written about since they are 'unremarkable' even within the Indian (mediated) public sphere let alone a *global* public sphere. Adivasi, Dalit and Bahujan societies, such as those in Surguja district, are thus in a double bind of exclusion – the margins of the margins as it were. However, the perspective of such groups need not necessarily be at the 'margins' of knowledge production. Multiple empirical accounts rooted in the global south, studied by Adivasi, Dalit and Bahujan scholars, studying internet infrastructures from different disciplinary interests can 'de-centre' the practice of theory building. It is not that every empirical research done outside the west needs to be bracketed – in India, or in Nigeria, in Mexico and so on. Instead, the unbracketed universals such as 'infrastructure' need to be grounded in rigorous research. Open-ended methods

such as ethnography and discourse analysis provide the scope for such rigorous empirical research without necessarily reverting to a metaphysical universalisation of epistemologies and politics.

Chapter 4 Positioning the digital as a basic need: 30 years of telecommunications policies and rhetorics

4.1 Introduction

In Chapter 2 I argued that internet infrastructure can be taken to indicate a set of intertwined technical and cultural systems, composed of both material and discursive-symbolic relationships. This thesis interrogates internet infrastructure as it relates to two dimensions of power: first, its relationship to the exercise of authority over others (governmentality) and second, its relationship to subjectivation. The processes of governmentality and subjectivation are inextricably intertwined. Governmentality as the art of governing involves the production of subject positions while processes of subjectivation involve the diverse ways of engaging with these subject positions. In this chapter the focus is largely on the discursive regimes[38] within and from which telecommunication and internet infrastructure derives its logics and is subsequently understood, installed and used – or left unused – across India.

My second research question is, 'how and to what extent does internet infrastructure play a role in governmentality?' Before beginning to investigate this question, it is necessary to unpack how internet infrastructure came into conceptual existence, how internet infrastructure and the accompanying imaginaries of connectivity and development obtained legitimacy as modes of state intervention in society. When internet infrastructure appears in the 'field' as a set of practices, institutions, material objects and so on, it does not appear out of a vacuum. This chapter shows that internet infrastructure appears in the field as a set of real networks, materials and practices by 'passing through' a discursive regime which shapes its meaning, its operations and, to a large extent, its functions as understood and imagined by state actors and administrators.

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[38] To be clear, by discursive practices I refer to the usage of discourse (as I have argued previously in Chapter 3, Section 3.5) that incorporates three layers of interaction: *intra-discursive* interactions between different texts on the same set of topics; *inter-discursive* interactions between texts on different but related topics and *extra-discursive* interactions between discourse and other political and economic networks.

This chapter covers policy and regulatory documents including the National Telecom policies of 1994 and 1999, the Broadband Policy of 2004, the National Telecom policy of 2012 and the recommendations on universal broadband by the Telecom Regulatory Authority of India (TRAI) in 2010-11. Since the discursive formation connected to communicative infrastructure is dispersed (especially after BJP came to power after 2014) and spills outside the formal policy domain, I have also included statements from other non-policy sources. These include a report from the International Telecommunications Union in 1984 on need for investments in telecommunications in underdeveloped countries, an article in the Harvard Business Review in 1993, written by influential technology expert Sam Pitroda justifying telecommunications infrastructure in the name of democracy and development, a speech by Atal Behari Vajpayee of the BJP as Prime Minister in 2003 highlighting technological progress, and a speech by Narendra Modi of the BJP as Prime Minister in 2017 talking about the need for technological and infrastructural development in India. In this chapter, I present my data in chronological order to emphasise the emergence of distinct but inter-related discursive formations. These discursive formations make truth claims about the epistemic status of internet infrastructure in concomitance with socio-political contexts that change over the years subject to limits and pressures from various extra-discursive aspects including economic pressures at the national and international levels. I also discuss how these discursive formations translate into 'ways of seeing' and thus 'ways of producing' the nation and its subjects through multiplying the number of addressees or subject positions implicit in such discourses.

4.2 From luxury to necessity: National and international shifts in perspectives on telecommunications

In this section, I set the grounds on which early discussions on telecommunication emerged, coinciding with suspension of civil liberties and democratic rights. I examine the national and global political and economic conditions in which policy discourse on telecommunications infrastructure was produced by government. I conclude with reflections on the centrality of policy discourse in shifting the normative notion of telecommunication from a luxurious commodity to an essential service in the national interest in less than two decades.

In 1977, the Congress Party led by Indira Gandhi was in power. Under her government, an approach paper to the Sixth Five Year Plan (1980-1985), argues that:

> The primary need of the people is food, water and shelter. Telephone development can wait. In place of doing any good, development in the telecommunications infrastructure has tended to intensify the migration of population from rural to urban areas. There is need to curb growth of telecommunication infrastructure, particularly in the urban area (cited in Dossani, 2008, p. 49)

It should be noted that this is from an 'approach paper' and the actual Sixth Five Year Plan document does not situate telephone development intensifying rural to urban migration or the need to curb telecommunication in urban areas. In the text of the Sixth Five Year Plan, however, telecommunication is simply absent from the list of priorities. For example:

> …Greater emphasis has been laid on the speedy development of indigenous sources of energy and infrastructural sectors of coal, energy, irrigation and transport. High priority has been given to agriculture and rural development and allied agricultural activities like animal husbandry, dairying, fisheries and also the forest sector, with accent on development and conservation (Written by Indira Gandhi, *Foreword to Sixth Five Year Plan[39]*)

The priority of the then Congress-led government, was what the development literature[40] calls the 'basic necessities' of food, water and shelter. The most pro-poor slogan available for the times was *Roti, Kapda, Makaan (*food, clothing, housing). In 1971, Indira Gandhi campaigned around the slogan *Garibi Hatao* (Eradicate Poverty) and won the general elections with 352 out of 543 seats in the *Lok Sabha* (lower house) of Parliament (Hasan, 2019). A public commentator writing the story of India's liberalism writes of this period:

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[39] Retrieved from: http://planningcommission.nic.in/plans/planrel/fiveyr/6th/6vfore.htm.
[40] See for example (Kothari & Francis, 2001; Kothari, 2001; Manyozo, 2012; Melkote, 1991; Singhal & Rogers, 2001; Sparks, 2007)

> …When an MP complained in Parliament of these [phone] breakdowns…Mrs. Gandhi's communications minister replied that telephones were a luxury, not a right…there was an eight-year waiting list for this broken-down product (Das, 2002, p. 208)

Telecommunications infrastructure is strongly associated with urban development which the then Congress government discouraged since urban development was accompanied by massive destabilising migration from rural to urban areas[41]. Since Independence, the economy had been run on the principle of increasing productive capacity in both agriculture and industrial manufacture. Such a production-oriented import-substitution growth policy[42] was at least partly influenced by the undercurrent of self-determination and popular sovereignty in postcolonial politics (Athique, Parthasarathi, & Srinivas, 2018). It should not be assumed that technological innovation *per se* had no place on the canvas of Indian national development. Rather, technological innovation in the communications sector was subordinate to basic necessities and carefully controlled by the State, inflected by the rather complex history and role played by technology during the colonial era[43].

By the mid-1980s, the policies of neoliberalism were being put in place. As commonly understood, neoliberalisation was not merely the withdrawal of the State and its regulatory mechanisms in order for the 'free market' to develop. Neoliberalisation in India entailed re-regulation rather than de-regulation, i.e. a change in both the culture of regulation *and* the regulation of culture (Hall, 1997). As I have argued earlier (in Chapter 2, section 2), historically speaking, the production of surplus value through capitalist accumulation also produces an expansionary drive to seek out new markets across the globe, or a 'spatial fix' as the phenomenon is popularly called (Harvey, 2006; Luxemburg, 1951). By the 1980s,

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[41] The urban population in India in 1951-1961 grew at 3.1 percent, at 3.2 percent in 1961-1971 and 3.8 percent in 1971-81. Rural-to-urban migration accounted for nearly half the growth of urban population during 1971-1981 (Dyson & Crook, 1982; Skeldon, 1986)

[42] Since the end of the World War Two, many of the developing countries who gained independence have been strongly influenced by the import substitution model of development that in turn was closely associated with dependency theory. The Indian version of this policy has been called the Nehru-Mahalanobis model of planning (See Amin, 1976; Frank, 1967; Kay, 1989)

[43] I have highlighted this complex historical role of communication infrastructure in India through my emphasis on the telegraph system (from 1850-1947) and on broadcasting of television and radio (1947-1990) in Chapter 2.

there had been tremendous investments flowing from the US to places such as Japan and Taiwan which in turn had accumulated surplus value and were looking for suitable investment destinations. Telecommunications and internet infrastructures played a multi-faceted and crucial role in this transformation. First, infrastructures served as the material basis for routing global investments into India. In a literal sense, the stretching of fibre optic cables across the oceans, the building of cell phone towers, switching systems and service centres were all useful conduits for putting global investment to work.

By the early 1980s, the owners of such surplus value[44] were seeking new markets and new circuits for capital flow and they worked through a range of rhetorical devices to ensure that these would be available. In 1984, the Maitland Commission Report, titled 'The Missing Link' was published by the International Telecommunications Union (ITU) (Chakravartty, 2004). From the outset, the report is unambiguous about the context and therefore what kind of intervention would be needed:

> Our task was essentially political in character. Of the 600 million telephones in the world, three quarters are concentrated in 9 countries. The remainder are distributed unevenly throughout the rest of the world. While telecommunication is taken for granted as a key factor in economic, commercial, social and cultural activity in industrialised countries and as an engine for growth, in most developing countries the telecommunication system is not adequate even to sustain essential services. In many areas there is no system at all. Neither is the name of common humanity nor on grounds of common interest is such a disparity acceptable (*Page 3, Executive Summary of 'The Missing Link' – A report of the Independent Commission for worldwide telecommunications development, December 1984[45]*)

The ITU Maitland Report takes for granted that telecommunications are a key factor for economic, commercial, social and cultural activities. More important is the need to balance between economic and commercial activities, and social and cultural activities. This is not

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[44] Primarily from the U.S, Western Europe, Japan and Taiwan
[45] Maitland Report, *International Telecommunications Union*. Retrieved from: https://www.itu.int/en/history/Pages/MaitlandReport.aspx.

simply a matter of ensuring a precise description of the scope of telecommunications, but itself a political statement of how telecommunications can and should be considered in terms of their social value and market value. Telecommunications infrastructure and its impact are firmly situated in the binary of industrialised and (by implication) non-industrialised countries. The association of telecommunications infrastructure with industrialisation is further strengthened when telecommunications is positioned as the 'engine' for growth.

The words 'an engine for growth' serve as a reminder of 19th century industrial development (including colonialism) in Western Europe and the US where development of the steam engine played a crucial role. The same appeal is also made towards the end of the paragraph in terms of the balance between 'common humanity' (the social good) and the 'common interest' (economic and commercial activity). Beginning from the approach paper to the Five-Year Plans in the late 1970s, the emphasis of the central government was on urban to rural migration as an adverse *effect* of investment in telecommunications. Within a decade, transformations in the global economy produced the discourse of communicative infrastructure as a public good in revolutionary terms, through the identification of communicative infrastructure with the period of the industrial revolution. This new global discourse, espoused by international organisations, including the International Telecommunications Union, was also operationalised in India.

It so happened that in 1984, the then Prime Minister Indira Gandhi was assassinated by two of her Sikh bodyguards following her mishandling of the Khalistan separatist movement in Punjab that ended in armed forced forcing surrender of key separatists in the Golden Temple of Amritsar (Nayar & Singh, 1984). Also, in December 1984 her son, Rajiv Gandhi, of the Indian National Congress party won the general elections with 401 out of 508 seats – the largest mandate in the history of independent India. Rajiv Gandhi had been a youth leader of the Congress and widely portrayed by the press as a liberal, modern-minded 'Mr. Clean'[46]. Educated in the elite institutions of the West, and a pilot by profession, Rajiv

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[46] '1984: Rajiv Gandhi wins landslide election victory'. *BBC News*. Retrieved from: http://news.bbc.co.uk/onthisday/hi/dates/stories/december/29/newsid_3314000/3314987.stm.

Gandhi was much more inclined to view modern technology, namely computers and phones to bypass and transcend failures of old style feudal and inefficient governance practiced in India. In order to implement his technocratic vision, Rajiv Gandhi chose Sam Pitroda, a US-based entrepreneur of Indian origin who had recently sold off his own technology company in the US and was keen to bring the benefits of new and emerging information and communications technology to India.

Despite the lack of any prior background in politics, Pitroda became the director of the Centre for Development of Telematics (C-DOT). The Rajiv Gandhi-led government provided C-DOT with 36 million US dollars over three years to help the Indian telecommunications switching system move from electromechanical to digital switching systems. Pitroda himself was an expert in the development of digital switching systems, and for him the rationale was not just efficiency in terms of expansion (more telephone lines per exchange), but also 'efficiency' in terms of cutting down the human labour required to maintain and operate the switches. Although Pitroda never acknowledges it directly, the shift from electromechanical switches to digital switches did not just cut the number of people who needed to be employed, it also transformed the character of the telecommunications labour market.

The arrival of Sam Pitroda is a crucial signifier for not just the transformation in the telecommunications labour market but also a broader transformation in broader processes of governmentality. In this section, I have showed that from the late 1970s, telecommunication infrastructure was positioned as an unnecessary luxury that could have adverse impact on national interest (by stimulating rural to urban migration). Within 2 decades, political and economic transformations both within and outside India mediated by international institutions such as the International Telecommunications inaugurated modern governmentality as a project of seduction and aspiration as much as it is about coercion.

4.3 Constructing hegemony: Affective persuasion and coercive logics of technological nationalism

In this section, I decouple the twinned logics of coercion and persuasion that accompanied the introduction of telecommunication infrastructure. This infrastructure was both produced within a discursive formation that began to be couched in discourses of scientism, economism and technical expertise while simultaneously exhibiting something more, a surplus that could only be imagined by the addressee of discourse – of a nation and a subject in a better future. In this section, I examine discourses of affective persuasion and technological nationalism exemplified by Sam Pitroda as the architect of neoliberal reforms for telecommunications infrastructure, the precursor of internet infrastructure in India.

The new telecommunications system in India required engineers and labourers who knew how to fix 'digital systems' rather than electromechanical systems:

> A large metropolitan switching station for 50,000 phones once occupied a six-to-ten floor building and needed hundreds of people to keep it operational. The same capacity can now be housed in one-tenth of the space and requires a staff of perhaps ten people to operate its computer and software controls (Pitroda, 1993, pp. 67–68)

The comparative logic used by Pitroda in this quote emphasises the disruptive transformation that *could* be brought about in telecommunications through modernisation and upgradation. Progress (signified by the capacity to handle 50,000 phone switching station) in Pitroda's view is twinned – on the one hand, from a six-to-ten floor building to one-tenth of the space, but also crucially from 'hundreds of people' to 'a staff of ten people'. Obscured under the banner of technological advancement slides the notion of inevitable labour retrenchment (I come back to this theme in the next section 4.4). Further, if we suspend the content of Pitroda's remarks for its facticity (whether such efficiency is indeed possible or not), the statement is significant for the quantitative aesthetic used for thinking about achieving the required expansion in telecommunications infrastructure. The logic of numbers is intimately linked to scale since it necessarily involves abstraction of

infrastructural expansion into constituent components – number of phones, physical space and number of employees. This had a double benefit – it was a continuation of the planning style employed by those responsible for Five-Year Plans in the Planning Commission, and yet it was a language of science, futurity and modernisation, a promise to sweep away the failures of the past and a promise that the new will effect genuine change.

In 1989, the Rajiv Gandhi-led Congress government (based on a recommendation from Pitroda), created the Telecom Commission with a special mandate to expand access to telecommunications in rural areas[47] (Chhaya, 1992). As a result, Pitroda's interviews, speeches and opinions are important as an indicator of the manner in which the Congress government of the day spoke about and put into practice telecommunications policy and investment. Writing in the *Harvard Business Review*, Pitroda[48] (Pitroda, 1993) voiced the different boundaries and contours of a discourse on telecommunications, infrastructure, politics, and national pride:

> …as a great social leveller, information technology ranks second only to death. It can raze cultural barriers, overwhelm economic inequalities, even compensate for intellectual disparities. In short, high technology can put unequal human beings on an equal footing, and that makes it the most potent democratizing tool ever devised (ibid., p. 66).

Pitroda is making both a rational argument and an affective one. His words attribute a sense of intensity and sensuous power to technological development – social levelling, the 'razing' of caste barriers and the potency of a democratizing tool. As Mazzarella (2009a, p. 299) notes, 'any social project that is not imposed through force alone must be affective in order to be effective'. However, there is also a strong subtext to this discourse; namely, inequalities could now be tackled via new technology rather than directly by the state. This does not mean that Pitroda assumed that the state would withdraw, but rather that he envisaged that its relationship to the people would now be a facilitator of technology and

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[47] Pritish Nandy. 'The messiah of high-tech', *Illustrated Weekly of India*, (25th October, 1987). Retrieved from: https://archive.org/details/in.ernet.dli.2015.110088/page/n735.

[48] See Appendix 2C for full text of Pitroda's article

then, in turn, facilitated through technology. In a sense, **information and communications technology beginning with infrastructure, was imagined as the mediator for a new form of governmentality and subjectivation**. The second key marker of this discourse is the individualisation that was uniquely different from both colonial and post-independence rule – in the sense that the onus was on individual capacities to rise above difficulties and become successful:

> My family was of the *suthar* caste – lowly carpenters – yet my father was an ambitious man…my Master's degree in physics, specialising in electronics, from Maharaja Sayyajirao University in the city of Baroda in Gujarat state, gave me membership in a new technological caste that superseded the one I was born to' (Pitroda, 1993).

Here, the emphasis is markedly different from the language used by the census administration that emphasised old forms of biopolitics such as enumeration to first identify inequality and then presumed that the state would take a moral stance and intervene to address the inequality. Pitroda emphasises his own specialisation in acquiring niche education to gain membership to a new 'technological caste' through personal drive and ambition. The third, and related marker of this discourse was the origin of powerful imaginaries that linked individual well-being to technology:

> …information technology played an indispensable role in promoting openness, accessibility, accountability, connectivity, democracy, decentralisation – all the 'soft' qualities so essential to effective social, economic, and political development…and without it, India's democracy could founder (ibid. p.68).

Pitroda's discourse of a new 'technological caste' is not only an implicit acknowledgement of how caste in conventional terms is supposedly to be erased and replaced by a new 'caste' system mediated by technology, but also a second level of abstraction – the linking of technological mediation to democracy itself. It is an example of the aesthetics of politics (Rancière, 2006) creating a new terrain on which a political relationship can be forged. In such a terrain, the historical subject position of the Dalits is no longer considered valid or

visible. The discourse here incubates a *desire* – that only the new technological caste will be visible to the state. It is a powerful encoded appeal to the oppressed castes who have witnessed a struggle to achieve better political representation through better accountability within the Census (as I have elaborated in Chapter 2). All of this is intended to signify that the terrain of politics has shifted, that the flows of power have been reconfigured, and that telecommunications will play a central role in both these processes. As an original member of the World Telecommunications Advisory Council of the International Telecommunications Union (ITU), Pitroda became the crucial bridge that led to a convergence between the discourses of the ITU and the telecommunications policies and practices of the 1984-1989 Rajiv Gandhi led Congress government.

In order to gain power, as with most ideological discourses, the shift to technological governmentality in the period 1984-1989, needed both persuasive and coercive strategies, which varied depending on the class of addressee. I argue that the shift to a techno-rationalist and managerial style of government was replete with a positive aspirational message for national development, and promised to break centuries-old barriers of caste and decades-old barriers to nationalist pride. Pitroda embodied a dream – that technology would cut through the minutiae of politics and bring about magical change. Pitroda himself describes the mood, 'I was doing my best to generate ideas, communicate goals and enthusiasm, fight red tape, clear obstacles, mend bureaucratic fences and bridge bureaucratic ravines' (Pitroda, 1993). Although these imaginaries have long been dominant in the 'American dream' espoused by the Republican Party, the figure of Pitroda was crucial in translating this vision as something that would be beneficial for India.

The main addressees of Rajiv Gandhi's and Pitroda's discourse on telecommunications technologies were the elite English-speaking middle and upper middle classes living in the biggest four or five cities of India and in other metropolitan centres across the Western world. The examples I have chosen - an article in the *Harvard Business Review* in 1993 – was aimed directly at the Indian and global elite. To the Indian elite, the discourse focused on the potential of technology to re-imagine nationalism and a promise that technological development would subsume traditional barriers such as caste – something that

conventional politics had failed to accomplish. To the global elite, it signified that 'India' was ready to be a member in the new ways of technocratic nationalism and governance.

The discourse was also seemingly progressive, in that it appealed to an audience who were, apparently, ready and willing to relinquish any class power attached to their old caste positions. The 'truth effect' of this was that Pitroda, himself from an oppressed caste, believed in the power of technology since he was a living example of the narrative he espoused. To the global elite, the discourse positioned India and the Indian people as (new) members of a global community, sharing and partaking in the technocratic vision of growth and prosperity to each individual. To some members of the Indian elite, the discourse implied that dominant castes and classes would also benefit since new blue-collar jobs and opportunities would be available to the qualified (rather than to those with reservations), even though technology would benefit *all* or even particularly aimed at eradicating caste barriers. To the global elite, the discourse implied that the Indian government was prepared to move away from a 'protectionist' import-substitution policy framework and instead move towards a new (multi)nationalism that would be forged in and through participation in a global technologically mediated economy.

4.4 Dismantling public infrastructure under neoliberalism

While in the previous section, I unpacked the persuasive and affective aspects of the discourse on (expanding) telecommunications infrastructure, in this section I discuss how such new discourses of modernity were underpinned by extra-discursive shifts – the dismantling of existing public sector telecommunications. In the dismantling of the public sector telecommunications, I draw a 'deep-time' connection with the unrest and struggle of the telegraph and postal workers at the beginning of the 20th century in India where infrastructural politics became a crucial site of negotiation and some partial victory for workers. By contrast, in the late 20th century, any such potential unionisation and negotiation was cut off in advance by hiving large public sector units into smaller organisational units.

Although the discourse I analysed above was seductive to some members of the Indian elite, the extra discursive component, i.e. the interaction between discourse and political-economic practices, was quite ruthless in breaking up public sector institutions and in fragmenting a strong and unionised workforce. The extra-discursive material shifts were, unambiguously coercive in nature. In 1985, the Indian Posts and Telecommunication Department was abolished in favour of a newly formed Department of Telecommunications (DoT) under the Ministry of Communications and Information Technology. In 1986, the DoT gave way to a public corporation Mahanagar Telephone Nigam Limited (MTNL) for the cities of Delhi and Bombay and Videsh Sanchar Nigam Limited (VSNL) for international long-distance operations. In 1989, the Department of Telecommunications also gave way to a newly created Telecom Commission chaired by Sam Pitroda (Agur, 2018; Athreya, 1996; Mody, Bauer, & Straubhaar, 1995; Sinha, 1996). According to Pitroda's own admission, at the time of his leadership of the Telecom Commission, the telecom workforce comprised of a labour force of 500,000 people represented by as many as 37 separate trade unions. Most of this workforce was from the blue collar working-class and lower-castes and the government jobs they held were relatively secure. Pitroda describes how:

> … I met with leaders of 37 telecom unions and the telephone white-collar bureaucracy. At the moment I took over, Telecom had 500,000 employees managing five-million lines and it took me nine months to get their leaders to buy into my plan to quadruple the lines by the year 2000 without adding to the workforce (Pitroda, 1993, p. 76)

The coupling of 'unions' and 'bureaucracy' together with the contrast of 500,000 employees managing five million lines provides an immediate sense of bloated inefficiency in the public sector – a common imaginary in middle class and dominant caste groups. Pitroda is quick to couple this imaginary of inefficiency with a new vision – quadrupling the lines within a timeframe (the year 2000) *without* adding to the workforce. The framing is careful to avoid any talk of net reduction in employment, only focusing on *not adding* to the workforce. This is a discourse of persuasion ('buy into my plan') coupled with coercion as discussed in Section 4.3.

Rajiv Gandhi lost the elections in 1989 and was assassinated by a suicide bomber while campaigning in 1991. Weeks later, the Congress party nominated P.V. Narasimha Rao who then won the elections. By 1991, due to famine and drought in the preceding years, and impact of the Gulf War on India's oil import costs, an unsustainable rise of fiscal deficit and a steep decline in the value of the Indian rupee, the Indian government faced a shortage of currency reserves and had to borrow from the World Bank[49]. As part of this borrowing India agreed to institute a series of policies, including the deregulation and liberalisation of the telecom sector, called the Structural Adjustment Programme (Chakravartty, 2004; Joshi & Little, 1994; Mukherji, 2008, 2009).

In 1994, Rao heading a Congress-led government announced the 1994 National Telecom Policy (NTP 1994 hereafter). The NTP 1994[50] acknowledged the input needed from the private sector for growth in telecoms service provision. Government funding for the telecommunications sector also increased along with subsequent National Telecom Policies which were published roughly corresponding to the Five-Year Development Plans. Until 1985, the total allocation of government funding for telecommunication services (including infrastructure) was up to three percent of the total outlay of government funding, whereas it steadily increased in the subsequent Five-Year Plans. For example, in 1990-92, the Plan outlay for telecommunications was close to a billion US dollars[51] while in the 8th Five Year Plan from 1992-97, the outlay was close to 3.7 billion US dollars[52]. Increased central government investment in telecommunications was matched by a dismantling of existing institutional arrangements (Sridhar, 2012a).

The policy was the first ever document outlining a coherent objective with respect to the telecommunications sector outside the Five-Year Plan documents, and this policy was tightly aligned with both the language and the ideas in the Maitland Report. The policy begins with:

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[49] See section 2.4, where more detailed figures are cited from the Indian budget figures for 1990-91. Retrieved from: http://indiabudget.nic.in/es1990-91/1%20The%20Economic%20Situation%20in%201990-91.pdf.
[50] Retrieved from: http://dot.gov.in/national-telecom-policy-1994.
[51] Assuming an exchange rate of roughly 66 Indian Rupees to a U.S dollar (as of mid-2019), this comes to 6672 crore Indian Rupees
[52] Roughly 25110 crore rupees. Figures from Department of Telecommunication. Retrieved from: www.dot.gov.in.

The new economic policy adopted by the Government aims at improving India's competitiveness in the global market and rapid growth of exports. Another element of the new economic policy is attracting foreign direct investment and stimulating domestic investment. Telecommunication services of world class quality are necessary for the success of this policy. It is therefore, necessary to give highest priority to the development of telecom services in the country.

The 'new' economic policy is perhaps the most obvious but abbreviated acknowledgment of the structural changes that had taken place from the mid-1980s and more explicitly after 1991. The policy positions telecommunications and along with it, India itself, in the 'global market' and the emphasis is clearly on stimulating both international and domestic investment. The word '*therefore*' is revealing of the policy as not just stating facts but also hints at persuasion that telecommunications is necessary (compared to the dismissive or short-sighted attitude until the 1970s under Indira Gandhi's Congress Party). However, it is not clear who is being persuaded.

As is the case with most policy documents, there is no explicit addressee in the document itself. In this context, I argue that there are at least three distinct groups of addressees of this policy. The first group of addressees is an erstwhile global audience comprised of international investors – including governments, international agencies, monetary institutions and international organisations such as the International Telecommunications Union and World Bank. The second group of addressees is the national elite comprised of business interests in India who had been looking for ways to enter the lucrative telecommunications market. The national elites also include the slowly but steadily growing and hegemonic upper-castes and classes. Partha Chatterjee (2004) calls this group 'civil society', a small minority who have disproportionate power and influence in bureaucracy and administration, judiciary, politics and the media. Enmeshed within this discourse is a much older tension between 'national' and 'foreign' capital – a recurring theme in postcolonial India, with an established rhetoric of self-determination and self-rule. The task of the National Telecom Policy 1994 at least in rhetorical terms, was to persuade the labour force and the political opposition and large sections of the media - that narrow national

business interests would not undermine global competition; and that the 'new' national interest coincided with India as an exporter in the services industry.

The final group of addressees is the aforementioned large telecommunications labour force of almost 500,000 directly employed by the government who would be impacted by the entry of private investment and structural transformation of the Indian economy. This labour force had the strong support of millions of other public sector employees and together they represented a significant mass base of working-class voters. Why would the policy need to address the labour force?

There is a little-known but strong tradition of labour mobilisation by the working unions of communicative infrastructure. For instance, as early as 1907-08, clerks, signallers and peons (most of them Indian workers) of the Telegraph Department across the country went on strike over pay and working conditions; utilising a range of protest strategies such as mass petitions to the government, stopping of work and more 'passive' forms of resistance such as reporting sick, delaying the rate of sending telegraphs creating artificially induced delays and reporting technical faults with wiring and electricity (Choudhury, 2003). Choudhury argues that 'it was the direct experience of state repression and representational politics of the time that led to the subsequent hardening of community identities among the workers. The Eurasian and European signallers were re-employed if they agreed to try out the new working system and hours. Though many requests were made to re-employ the dismissed peons they were not taken back' (ibid. p.68).

The Department of Telecommunications like any other large technical or technological public sector unit could be termed as practicing 'Brahminical Socialism', i.e. senior officials drawn from higher castes and a large number of lower positions reserved for marginalised castes, religious minorities and tribal groups (Bardhan, 1984, p. 58). For instance, taking the public sector undertaking Indian Telephones Industry (ITI) in mind, Dilip Subramanian (2011) argues that Dalits remained over-represented at the lower levels of the workforce and it was common for dominant castes to swear and abuse the workers in the workplace. Communicative public sector undertakings until the 1990s was marked by the combined logics of the colonial and caste system.

Unsurprisingly, given this historical context, the 1994 National Telecom Policy too was controversial and was followed by a nationwide strike of the labour force who feared job losses and take over or acquisition of the public sector by private and/or foreign interests.

> Efforts to bring private capital to the telecommunications sector by the Rao administration have been met by resistance from the more than 450,000 telecommunications employees. Strike threats from the National Federation of Telecom Employees (NFTE), the Federation of National Telecom Organizations (FNTO) and Bharatiya Telecom Employees Federation (BTEF) were made public as soon as the new telecommunications policy was announced in May 1994. A year later, in June 1995, workers launched a massive strike in an effort to stop the bidding process. Workers were against what they called 'deviations from the original telecommunications policy'. They feared that private companies, which would launch operations with new sophisticated technology, would take a large number of subscribers away from the Department of Telecommunications, which would be detrimental to workers' job prospects. (Petrazzini, 1996, p. 43)

The auction of licenses in 1995 was marked by a capping of the amounts that could be charged to subscribers, alongside the imposition of high license fees. The first policy also introduced the concept of telecommunication 'circles' based on market value and for which licenses would be awarded to private players. Crucially, the policy did not privatise the Indian telecommunication public sector units but allowed private Indian firms to apply for licenses and capped foreign investment in such firms to 49%. The policy also foresaw the need to introduce an independent telecommunications regulator (Athreya, 1996; Chowdary, 1998a; Petrazzini, 1996).

4.5 Deepening neoliberalism and the emergence of the private telecom sector

In this section, I draw attention to the early struggles of privatisation of the telecommunications sector. As a cash-strapped central government justified the rather drastic transformation of the structure of telecommunications in the name of growth and

progress, the reality on the ground indicated that the early efforts were not working since private sector investment was not enough to provide windfall revenues for empty coffers of the state.

Narasimha Rao of the Congress Party finished his term in 1996. There was political instability for the following three years and India had four prime ministers, each for a brief term. Atal Behari Vajpayee of the right-wing Hindutva party, the Bharatiya Janta Party (BJP), had tried twice (between 1996 and 1999) to form a government but had failed to control a majority in parliament for more than a few months. Finally, after a series of unstable governments, a Vajpayee-led BJP along with a few other regional parties won the elections and formed the government under the coalition banner of National Democratic Alliance (NDA).

This National Democratic Alliance (NDA) led by the BJP came to power riding on a tide of rabid anti-Muslim hyper-nationalism that right-wing Hindu organisations had been stoking since early 20th century (Banaji, 2008; Sarkar, 1993). This agenda had been embraced very actively and openly by the BJP since 1992[53], following India's 'victory' over Pakistan in the so-called Kargil War of 1998, and the nuclear tests in 1998-99. In the NDA's 1999 manifesto, telecommunications find no mention. However, the NDA did try to address a contradiction. On the one hand, its biggest party, the BJP was operating on a platform of Hindu supremacy which had cast itself as a long-suppressed form of Indian nationalism. On the other hand, the NDA was inheriting a government that had already dismantled the public sector institutions and urgently needed capital investment and the privatisation of key sectors to continue their Structural Adjustment Programmes which had begun in 1991-92. The NDA manifesto resolved this contradiction through a selective disavowal of Hindu chauvinist ideology at the altar of efficiency, growth and dignity:

[53] The Rashtriya Swayamsevak Sangh (RSS) is a cultural organisation founded in 1925 with more than a million members and its mission is to achieve a Hindu nation. The political party Jan Sangh was founded by RSS members in 1951, and the Jan Sangh became the BJP in 1980. In 1992, senior BJP leaders played a crucial part in mobilising huge mobs to vandalise and destroy an ancient mosque leading to widespread violence and rampant hatred towards Muslims in many parts of the country.

We want domestic markets to flourish and acquire a Trans National status. At the same time, the country cannot do without FDI because besides capital stock it brings with it, technology, new market practices and most importantly, employment. Our target is to achieve at least $10 billion per year which will commensurate with our growth objectives. The old leftist approach sought complete control of industry while the rightist approach wanted to leave everything to the market. We reject both…in fact issue is not about capitalism or socialism, market or less state. It is about better society…about dignity for all (*Page 125-126, 1999 National Democratic Alliance Manifesto*[54])

This discourse is significant because it conceals a contradiction between the attitudes of the mass base of the BJP – who believe in Hindu chauvinist nationalism and should therefore be against foreign investment in India (since the BJP had only recently cast it as another form of colonial control), and the supposed necessities of opening the Indian economy to foreign investment and so-called 'structural reform' due to a crisis of liquidity that had become progressively worse since the late 1980s. Telecommunications and internet connectivity was still very much a 'policy' issue in the 1990s and not a public issue as it is presently. This is because in the early 1990s telecommunications was constrained to wireline (land line) telephony restricted to very few subscribers who were concentrated in urban areas.

What had begun tentatively with the National Telecom Policy of 1994 was now implemented more intensively by the New Telecom Policy of 1999[55] (NTP 1999 hereafter). NTP 1999 emphasised the need for responsible privatisation with an eye on the growth of the industry. Its authors recognised the initial steps to privatise telecommunications by NTP 1994, but also identified a few problems:

The Government recognises that the result of the privatisation has so far not been entirely satisfactory. While there has been a rapid rollout of cellular mobile networks

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[54] The 1999 National Democratic Alliance Manifesto. Retrieved from:
http://library.bjp.org/jspui/bitstream/123456789/242/1/BJP%20ELECTION%20MANIFESTO%201999.pdf.
[55] National Telecom Policy 1999. Retrieved from: http://dot.gov.in/new-telecom-policy-1999.

in the metros and states with currently over 1 million subscribers, most of the projects today are facing problems. The main reason was…actual revenues realised by these projects have been far short of the projections and the operators are unable to arrange the financing…The private sector entry has been slower than what was envisaged (*Section 1.2 of the New Telecom Policy 1999*)

Such problems had, in fact, been envisaged even in 1994. Previously, the central government under Congress rule had entertained the possibility of licensing private players in three categories– with low, intermediate and high market potential. The idea was that investors would flock to the high and intermediate markets but would require subsidies to invest in the low potential markets, notably in rural areas. Given the obligation to see telecommunications covering the entire country as per existing policy and political rhetoric, the government decided to license telecommunications through 20 'telecom circles' that closely resembled state boundaries in the country. Further, the National Telecom Policy 1994 retained for the Department of Telecommunications DoT monopoly rights over landline connections while allowing for private investment only in cellular technology – an uncertain market in 1994. Immediately after National Telecom Policy 1994, cases were filed by private telecommunications operators in the courts pleading that the Department of Telecommunications was protecting its own interests against private investors (Agur, 2018; Athreya, 1996; Petrazzini, 1996). The policy focus changed from directly planning and implementing the expansion of telecommunication infrastructure to a slightly different objective: managing the private sector which in turn would fulfil the responsibility hitherto taken up directly by the State. The creation of telecom 'circles' is suggestive for how telecommunications infrastructure produced new ways of imagining the nation managed by the state but acted upon by the private sector.

In response, under a right-wing neoliberal BJP government, the authors of New Telecom Policy 1999 made some long-term changes to the policy. First, they separated the operations component of the Department of Telecommunications and incorporated that component as a new public corporation – Bharat Sanchar Nigam Limited (BSNL) in 2000.

Currently, the licensing, policy making and the service provision functions are under a single authority. The Government has decided to separate the policy and licensing functions of DoT from the service provision functions as a precursor to corporatisation. The corporatisation of DoT shall be done keeping in mind the interests of all stakeholders by the year 2001 (*Section 4 – Restructuring of DoT, New Telecom Policy 1999*)

In 2000, as per the policy, Bharat Sanchar Nigam Limited was set up by the government as distinct from the Department of Telecommunications. The policy mentions that this would be in the interest of 'all stakeholders'. However, even as the policy discourse propagated inclusiveness, the outcome of the corporatisation of the telecom sector went against workers' interests. In the period 1985-2000, a single postal and telecommunications ministry already had branched off into: Videsh Sanchar Nigam Limited (VSNL), Mahanagar Telephone Nigam Limited (MTNL) (specifically for metropole areas) and Bharat Sanchar Nigam Limited (BSNL) as a public telecom corporation tasked with expanding access to rural areas. Apart from the corporatisation process, the monopoly of Department of Telecommunications was removed in practical and material terms.

In National Telecom Policy 1994, the last mile linkage of telecom services had to be of copper (since the state controlled the copper bundling loop), however, in New Telecom Policy 1999, this condition was removed (Singh, Soni, & Kathuria, 2000, p. 7). In 1997, a coalition government headed by H. D. Deve Gowda established the Telecom Regulatory Authority Act to establish the Telecom Regulatory Authority of India (TRAI). This authority was indirectly controlled by governments via both a limitation of its mandate to recommendations only (rather than to full-fledged policy making and implementation) and the political appointment of its chairman (Chowdary, 1998a; Chowdary, 1999). In the period 1997-1999, a series of disputes occurred between the regulator TRAI and Department of Telecommunications which went to the courts. Significantly, these disputes were about technical issues such as imposition of tariffs for service providers, the definition of Aggregate Gross Revenue (AGR) and deciding on various other disputes between state and service providers (Tangirala, 2019). The judiciary gave the upper hand to the Department

and subsequently the regulator TRAI was further branched off into the Telecom Dispute Settlement and Appellate Tribunal (TDSAT) after 1999.

The National Telecom Policy 1994 had a fixed license fee structure for cellular telephony and this was because Department of Telecommunications wanted revenue from private investment even if the investments did not pay off later. However, the National Telecom Policy 1999 shifted to a regime of revenue-share rather than a fixed license fee.

> Apart from the one-time entry fee, operators would also be required to pay licence fee based on a revenue share. It is proposed that the appropriate level of entry fee and percentage of revenue share arrangement for different service areas would be recommended by TRAI in a time-bound manner, keeping in view the objectives of the New Telecom Policy (*Section 3.1.1 Cellular Mobile Service Providers, NTP 1999*)

While the impetus of the policy was on the expansion of infrastructure and service delivery in the cellular mobile services, the BJP government in the late 1990s was also keenly aware that unless there was proactive government intervention, the private sector would only invest in metropolitan areas, i.e. a few big cities and/or states where the emerging middle-classes had shown evidence of the purchasing power for telecommunication services. As a result, the National Telecom Policy 1999 decided to formalise the government's 'universal service' obligation, and provide: (a) low speed data and voice services to roughly 300,000 villages that did not have coverage yet by the year 2002 (b) internet access to all district headquarters by the year 2000 and (c) telephone on demand in rural and urban areas by 2002:

> The resources for meeting the universal service obligation 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 implementation…for rural/remote areas would be undertaken by all fixed service providers who shall be reimbursed from the universal access levy funds. (*Section 6 – Universal Service Obligations, NTP1999*)

The Universal Services Obligation Fund (USOF) was established in April 2002 under the auspices of a BJP led central government. The fund was initially designed to provide public telephones and broadband through public tele-information centres in villages – i.e. an extension of telephony and internet to rural areas. The founding of a universal access levy system is an implicit admission from the government that all efforts to spread telecommunications outside urban areas had not sufficiently enticed the private sector to invest. The strategy of the policy was to extract a levy from licensees and then to hope that the private sector would reclaim the levy by investing in rural areas.

The fundamental contradictions of communicative infrastructural development were already clear during this period and would worsen in the coming decades. Essentially, up to the 1980s, the state carried the political and financial burden for infrastructural development of all sectors, including (tele)communications. After the privatisation and dismantling of the public sector with a strong emphasis on bringing in foreign direct investment and private sector operators to continue the service provision, the 'moral burden' from the government's perspective was entirely concentrated on ensuring that infrastructural access reached 'rural and remote areas' but with no commitment to delivery. Since now the actual infrastructural roll out was in the hands of the private sector operators, the state could not force them to deploy infrastructure in rural areas.

From the early 2000s, the state and the private sector telecommunications industry entered in to a complex game of cat and mouse. The state had to incentivise the private sector sufficiently to invest in rural areas and to fulfil the remaining political obligation of universal access as laid out by policy. The private sector had to pretend to care about the government's moral/political obligation even while they sought via every means possible to make profits in a new market characterised by state bodies hitherto unused to competing with private operators, and hence behaving in ways that seemed, at times, hostile to the private sector. Over the coming years, this basic contradiction would appear to resolve itself in favour of the discourse of increasing economisation and monetisation of internet infrastructure (as a source of surplus value and revenue for government, as a site of corruption, an enabler of Gross Domestic Product growth and more). For all its apparent developmentalist techniques, as I will illustrate in the next section, this economisation of

internet infrastructure was crucial in terms of bringing about a series of regime changes ending with the victory of the far-right Hindu majoritarian Bharatiya Janata Party under the leadership of Narendra Modi in 2014.

4.6 The economisation of internet infrastructure and its role in electoral politics

In this section, I illustrate the subtle shift in policy that came about with a change of regime from the BJP to Congress-Left coalition government. From the early 2000s, the central government had begun to explicitly focus on broadband as an issue that merits separate attention (rather than adjunctive to the 'core' business of telecommunications). I show that the policy language depends on a discourse of scientific rationality and expertise in translating subjects to individuated users.

The years 1999 to 2003 represent a period of proactive fiscal and market liberalisation. By using the term 'proactive' I suggest that the government did not just withdraw from the market but actively intervened to dismantle existing public sector infrastructures and institutions and simultaneously to facilitate the entry of major Indian private investors. The BJP had consolidated its power through a mobilisation of voters on the basis of hard-line, chauvinist Hindutva ideology that discriminated against Muslims and lower castes, orchestrated pogroms, and thrived on a narrative of romanticised Hindu nationalism (Aloysius, 1997; Jaffrelot, 2007; Banaji 2018). This ideology played a crucial role in 2002 in Gujarat where more than 2000 Muslims were murdered in the space of two days while the BJP-led administration of Narendra Modi failed at the very least (if not actively complicit) to stop the violence or to intervene on behalf of the victims (Ayyub, 2016; Engineer, 2002). The period 1999-2003 thus polarised further an already fragmented caste society concentrating a new civic subjectivity as Hindus by 'othering' Muslims (Aloysius, 1994a).

This was a period when there was an emerging middle class with rising consumption of commodities and images (Hatekar & Dongre, 2005; Krishnan & Hatekar, 2015). Billig (1999) argues that new technologies, slanted towards consumerist capitalism, play a role in suppressing and erasing the labour value involved in the production of commodities. In India, the cultural industries such as Bollywood, as well as the cable and satellite television

channels, showcased the prosperity of this new class as well as a nation ascendant towards progress. Optimism about science and technology as well as modern communications had a special libidinal appeal for an emerging consumerist class (Banaji, 2012 & 2017; Brosius, 2011). In his address to the country as Prime Minister, delivered from the historic Red Fort in Delhi on India's Independence Day in 2003, one year before the 2004 general election, the BJP's Vajpayee highlighted this narrative of development 'progress'[56]:

> There are no waiting lists now for telephones or gas connections. The number of mobile phone users has gone up from 8 lakh [800,000] to 1.5 crores [15 million]. In the coming year, 1.5 crore more mobile customers will be added.

> Lakhs [hundreds of thousands] of young Indians have got attractive employment in the field of computers. Sitting in our cities, they are providing services to hospitals, factories and offices in various countries. Software exports have zoomed from Rs. 8,000 crores [80 billion] to nearly Rs. 50,000 crores [500 billion]

> Our country is now ready to fly high in the field of science. I am pleased to announce that India will send her own spacecraft to the moon by 2008. It is being named Chandrayan I.

Much of the infrastructure was not created overnight by the BJP government, in fact most of it was incremental reform building on the infrastructural orientations and proclivities of the previous Congress regimes. What is significant is the positioning of the discourse with its emphasis on associating national pride with the economic growth, development of communicative infrastructure, science and technology. It was a new political discourse where the fetish of numbers (number of subscribers, value of software exports and so on) and naming of flagship programmes took centre stage rather than even a rhetorical concern for the oppressed. Technological development had been rendered conspicuously visible in India's post-independence political and public imagination as a marker of national ability

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[56] Transcript of Atal Behari Vajpayee speech retrieved from: https://archivepmo.nic.in/abv/speech-details.php?nodeid=9239.

and scientific temper among other things (Chakravartty, 2004). In the early 2000s, the emphasis on technological and infrastructural development in political discourse provided conspicuousness with hitherto unprecedented levels of visibility and importance. Technological development is what provided the sheen to the much-vaunted 'India Shining' campaign of the BJP. The Vajpayee-led BJP government through these changes oversaw a period from 1999 to 2003 where the mobile telecom sector witnessed significant growth in subscriptions – from 23 million in 1999 to 100 million by 2005 (Doron & Jeffrey, 2013, p. 50).

In 2003, the government attempted a second round of liberalisation wherein spectrum was awarded at little or no cost and allocated on a discretionary first come first served basis. This round of licensing saw a range of private players enter the market – including Indian and foreign players. The BJP government led by Vajpayee saw a steady growth of the telecom market albeit largely limited to urban areas and this growth reflected the overall neoliberal development across the country, i.e. an economy that shifted from agriculture to services, from production to consumption, the grounds for rapid growth of Hindu upper caste middle class concentrated in urban areas (Desai, 2006; Dokeniya, 1999; Kathuria, 2000; Roy, 2009). In and through the policy discourse, the population gets converted into and represented in the form of metrics and targets to be reached: how many with access, how many without, at what rate should the work be completed, at what cost, how many jobs created, what is the expected cost and what is the expected return and so on and so forth. The swift outcome was both a *quantification of politics and a politics of quantification*, both of which simultaneously accompanied the substitution of state functions and responsibilities with technological systems – the first step of which was infrastructural development.

I would like to clarify here that the state could not abandon the concept of well-being of the population, it merely reduced its own corporeal presence and proposed the substitution of technological infrastructure as a more effective vehicle for well-being. In other words, from the mid-1980s to the early 2000s, there was a shift, not just in the substance and content of politics but in the very *terrain* on which autonomy, authority and power were exercised and contested in India. This shift was from the apparently messy domain of caste and regional politics to the apparently efficient, transparent and neat domain of governmentality, i.e.

techniques of administrative management and conduct. In other words, the period from mid-1980s to early 2000s policy discourse on internet (and telecommunications) infrastructure was concomitant with a shift from governing subjects to governing a population.

Alongside Prime Minister Vajpayee, the BJP's then communications minister Pramod Mahajan was credited for the rapid growth of cellular mobile subscriptions even though this growth was concentrated in cities and despite allegations that Mahajan provided undue favour to one industrial group – Reliance, owned by the Ambani family – over other competitors. Mahajan also personally took charge of the BJP's election campaign for the general elections in 2004. The BJP ran with the slogan 'India Shining' and highlighted growth in modern urban infrastructure as the centrepiece of the India Shining narrative, neglecting to speak about the intention of the BJP to provide services to rural areas and to the poor (Bagga, 2013), or to apologise for the extreme violence in Gujarat in 2002. Partially as a result of these strategic failures, in 2004, a Congress-led coalition government called the United Progressive Alliance (UPA) was voted to power.

The lopsided neoliberal and urban-centric growth narrative proved to be unpopular, as indicated that the two parliamentary communist parties – Communist Party of India (CPI) and Communist Party of India (Marxist) (CPI(M)) which together contributed 53 seats to the United Progressive Alliance government. This was the best performance of the Left in any general election in the history of independent India. The specific contours of this Left-Congress coalition connoted a broader paradox – the concerns of the parliamentary Left parties (mostly concerned with organised workforce and protectionism against globalisation) had to contend with the neoliberal politics of the Congress – 'capitalism with a human face' as it were. Technological development was no longer discussed in euphoric terms as a public good in its own right, but rather than technological development (including that of communicative infrastructure) was meant to serve the interests of the population at large. This was the language of inclusion at best rather than explicitly acknowledging inequality, oppression and discrimination.

In 2004, the Congress-led central government, with Dr. Manmohan Singh as prime minister, published a National Broadband Policy[57]. This policy pegged its hopes on the private wireless telecommunications sector to provide service in rural areas along with the urban areas. Already the language had changed significantly from the heady optimism displayed by Sam Pitroda in the early 90s. The preamble to the 2004 Broadband Policy begins with the words, 'recognising the potential of ubiquitous broadband service in growth of Gross Domestic Product and enhancement in quality of life'. The policy emphasises that the role of fibre optics is crucial from a long-term growth perspective and highlights the 'facilitative' role of other state agencies in accelerating decentralised governance at the village level for rural 'users' (section 4.3, Broadband Policy, 2004). However, at this point, there were also a host of other considerations – i.e. the technological options were open even though the objective was clear. This objective was nothing short of complete coverage and penetration of broadband across the country. Such coverage was discursively framed between the twin limits of social and economic development (reflecting the nature of the Left-Congress coalition government). The very first paragraph of the Broadband Policy 2004 begins with an assertion – that 'ubiquitous' broadband has potential in terms of 'GDP growth' *and* 'enhancement in quality of life'. This twinned logic is a continuation of the discourse seen in the Maitland Report of the International Telecommunications Union mentioned earlier in this chapter.

In the 2004 broadband policy, possibly reflecting the caution of the superficially secular coalition in power and its fear of the still strong Hindutva ideology propagated by the BJP, there is no mention of caste or of opportunities for the development of any specific social or ethno-religious group. Instead we have a proliferation of seemingly technical terms that fetishise a new form of rationality. A common technique in this document is the enumeration of subjects, for example from the Broadband Policy: 'Penetration of Broadband, Internet and Personal Computer in the country was 0.02%, 0.4% and 0.8% respectively at the end of December 2003'. Rather than emphasise the social objectives of communicative infrastructures, by the early 2000s, the goal of policy was to expand infrastructure itself which in turn were taken to 'automatically' signify social objectives –

[57] National Broadband Policy 2004, Department of Telecommunications. Retrieved from: http://dot.gov.in/broadband-policy-2004.

development, overcoming poverty, provision of basic needs, employment and so on. In this policy discourse, and setting the tone for future discourse, the opening twin objectives of social and economic development is the normative foundation upon which policy draws its legitimacy. Gradually, rather than see connectivity as a means to an end, universal internet penetration becomes an end to which policy begins to aspire.

What follows is a precise enumeration of the population in terms of whether they are mapped within the nodes of digital networks. In such a reconfiguration, the 'population' become 'subscribers' who are entitled to 'always-on' connections at a suitable 'point of presence (POP)'. The usage of such terms, indeed, the 'technologisation of discourse' (Fairclough, 2013) as it has been called, performs various functions – it recasts the population into individuated subscribers – an entirely new way of seeing and perceiving social relations. The distinction of who is and isn't a 'subscriber' is also a related *way of seeing* although here it is seeing from 'above'. This tendency to view the population of India from 'above' intensified in the coming years. Such technologisation of discourse also seeks to provide hegemonic authority to technologically mediated governmentality, and it works practically through the use of technical jargon, complicated numbers and tables, maps, and the demonstration of complexity involved in the task of planning and operationalizing infrastructure.

The political significance of such 'technologisation of discourse' is that during Congress-Left government, there was a semblance of the welfare state that was at least on paper, committed to some redistribution of wealth and obligations of the state towards its subjects. This obligation was carried out by an elite Congress party think-tank called the 'National Advisory Council' headed by Sonia Gandhi, wife of the late Rajiv Gandhi and then President of the Congress Party. Advised by some of the most influential members of voluntary organisations and people's movements, programmes supporting public employment guarantees and food security were implemented (Sankaran, 2010). This sense of social obligation would be completely transformed into technologically mediated authoritarian governmentality in the future BJP regimes.

4.7 Enter the internet

In this section, I show that the discourse on internet infrastructure shifted to domains outside government policy. In particular, in this section I focus on the so-called 2G scam that became one of the most effective markers of widespread corruption at the highest levels of government. As a symbol of modernisation, high-revenue and economic growth, the telecommunications and internet sector became a central bone of contention in an ideological and political struggle eventually won by the BJP. The BJP managed to buy and/or co-opt much of the mainstream media, especially television news channels in this ideological battle.

The telecommunications and internet sector by the late 2000s had become a cash cow for the central government since both national and international firms were keen to invest in India. To these firms, in spite of competition India represented a fresh market with seemingly endless possibility for growth, because of India's large population waiting to be tapped under more or less favourable market conditions (especially a neoliberal-friendly government). Regardless of whether the private telecom sector would fulfil its social objective, the real scrutiny was on whether telecommunications and subsequently internet infrastructure would deliver long-promised high Gross Domestic Product growth. The immateriality of telecom spectrum had a very material underside – for spectrum apart from carrying telecom signals, was also the carrier of huge flows of capital between a complex mesh of networks involving government actors, a wide range of Indian and international corporate players representing very diverse businesses but all interested in exploiting the economic potential in developing India's internet infrastructure. It is not without irony that it was a case concerning telecommunications and internet infrastructure (specifically spectrum pricing and licensing) that triggered the downfall of the Congress and enabled the rise of the BJP as the political alternative – a shift to the far right after 10 years of neoliberal capitalism inflected with minimum welfare state obligations by the Congress.

In 2008, the then telecom minister, A. Raja serving under the Congress-led coalition United Progressive Alliance (UPA) government, allotted 122 licenses across 22 telecom circles[58] but the licenses were awarded at 2001 prices. A pan-India license covering all telecom circles was awarded at roughly 300 million US dollars. Many companies, including some real estate companies, were 'lucky' enough to gain licenses on the cheap. Unsurprisingly, immediately after procurement of license and spectrum, they resold the licenses or stake in their company to new buyers for prices as much as four- or five-times higher than their initial buying price. New third-party buyers included the Saudi-based Etisalat and the Norwegian telecom company, Telenor. The Comptroller Auditor General of India (CAG) reported a 'notional' loss to government of billions of dollars because the licenses were given away for little or no money while awardees resold (directly or indirectly) stakes for a much higher price (Doron & Jeffrey, 2013; Prasad & Sridhar, 2014; Sridhar, 2012b).

The 2G scam provided the basis for media framing of the political contest between the Congress and the BJP in terms of a corrupt Congress versus a clean and transparent BJP personified by Narendra Modi (Chhibber & Verma, 2014; Jaffrelot, 2015b; Mohan, 2015; Palshikar, 2014). The site of telecommunications and internet infrastructure thus became crucial in providing a meaningful frame for his politics, simultaneously obfuscating Modi's role as Chief Minister of Gujarat during the 2002 carnage of Muslims. By the time what came to be known as the 2G 'scam' was in the public eye in 2012-13, the general election of 2014 was imminent. An influential business elite with links to Narendra Modi and the BJP, and which also controlled much mainstream media infrastructure including the press and electronic media, capitalised on the optics of the so-called 2G scam to glorify the far-right politics of the BJP and the persona of Narendra Modi. Ultimately, because of the way in which the BJP, then in opposition, capitalised[59] on a single aspect of the process – the fact

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[58] India is divided into 22 telecom circles that more or less correspond to state boundaries with a few exceptions. Licenses are awarded to multiple players across the telecom circles.

[59] A key figure who capitalised the corruption issues in favour of the BJP is Ajit Doval, the current National Security Advisor to the Prime Minister of India and commonly believed to be very close to Modi. Around the time of the 2G scandal, Ajit Doval through an intricate network of lobby groups and thinktanks created a sophisticated campaign against the Congress in the name of a moral movement against corruption. For more details, see Praveen Donthi 'How ties with the think tanks Viveka International Foundation and India Foundation enhance Ajit Doval's influence' (November 5, 2017). *The Caravan*. Retrieved from: https://caravanmagazine.in/vantage/vivekananda-international-india-foundation-ajit-doval-influence

that it was a Congress-led coalition and a Congress minister who was responsible for the seemingly flawed process as it unfolded – the whole episode was linked irrevocably to the notion of Congress government ineptitude and corruption.

[redacted for copyright reasons]

Figure 2: A newspaper clipping headlining the '2G scam'

It is clear, then, that the infrastructural politics and technological imaginaries of the BJP under Modi did not emerge from a vacuum. They were, rather, inherited from the previous two Congress regimes' 'soft' neoliberal policies and in particular from the work of Prime Minister Manmohan Singh. While the Congress governments (through support from the Left parties) did also imagine, outline and push through various pro-poor policies and welfare mechanisms (Dasgupta, 2013; MacAuslan, 2008), there was a simultaneous advance towards technological development and neoliberalism. The development of media and communications as well as information technologies was absolutely crucial both for reconfiguring internal (within the boundaries of the nation state) politics and linking effectively with external, i.e. global economic networks.

4.8 The fetish of systems rationality: Seeing from above

In this section, I illustrate that it was the Congress government especially in its second term (2009-2013) that inaugurated the project of systems rationality powered by practices of digital governmentality. This is not to imply a conspiratorial 'evil intention' by the Congress party leadership but rather to suggest that their vision was at best short-sighted in its understanding of the damage that could potentially be done by such networked communicative and enumerative surveillance technologies if allied to an ideologically far right agenda. It is also to argue that while telecommunication and internet infrastructures became crucial to GDP growth and linking with international capital flows, it became inevitable that infrastructural development in the internet sphere would become a part of the political logic of the state – in the process transforming the state or the space of the state itself (Mitchell, 1999).

In 2010, the independent regulator Telecom Regulatory Authority of India (TRAI) recommended[60] to the Department of Telecommunications that mass broadband could be achieved by building a National Optical Fibre Network (NOFN) leveraging the unspent money from the Universal Service Obligations Fund (USOF). The regulator made a range of arguments – from transitioning to a digital economy to meeting the Sustainable Development Goals in order to plead for a National Fibre Optical Network. The fundamental rationales were that fibre would *future proof* for increasing bandwidth requirements as rural market consumption grew, and secondly, that it would be possible to wire up the whole country, given the lack of connectivity in rural areas (in other words, to answer the failure of the wireless telecom service over the last decade). Advocating for a national public corporation to manage the National Optical Fibre Network, the regulator made the following case:

> The government will make available the funds for creation of the block level aggregation network and the backhaul. The company would be eligible to get grants from government funds like Universal Service Obligations Fund (USOF) and Mahatma Gandhi National Employment Rural Guarantee Scheme (MNERGS). USOF has an available balance of about Rs. 13789 cr[61]. The last year collection was 5778 cr and assuming same collection for next two years, then funds of the order of 24000 cr would be available. The company can also raise finance from the market. (*Recommendations on National Broadband Plan, Telecom Regulatory Authority of India* 2010, p. 113)

Along with the repurposing of this fund, the regulator also recommended the organisational and financial infrastructure needed to operationalise the National Optical Fibre Network. These include setting up a national public corporation and state-level agencies to deploy and manage the infrastructure; leveraging the Universal Service Obligations Fund (USOF) funds for further loans and auctioning last mile services. This kind of institutional

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[60] Recommendations on National Broadband Plan, Telecom Regulatory Authority of India, published 8th December 2010. Retrieved from: http://trai.gov.in/sites/default/files/Rcommendation81210.pdf.
[61] At the exchange rate of 60 INR for 1 US Dollar, 1 crore rupees is equal to 160,000 US dollars.

arrangement comes with its own *ways of seeing* – a seeing from above that abstracts to a much higher degree when compared to older forms of governmentality. Number 5.7 (p. 81) brackets the population as follows:

> Demographically speaking the total population estimated in the census of 2001 of 1.03 billion is distributed in the ratio of 72.2% and 27.8% in rural and urban areas. There are 593,615 inhabited villages, 374,552 villages with population more than 500 and 265,000 gram panchayats[62]. There are 6374 blocks and 610 DHQs[63]. The total area of the country is 3,287,240 square km giving about 13 km average block radius. There are about 266 households per village.

In the context of the 'view from above', especially satellite imagery deployed for aerial warfare, Lisa Parks (2012, p. 79) argues that "the overhead image provides an opportunity to think about knowledge practices and the materiality of communication in ways that do not rely exclusively upon the visibility of bodies or frames as 'purely representational'… satellite images can be used to bring (infra)structural processes and matters to the fore by intimating or revealing parts of systems or processes that are simply too vast for the frames, conventions and capacities of modern media". It would seem that in the case of fibre optic networks, we have a situation where it is the very designing and planning of infrastructures that provides us with the 'view from above', i.e. it is the knowledge practices and other aspects of governmentality that creates the 'overhead image' rather than the other way around.

[redacted for copyright reasons]

Figure 3: A status map of 'ready' sites of the NOFN. Screenshot from BBNL website (bbnl.nic.in)

Further, policy and planning documents such as the ones currently under analysis, do not just provide the view from above but also provide a view from ground zero. Take for instance, point number 5.66 of the report, which argues:

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[62] Village level governments are called *Gram Panchayats*
[63] DHQ stands for District Headquarters – the administration for governance under each state government

A total of 327 km fibre is to be laid in the access network and about 50 km for every block. This gives a total requirement of about 2,402,998 km of fibre for all 6374 blocks. Depending on the soil condition one labourer would be able to do 1-2 meter per day. Taking 2 meter per day for rural areas the number of man days would be 1,201,499,000. This indicates the amount of work that will be generated for the poor through this project (*Recommendations on National Broadband Plan, Telecom Regulatory Authority of India* 2010, p. 114)

In the above section infrastructure-labour is positioned as an opportunity for the poor as prospective employment in the same way that roadbuilding did in the 1970s. The fibre optics are intended to benefit the 'rural mass' but at the same time some unknown 'poor' (presumably from the 'rural mass') are going to be digging the soil for their employment. An analysis of the discourse reveals that while 'rural mass' may be a vague concept not as clearly defined as the overall population, the 'poor' have been mapped down to how many meters of soil to dig per day and how many days of labour are involved. Such a slippage and ambiguity involved in invoking a section of the population is mirrored in the ambiguities of discursively producing the nation state itself (Bhabha, 1994). Above all, these linguistic slippages are a reminder that while the discourse of fibre optics is all about high-tech and high-speed applications with 100 megabytes of internet per second, the materiality of the infrastructure involves differentiated temporalities for different subjects and types of labour (Marx, [1867] 1990; Sharma, 2012).

The recommendations of the regulator TRAI were reflected in the National Telecom Policy 2012 (NTP 2012). For the first time, the 2012 policy was a 20-page policy document addressing different aspects of telecommunications and internet infrastructure in great detail. The preamble of the policy is in line with earlier telecommunications policies maintaining the twin goals of economic growth with special emphasis on services in remote and rural areas, although the same preamble acknowledges that 88% of the total mobile phone connections are from the private sector. Thus, it is no surprise that the 2012 policy is also about continuing the drive to increase investment from the private sector, especially foreign investment (significant given the financial crisis of 2008 which affected investments in India). In the Strategies section of the 2012 Policy, section 1.3 notes:

To lay special emphasis on providing reliable and affordable broadband access to rural and remote areas…Optical fibre network will be initially laid up to the village Panchayat level by funding from the Universal Service Obligation Fund (USOF). Access to this Optical Fibre Network will be open, non-discriminatory and technology neutral.

Telecommunication and internet infrastructure became a site where 'clean' and 'modern' politics could be reimagined – as a corporeal albeit digital connection between Modi and every citizen. In this rhetorical construction, the panacea of connectivity would allow for a *direct* connection between a central leader figure in Delhi and any common citizen for whom the corridors of power may have previously seemed out of reach. As I show in Chapter 5, local elites in charge of technical maintenance and engineering standards of the National Optical Fibre Network in Chhattisgarh echo and valourise precisely the same kind of discourse in their daily practices. The BJP ran with Narendra Modi as its prime ministerial candidate in the 2014 general elections and swept the elections with 282 seats out of a possible 543 seats in the lower house of Parliament.

Maintaining this brand connection with technological modernity, after coming to power in May 2014, Modi regularly encouraged the spectacle of 'direct contact' as the essence of mediated politics. He speaks to the people on a monthly radio programme called '*Mann Ki Baat*' (loosely translated as 'talking from the heart') distributed via the public broadcaster. In addition, he also holds tele-conferences where supposedly ordinary people from different villages in different parts of the country could interact with him – and ask him questions or share their experiences – albeit vetted in advance by his party workers and aides. Of course, as it has been argued[64] (Sinha, 2017; Srivastava, 2015), the questions allowed through were carefully stage managed, and those chosen to interact have been prepared, questions (and answers) rehearsed. Such performances are then dutifully shared across social media

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[64] Shamni Pande. 'Just the right image' (June 8, 2014). *India Today*. Retrieved from: https://www.businesstoday.in/magazine/case-study/case-study-strategy-tactics-behind-creation-of-brand-narendra-modi/story/206321.html

platforms and on television news channels as examples of a man who is doing something new.

Exceeding by far what was done during 10 years of Congress-led government from 2004-2014, the Modi-led BJP government has placed internet and digital communication at the very heart of political discourse and of Modi's mode of governance – qualitatively and quantitatively enhancing the conspicuous spectacle of technological progress infused with the religious fervour of nationalism. Modi, conflated most of his government schemes, his own public persona, his vision for economic growth with the framework of 'Digital India'. The coincidence of an image-obsessed far right leader with the emergence of a technologically mediated infrastructure for governance available transformed the architecture of governmentality in India.

Dean suggests that 'if technocracy aimed to eliminate politics in the name of efficient administration, technoculture forecloses politics in the name of communication' (2002, pp. 112–113). In response, Mazzarella (2006, p. 481) argues that the shift to e-governance suggests 'an ongoing attempt to bring old fashioned centralised power into alignment with a decentralised consumerist populist notion of empowerment…the juxtaposition of a fetishised systems rationality with an affectively charged ideal of communicative immediacy'. It is precisely this process of alignment, this juxtaposition of fetishised rationality, communicative immediacy and centralised power that continues to play a very important role in Modi's aesthetics of politics at the time of writing in 2020.

4.9 The infrastructural politics of the BJP: Digital governmentality and Hindutva ideology

In this section, I focus on the extra-policy domain where governmentality spilled to the non-government sectors of mainstream commercial and public sector media as well as the emergence of phone apps and social media. Since the National Telecom Policy in 2012, there have been no policy documents save one in 2018 which is not included in the corpus of my doctoral research. Rather than policy documents, I show how some key aspects of the Modi government were marked by popular communication strategies that emphasised a

particular mode of digital governmentality underpinned by the ideology of Hinduvta nationalism.

In 2014, Modi from the BJP won the general elections with what was touted as a landslide victory – 282 seats out of a possible 543. Since then, via a largely censored or co-opted media (Banaji, 2020), Modi's government has spouted a steady stream of propagandist sound-bites such as 'anti-national', 'half-Maoist', 'Urban Naxal', and more, through which the voicing of any political concern or criticism is instantly challenged. There have been numerous incidents of spectacular violence against Muslim, Christian and Dalit communities (Banaji, 2018; Ganguly, 2019; Ghoshal, 2019). The Modi regime, through a strategic consideration of speech and silence (when minorities are attacked or killed) has given clear signals to encourage and enable a culture of mob vigilantism, primarily by upper caste Hindu groups (Banaji & Bhat, 2019). In many cases, the people who have led such vigilante mobs are rewarded with 'tickets' to contest local elections or their social media accounts are followed by Modi. It is clearly a case of uniting a diverse social body of the population into a unifying frame of Hindu nationalism or *Hindutva*. However, this forced social construction of a unified Hindu social body necessarily involves the production of the figure of the Other – Dalits, Muslims, Christians, communists, women, journalists, public university students have all become victims to this constant process of othering that predates the 2014 election (Andersen & Damle, 1987; Banaji, 2018; Chatterjee, 1992; Hansen, 1999; Pandey, 1993).

Prior to the 2014 election, one of the Modi campaign's most popular election slogans was '*Sabka Saath, Sabka Vikas*' (loosely translated as 'with all and for the development of all'). On the face of it, the slogan seems like an inclusive and progressive plank to adopt for the campaign. However, in practice, the discourse worked in complex ways. This slogan was preceded by years of BJP propaganda about the supposed minority 'appeasement' policies of the Congress. In contrast, the *development of all*, delivered an implicit message that Modi would not be following through on any of the affirmative action or protections for Muslims which previous regimes had appeared to endorse; instead, ignoring a history of oppression and discrimination he claimed he would bring both Hindus and Muslims under one set of rules and laws.

Since the 1990s, there had also been simmering dominant-caste resentment against 27% reservation in jobs and seats in public universities for Other Backward Classes (OBCs), or the so-called lower castes. The slogan of *development for all* was a subtle way of indicating that the Modi regime stood against such measures of anti-caste affirmative action. Reminiscent of the slogan 'All Lives Matter' in the US, this political slogan is in fact metonymic of the entire approach of the Modi-led BJP government. On the surface, the rhetoric is inclusive and development-oriented, and beneath the surface there is always another meaning that is specifically addressed to construct the dominant-caste Hindu middle classes through a process of othering of minorities and validation of the view that the minorities have been pandered to and 'had it easy' under preceding governments. In this context, is my contention that the spectacular development of media and communications infrastructure after 2014 was a crucial mechanism through which to create an ecosystem that could spread pro-regime propaganda, hate speech, misinformation and therefore fuel violence against the figure of the Other at any given moment while publicly be seen espousing inclusive and secular development.

After coming to power, Modi continues to avoid press conferences or interactions with the general press. Instead, he often provides two or three interviews with carefully chosen and always favourable reporters. When not talking to his chosen elite friends, he is active on Facebook, Twitter, and a whole host of other social media applications. In this he is supported by a vast electoral machine that regularly puts out edited clips of his speeches, posters, audio clips, memes, GIFs and info-graphics to keep the networks buzzing with activity. The speeches and bytes given by Modi and the president of his party, and later, Home Minister, Amit Shah have a seamless intertextuality with the public broadcasting, the news media (television and print in both English and regional languages) and social media platforms (Banaji, 2017 & 2018; Chakravartty & Roy, 2015; Chakravartty, Roy, & Mohan, 2015; Jaffrelot, 2015).

Telecommunication and internet infrastructure are crucial symbols for the surface level sheen of development, modernity, futurity, transparency, immediacy, growth and inclusion. It is in this broader political context that Modi rebranded the National Optical Fibre Network

as 'Digital India'. As part of this broad vision, Modi's government has not just accelerated and expanded but also qualitatively transformed the basic systems-rationality approach to governmentality that the Congress had already begun to consolidate since 2004. A crucial feature of this new vision depended on pointing out that earlier efforts of governance were haunted by leaky and slow implementation of welfare schemes. Contrasted to the old way of doing things, Modi projected 'Digital India' as a fresh start, a new way of governing where individuals could get exactly what he or she was entitled to directly from the central government without any corruption, leakage or delays.

Digitally mediated government would be clean, efficient and transparent – it would be the ultimate signifier that India has arrived as a superpower on the global scene. Such a *direct contact* involved in governmentality required infrastructure to operationalise, especially the JAM infrastructure. J stands for *Jan Dhan* (public wealth) bank accounts, A stands for *Aadhar* (a biometric identification card), and M stands for mobile telecommunications. With such infrastructure in place, the old group subjectivity would give way – the Modi rhetoric argued – to individual citizens identified as a unique number, and the government could act for this individual easily since he or she would be identifiable (Hönke et al., 2012; Jacobsen, 2015; Thomas, 2014). The National Economic Survey of 2017-18 specifically mentions the possibility of targeted basic income as a way of reducing leaky welfare schemes and since then various pilot or trial projects have been conducted in different parts of India.
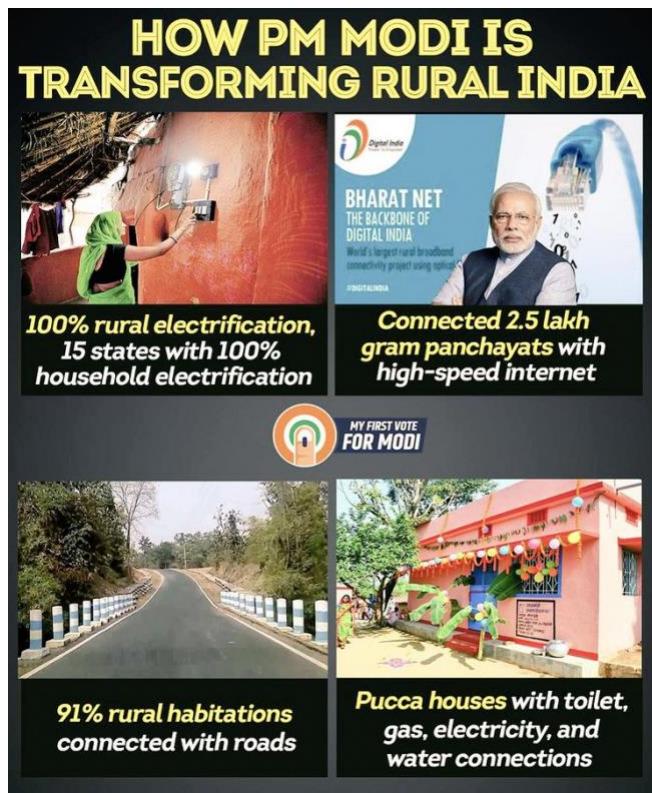
Figure 4: Modi government's emphasis on infrastructure

Since coming to power, Modi has constantly harped on what has been called the 'promise' of infrastructure (N. Anand, Gupta, & Appel, 2018). Modi has emphasised electrification projects, roads, bridges, super-fast trains, new airports for smaller towns and of course the national optical fibre network along with the aforementioned Jan-Dhan + Aadhaar + Mobile (JAM) infrastructure (discussed in more detail in Chapter 5). Most of his speeches in Parliament for example are focused on reading numbers that supposedly provide the 'hard evidence' for efficient government. Behind all the rhetoric lies a very different story of alleged embezzlement, cronyism and mismanagement[65] (Gowda & Sharalaya, 2016).

In November 2016, Modi announced demonetisation, i.e. key currency denominations of 500 and 1000-rupee notes would become illegal tender overnight. Chaos ensued and hundreds of people died from stress, anxiety or because they could not access legal tender (Singhal, 2018). Modi in his next Parliament speech chose to ignore all of these ground realities, and to emphasise that he met an ordinary vegetable vendor who used online

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[65] Panos Mourdoukoutas 'Corruption is still thriving in Modi's India' January 31, 2019). *Forbes*. Retrieved from: https://www.forbes.com/sites/panosmourdoukoutas/2019/01/31/corruption-is-still-thriving-in-modis-india/

payment and was thus happier in the bargain since he did not have to deal with the 'messiness' of handling real currency, giving change and so on. The digital network in other words, was made to appear crucial to the transformation of politics that was able to leapfrog problems of politics that had plagued India for decades. I argue that telecommunications and internet infrastructure juxtaposed with the Hindutva style of politics is crucial to the BJP's sustained political hegemony. It is precisely the digital element in governmentality that enables the political discourse to conceal and disavow corruption, authoritarianism and neoliberal elitism. I discuss the full implications of digital governmentality with more empirical research from the state of Chhattisgarh in Chapter 5.

The point here is not to ask whether infrastructural politics and digital governmentality is a good or bad idea, or whether the abovementioned trial projects are successful or unsuccessful. To do so would be to miss the very grounds on which the relation between state and population is being reconfigured. The government claims that it plans to eliminate all existing public subsidies and instead to use existing 'saved' funds to target welfare in more precise terms. In essence, this is a *commodification* of the political relationship between state and population – one in which the population is always visible and legible, but also directly under the surveillance of the central government, which, in turn, does not have to be accountable for failures in the systems which have been privatised. While, this is a technical project that began with the Congress, and Rahul Gandhi announced that the Congress would wish to implement a targeted basic income scheme if voted to power in the general elections of 2019 (Safi, 2019) the logic and actuality of its current implementation goes far beyond and in directions quite different from those envisaged. As I show in Chapter 5 and 6, there exist significant sections of society that accept what I call, following Foucault, the *telos* of Modi's digital governmentality in principle even as they attempt to subvert such governmentality in practice.

4.10 Conclusion

I have argued that the (re)turn to configuration as population in the late 20th century involved the participation of telecommunications and internet infrastructure. Policy and political discourses (and the infrastructure that emerged from policy actions) are intrinsic

and fundamental to the techniques of governmentality that began in the mid-1980s, and it is this regime of governmentality that continues to the present day, although with a few important distinctions. In this chapter I have identified distinct discourses of **systems rationality, enumeration and digital governmentality.** Each of these discourses are interrelated and interdependent while retaining their distinction in terms of emerging in specific socio-political contexts which I have unpacked. The current hegemony of digital governmentality is accompanied by populist authoritarian governance that includes symbolic and physical violence targeted at specific social groups as and when needed. Over the last five to six years, increasingly digital governmentality, systems rationality and enumerative strategies have perhaps irreversibly spilled outside the formal policy domain and now include a range of communicative strategies – from social media, to apps, hologram virtual meetings, radio programmes and so on. In other words, digital governmentality has seeped into everyday life and political *culture*. As such infrastructural practices come charged with meanings of digital governmentality.

The contemporary political and aesthetic logics of modern communicative infrastructure is radically different from the colonial sublime that characterised communication (and other) infrastructure since the late 19th century. We now have infrastructure that is no longer sublime (i.e. awe-inducing and terrifying, yet seductive) in the physical sense (Larkin, 2008). What we have instead is a **discursive sublime to compensate for the fragmentation of the physical infrastructure** –privatised, no longer directly connected to the political authority of the state and increasingly with invisible ties to the state – using spectrum and servers and small pocket devices and private home computers or mobile devices. The whole 'strength' of the sublime aspect of infrastructures has shifted to the discursive domain. This populist governmentality operationalised through the discourse on digital India is supported by massive increases in investments in internet infrastructure. Along with this increase in investments came greater centralised control over the communicative capacity of infrastructure. In 2019, the central government shut down phone connectivity and internet

connectivity in the Muslim majority state of Kashmir for six months and even at the time of writing in early 2020, 4G access has not yet been restored[66].

Internet infrastructure was initially seen as an unnecessary project for the state, to be avoided in order to prevent migration from rural to urban areas and subordinate to the processes of the social upliftment and reproduction of the population (i.e. the basic needs approach). Over three decades, this way of seeing has changed dramatically, rendering the discourse on internet infrastructure increasingly visible and important for the state to brand itself modern, business-oriented, and forward thinking, and to govern the populace. The anxieties of migration and displacement (and its effects) in the early discourse (in the 1970s) showed that the object of policy discourse was very much about the effects of state intervention on the population. Over time, the object of policy was and is to attract capital – both as production (of symbolic and material commodities) and finance (attracting investment and stimulating demand) and to disavow care for those othered by wider policies, strategies and rhetorics. In the course of this change, the telecommunications policy discourse in India reveals not just a shift of *priority* for the state but also concomitant *re-conceptualisations* of the nation state and the population

First, in order to undertake this complex exercise of balancing interests of capital circulation and realisation, the population had to be **reconfigured and produced as enumerated units** to be managed as nodes on a network that stands as the backbone for the new nation state. Second, such a process of reconfiguration involved **new symbolic and material practices** of seeing from above, i.e. a unique position where the spatial logic of the nation state was dissolved into mappable units such as villages/cities, district headquarters, blocks, urban/rural areas and heat maps that would show coverage of broadband and kilometres of optical fibre laid out. However, simultaneously, this process of seeing from above was accompanied by a rising trend of authoritarianism which operates through a complex relationship between the BJP politicians and mob vigilantes comprising of upper caste Hindu

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[66] Kai Schultz and Sameer Yasir 'India restores some internet access in Kashmir after long shutdown' (January 26, 2020). *New York Times*. Retrieved from: https://www.nytimes.com/2020/01/26/world/asia/kashmir-internet-shutdown-india.html

men. While there is no 'smoking gun' evidence to link the party to specific instances of violence, these relationships are forged through strategic considerations of encouragement or sanctions as and when needed. Third, in order to conceal and disguise this authoritarianism, the discourse on infrastructure – and indeed the *promise of infrastructure* – has proved to be indispensable as a **mode of populist governmentality**. In doing so, the population is invited to articulate itself into different kinds of subject positions that range from the 'rural masses' and 'poor' to 'citizens' and 'subscribers'. My next two chapters will focus on my field work in the central Indian state of Chhattisgarh and investigate to what extent such discursively created subject positions are negotiated through various infrastructural practices.

Chapter 5 Link fail: Investigating processes and practices of governmentality and subjectivation with 'Digital India'

5.1 Introduction

In this chapter, answering my research question 'In contemporary India, how and to what extent does internet infrastructure play a role in processes of individual and group subjectivation?'; I explore how internet infrastructures is entangled with practices and processes of governmentality and subjectivation in the city of Ambikapur, the capital city of the district of Surguja as well as in other sub-districts and villages in northern Chhattisgarh where I completed my field work. This chapter is based on ethnographic participant

observation and semi-structured interviews I conducted in 2018 with various individuals and groups who engaged with internet infrastructure in diverse ways.

In the following sections, I show how different individuals and groups based on pre-existing forms of privilege and capital (linked to their subject position in terms of caste, class and gender) shape how they engage in infrastructural practices, and how they make meaning of those practices. I show that local elites from dominant castes who administer, plan and engineer internet infrastructure, uphold and reproduce national level policy discourses discussed in Chapter 4. In other instances, social groups such as school teachers accept the underlying *telos* of governmentality in principle but attempt to subvert governmentality in practice.

In the latter half of this chapter, I show that processes of governmentality are no longer strictly confined to the state as conventionally imagined. New institutions exert what Mitchell (1999) has called 'state effects'. In such a context I show that for subjects who are already marginalised (such as Muslims), processes of subjectivation are experienced in relational terms. I conclude this chapter by illustrating the ways in which the technological mediation, centralisation and enumeration of welfare schemes suggests the emergence of a new architecture for the exercise of authority in India. I argue that the question of politics as a struggle for visibility, accountability, subsistence, power flow and so on is now *experienced* and *understood* in terms of infrastructural practices for (non-Adivasi) subjects living in and around the city of Ambikapur.

5.2 Desires and moral panics of local elites building internet infrastructure

This section discusses how the national level policy and political discourses on internet infrastructure and connectivity (as outlined in Chapter 4) are not only echoed by local elites but also simultaneously accompanied by new desires, anxieties and moral panics.

Ambikapur, as per the last census conducted in 2011, has a population of 121,071. Of this, 23,912 (just below 20%) are Adivasi. By and large, Ambikapur is a small city of Hindus who comprise 80% of the population. The Dalits (or Scheduled Castes) population is 5384,

roughly 4.5% of the population. With almost 14,000 (11.4%), and 10,000 (8.2%) people, the city also has a significant Muslim and Christian (Adivasis who have converted to Christianity) population[67]. In other words, the bulk of the population of Ambikapur is comprised of dominant-caste Hindus. Spatially and politically, the city is divided into 48 wards managed by the municipal corporation (See Figure 5 below).

Figure 5: A political map of Ambikapur

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[67] Data from 2011 Census. Retrieved from: https://www.censusindia.co.in/towns/ambikapur-population-surguja-chhattisgarh-801927.

The inner core wards are where capital and power is concentrated. The houses and workplaces of the wealthiest families of Ambikapur, all the government offices, courts, police station, district magistrate office, the water and electricity board, the most well-established public and government schools are all located in the inner wards. The commercial markets (vegetable and commodity markets such as textiles, wood, clothing) and the new markets (big brands such as Adidas and Reebok, Marks and Spencers, Peter England, and large supermarkets) are also located in these wards. The Dalit communities are segregated in a few wards in the outer peripheries. Some Muslim households are concentrated in the inner wards, but these are usually the middle-class Muslims who come from trading families or who have white collar jobs in the modern economy. The Christian households[68] are concentrated in one part of Ambikapur although their occupations are diverse – from working in local government offices to school teachers or owners of small grocery/stationery shops etc.

PV, a retired banker provided a different 'map' of Ambikapur, the key to which was caste, religion and ethnic status:

> Oraon – Adivasis who migrated from Jharkhand, a nearby state, many of them have converted to Christianity. Brahmins – Sub-castes or *Jatis* being Dwivedi, Trivedi and Chaturvedi. Gupta *jati* – primarily involved in the alcohol business, common names being Teli or Sahoo. Kayasths – Sub-castes or *Jatis* being Verma, Srivastav, Saxena, Nigam, Sinha, Bhatnagar, Mathur. Sindhis, Sardars (Sikhs), Muslims. The Muslims control the cloth related business here. The business *jatis* of Agarwal, Sindhi, Sardar (Apparently there is a shortage of women and hence the Agarwal men are marrying Gupta women out of desperation). The castes of Rajputs, the *Gond* Adivasis, the Kanwar and Rajwaar control most of the land, while the Brahmins and Rajputs who have migrated from Uttar Pradesh and Bihar dominate government service jobs. Muslim weavers from Bihar migrated here and their primary income was from

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[68] These are Adivasis who have converted to Christianity, usually implying a more modernised upbringing including access to convent education, thereby access to good jobs and improved standards of living.

transporting clothes. Even now they are called *Jhulahas*. Another 'backward caste' (commonly grouped under the moniker Other Backward Castes, or OBC) are the Pannika with *jatis* of Das, Mahant or Das Mahant work on weaving and transporting cotton and tussar silk. (*Interview with PV, 27th July 2019, Ambikapur, Chhattisgarh*)

During the course of my six months in Ambikapur and surrounding areas, I very rarely met any Adivasis who lived and worked as higher-level officers in government or owners of large business enterprises. There were many Adivasis who left their villages in the morning, came to Ambikapur for daily wage labour and then went back to their villages at the end of the day. Most of the economic and cultural capital, both in government and outside were controlled by dominant Hindu caste groups. These caste groups were further tightly enmeshed in kin networks through caste-based endogamy, they were neighbours and they had similar jobs (government jobs, high-rent producing shops, real estate, construction or had shops of their own). When it comes to practices of governmentality and subjectivation, particularly with respect to internet infrastructure, it is necessary to understand the pre-existing network of authority and historical forms of subjectivity. The city of Ambikapur, as with many other small cities, is a caste-structured society dominated by 'upper' caste Hindus and in Ambikapur's case, the city is surrounded by villages and settlements where mostly Dalits and Adivasis live. Most of the residents of Ambikapur trace their history to other parts of India. The most well-to-do residents belong to families of government employees – teachers, clerks, police, bankers and so on, who were sent by the central government to set up basic government services after India won independence in 1947. The other immigrant group is that of traders and merchants from upper class and dominant castes who came here to exploit economic opportunities from at least the last 70-100 years. Even as the city is slowly expanding with new markets, new products, new infrastructures – there is no doubt that the power structures have remained largely unchanged since at least the 1950s. Most of the government officials in charge of installing, operating and managing the internet infrastructure in the state of Chhattisgarh are from upper or upper middle classes and dominant castes thus putting them in the category of 'local elites' compared to the majority population in Chhattisgarh.

On the 10th of June 2018, the then BJP Party President Amit Shah visited the small city of Ambikapur. A few days before he was due to visit, what stood out the most was the frantic pace at which all the main roads of Ambikapur were tarred. Prior to his visit, the roads were conspicuous by their absence, and in their stead lay mud paths. The BJP had won the last three state elections in Chhattisgarh (2003, 2008 and 2013) and at the time of my fieldwork they were campaigning for the state elections due in late 2018. Roads were a significant aspect of infrastructure, an affective marker of development. It is as with the colonial Dutch building roads in Indonesia at the turn of the 20th century, 'cleanliness of the roads, in this logic, was purity of the times, democracy even' (Mrázek, 2002, p. 8). The 'hardness of the road, the intensity of its blackness, its smooth finish – produces sensorial and political experiences' (Larkin, 2013, p. 337). In a dusty city, new black gleaming tar roads with neat white divider lines were something more than just roads. They were signs that encoded the desire for modernity, futurity and progress into a material form.

The building of an overnight road in Ambikapur is not to meant to signify that progress has already arrived. Rather, such seductive infrastructures work as prophetic signs, of embodying and simultaneously offering a glimpse of a future time (Anand et al., 2018; Dalakoglou & Harvey, 2012; Harvey, 2018). Although this affectively charged glimpse of the future is very much on offer, it is not always accepted as such. I spoke to many people who attended Amit Shah's rally. They were keenly aware that the road had hastily materialised to coincide with the politician's visit. They also predicted that the road would not last for more than ten days at best. The new road, along with all the other paraphernalia and symbolism of the political rally, was understood as a necessary but artificial exercise in political rhetoric. The very same materiality of infrastructure thus gets caught up in institutional, political and cultural processes. Contrast this with the discursive sublime that characterises the digital governmentality of the Modi government. Infrastructures do not just perform their sensory or their technical functions – there is a struggle and social construction 'behind the scenes' that plays a role in how subjects experience infrastructure, and in the way in which this experience further shapes subjectivity.

An engineer, Mr.S, employed in the water department told me the inside news on the infrastructure troubles that he had heard from his neighbour – an employee of the public

telecom corporation BSNL. First came the competition between BSNL and the new service provider in the market – Jio Telecom, owned by India's richest business family, the Ambanis.

> Officials in the government would take bribes from Jio and then 'forget' to put water in the batteries of the BSNL network. Whenever there was a power failure, the BSNL telecommunication network would then go offline in fifteen minutes because of course the batteries cannot provide backup. Otherwise in reality the [BSNL] service is very good. They [Jio] are very devious. (*Conversation with Mr. S, 28th June, Ambikapur, Chhattisgarh*)

Apart from the battles between public and private service providers, there are also entanglements of different infrastructures even within the government. Mr. S gave me another example. In 2011-11, the internet cable to their office was cut when the city council undertook road and sewage works and dug up the roads. As a result, their office shut down because the server stopped working. Neither the internet provider, BSNL, nor the city council would restore the internet infrastructure, each blaming the other for the disruption. The city council engineers finally found a document with a stipulation: internet cables need to be laid at least six feet below the ground, whereas city council digging works at one or two feet. Mr. S confirmed that this information became crucial for leverage:

> The Deputy Collector then called the BSNL person and said that obviously from six feet (as per rules) to two feet, the BSNL people have saved and eaten up at least five times the budgeted amount. Since they have enjoyed the fruit, it is now their responsibility to ensure that the cables are working by the next day. Else the Deputy Collector would arrest the BSNL person as well as the contractor on some pretext or the other. (*Conversation with Mr. S, 28th June, Ambikapur, Chhattisgarh*)

Infrastructures, as Edwards (1996) has pointed out, are in circular relationships. The internet relies on electricity, and electricity maintenance itself may rely on online maintenance systems that required internet access. The above anecdote reveals that infrastructural relations maybe configured in circular terms but often the establishment of such circularity is antagonistic. Government at the local level is as much about stabilising its own

institutional nature, negotiating the conflict between upholding norms and supporting patrons, and managing the sheer size of its own operations. In this case, the electricity department, the city council, BSNL and various other professional and commercial services suddenly came into each other's 'fields' because subterranean cables rose to the surface and became the central bone of contention.

Further, local elites are crucial actors when it comes to 'behind the scene' view of internet infrastructure. Infrastructures are beset with struggles over aspects of administration, finance, personnel and maintenance. A government official, Mr. G, involved in managing the digital network in Ambikapur shared some of the struggles he faced:

> In our office we are supposed to have a video conferencing system where citizens can bring their complaints and talk directly to the highest officials of the state machinery. This is so that problems can be solved quickly. However, since the last month or so, we are not able to fix the problem in the video conferencing system. As a result, it has been stopped for some time. Many people don't know about it and we are also not doing a good job of advertising about this system on our premises. Then there are frequent power cuts and we don't have enough battery back up in our inverters. This means that the internet network is frequently down. We don't have enough staff, there are just two of us who are managing the whole network. Imagine if even one cable stops working, it could mean that the records of the local court, or the hospital will suddenly become unavailable. This is important but we simply don't have enough people to ensure that the network remains stable. It's a mess. (*Interview with Mr. G, government official in Ambikapur, 8th August, 2018*)

Mr. G experienced these failures and struggles as a lack – suggesting that he had a mental picture, almost a faith about how things *should* work if only some shortcomings were overcome. Mr. G saw this digital infrastructure as the important but unfortunately ignored nerve centre of government – crucial to the running of government institutions such as courts and hospitals. This vision of internet infrastructure as nerve centre involved a much grander vision than just the maintenance of local institutions. For Mr. G, infrastructure is

crucial and indispensable for the realisation of imaginaries and ideologies of 'Digital India' voiced by the BJP. He elaborates:

Since the early 2000s, the government started to wire itself up. First the central government ministries in Delhi were all connected through the internet. The second step was to connect the central government with state level governments and their departments and so on. The NOFN in its current stage is looking to wire up the very last mile remaining – connecting the village governments (Panchayats). Once this step is achieved successfully, the Prime Minister who is at the top of the hierarchy can speak to any Panchayat official in any village of the country. It will be a powerful government where decisions can be taken quickly, files can move digitally without leakage, and governance can be made more effective and transparent. The benefits are numerous for both government and citizens. To achieve this, there are various institutions who have been working – the government departments who have to cooperate, the National Informatics Centre, BSNL, the new agency for fibre network the BBNL, the various partner agencies such as the Railtel, the various government agencies which need internet – such as schools and hospitals, and various secondary and peripheral institutions – trainers, service and repair institutions and individuals etc. It is a tremendous long-term effort (*Interview with Mr. G, government official in Ambikapur, 8th August, 2018*)

Indeed for Mr. G (and many others like him working in local government), infrastructure is the basis for the material constitution of the nation state. Hitherto large parts of country, indeed the government was out of reach, disconnected, faulty, analogue, inefficient. There is an underlying sense of completion and closure when that gap is closed[69] – by 'wiring up the last mile remaining'. For the elites, the promise of infrastructure contains within it, an element of *jouissance* – long delays will be replaced by quick decision-making, thick dusty files in government offices will be replaced by fast-moving digital files, corrupt and leaky government will be replaced by efficient and transparent government. As I have showed in

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[69] In a Lacanian vein, one could say the pleasure of this vision stems precisely from that gap of not achieving full connectivity; something which forever must remain narrowly out of reach so that it can retain its position as a lofty objective to be reached.

the analysis of policy and political discourse in Chapter 4, there is much literature on 'promise' *of* infrastructure ((N. Anand et al., 2018; Hetherington, 2014, 2016). As Mr. G noted, one of the ways in which the promise of infrastructure appears is the emergence of a 'powerful' government rather than a democratic or equitable one. For the elites, the promise while explicitly articulated in philanthropic or developmental terms, implicitly articulates and affirms their own superior material and moral subject position.

These bureaucratic local experts (or local elites) experience pride in echoing and amplifying the official discursive regime of infrastructural promise. They represent themselves as saviours who will finally deliver India from underdevelopment, backwardness and ignorance. This hubris is only acknowledged indirectly. Internet infrastructures have lofty goals embedded in them, but since the task of providing them is mammoth, and there are multiple agencies involved, the tremendousness of the effort is both humbling and self-affirming at the same time. It allows people like Mr. G to feel like they are part of a heroic, and quite literally, nation-building effort.

Even though internet infrastructure is mostly talked about by national and local elites as benefiting others (since they have the capital, it is assumed, to access these digital services without the infrastructure), their own subjectivation is also significant. The process of constructing their own subject position (adorned by moral pride and a show of humility) that provides some members of the local elites I interviewed, with a sense of motivation to 'carry on' in spite of all the technical, administrative, financial obstacles they face on a daily basis. It could be argued that many of these local elites may be simply speaking the official 'script' when talking to a researcher. In reality, they may not 'believe' in the script but perhaps deploy it cynically as and when required. Even if that was to be the case, it is precisely the performance of discourse that is relevant to my research. From the rarefied corridors of policy making in Delhi down to a junior engineers and officers in a small city in Chhattisgarh[70], the discursively constructed promises of infrastructure are relayed without

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[70] Even though I have not checked with them, I am fairly sure that they have not been required to perform this 'script' on promise of infrastructure, since they are rarely asked for their opinions given their position in government. When I refer to them as local elites, it is in relation to the majority of individuals who live around the city of Ambikapur.

much 'distortion'. It is precisely this discourse that then serves as the boundary within which engineers, clerks, managers and various other officials engage in daily infrastructural practices such as installation, maintenance, budget allocation, repair, documentation, and so on. Such local elites are explicit when it comes to the promise of infrastructure for so-called beneficiaries – the poor, the rural, the Adivasis, the illiterate, the Dalits, women, youth and children. In other words, the work of infrastructural governmentality carries within it, an infrastructural subject position. While I have so far written about infrastructure in secular terms, internet infrastructure in particular is not necessarily viewed, say like roads, as infrastructures that are obviously for *all* sections of society in a simple way.

I argue that when it comes to the subject position of the Other with respect to internet infrastructure, local elites are not only more explicit, they are also ambiguous and convey a sense of moral panic (Cohen, 1972). Mr. J is an employee of the public sector telecommunications service provider Bharat Sanchar Nigam Limited (BSNL). While not directly in charge of the National Optical Fibre Network (NOFN), his work ensures that the work of constructing the network does not face any technical difficulties. Mr. J assumed an ambiguous position on the worthiness of subjects to assume the subject position of a worth internet infrastructure beneficiary. Initially, upon hearing about my research topic, he remarked,

> Why would you want to talk to them about something they do not understand? They will just laugh it off because they have nothing to say. Our rural people are very simple and innocent and they do not understand all these things (*Interview with Mr. J, 17th August, 2018, Ambikapur, Chhattisgarh*)

The intended addressees of the NOFN infrastructure then are simply 'they'- i.e. rural people. Communication infrastructure, like most other infrastructure, tends to reproduce the discursive formation that has been propagated by policies, press, films, speeches and everyday discourse. It is telling that most of the government officials working on internet infrastructures in some capacity or the other, rarely mentioned the residents of Ambikapur. The default position was that infrastructure was for the 'poor in rural areas', a phrase often used by government officials to refer to Adivasis, and of course echoed in policy discourse.

As I have argued in Chapter 4, much of the telecommunications policy and political discourse hinges on appealing to the potential for bringing 'development' to 'remote, rural and hilly areas'. Implied in such a discourse is the assumption that 'they' are simply a *tabula rasa*, upon which modernity can be (re)inscribed with every wave of technological and infrastructural development. Mr. J adds,

> [this infrastructure] …will convert the rural population into e-citizens because this infrastructure will help in e-medicine, e-education and e-governance. Life will become online since all facilities will become available directly at the village level itself (*Interview with Mr. J, 17th August, 2018, Ambikapur, Chhattisgarh*)

This statement is a subtle nod to an attitude that was popularised and mainstreamed by M.K. Gandhi, one of the founding leaders of the National Congress party and renowned for his civil disobedience methods against the British. Known as the 'father of the nation' Gandhi romanticised the self-sufficiency of the village economy. Migration, especially when it involved 'flocking' to urban areas, was anathema for Gandhi, not just because it would disrupt the centuries-old village system, but also because it would imply that Indians were leaving behind the traditional in favour of, what seemed, to him, to be aping and imbibing Western/colonial ideals encoded in the modern cities of India. Modernising infrastructural projects were perceived by some elites and middle classes as doubly dangerous since these projects inaugurated pathways to Western modes of life even as they threatened to disrupt the entrenched and violent feudal system held in place by caste relations.

Talking about the intended beneficiaries of internet infrastructure, Mr. J elaborates:

> The concept of Wi-fi Choupal [Wi-fi Public Space] is that like how some people sit under the *peepal* tree [sacred fig tree] and do brainstorming, i.e. general discussion on burning issues, they do time-pass. It is actually just time-pass. Once they access the Wi-fi Choupal whatever they can get benefit, they have to see. If someone chooses to use the internet to download films and watch them, what can we do? (*Interview with Mr. J, 17th August, 2018, Ambikapur, Chhattisgarh*)

It is significant that the provision of internet infrastructure already pre-supposes a 'we' and a 'they'. The use of 'we' here refers to the invisible dominant caste position while 'they' refer to the 'Other' – variously categorised as poor, rural, indigenous, lower caste, illiterate and so on. The phrases 'time pass' and 'download films' connote not just a contempt but also traces of panic – what if 'they' waste the opportunity, what if 'they' are not the good obedient subjects as local elites imagine them to be?

The prescriptive morality (leading to hope and promise of a better life) intertwined with moral panic ('but what if they waste or misuse it') is similarly mirrored in the infrastructure itself in terms of how it should be used. E-medicine, e-governance and e-education are associated with notions of civic responsibility whereas downloading and watching films is the possible risk that 'rural people' will not assume or perform the expected subject position of the 'e-citizen'. Internet infrastructures are encoded with such desires and anxieties:

> In the old phase, there were 24 pairs, in the new phase, there are 48 pairs and in some places 96 pairs. In many places we have only terminated one pair. Let us suppose that the healthcare centre or high school is only 200 meters from the Gram Panchayat. So there, we have to give them connectivity. For e-education or for telemedicine, video conferencing with super specialist doctors so that for the patient he can talk to the doctor there itself, the symptoms and diagnosis can be explained by the doctor – who can sit in his own place and explain. (*Interview with Mr. J, 17th August, 2018, Ambikapur, Chhattisgarh*)

The quote is a good indicator of how closely the materiality of internet infrastructure (the pairs of fibre optics in this instance) is irreducibly and indissociably linked to wider ideological issues of how the materiality of infrastructure will be put to use. Apart from the moral panic about how the 'other' will behave, internet infrastructures also serve as props for the construction of an imagined civic subject position. There is not only an e-citizen, but Mr. J can clearly and vividly imagine a super specialist doctor appearing on a video conference call, explaining away the symptoms and diagnosing illness to grateful (rural-e-citizen) subjects.

The moral panic of these local elites are necessarily contradictory when it comes to describing the subject position that is available to beneficiaries of internet infrastructure. The beneficiaries are on the one hand naïve and innocent, primitive and traditional – notice Mr. J's comparison of Wi-fi connectivity with an older public space-cum-public sphere of the *peepal* tree, strongly suggesting that these beneficiaries are assumed to not be able to grasp the concept of internet connectivity without referring to some ideal-type reference from the past. On the other hand, they are cunning enough with enough technical capacity to download films and idle away their time. They are suspected of being lazy and unproductive thus inherently unworthy, and yet simultaneously deeply deserving of the fruits of technological progress since they have been 'left behind'. Beneficiaries can avail of basic needs (health, education and more) even as they may not have the moral capacity to avail of it without slipping into bad habits – given their inclination to download and watch films instead

This contradiction between the assumed promise and assumed dangers of democratising infrastructures arises since most of the local elites are men from the dominant castes and their position of domination in a patriarchal caste-structured society comes from expropriating surplus value from the labour of women, Dalit Bahujan and Adivasi groups. This expropriation has historically shaped the habitus of 'upper' caste groups so it is 'natural' for the local elites to assume that they have a monopoly on systems and production of knowledge and anyone else who lays claim to knowledge (and internet infrastructure is undoubtedly a disruptive system in opening up knowledge to other, oppressed castes) is either unworthy or deviant. This habitus of the local elite comes into direct conflict with their professional occupation as facilitators of technological development for all on behalf of the state.

In this section, I have discussed the discursive construction of infrastructure 'experts' who through a variety of institutional practices (administration, sub-contracting, financial management) 'suture' national policy discourse to local institutional practice. Processes of subjectivation are in relation to the imagined 'Other' as a *tabula rasa* in line with policy

discourses. In the next sub-sections, I focus on infrastructural practices by different social groups, moving from the 'supply' side to the 'demand' side of internet infrastructure.

5.3 The deontology and telos of digital governmentality: Negotiation and reproduction

In this section, I show the sheer range of diversity in terms how government and private school teachers (as representative of a social group) in and around Ambikapur engage in infrastructural practices that play a role in processes of subjectivation and governmentality. For several years, government school teachers across Chhattisgarh have mobilised to form six trade unions and have been demanding that their job be regularised. The state has resisted since such a regularisation of employment would mean increasing expenses on salaries and providing additional employment benefits and facilities. With state elections approaching in late 2018, the BJP promised to regularise most of the teachers, or at least those who had been working as teachers for more than eight years. Any teachers who had worked for fewer than eight years would not be regularised. The unions saw this tactic as a cunning attempt to sow divisions amongst the members of the unions and decided to call for a strike in the capital city of Raipur. Most of the strike and the anger against the government approach to public education was mobilised by teachers using WhatsApp groups and Facebook groups.

On the day of the strike, police were deployed at railway stations. They checked the phones of anyone alighting from the trains. The first thing to be checked was their smartphone, specifically WhatsApp and Facebook. If there was a single mention of the strike or even broadly if any of the complaints raised by teachers found on their phones, they were placed under temporary arrest for two days. Many teachers I interacted with during this period expressed anger at the government for treating them in this cavalier fashion and vowed to make the BJP government pay for their arrogance. It was not entirely clear what the teachers would do in retaliation except vote for the opposition at the soon-to-be-held elections, although a couple of teachers hinted at a comeback that would be more immediate and tangible.

Since 2014-15, the Chhattisgarh Infotech Promotion Society (CHIPS), a state-level organisation was awarded the COSMOS project – Chhattisgarh Online School Monitoring System, wherein all government school and college teachers are required to provide their thumbprint on a tablet that records their biometric data (see Figure 6 below). The teachers are required to do this twice a day – at the beginning and end of the school day. The biometric data is linked to the *Aadhar* (the biometric linked identity number) and is maintained at the district level education department office. At the end of the month, the salaries of the teachers are paid depending on their levels of attendance. Every day, they have 15 minutes of leeway in the morning and afternoon. If they register their thumbprint after that time, the software will not accept it and a day's wages will be cut from their salary. The CHIPS website[71] however describes COSMOS as 'an integrated system which encompasses other services requisite for efficient working of teachers and admin staff. It is emerging as a comprehensive solution for the education department to efficiently monitor and control school level information in real time'

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[71] Chhattisgarh Infotech Promotion Society (CHIPS) website. Retrieved from: http://www.chips.gov.in/cosmos.
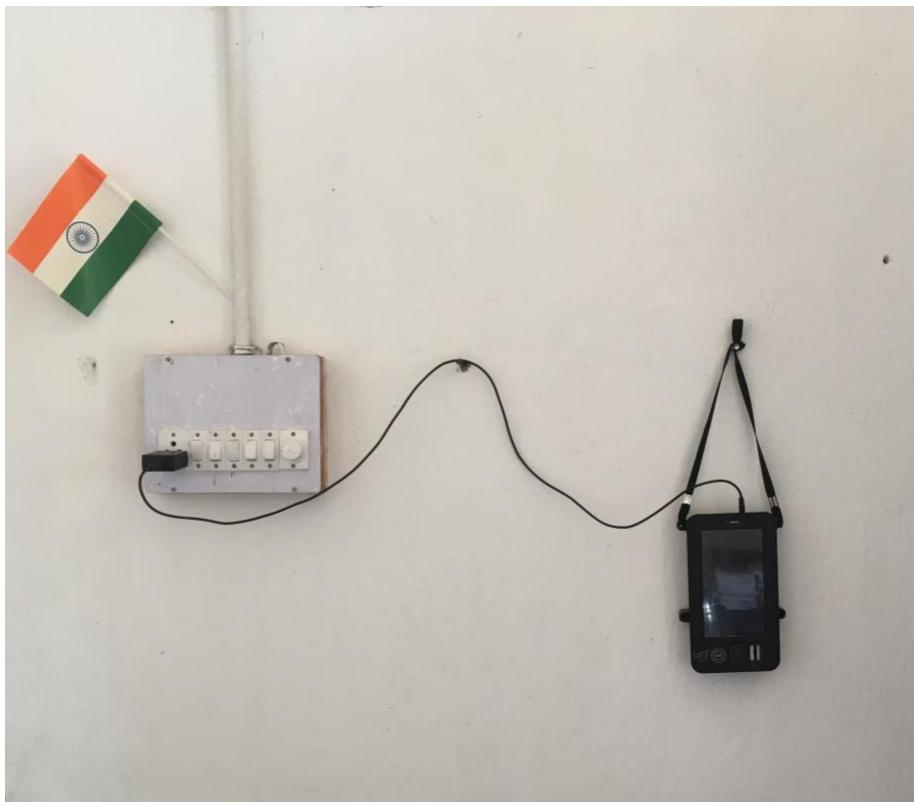
Figure 6: Biometric tablet at a government school in Chhattisgarh

Within a month of the teachers' strike, the biometric tablet was hacked in most schools and colleges across the state of Chhattisgarh in such a manner that when it was turned on, a browser would pop up and start playing pornographic clips. The only way to stop it was to shut down the tablet itself. The incident was widely covered by the local press and also gleefully shared by the 200,000 strong work-force of public school and college teachers across Chhattisgarh on social media platforms. Embarrassed by this incident, the state stopped the biometric system until a solution could be worked out. At the point at which I left Chhattisgarh in October 2018, the state had still not re-introduced the system fully. This hacking of infrastructure, assuming that the teachers were somehow involved, is not, I argue to be interpreted as pure resistance to the logic of digital governmentality *per se*. One teacher, Mr. K, an active participant in the strike told me:

> The government is wasting money by putting in these tablets. In practice, very few teachers don't turn up to teach. Just because of a few bad cases, they are doubting the honesty of hundreds of thousands of teachers. They [the state] will pay for it. If the government really wanted to improve the education in Chhattisgarh, they should

have put a CCTV camera in every classroom and they can check if teachers are doing their job. You are from London, do you know of any way a fake thumbprint can be made with some local material? I would like to see if we can fool this tablet [laughing] (*Conversation with Mr. K, 9th June, 2018, in a village near Ambikapur, Chhattisgarh*)

As Von Schnitzler (2008) points out, infrastructural practices are deeply implicated in producing subjects who are disposed towards calculative rationality. In her research, prepaid water meters become crucial objects of observation where both practices of governmentality and subjectivity intersect. Similarly, in Chhattisgarh, the biometric tablet became the object where the conflict between the state and teachers was rendered transparent. I argue that we should not use this example to posit a simplistic binary between a disciplinary state and a resistant subject (teachers) but rather the opposite – that it illustrates the hegemony of internet infrastructures within which both processes of governmentality and subjectivation are negotiated.

As I have argued in section 1.3, governmentality is a useful analytical concept since it requires a descriptive analysis of the various ways in which authority is exerted over others *and* over the self through a range of practices. The tussle between teachers and the state government of Chhattisgarh reveals practices of governmentality, in particular practices of *deontology* i.e. modes of subjectification, or who we are when we are being governed, and *telos* – the explicit or implicit lofty goals that underpin practices of governmentality. To some extent, both the state and teachers have already 'bought into' the logic of digital governmentality and the potential of calculative rationality (I suspect the sheepish laugh of my informant is a recognition of the contradiction – buying into the telos of digital governmentality in principle but seeking to subvert it in practice). The *telos* here is one of efficiency and transparency in public education (as a response to the allegedly widespread allegation that teachers in government schools are corrupt, often absent from work and operate with a complete lack of accountability to students and state).

The teachers in Ambikapur, while subverting the practice of biometric identification, have accepted the *telos* – which is why teachers themselves, such as Mr. K and many others are

willing to suggest cameras in the classroom as even more pervasive and efficient technologies of surveillance that will apparently deliver greater efficiency and transparency. The teachers inhabit and take ownership over the subject position of an honest and ethical public worker precisely by being implicated in everyday practices such as submitting their fingerprints to a tablet – first as submissive subjects participating in the exercise of verification and then as subversive subjects by seeking to 'fool' the tablet or possibly playing a role in the hacking. In other words, these seemingly diametrically opposing subject positions serve as boundaries of subjectification and in the process reproduce and affirm the *telos*, namely, public education has a moral crisis that needs technologically mediated addressal and intervention.

While the above example refers to a 'secular' deontology – i.e. the subject position of an ethical public teacher (secular in the sense that the position is open to individuals regardless of caste, religion etc.), there are instances when practices of governmentality intersect with Hindutva ideology too. After Narendra Modi was elected to power in 2014, the BJP since 2015 has declared that June 21st of every year is the International Day of Yoga. The Modi led government proposed a resolution in the United Nations and received 175 countries joining as co-sponsors, the highest number for any general resolution in the history of the United Nations[72]. Modi said that the date had been chosen because the date is the longest day in the Northern hemisphere and has special significance in many parts of the world. It seems far from coincidental that June 21st is also the death anniversary of Keshav Hedgewar, the founding leader of the mass far right organisation, the RSS which was founded in 1925 and is the parent organisation of the BJP. Modi has similarly appropriated Christmas, December 25th, as 'Good Governance Day' since it is the birth anniversary of the first BJP prime minister Atal Behari Vajpayee, and many other such significant days that have to be 'celebrated' by students and teachers in government schools have been similarly 're-memorialised' in line with Hindutva ideology[73]. The explicit discourse on *Yoga* is of good

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[72] 'UN declares June 21 as 'International Day of Yoga' (2014, December 11). *The Times of India*. Retrieved from: https://timesofindia.indiatimes.com/india/un-declares-june-21-as-international-day-of-yoga/articleshow/45480636.cms
[73] Subhash Gatade. 'Exit Azad! Enter Savarkar!!' (2019, November 10). *Newsclick*. Retrieved from: https://www.newsclick.in/exit-azad-enter-savarkar

health, harmony, spirituality and global fraternity. However, beneath this discursive surface, lies a far less benevolent and more sinister set of governmental practices.

The central government has consistently forced various institutions, including government offices and schools to 'enthusiastically' observe *Yoga Day* by asking all students and employees to suspend work in the morning and perform a set of *yoga* exercises. The Ministry of Human Resources Development (HRD) which is responsible for education, has 'suggested' that schools across the country get their students to practice *Yoga* on 21st June every year. In order to facilitate and implement this suggestion, the government has set up an administrative infrastructure including district level and state level committees[74]. What has not been written about (but I got to know from several teachers and other government officials) is that every institution has to meticulously document the *yoga* exercises of their students and employees through photography and videos. These videos and photographs then have to be uploaded to the HRD Ministry's website.

In one of the schools in Surguja district, teachers told me that the school management had received a 'request' from the state government about asking their students to do exercises on Yoga Day. The management was not in favour since they might get complaints from non-Hindu students who would see the exercises as unfair religious imposition. However, these concerns were set aside because the biggest concern was that if they did not comply, they might come under the scrutiny of the state government, and might be punished in the future under some alleged violation of some yet unforeseen legislation. During the course of my fieldwork, I was informed by some teachers that in the first year when this 'request' was made, the school dutifully obeyed. However, by the second and third year, the students would be asked to come out and pose for some *yoga* exercises for a few minutes and then go back to classes. One of the teachers who was proficient at computers would then create a new set of digital documents by putting a few genuine photographs initially, but most of the images and videos in the set were uploaded by 're-using' videos and photos from earlier years. All this teacher had to do was to change the time-stamps to reflect the current year

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[74] 'Yoga Day celebrations made mandatory in schools' (2016, June 9). *India Today*. Retrieved from: https://www.indiatoday.in/education-today/news/story/international-yoga-day-in-schools-13241-2016-06-09

and date. It was not clear whether the management was aware of this manipulation of videos and photographs, but the teachers who had managed to do this figured that if hundreds of thousands of schools across Chhattisgarh and across India have been asked to upload evidence, it would be practically impossible for a handful of officials in the central government to go through the millions of photographs and verify their authenticity.

As with the case of the biometric tablet, the overall regime of governmentality invites (Banaji, 2006) subjects to engage in infrastructural practices. In the process of engaging with these practices, subjects negotiate their stance depending on what is possible. As both these examples illustrate, administrators and those subject to administration have a range of views and positions implying that the processes and practices of governmentality are not always neatly translated from top to bottom. Further, the exercise of authority is simultaneously riddled with anxieties and moral panics that are historical in nature. Regimes of governmentality that are digitally mediated are by no means 'airtight' as assumed in popular discourse leaving subjects no space to negotiate. As with analogue practices of governmentality, there are always leakages to be exploited and subverted. One could 'zoom in' further and discover that perhaps students are also finding their own ways to subvert the imposition to do *yoga* exercises by only doing them half-heartedly, faking illness and so on. However, what is *not* open to debate is the legitimacy of the practices themselves, their role in reminding the multitude of citizens of the ruling Hindutva regime and its ubiquitous authority, and their subsequent mediation (documenting through photo and video, uploading to the government website). This is because digitalised governmentality exerts authority not in the name of disciplining subjects but in the name of improving them with the *telos* of good health, moral improvement, efficiency and so on. In this context, apparently counter-hegemonic negotiations (along with processes of subject construction) may end up reinforcing the telos even as negotiations and subversions provide dispersions and set up boundaries of acting within the telos of governmentality.

5.4 Modes and processes of subject construction in caste-structured society

During my field work, I used to 'hang out' frequently with a group of young and middle-aged men who were all mostly dominant caste Hindus and work in various businesses and

professional roles in Ambikapur. One is a real estate dealer, another works in the real estate construction business. A couple of them are teachers in public and/or private schools and colleges. Some of the older members of this group are retired. A few of them are salespersons for pharmaceutical companies, while some of them own stationery or computer parts, or mobile phone repair shops. The routine was the same – they meet at one tea shop on one of the main roads of the commercial market thrice during the day - in the morning, afternoon and then again in the evening. Sometimes, for no obvious reason there would be more than 15-20 people while on other days, most members would be busy and only two or three would appear at the tea shop. Most of them are earning good money (compared to the majority of citizens I met during my stay in Ambikapur) – easily above 50,000 Indian Rupees (approximately 720 US Dollars in mid-2018) per month and have no real compulsions or urgency in their daily activities. They all belonged to Ambikapur, grew up in the city and therefore could be said to have tremendous cultural capital alongside their secure financial positions. Most of these men knew on a first name basis virtually everyone in the administration, courts, police force, not just in Ambikapur but in Surguja and sometimes even across the state of Chhattisgarh. In fact, it is through this group of friends that I easily got research access to the bureaucracy and to a wide range of people working in the state.

To my surprise, most of these men did not express much care about or interest in the internet. As far as I could see, most of them used internet infrastructure to change their personal modes of life and sociality through mobile phones and applications such as Facebook, Instagram and cross-platform applications such as WhatsApp. The older members in the group bemoaned the stupidity of smartphones and wished to bring back the bygone era of discussions of Hindi literature, poetry and politics. One of them did use the internet to look for books on poetry and literature, or specialised canvases and paintbrushes for his art – equipment and material that was not available in Ambikapur – while another used the internet to download European art cinema and to post political content (critical of the BJP) on social media networks. However, these two were the outliers amongst the group, for they actively seek out other life-worlds to which there was absolutely no access in Ambikapur.

While their physical bodies were caught up in the humdrum of daily life in a small city (and it is easy to see it as humdrum when one has caste, cultural and economic capital), internet infrastructure (especially broadband access and digital literacy on figuring out niche websites, using social media, piracy tools for downloading movies etc.) provided them with a portal to alternative life-worlds. In these outlier individuals, the process of subject construction with respect to internet infrastructure was double-edged. Access to virtual life worlds was liberating, like leading a double life where the private mediated life provided enjoyment, solace and an outlet for that part of them which had no outlet in the offline world. At the same time, this very same virtual life seemed to exacerbate the 'disconnect' they experienced with offline social networks – the people they had grown up with, the people they knew better than anyone else, and the people they knew would be their companions for life – for better or for worse.

However, as far as I could see, most people in this local elite group of men were either interested in discussing the politics of their WhatsApp groups or sharing pictures of their family and friends, or selfies which they had posted on Facebook. For example, they had started a WhatsApp group called "Friends Forever". In this group, the same people who would meet sometimes thrice a day in a tea shop, would perform sociality for the benefit of the larger WhatsApp group. In this group, sides would be taken against some and in favour of others, 'fights' would occur over banal issues (for example, 'why wasn't I invited to X's birthday party') and then compromises made to resolve the disagreement. Snide remarks were made against some while others were praised. In the physical space of the tea shop, most people would endlessly discuss the chatter and banter of the WhatsApp group and complain about each other's online behaviour or tease each other. And then the conversations in the tea shop would find their way back into the WhatsApp group. An everyday circular sociality had formed around this extremely male-centric group. These sets of everyday practices – selfies, sharing information and messaging on WhatsApp etc. had little overt impact on their economic or cultural situation on a daily basis. Elsewhere, I have argued that along with such relatively benign everyday practices, local elites are highly likely to share misinformation and disinformation, especially during charged occasions (elections, religious festivals, cross-border conflicts) resulting in mob violence against Muslims, Dalits and Adivasis (Banaji & Bhat, 2019).

Most of them were already absolutely dominant in Ambikapur through their caste position, their (offline) social networks and the extent to which these networks were embedded in government and business structures in Ambikapur. Everything that I observed and everything that they told me indicates that the internet had nothing to do with this dominance and neither was the internet required to sustain it in the near future. What mattered was their social networks based on caste, which were then reflected in terms of occupation, or spatial logics – as neighbours, friends and so on. If internet infrastructure appeared at all, it would be superimposed on pre-existing offline modes of sociality and dominance, and thus their digital footprint would work to *reinforce* offline dominance. Every time I brought up the subject of my research with them, they would always direct me to the villages where I could ask about these things with the Adivasis, but we rarely if ever discussed what the presence or absence of internet infrastructures meant for them. This is not to suggest that they were reluctant to disclose their thoughts on the subject. It was more the case that they had not thought about their own subject positions with respect to internet infrastructure. If they had ever thought about internet infrastructure at all, it was as bystanders – internet connectivity, internet infrastructure, the discourse of development – all of this was meant for others who lived and suffered elsewhere.

A young man, the son of one of my key informants was interested in buying a tablet to read digital books. He had ordered some e-books on Amazon and had downloaded some free publications already. He was not sure which tablet had the best characteristics for the price he was willing to pay. To make matters worse, he bemoaned the fact that there were no proper distribution, storage and other logistical systems for online delivery of goods in Ambikapur. His order on Amazon would take weeks to arrive. A few days later, he was scanning a few different identity cards, and uploading them to a service called DigiLocker, a digital locker service provided by the central government under the banner of 'Digital India'[75]. In order to upload his own documents digitally as well as to store digital documents

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[75] Nikhil Agarwal. 'What is DigiLocker and how to use it to carry all documents on your mobile phone'. (2018, August 10). *Livemint.* Retrieved from: https://www.livemint.com/Technology/vt7Sx2J2DTaoyVpMqsRxiM/What-is-DigiLocker-and-how-to-use-it-to-carry-all-documents.html

sent by government agencies, he had to link his digital locker with his *Aadhaar* (biometric identification) details. On the one hand, this would mean that his documents were apparently secure and that there would be less paperwork, but on the other hand, his personal data and hence his privacy were now vulnerable on yet another government platform.

Another young woman, just starting her Master's degree in a college situated in the capital city of Raipur shared the complexities of negotiating with a host of smartphone applications. She had more than 10 applications that enabled messaging, moderating on discussion forums and posts, posting photographs, posting text and so on. She also had different sets of friends who would engage with her on specific applications, so she would often juggle between several applications through the day, whilst managing different groups of people – ranging from family and friends to study groups in her university. There were several other things on her mind – the difficulties and the excitement of life in a large public university, meeting students from other backgrounds, the sexism, indifference and academic incompetence from her teachers and administrators but also the freedom to stay up till late in the night and explore romantic relationships and her own sexuality.

In the case of these two young middle-class subjects, both of their subjective attention is significantly invested in online life. Like the media-rich teens and young people discussed by Banaji (2017), they were familiar with memes and jokes about *Game of Thrones*, and with the latest sporting news from around the world, and with political news from across the country. Both of them would spend significant amounts of time on their digital devices chatting with their peers and discussing all elements of their life, their dreams and aspirations. In contrast they were alienated from what has happening in the villages merely 10-15 kilometres away from their homes. Their everyday practices of using their phones and other digital devices generated new kinds of anxieties (about privacy for example) but also generated or promised to generate new kinds of freedoms (exploring sexuality or polyamorous relationships). These anxieties and freedoms were present with even other non-Adivasi groups in Ambikapur. In contrast to my account in the previous section, internet infrastructure here was entangled with processes of subject construction that involved using public and private infrastructure (both physical and virtual). For these well-to-do young city

folk, subject construction processes were tied to the global public sphere (for example, they were 'interpellated' by the global discourses on the individual subject whose privacy was at risk) whilst simultaneously negotiating with local challenges (relations with peers, local convenience, logistical flows, contrasting their own situation with their imagined counterparts in other bigger cities in India or indeed other parts of the world). It is unsurprising that subject construction processes of this type are much more tightly integrated with wider and more global media and technoscapes (Appadurai, 1990; Banaji, 2017)

5.5 Subjectivities at the margins

Both of the young people discussed in the Section 5.4 are from upper middle class and dominant caste families. The situation is slightly different for religious minorities such as Muslims and Christians. These minorities, regardless of their class, was much more aware of their position *in relation* to the caste-structured Hindu majority society. All processes of subject construction, including processes entangled with internet infrastructure, took place in the backdrop of this majority-minority power relations. I also met with caste-Hindus but who were either from a lower middle or lower class and struggling to make a living. In interactions with lower-class caste Hindus most of them had an aspirational attitude towards internet infrastructure and its promise, although they were clear the benefits would materialise for their children. When it came to their own position, they became more melancholic and philosophical. They had spent decades toiling away without any real transformation in their material conditions. The toil of daily social reproduction had put them in a sort of long-durée meditative state where they had got used to stasis. Life from their perspective was unchanging and repetitive. I interacted with people who sold tea or were helpers in these shops, or managed small cigarette shops on the streets for many years. They had small basic phones and could make and receive calls. However, their economic income and expenses ran on daily calculations, and their families were still living in villages far away from Ambikapur, while they had come to the city to earn money. They had arrived at a more or less stable rhythm of social reproduction even as they hoped that their children or grandchildren would break out of the cycle of poverty and struggle. For this class, life was mostly analogue and internet infrastructure was outside the ambit of their

daily lives and experiences except basic mobile telecommunications. One of them shared a story about getting disoriented and losing his way back to his village because the bus stop had changed to half a mile ahead of the old bus stop.

In many ways, Ambikapur city was, as Lefebvre (1991, p. 86) once described it, a socially produced space akin to the flaky *mille-feuille* pastry, with multiple social spaces interpenetrated and superimposed on each other. There exist multiple older forms of sociality, media and communication networks, spatial logics, community networks upon which digital and communicative infrastructures were superimposed – and not always neatly. For example, at the main market road where I would 'hang out' with the 'upper' caste group at a tea shop, there was an old book store where students would still come to get a photocopy of an entrance or application form for a government job and would ask the shopkeeper to explain the paperwork required and whether they would be eligible for the job. Opposite the bookshop was a theatre which would be frequented by families and young couples who would come in droves every time the latest Bollywood film was released. Next to the theatre was a recently built supermarket with the latest fashionable foodstuffs advertised on television but now available in their city. While my respondents would be chatting away on their smartphones, there would be a regular stream of cyclists who would put up a small billboard with the name and address of a local business or a local candidate standing for elections, on their cycles lit up with a tube light and he would cycle slowly up and down the main market street – an old form of advertising operating at a much slower space.

Figure 7: A cyclist advertises for a BJP candidate in Ambikapur

On more than one occasion, upon hearing my research topic and that I was from a UK university, I was invited to the humble homes of some of my respondents where they would show a desktop computer they had brought by saving up money over the years. Their children or grandchildren would use it to train themselves and set up a career in a big city. The computer always occupied pride of place in their homes – a sacral object. My inspection was a moment of pride and anxiety for them and I would be asked to judge whether the computer was good enough for their children. It was a powerful reminder that although I could provide a nuanced explanation of the social construction of technology, power flows, the discursive regime that framed how technology materialised and functioned and so on, when faced with the object in the intimate space of a home, and the atmosphere charged and suffused with expectations of a family with high hopes – I found it difficult to speak. Our meetings always ended with my rather lame evaluation of the computer's technical specifications and some advice on whether the operating system needed an upgrade or whether a set of speakers would be helpful or some such advice. As a social science

researcher with all my privilege and knowledge about critique of infrastructure, it seemed too cruel to interfere in their life worlds beyond a certain point. Every interaction of this sort was an echo of the discourse on social emancipation of technology voiced by technologists like Sam Pitroda as well as policy and political discourse by the Congress and BJP since the 1980s through various iterations as I have illustrated in Chapter 4. Whether my informants' children would leapfrog poverty or not only time would tell. Meanwhile, these material objects of internet infrastructure were conduits of hope in the otherwise difficult life worlds of the lower classes.

One of my key informants was AK, an upper middle-class middle-aged Muslim man in Ambikapur. He had two jobs – one as the owner of a small shop which he ran from late afternoon till evening. In the mornings he would teach at a college in Ambikapur. AK saw himself as a modern Muslim in a society that increasingly accepted a majoritarian Hindutva as the status quo. In his classrooms, he said he would encounter young Muslim students who were ambiguous about their faith. In the class, AK would urge them to learn about the technicalities of the computer so they could earn money for themselves and their families by becoming participants in a modern technology-led economy. He also saw the teaching of computer science as an honourable profession through which, he was furthering the promise held out by secular modern science based on rational facts. The promissory appeal of these technologies is particularly effective since the banal objects of internet infrastructure appear to be *secular* objects that are available for the emancipation of all people and not just the privileged caste-Hindu majority.

As AK saw it, the task of reformism was split and *internal* to each religious community. It should be the Hindus who should hold the majoritarian politics of the BJP to account, while the Muslims should try to modernize themselves without blaming the BJP or the Hindus for all their social problems. Everyday AK would post a series of posts on Facebook directly challenging the local *Maulana* (local religious scholar who has both formal and informal authority over believers, often seen as representatives of Muslims amongst Hindus). The internet itself was a significant site of debate:

The cassettes were crucial, during the 1980s and 1990s, to getting song and dance to travel widely in the Muslim community – just as with any other community. This was seen as a problem by many Maulanas. Today with the internet, the Maulanas again have a problem. For example, when we die, we believe that a *Farishta* (angel) appears to us and asks us the crucial questions – who are we, what is our name, what is our family lineage, what good work have we done, what bad deeds have we done and so on. Recently a Maulana said that Muslims must remember this time of judgment that all of us have to face. During this time of questioning, no Muslim will have access to Google. We have to find the answers within ourselves. Now these kinds of things really irritate me. They don't like the fact that even women can access the internet and see all kinds of things online. People are using WhatsApp and Facebook to chat and see videos, and music and all kinds of things. I have to respond and provide young Muslims with another perspective. I get a lot of abuse from my own community, but I don't care much about it. (*Interview with AK, 7th July, 2018, Ambikapur, Chhattisgarh*)

In his study of Hausa Muslims in northern Nigeria, Brian Larkin (2008) points out a similar tension emerging during colonial rule. Media technologies and infrastructures, such as cinema theatres[76] posed new challenges – for example, the intermingling of men and women in the same physical space without supervision, or the portrayal of romantic and sexual pleasure for public consumption, or the suggestion that modern medicine can cure illness thought to be beyond human cure and so on. Media technologies and infrastructures threatened to undermine the scriptural authority of the holy texts as well as the personal authority of the religious scholars and leaders who were representatives of the Muslims as a coherent religious community. AK seemed to hint that the spread of internet amongst Muslims was perceived as a threat to the authority of the *Maulanas* (religious scholars who exert religious and social authority) although AK was not sure how these tensions within the Muslim communities in India would play out in the future. This is because the specific

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[76] S V Srinivas. 'Is there a Public in the Cinema Hall?' (2002). Volume 42. *Framework*. Retrieved from: https://8ba99043-46ef-443e-8e66-bc36ac01fd7b.filesusr.com/ugd/32cb69_95584ff57df547febaf04c3e0bafa3fc.pdf

tensions generated by the advent of sophisticated internet infrastructure were overshadowed by national and state level political changes – namely the increasing success of the BJP and therefore by implication, the increasing social acceptance of hardline majoritarian Hindutva based largely on structural discrimination, increasing violence and interpersonal hate against Muslims.

For AK, it seemed an uphill task to modernise Muslim communities through science and technology when the majority of the society was bent on hating them. In such a majoritarian society, he felt that most Muslims would tend to fall back on their religious subjectivity – including on adherence to religious rituals, religious scholarship, religion-based intermingling, discussion and so on. Since late 2018, after the BJP lost the state-level elections in Chhattisgarh, AK has become much more vocal in his criticism against the BJP and its politics of religious majoritarianism both online and offline. In a city surrounded by dominant caste Hindus, he is rarely taken seriously. It appears that the historical social-cultural-political relations of AK (and other Muslims like him) to dominant castes in Ambikapur severely constrain any radical possibilities that internet infrastructures could bring for challenging orthodoxies in Hindu and Muslim groups. Unlike the Hausas of northern Nigeria, the Muslims of Ambikapur are a suppressed minority and their struggles over processes of subjectivation have so far gained little traction with respect to the broader social and political dynamics. This is at least partly because the broad social-political dynamic has been technologically reconfigured by the BJP state government to defeat any potential Adivasi opposition to continued power in government.

5.6 Intimate infrastructures: From the state to the home

The large-scale internet infrastructures in Ambikapur and indeed in the whole state of Chhattisgarh, were a project of reconfiguring the old politics based on historical forms of subjectivity. In the new configuration, the BJP used internet infrastructure to reconstitute roughly five and half million people as 'students and women beneficiaries' so that together, this new demographic would numerically outdo any specific caste or Adivasi based opposition.

In August 2018, the BJP ruling government in Chhattisgarh led by Raman Singh stepped up the campaign for state elections due in December 2018. The chief highlight of the campaign was the *Sanchar Kranti Yojana* (SKY) or the Information Revolution Scheme. The state government proudly announced that 10 billion Indian rupees was dedicated to this scheme (approximately 150 million US dollars). As part of the scheme, the government would hand out five and half million smart phones to college going students and to all women of the state of Chhattisgarh. In other words, the government estimated that there are five and half million women and college students and targeted all of them. This was a bold attempt to interpellate the hitherto alienated members of the state population in new ways – to an acknowledgement that young people (as first-time voters) and women voters of all ages, hailed as groups with specific identities and needs, would be more likely to transcend their political subjectivity as members of historically discriminated groups of Adivasis and/or their specific caste loyalties. The BJP assumed that as beneficiaries of a digital revolution through the SKY scheme, their allegiance would be then to vote for the BJP, outweighing any alternative political choice based on other subjectivities – including Adivasi subjectivity, language group, district, local issues, profession and so on.

Before the scheme was announced, the government had sought Expressions of Interest (EoI) from various telecommunication service providers. Curiously, no one entered a bid to provide services for this scheme even though it meant a captive subscriber base of five and a half million. Not even the public telecommunications service provider BSNL entered a bid. After two failed bidding rounds, in the third round the state government voluntarily selected the Ambani-owned Jio as the partner. The phones themselves were manufactured by Micromax – an Indian manufacturer of smartphones with a nascent but growing market in South Asia. As per the SKY scheme, the government would hand out a smartphone loaded with a Jio SIM card. The Jio SIM card would be 4G enabled and each subscriber would have free data and voice calls for the first six months – from July to December 2018 – just until the elections were completed.

Figure 8: Billboard for the SKY scheme, Ambikapur

In the months before the elections, the scheme was heavily advertised with large billboards across the city of Ambikapur (see Figure 8 above). Most of the billboards focused on showcasing women and young people as the main beneficiaries. Just as it happens on the national scale with photos of Narendra Modi and Amit Shah, the state elections highlighted the face of the chief minister Raman Singh for all the campaign and publicity material. This was presidential-style personality-driven politics enabled precisely through internet infrastructure operationalised by schemes such as the Information Revolution Scheme (known as SKY). In such a conception of politics, the person at the top of the political system, Dr. Raman Singh, the chief minister would be available to the very lowliest citizens on the ground. This apparent shift in politics was rhetorically grounded in infrastructural practices. This began with the question of financing and distribution.

First the Raman Singh-led BJP government wanted to finance the scheme by appropriating money meant for development of the *Gram Panchayats*. When there was widespread

protest even within the BJP about this move, Raman Singh decided to return the money already borrowed from the amount earmarked for the *Panchayats* and instead fund the new scheme from the central pool available for the state budget. Second, the state government handed out the task of implementing the project to a quasi-state organisation called the Chhattisgarh Infotech Promotion Society (CHIPS) mentioned in section 5.3 of this chapter. This public but corporate-minded organisation depended on the Village Level Entrepreneur (VLE) as a crucial node to distribute smartphones even to the remotest corners of the state.

Each *Panchayat* (village government) had previously employed a Village Level Entrepreneur (VLE) who used to provide government-related services at the *Panchayat* office. The state government used to pay them a monthly salary of Rupees 5000 (approximately 70 US dollars). Since early 2018, the state government had stopped salary payments and instead asked all VLEs to earn their salary through commissions on a series of services that they would provide. For example, the VLEs were tasked by the government with taking charge of the distribution of smartphones under the SKY scheme. For each 'camp' in which phones were distributed to eligible voters, the VLE would get paid a certain amount. Most of the VLEs had obtained loans from the bank to buy a desktop computer and they had connected these computers and were authorised by each Panchayat to provide government services. With no warning or negotiation from the state, the VLEs were forced to accept ad hoc contracts such as the SKY scheme for their survival.

As part of my fieldwork, I spoke to approximately 20 VLEs across Surguja district. Demoralised by the government moves, some of them had already quit their previous jobs working with village governance systems to try their luck in the private sector, whereas others were considering forming a union and putting pressure on the government even though these VLEs were pessimistic about reversing their situation. The distribution of the phones under SKY required beneficiaries to provide their biometric identification number (called the *Aadhaar* number). Ostensibly, the government wanted to ensure that one eligible voter would only get one smartphone. In effect however, one could say that it was existing and new internet infrastructure (i.e. *Aadhaar* cards, Jio SIM cards, extensive Jio telecom networks and spectrum across Chhattisgarh and the Micromax smartphone) that

enabled a specific transaction between subjects and the state. Eligible beneficiaries, in exchange for submitting their biometric identity, a six-digit number, received a gift of a smartphone that pledged to 'empower' them through a promised free flow of information.

Each phone was packaged in a box with the face of Raman Singh prominently displayed on it (see Figure 9 below). Each phone when loaded had a Raman Singh BJP app pre-loaded on the phone. This app contained various speeches of Raman Singh as well as supposedly inspirational messages from him addressed to the beneficiary. The central government with BJP's Narendra Modi as Prime Minister had started the practice of addressing the nation through the public radio in a monthly address called *Mann Ki Baat* (loosely translated as Matters of the Heart). Raman Singh in Chhattisgarh copied the same aesthetics with an address called *Raman Ke Goth* (loosely translated as 'Raman Talk'). These radio broadcasts not only invoked the Modi-led BJP style of governance, but also reaffirmed the centralised and personality driven politics in the state of Chhattisgarh. Now these radio broadcasts of both the chief minister and the prime minister were also available on the phone, loaded on the Raman Singh app and the Modi app respectively.

Governmentality, the space of the state in terms of exerting its political authority was patently manifest in these technological relations. These relations attempted to interpellate significant parts of the population as secular subjects, specifically as students and women, and simultaneously flatten out previously important subject positions – specific Adivasi group, language, caste and so on. Such a hoped-for transformation of subjectivity required validation and was interlinked with other infrastructure – both human, institutional and technical, such as the use of Village Level Entrepreneurs and the Aadhaar card. However, these assigned subject positions constituted through practices of governmentality and internet infrastructure were not always accepted. They were questioned, subverted and negotiated, even partly rejected in the state of Chhattisgarh.

Figure 9: The SKY box, Ambikapur

The SKY scheme, for instance, was discussed by all the people I met in the course of my fieldwork. The dominant caste groups, all of whom already had one and sometimes two smartphones, dismissed the scheme, although many of them were trying to figure out how to buy these phones off poor students for a cheap price, or to get the women in their houses or in their social networks to line up and get a free phone. Moreover, most of my respondents in Ambikapur remarked that they perceived the SKY scheme for what it was - a desperate attempt to bribe the voters after having failed to deliver 'development' to the state for three terms.

For the dominant castes of Ambikapur, development was expressed in specific infrastructural forms. They were not happy with the state of the roads, they were not happy about government employees not getting regularised (such as government school and college teachers), and they were not happy that in spite of being an electricity surplus state, since June 2018 Ambikapur city had begun to experience regular power cuts for at least three to four hours every day since June 2018. Historically, the Surguja district of Chhattisgarh has voted for Mr. T.S Singhdeo, a Congress leader and a member of the royal family from this region. Mr. Singhdeo still owned large plots of land stretching across the region, and owns multiple cinema theatres, shops and other commercial establishments in

Ambikapur additional to his ownership of rural land in villages surrounding Ambikapur. However, the city of Ambikapur itself, given that it was controlled by dominant and largely business-based castes, was biased towards the BJP. In the end, the SKY scheme sought to flatten out these nuances and win over crucial segments of potential Congress party voters (youth and women) to win a fourth term of power. This time, the BJP did not succeed. On the contrary, the BJP suffered its biggest electoral setback in recent times at the state-election level (see Figure 10 below).
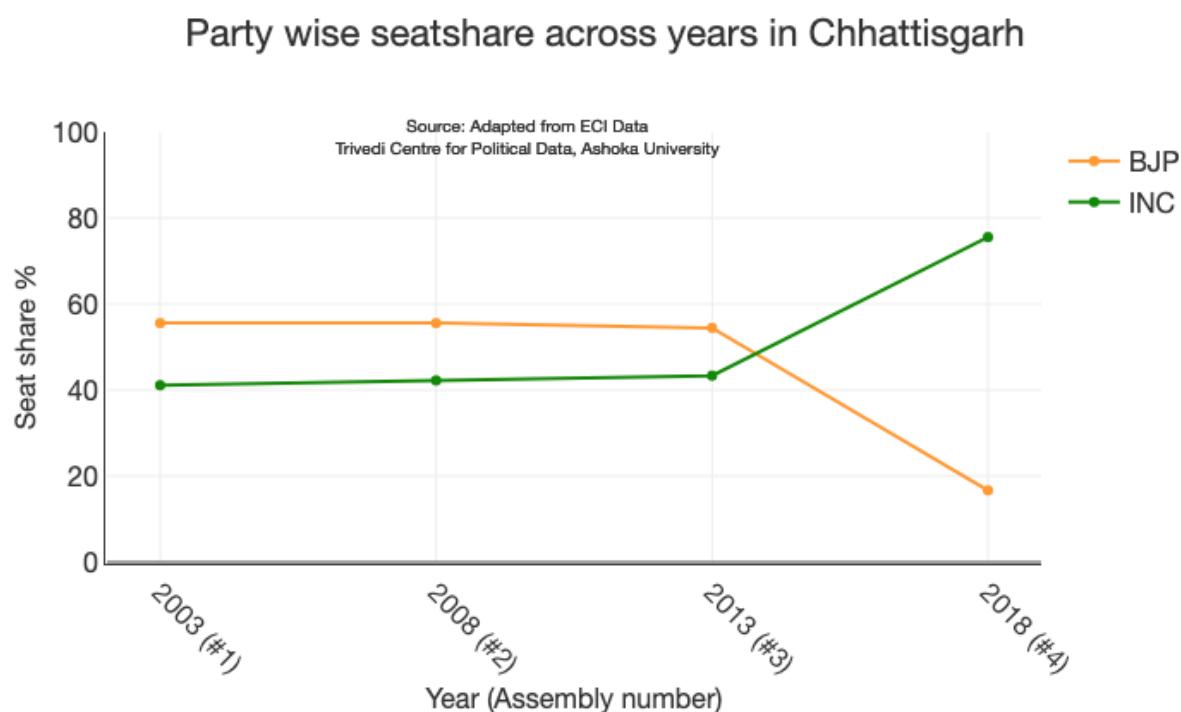
Figure 10: 2018 Chhattisgarh assembly election results

Although the dependence of the BJP on the SKY scheme did not yield electoral dividends, it would be a mistake to underestimate the importance of such efforts with regard to politics and social life, not just in Chhattisgarh but more widely across the country, where the BJP was returned to power with an increased majority in the national elections held in May 2019. I argue that internet infrastructure has in fact played a crucial and increasingly central role in redefining state-subject relations, and hence shapes the terrain and aesthetics of political contestation in India.

5.7 Digital governmentality: Reconfiguring old subjectivities and state effects

Since 2003-04, India witnessed a boom in mobile phone subscriptions which was followed by the Congress-led United Progressive Alliance – 2 (UPA -2) government introduction of the idea of a biometric identification scheme called the *Aadhaar* card. This scheme was never fully implemented under the Congress-led United Progressive Alliance government. However, since the BJP came to power in 2014, the central government has taken the basic legal and infrastructural work done by the previous regime and transformed it completely to make biometric identification and technologised identification, surveillance, categorisation, information and communication the centrepiece of Modi's political programme. As I have argued in Chapter 4, the BJP's Narendra Modi and his advisors not only accelerated the National Optical Fibre Network (NOFN) inherited from the previous Congress government by rechristening it *Bharat Net*, they also widened the scope of technologising the state by constellating a wide range of technological transformations of state functions and institutions through an architecture which Modi touts as 'Digital India'. This architecture of Digital India first appeared through the trinity of JAM: *Jan Dhan* (public wealth) bank accounts, *Aadhaar* biometric card and mobile phone number referenced earlier in Chapter 4, Section 4.9.

To recap the discussion on the so-called JAM trinity, the BJP's social engineering rests on the so-called JAM trinity that comprises of *Jan Dhan* bank account (a zero-balance bank account promoted for the poor by the Modi government), the Aadhaar biometric identification and the mobile phone number. Essentially, each individual would now be a triangulated data point produced by three numbers – a *Jan Dhan* bank account number, an Aadhaar number and mobile phone number. The idea was first introduced by the Economic Survey in 2014-15 and as early as 2016, the then Finance Minister, Mr. Arun Jaitley said that the database of 1.2 billion bank accounts, when linked with 900 million mobile phones and about 1 billion Aadhaar numbers would effectively ensure that subsidies would reach the needy without duplication, leakage, corruption etc. (Mishra, 2016).

With this JAM trinity as the infrastructural base, the Modi government was able to start and propagate a wide variety of welfare schemes that were aimed at specific groups across the

country. The important schemes were the *Pradhan Mantri Fasal Bima Yojana* (Prime Minister Crop Insurance Scheme) for farmers, the *Sahaj Bijli Har Ghar Yojana* or the *Saubhagya* Scheme – a scheme were households below the poverty line could access electrification and sought to target over 40 million families across the country (Bhaskar, 2017). The *Ujwala* scheme where approximately 50,000,000 gas cylinders with Liquefied Petroleum Gas (LPG) was given away over three years to families below the poverty line by cash transfer of Rs. 1600 (roughly 23 US dollars) to each household per connection[77]. In mid-2019, 2,691,125 LPG connections had been released in the state of Chhattisgarh[78]. Finally, the two other significant schemes were the *Pradhan Mantri Awaas Yojana – Gramin* (the Prime Minister Rural Housing Scheme) and the *Swachh Bharat* scheme (the Clean India scheme). In the scheme for rural housing, the Ministry for Rural Development had a target of 788,235 houses for Chhattisgarh, whereas the actual registered houses to be built were 885,442[79]. Chhattisgarh has one of the highest number of houses built across the country, with the other high-performing states being the crucial states in the so-called Hindi belt and electorally important states like West Bengal and Orissa (where the BJP hoped to gain seats in the national elections of 2019).

These schemes not only rested on the JAM infrastructure of bank account, biometrics and mobile phone number, but also used older infrastructures such as the Social Economic and Caste Census last conducted in 2011. For example, this Census provided the official numbers of households below poverty line so that the BJP-led government could transfer cash for LPG cylinders only to those households. Further, schemes like the rural housing scheme *Awaas Yojana – Gramin* had a highly sophisticated workflow and itself brought about the use of many other infrastructures. The rural housing scheme manual states:

> Programme implementation and monitoring is to be carried out through an end-to-end e-governance model, using AwaasSoft and AwaasApp. While AwaasSoft is a workflow enabled, web-enabled electronic service delivery platform through which

[77] Ujjwala scheme Website. Retrieved from: http://www.pmujjwalayojana.com/about.html.
[78] Retrieved from: http://www.pmujjwalayojana.com/released-connections.html.
[79] Retrieved from: https://rhreporting.nic.in/netiay/PhysicalProgressReport/physicalprogressreport.aspx.

all critical functions of PMAY-G, right from identification of beneficiary to providing construction linked assistance (through PFMS), will be carried out; AwaasApp – a mobile application is to be used to monitor real time, evidence-based progress of house construction through date and time stamped and georeferenced photographs of the house. All payments to beneficiaries are to be through Direct Beneficiary Transfer (DBT) to beneficiary's Bank/Post office accounts registered in AwaasSoft Management Information System (MIS) (*ix, Executive Summary, Framework for Implementation, PMAY-Gramin*[80])

As Scott (1998) has pointed out, 'seeing like a state' involves a complex interplay, a coincidence of four aspects: the administrative ordering of state and society; a high-modernist ideology borrowing from the legitimacy of science and technology; an authoritarian state and a prostrate civil society that lacks the capacity to resist the state. As we have seen in this chapter and as I will argue in the next chapter, resistance is a complex phenomenon and process, whether by civil society or by social groups. Certainly, there is negotiation and struggle, but there is also the reproduction of the foundational logics of administrative ordering and the (digitalised and communicative) high modernist ideologies of the state.

The architecture of the JAM trinity which further feeds into other complex architectures enabling cash transfers under various schemes is highly dependent on the operationalisation of internet infrastructures – including institutional, financial, human and administrative structures for the smooth delivery of targeted benefits to select groups or individuals. This architecture, as I have noted in Chapter 4, Section 4.8, is only possible if the 'seeing like a state' is positioned as a 'view from above'. Although the architecture of digital governmentality is designed keeping in mind an aerial view of the nation state constituted by technological relations, the unique aspect of the technological relations is that it permeates, or at least supposed to permeate to the 'last mile' – that conceptual and geographical space that has hitherto eluded both state and civil society. In the course of my

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[80] Pradhan Mantri Awaas Yojana – Gramin website. Retrieved from: https://pmayg.nic.in/netiay/Uploaded/English_Book_Final.pdf.

field work, I visited multiple *Panchayat* offices where the list of beneficiaries of the rural housing scheme were displayed on the walls (see Figure 11 below).

Figure 11: Beneficiaries of rural housing displayed at a Panchayat office

Although this did not necessarily pay off in the 2018 Chhattisgarh state-level elections, across India, the announcement of welfare schemes involving direct cash transfers to targeted populations has not only paid rich electoral dividends for the BJP[81], it has also created a discourse where the BJP is able to claim that through Digital India, the prime minister is creating a new kind of nationalism where religious, ethnic or any other kind of distinctive subjectivity matters less than a direct connection to a strong central government. As seen in Figure 11 above, this discourse is manifested in the various infrastructural

[81] Louise Tillin, 'Do government's welfare schemes influence the patterns of voting?' *Hindustan Times*. (December 6, 2019). Retrieved from: https://www.hindustantimes.com/analysis/do-government-s-welfare-schemes-influence-the-patterns-of-voting/story-MG7M07QT6AL6zwJziUI91N.html

systems used to operationalise this new nationalism. The wall painting is a list of 126 beneficiaries with their names printed along with their caste status (all 126 of them are Scheduled Castes), and next to their caste status is their PMAY ID – the unique identifier as per the housing scheme. In this way, each individual is known to the state in terms of their distinctive subjective position (caste status or in other instances their profession – as farmers, or their income etc.) but that information is simultaneously accompanied by a secular subjectivity – a unique identifier number that supposedly flattens out any distinctive subjectivity. In the Panchayat system, a local person called *Aawaas Mitr* (Housing Friend) is recruited on contract. His (the person recruited is predominantly male) job is to photograph completion of the house at every stage and then upload these time-stamped photographs to the central government ministry website. As long as the *Awaas Mitr* 'cooperates' with the secretary, the evidence is produced or delayed or goes missing as and when desired.

In reality, this kind of infrastructural politics has enabled the BJP to redefine politics based on extremely precise targeting. Earlier modes of political campaigning and expenditure would focus mostly on blanket sops for entire groups of people along with political rhetoric designed to appeal to that group's distinctive subjectivity and demands. Under the new logic of digital governmentality, the government bureaucracy already has precise data on which kinds of social groups can be sent benefits under which kind of scheme in ways that will gain the maximum electoral benefit to the ruling party.

To clarify, my objective here is not an investigative exposure of corruption when the BJP claims transparent and efficient government through Digital India. Neither is my objective a moral condemnation of corruption in politics. Corruption has always existed in Indian politics and has complex consequences that cannot be easily morally judged. My objective here is to describe how the political system retains its essential features in and through digital and communicative infrastructure. These essential features are expropriation of surplus value by non-Adivasi groups – whether it is from mining (as the next chapter will show) or in accessing government funds. The modes of expropriation in Digital India are to do with cash flow management (thereby forcing beneficiaries to go to select suppliers) and by retaining control over the local person who produces 'evidence' for the digital system.

5.8 Conclusion

In this chapter I have focused mostly on the city of Ambikapur in the northern part of Chhattisgarh. This city is the administrative headquarters for the district of Surguja and contains all the major institutions of the local and national government along with local elites who work in such institutions – including the institutions managing the National Optical Fibre Network. I have paid attention to a wide range of infrastructural practices as practiced by different individuals and social groups as they engage with internet infrastructure. These individuals include 'experts' in the bureaucracy and administration of internet infrastructure, specific 'user' groups such as teachers, political subject positions such as women, young people and so on. In the latter half of the chapter, I have showed how internet infrastructure is intimately entangled with processes of governmentality although not always with successful electoral dividends.

My third research question is concerned with the extent to which internet infrastructure plays a role in processes of individual and group subjectivation. Rather than a definitive truth-claim about Ambikapur and surrounding areas, I have provided a descriptive account of how pre-existing subject positions *incline* or provide a disposition for how internet infrastructures are imbricated in processes of subjectivation. For instance, local elites in urban areas by virtue of caste networks and employment in government entrench their moral superiority over supposed beneficiaries in rural areas through infrastructural practices such as setting of technical standards or fixing how internet infrastructure should be used (tele-medicine as opposed to downloading films).

School teachers as a social group seem to accept the telos of governmentality in principle while seeking to subvert processes of governmentality in practice. The state of Chhattisgarh, like many other states in India, show that processes of governmentality are no longer strictly confined to the state as conventionally imagined. New institutions such as CHIPS (Chhattisgarh Infotech Promotion Society) work in an 'adjunctive' way to exert what Mitchell (1999) has called 'state effects'. For subjects who are already facing social discrimination and symbolic if not physical violence, processes of subjectivation are experienced in relational terms. For example, Muslims in Ambikapur engage with internet

infrastructures with a different set of 'internal' objectives (reforming or modernising Muslims) and 'external' objectives (fighting Hindutva ideology, holding society at large accountable).

Through such infrastructural practices, I have also illustrated the ways in which processes of governmentality and subjectivation are changing. The technological mediation, centralisation and enumeration of welfare schemes suggests the emergence of a new architecture for the exercise of authority in India. The infrastructural practices are indissociably linked to state-subject relations and are likely to have played a huge role in the victory of the BJP in the national elections of 2019 even if the same strategy was not successful for the BJP in the state-level election of Chhattisgarh in 2018. Regardless of electoral outcomes in specific elections, I argue that the question of politics as a struggle for visibility, accountability, subsistence, power flow and so on is now *experienced* and *understood* in terms of infrastructural practices. With non-indigenous groups I have illustrated different processes of subjectivation as groups engage with infrastructure. The situation, as I discuss in Chapter Six, is quite different for indigenous groups, the Adivasis.

Chapter 6 Ghostly infrastructures, fractured temporalities: Processes of governmentality and subjectivation in Adivasi societies

6.1 Introduction

In this chapter, I explore the role played by internet infrastructure in processes of governmentality and subjectivation, specifically in Adivasi inhabited areas of Surguja district in Chhattisgarh. This is not to suggest that somehow Adivasis are ontologically different from other non-indigenous individuals and groups. Rather, I suspected before even beginning field work, that the subject position of Adivasi is a historically oppressed one, geographically based in areas that are valued for mineral deposits by the state and big capital and therefore might require separate empirical investigation.

This chapter like Chapter 5, is based on ethnographic participant observation and semi-structured interviews. Unlike the city of Ambikapur where I was staying with one of my informants, I had no place to stay in the Adivasi-inhabited areas. The rumours of child-kidnappers and organ harvesters made it impossible for me to stay overnight or even more than a few hours in any single village. Amidst such challenging conditions, I still collected data which I analyse to reveal that processes of governmentality and subjectivation for Adivasi groups are bound up in the *power geometries* (Massey, 2005) of differentiated spatialisation produced by coal mining.

In this chapter, I begin with the question of Adivasi subjectivity, including the question of whether such a distinct and cohesive subjectivity exists in the first place. This is a deeply political question and one which is rarely broached in the mainstream discourse in India, let alone internationally, despite the significant work on indigenous identities and subjectivities that has been done by South Asian, North American, Pacific Islander, Australian indigenous scholars (Anzaldúa, 1990; Coulthard, 2014; Knopf, 2015; MacNeill, 2014; Trask, 2005).

On the basis of my research I show that some Adivasis continue to invest in the promise of infrastructure articulating themselves in a position that can be called cruel optimism. As the scene of social action shifts closer to active mining areas, practices of governmentality and

subjectivation that appear inchoate with multiple beliefs, experiences and histories that underpin infrastructural practices such as the burning of voter or *Aadhaar* cards. In the absence of direct presence of internet infrastructure, I highlight infrastructural control as a *mode* of exerting authority both in epistemic and material terms.

I conclude the chapter by arguing that internet infrastructure is sometimes overdetermination by broader infrastructures (such as mining) that renders the familiar unfamiliar, producing a dynamic of social haunting. I will argue that silences and haunting are different registers of violence that call for transforming the conditions of social reproduction including epistemological transformation.

6.2 The question of Adivasi subjectivation

The inception of the state of Chhattisgarh in 2000 was based on the claim for a greater share – of mineral resources and symbolic as well as political recognition[82] for Adivasis, the indigenous inhabitants in the larger central Indian state of Madhya Pradesh. Chhattisgarh is a state with one of the highest levels of Adivasis relative to the total population, 36% of the total population. This largely indigenous region is geographically and psychologically so far away from the power centres in India (Delhi and the big erstwhile colonial centres now metropolitan cities) that written records and official histories are hard to come by or missing entirely. The official history or the lack of it notwithstanding, several of my Adivasi informants provided an account that is most commonly accepted in the region. They held that at some point until the 19th century, Adivasis lived here comfortably in the forests or had large tracts of land on which they practiced agriculture. Using false information about a threat, the local leader of the Adivasis was lured away to another site, and meanwhile, an upper caste Rajput family (from the warrior caste) killed the Adivasi leader's family, took over the land and proclaimed himself king. Since then, power has not gone back to the hands of the Adivasis. Initially, the traders and merchants would come with commodities that were of use but not available to adivasis – such as salt and sugar. In return, the merchants would take the *mahua* flower which could then be resold to other markets at

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[82] It is often the case that political representation of a social group (usually sub-caste or *jati*) leads to the greater penetration of that *jati* in the administrative and other state apparatuses which in turn enables that *jati* to redirect a greater share of material resources to its own members.

much higher value[83]. With time, the traders also offered commodities on credit and charged interest. Over time, deprived of the profits of their lands and forests, many Adivasi families became impoverished, and then debt-ridden and were forced to forfeit their lands when unable to repay their loans. In this way, the basic economic relationships between Adivasis and non-Adivasis have been characterised by expropriation and exploitation, and commonly understood as such even if this 'unofficial' grassroots history finds little or no place in mainstream history or other kinds of discourse.

Marx argued that colonial beginnings of capitalism are intimately connected to 'primitive accumulation', especially faced by indigenous populations across the world:

> The discovery of gold and silver in America, the extirpation, enslavement and entombment in mines of the aboriginal population, the beginning of the conquest and looting of the East Indies, the turning of Africa into a warren for the commercial hunting of black-skins, signalled the rosy dawn of the era of capitalist production. These idyllic proceedings are the chief moments of primitive accumulation...the different moments of primitive accumulation...all employ the power of the state, the concentrated and organised force of society, to hasten, hot-house fashion, the process of transformation of the feudal modes of production into the capitalist mode, and to shorten the transition. Force is the midwife of every old society pregnant with a new one. It is itself an economic power (Marx, [1867] 1990)

'Primitive accumulation' as a conceptual category seems almost but not quite to describe the extractive and brutal relations between a power-hungry state in the hands of a 'upper-caste' society and the Adivasis. Indeed, this conceptual category comes with its own dangers, for it plots oppression as one step in the dialectical movement of history. If such a view is followed to Marx's conclusion, it might appear inevitable that the feudal system will give way to capitalist relationships that in turn will lead to the proletarianisation of indigenous groups, alienation from their own labour amongst the proletariat and

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[83] The *Mahua* flower is the main ingredient in producing home-made liquor popular across the Central Indian region.

subsequently class consciousness and revolution. The actuality with Adivasis in India has not followed this pattern.

The settler colonial administration, which was fundamentally extractive in nature, had identified and intervened in forests as a key resource, since the teak wood was used as the raw materials for a then budding shipping industry in Britain (Das, 2015). In India however, the logics of expropriative industrial capitalism did not just stop with the end of British domination in 1947. It has evolved in complex ways even while extraction, expropriation, exploitation and domination have continued in various ways under successive Indian administrations. As mentioned in Chapter 2, section 2.2, the movement for independence although sustained through subaltern mass, the leadership in politics, law, bureaucracy, sciences, education, communications and all other areas of modern life has been dominated mostly by Hindu dominant castes. In the years following independence, the post-colonial state, through state and civil society apparatuses, all controlled by Hindu dominant castes, has continued internal colonisation over minorities, including the varied and diverse Adivasi societies spread across the country (Aloysius, 1997; Anderson, 2012; Sumit Sarkar, 1983).

Given this context, it would be all too easy to theorise Adivasi ways of life as homogenous and Adivasis as one-dimensional victims of Hindu caste-structured politics, British colonialism and then the resumption of internal (i.e. internal to the nation-state and its effects) settler-colonialism and capitalist expansion by the caste-structured Hindu society in its modern avatar. While elements of this characterisation are accurate, the picture is more complex. For instance, I found that Adivasis encountered internet infrastructure in diverse ways – cruel optimism about the promise of infrastructure to social haunting with a total non-recognition of infrastructure. These diverse ways of engaging with infrastructural practices leads me to argue that the question of Adivasi subjectivation just, as with any other social group, cannot be essentialised, either as a native pre-modern nor as fully integrated within neoliberal modernity and its trappings. The diverse ways in which Adivasi subjectivation processes are entangled with internet infrastructure are also subject to the territorialising effects of the nation state which also have found numerous ways of reproducing themselves – elections, receiving welfare or subsidies from the state, legal disputes and media consumption for instance. Even in the smallest of Adivasi settlements,

processes of subjectivation are further complicated because of co-inhabitation and thus interaction with others who are part of a caste-structured society.

In many of the villages I visited close to Udaipur town, I interacted with a wide range of Adivasis. Many of them were employed by the state government in some capacity – as cooks for mid-day meals in public schools, as teachers, as public health workers, *Panchayat* officials, Village Level Entrepreneurs (VLEs) and computer operators. These informants spoke eloquently about what has been called the 'promise of infrastructure' in the sense that infrastructures are technologies that the state uses to substantiate promises of development, progress and modernity (Appel, Anand, & Gupta, 2018). This does not indicate that they have lost their 'Adivasi' subjectivity, but rather that the category of Adivasi subjectivity is a spectrum that contains within it, a subject position that is invested in infrastructural desires, fantasies and faith.

6.3 Fractured temporalities of internet infrastructure

In a village barely 10 kilometres from the city of Ambikapur, I visited the house of an Adivasi family where a couple lived with their teenage son. I entered thinking about what questions I could ask them but as I entered their house, I saw that the 'house' consisted of two thread-bare beds next to each other, with a small stove in the corner that functioned as the 'kitchen'. There were lamps hanging from the bed, and a narrow corridor just outside the house where a couple of chickens were kept. This was a house that had no electric connection. Both husband and wife had no employment at the time of my visit. They were brick kiln workers and they had come back from one job and were waiting to be called for the next one. Their teenage son stood by in silence. He had dropped out of school a few years ago and now worked with his parents at the brick kiln. As soon as I realised that the house had no electricity, that they had an extremely precarious existence, my entire list of questions, discussion points and tendency to chat were engulfed in their silence. In the complete absence of the State or its infrastructure, it seemed cruel and absurd to enquire about internet infrastructure. We sat in silence for a good ten to fifteen minutes (although it seemed like an hour to me). Finally, I managed to finally ask whether the son had a mobile

phone. I was told the family shared one basic phone to receive calls about the next job. After a while, the woman L spoke

> Many houses in this village do not have electricity. If I fall sick, we have to go more than 30 kilometres to get medicines. If my son wants to study, he has to travel for more than an hour. I don't have money to last me this week. We are doing back breaking work to survive and you are asking about some internet cable? The government has no sense. What should come last, they are putting first, digging around for these useless cables. What should come first – electricity, health, education, livelihood, these things the government is not even interested in it at all. (*interview with L, village near Ambikapur, 17th June 2018*)

The contrast with the discussions I had been having and continued to have with informants from Hindu middle and dominant caste groups in the nearest city of Ambikapur could not be starker. This encounter took place early on in my field work, and it is one of the first moments where it occurred to me that for 'data collection' in the social sciences, we researchers take for granted respondents who readily articulate. I came away with the distinct impression that in this particular encounter, my informant L shared her thoughts only after great reluctance, and perhaps only after she took some pity on me. In reality, the silence between us at the beginning spoke much louder than anything she could say. This silence was the clearest indicator that in the complete absence of any support from the state, there was in fact nothing to say. The silence, in other words, was a reminder of my own caste position from which I have constructed the object of my research (infrastructural practices) and my theoretical framework (processes of governmentality and subjectivation). The dominant caste position led me to make some privileged pre-suppositions about existence of infrastructure and infrastructural practices.

When it comes to discussions about infrastructure, the time spent with the silent subject is not insignificant. Infrastructures have often been conceptualised as mechanisms to control time, 'instigating waves of societal progress' (Graham & Marvin, 1996, p. 42; Hetherington, 2014). Infrastructure, as a set of substrates (Edwards, 2003), indicates systematic penetration of infrastructural objects and systems (financial, administrative etc.) to

augment the introduction of modernity – from electricity provision to public institutions. The presence of the optical fibre network in the Adivasi inhabited regions of northern Chhattisgarh was an absurd one because it inverted the incremental logic of the substrates. In most of the Adivasi inhabited villages, there were optical fibre cables recently laid but there were no public institutions. Many homes had no electricity. The Adivasis themselves often had no smartphones (and only some even had basic mobile phones). It was as my key informant L said, what should have come last has come first.

Even though the last has come first, it begs the question of whether it has really arrived. Across the Adivasi inhabited regions, in more than 95% of the villages I visited, the internet infrastructure was in shambles – including the financial and administrative systems to operationalise connectivity. Yet L's remarks made sense. The materiality of internet infrastructure through its objects could not be missed in daily life – human bodies digging up the side of roads with tools such as earth-movers, spades and shovels etc., small stone markers along the road with meta-data on cabling painted on the stones, fibre optic cables of different colours terminating at a *Panchayat* office, desktop computers, box splitters, solar powered power back up systems, printers, banners, posters and wall paintings of Digital India in public spaces and on government buildings. Although each individual only saw or encountered only a part of this materiality, its presence could not be ignored. The conspicuous (and absurd) visibility of internet infrastructure in this context is strictly relative to the conspicuous *invisibility* (absence) of other infrastructural arrangements such as electricity, roads, schools and hospitals.

Benedict Anderson (1983) emphasised the role of print capitalism in transforming western society's notion of time from Benjamin's (1999, pp. 252–255) notions of 'messianic' to 'empty homogenous calendrical time'. Print capitalism was therefore an important marker not just for imagining a nation, but also simultaneously created a new subject position – as a participant in the community of anonymous individuals co-existing and living together with similar ideas, ideals and orientations to the nation in homogenous calendrical time. However, this does not mean that the notion of empty homogenous calendrical time has now spread evenly across the world, or that we should take it for granted. The presence of media and communication infrastructure along with other forms of infrastructures and

materials, in interaction with broader social, political and economic networks can fracture time and contribute to diverse range of subject positions (Bear, 2016; Chakrabarty, 2000) The ways in which temporality is experienced are major but often invisible characteristics that structure the habitus of subject construction (Banaji, 2016, pp. 154–155; Shome, 2016). These experiences of temporality are precisely what are missed out when social research focuses purely on media 'practices' as the objects of empirical research.

Carse and Kneas (2019) have developed a typology of unbuilt and unfinished infrastructures in order to understand their constitutive relationship with the unfolding and experience of temporality. *Shadow histories* to study infrastructures that did not happen but exist only as alternative imaginations; *Present absences* refer to the traces left behind by unbuilt and unfinished infrastructures; *Suspended presents* refers to social experiences and affective states associated with infrastructural delay; *Nostalgic futures* (c.f. Fisher, 2012) refers to promise and aspiration that once in the past accompanied infrastructural projects; *Zombies* refers to unbuilt and unfinished infrastructures linger between the dissipation and re-emergence of the social, political and economic networks that give infrastructures life. Building on their work, I argue that a relational perspective on infrastructures may provide overlapping and disjunctive temporalities.

For instance, my own gaze as a social science researcher places infrastructural development in a long durée and with successive investments and technological developments that increase the scope and depth of connectivity over time[84]. For my informant L, her own environment has produced an expectation of infrastructural substrates to develop in a specific pattern – loosely translated as the prioritisation of basic needs infrastructure and then to be followed by communicative infrastructure. It should be noted that in previous Congress-led regimes, it is precisely this set of basic needs that were the overarching objectives of the state as articulated by the Planning Commission and other documents I have referred to in Chapter 4. It is unsurprising that the startling but unwelcome presence of internet infrastructure appears as an apparition from the future. This reality of infrastructures as apparitions stand in contrast to the policy discourses the idealised subject

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[84] Although I note that the developments in infrastructure are accompanied by diverse motivations and forms of political control.

positions they have produced as internet beneficiaries smoothly integrating internet infrastructure (and digital-friendly lifeworlds).

6.4 The eternally deferred promise of infrastructure

There are other Adivasis who see the entanglement of internet infrastructure with their own lives in a different way. In one of the villages fairly close to the Udaipur town, I visited a local *Panchayat* wherein the elected leader (*Panchayat* president) was an Adivasi man, Ramesh in his late twenties and his secretary was a non-Adivasi ('upper-caste' Hindu) equally young man Dileep[85]. Hearing about my visit, both Ramesh and Dileep brought together their *Panchayat* team which included young men and women working as *Rozgaar Sahay* (Employment support), *Mitanin* (accredited public health worker), *Awaas Mitr* (Housing friend). These individuals had been hired by the local *Panchayat* on a contract basis for specific government schemes – such as housing or employment schemes. Their task was to execute the labour connected to technology. For example, the central government provided small direct cash transfers to individuals for constructing houses. However, the cash transfer was conditional upon uploading a time-stamped and location-stamped image for every stage of construction – as evidence that money has been spent on the purpose for which it was given. The *Awaas Mitr* would take photographs and then upload them to the central government ministry website database through a mobile phone app – also provided by the central government (see Chapter 5, section 5.4 for more details on the housing and other central government schemes that are technologically mediated and provide cash transfers from central government directly to individuals).

In the discussion that followed with Ramesh, Dileep and their team, we spoke about the internet infrastructures that they have seen. In the first instance, they showed, not without some pride, the computer, the inverter for power backup (since electricity supply is erratic at best), a printer, and there was even a radio. These were kept on desks covered with a cloth and I got the impression that the equipment was handled delicately and maintained meticulously. There was also a box installed by the state government for the fibre

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[85] Both names have been changed to protect their identity

connectivity although Ramesh did say that the box was currently not functional since it had to be activated. Both Ramesh and Dileep were smartly dressed in trousers and crisp shirts, had a couple of smartphones which kept them glued to the screen every ten minutes or so, and did most of the talking. The others who were much younger or much older, did not say a single word. Their presence it seemed to me, was to confirm the authenticity of the whole operation and that Adivasis were indeed involved and in charge of their own governance.

Figure 12: Objects of Digital India displayed at a Panchayat

Ramesh spoke of the hardships suffered by the Adivasis to access a wide range of basic services from the government, such as electricity bills and payment for those bills, recharging mobile phone data or voice packs for their phones, muster rolls to access state-funded opportunities for daily wage labour, or to receive compensation from the state if their property was damaged by wild life, medication for infectious diseases such as malaria, effective functioning of handpumps, vaccinations for children, birth and death certificates and more. He was convinced that once the optical fibre connectivity became functional, it would greatly facilitate increased access to government services. Both Ramesh and Dileep ran multiple WhatsApp groups with individuals living in their village as members of these

groups. Many of these groups had government officials as members who provided important information about government services which was vetted by Ramesh and then passed on to the villagers.

When I asked about how life would change once broadband internet connectivity became operational in their village, both Ramesh and Dileep were quick to create a binary distinction between 'good' effects and 'bad' effects. The latter included fears and anxieties about young children having unfettered access to pornography and wasting time on entertainment including video games (reminiscent of a government employee of the fibre optic network voicing his moral panic, mentioned in Chapter 5). All this talk took place while the public health worker, the only woman in the group remained silent as the gendered fears of connectivity were discussed threadbare. Rather than the content of what these two young men said, I was struck by the 'aesthetics' of their discourse, specifically how similar it was to the dominant-caste discourse that linked connectivity to the imaginaries of technologically mediated development (as I have described in Section 5.2). However, there is a crucial difference between the dominant caste engineers, bureaucrats and officials in Ambikapur and the Adivasis in Udaipur. For the former group, infrastructures are invisible at best, quietly delivering on their promise or at worst, something they have to negotiate. For the latter group, the stakes are much higher.

The discussion quickly sobered once we got out of the group discussion and I went for tea with just Ramesh and Dileep and after the rest of the team had left. Over tea, they started talking about how daily life has been completely turned upside down by frequent visits from the wild elephants who hitherto were restricted to the forests just outside their village. Over the years, elephants would ransack many of the nearby villages, including theirs, for food. Without warning the elephants would invade the villages in herds at dusk or at night, and destroy houses at random and loot all their food grains. Most Adivasi houses also store the *mahua* flower (used to make home-made liquor) and elephants consume the flowers and become even more aggressive and unpredictable. Most of the WhatsApp group activity, Dileep and Ramesh admitted sheepishly, involved warning group members about elephant incursions and trying to put pressure (mostly unsuccessfully), on forest department officials to provide timely compensation for property damaged by the elephants. Curiously, they

never mentioned or speculated about why over the last few years, elephants ventured out from the forests and into their villagers. Coal mining and its depredations on the local elephants and other aspects of the ecosystem did not come up in our discussions, even though both young men were of course well aware of these factors. Perhaps they thought it was irrelevant to my enquiries about internet infrastructure, or perhaps they thought that it would be too political for my taste or too dangerous to raise as an issue.

Here, it would be tempting to argue that the narrative of development and optimism that I heard from Ramesh and Dileep is a sign of their succumbing to the ideology of the ruling classes and castes, or indeed a form of false consciousness, or else that it was scripted and performed for my benefit – that the script of the 'good tribal' waiting for deliverance from the state and technology was perhaps what I as the researcher, wanted to hear from them. To have some certainty on this matter, it would require longitudinal ethnographic work to observe the dissonance (if any) between their discourse and their everyday practices. However, given the conditions under which I was conducting my fieldwork, some factors seemed significant - their geographical location (quite close to Udaipur city[86]), the steady supply of government funds under various schemes, the fact that they spoke and acted as delegates of government (as *Panchayat* president and secretary) and that they had access to government funding and its allocation. These factors seemed to enable Ramesh and Dileep to be partially if not absolutely invested in the potential of modernity to emancipate society at large (not just Adivasis). A large part of how this modernity was imagined was infrastructural – roads would be smooth and cover all villages, electricity would reach all homes, all children would have schools nearby, healthcare in terms of medicines, hospitals, doctors, equipment would be readily available, all government services would be available at the village. In this particular setting, I note the silence of the woman public health worker who remained silent in the group interaction and then did not speak even after the formal interaction had ended. This silence was a reminder of my own gendered position as a researcher and the ways in which the object of my research is necessarily inflected with the gender of my informants and my gender. It is also a reminder that internet infrastructure

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[86] The location of their village close to Udaipur city means convenience of transport, access to jobs and daily wage labour, access to markets to sell and buy produce, mobility, and enjoy basic infrastructural access – roads, healthcare, education.

itself is gendered in the ways that it is imagined into production and imagined into future consumption.

The architecture of digital governmentality has hollowed out the spirit of decentralised government via the empowerment of village government, i.e. Panchayat, introduced by the 73rd amendment to the Constitution in the 1990s. In my visits to the various Panchayat offices, the members' main task was to ensure that funds from the central government were transferred to the beneficiaries smoothly. In order to do this, they were supposed to hire on a contract basis some local staff who could document the transfer of money and produce the evidence that the money was being used for the intended purposes so that rest of the money could be transferred as per schedule. In real terms, the autonomy of the Panchayat had ceded to direct technologised relations between the individual resident and the central government ministry and the locally elected government official is there to mostly document and aid that relationship. Until the operationalisation of Digital India, and digital governmentality in general, Panchayat offices played an important role in governance by being the last link in a chain of government. The Panchayat of today is being left out of daily governance since central government is linked technologically to the 'last mile' through direct cash transfers. The institution of the Panchayat is now working mostly as a 'middle-man' institution that facilitates the transaction between an individual/household and the central government.

In some Panchayats, the secretaries proudly showed me an app on their smart phone. It seemed to be a government application where progress on most central government schemes could be displayed by entering the name of the Panchayat. In other words, the application simply mirrored the official database kept by the Ministry. However, even though the application itself was a simple exercise in technology, it produced a powerful effect of transparency. A secretary in one of the Panchayats insisted that I download the app on my phone so I could check how many houses have been provided in his village. I had no need of talking to him or taking his word – the data provided in the application was objective truth. It is in these moments that the discourse on technologised development, anti-corrupt or clean and efficient government promoted by Modi and the BJP government become most effective to a wide variety of groups (especially non-Adivasi Hindu 'upper

caste' groups). Applications as well as material and symbolic relations (cash flow, wall paintings, databases) create an overwhelming impression that things have fundamentally changed, and a new dawn has arrived.

However, regardless of how internet infrastructure lays claim to improved governance, the Adivasis stand to lose in most of the sites I visited. Every Panchayat president's post in the state of Chhattisgarh is reserved for Adivasis. However, the posts of the deputy, members of Panchayat and secretary of Panchayat are open to non-Adivasis. With the exception of one or two individuals, my experience was that the secretaries of the Panchayats controlled the cash flow and redirected it to themselves. For example, in the rural housing scheme, there are standardised fixtures for housing whose dimensions as well as the materials are already specified by the central government. The secretaries in collusion with administrators and bureaucrats in district-level government, open fly-ash, cement and brick units in the names of their relatives (since direct ownership would be conflict of interest). These units become the key suppliers for all houses built in and around that Panchayat with funds provided by Central government. Of course, the beneficiary of the housing scheme is free to approach other suppliers for his or her house, but then the higher-level government officials and the Panchayat secretary delay payments to the external supplier and fast-track existing funds to his own units. In this way, even though residents get housing from the government, the institution of the Panchayat has become a conduit for non-Adivasi members to redirect large portion of these funds to their own pockets.

Affective investment in infrastructure (as evidenced by my key informants Ramesh and Dileep) seems to be a sort of 'cruel optimism' (Berlant, 2011) wherein infrastructural modernity has for the most part invited ruthless extraction from Adivasis, but at the same time the presence of infrastructures also signal a *possibility* of positive and secular transformation – the assumption that we (and they) know to be false, yet persistently touted by government and technology enthusiasts alike - that the machine will not discriminate against a human being simply because he or she is an Adivasi or Dalit. The investment in infrastructures is also a reminder that infrastructures are not just conduits for modernity, but also work on affective registers. De Boeck (2011) in his investigation of slum dwellers in Kinshasa, DRC points out that in spite of the government ruthlessly demolishing

their residence, some of them persisted with hopeful accounts about the imagined beauty of what would replace their slums. I argue that it is precisely the affective engagement with infrastructures that produce the difficult but also pleasurable double bind of cruel optimism – the sense that one cannot live with it or without it.

6.5 The materialities of coal mining

In the previous two sections, I discussed internet infrastructure and temporality as a crucial dimension of subject construction processes by different individuals and groups of Adivasis. As I moved closer to the mining operations, it became apparent that for the Adivasis living next to the mines, their very existence was under threat. However, since the mining related infrastructural development is gradual and incremental (also due to the matter being involved in litigation), the traumatic experience of systemic violence is experienced as a process rather than as a shocking event. As a result, several of the Adivasis I met and worked with in this region spoke of a slow-burn anger that has been building, including a sense of betrayal, resignation, shock, indignation and outrage. It was, even and especially in an affective sense, clear that the villages here were living on borrowed time. The land on which their houses were built had already been identified as holding valuable reservoirs of coal. In one of the villages, there were about 125 people living in roughly 25 households.

When I visited one such village along with two local journalists, the *Panchayat* office was functioning as a warehouse for food grains. People were coming with sacks, and there was one *Panchayat* official who was checking their paperwork and distributing grains. There were no desks, there was no office to speak of, let alone a ceremonious display of internet infrastructure. It seemed that the *Panchayat* existed mostly in name, and the building itself was used as a warehouse for grains. I asked about the internet infrastructure and whether the national optical fibre network had reached their village. By then the president of the *Panchayat* had arrived us and showed us a dilapidated room inside the office (see Figure 13 below).

Figure 13: Dysfunctional internet infrastructure, in a Panchayat close to a coal mine

The secretary of the *Panchayat* explained: 'They did not even inform us, they just came one day and installed it, but they did not even inform us on the phone'. The president of the *Panchayat* was even more forthcoming: 'This green light keeps burning all day, what the hell is this thing? Shouldn't we cut it and throw it? It is useless in any case'. The others who had gathered around us said that in any case, their village had been earmarked for demolition in the near future, since there was coal underneath their land.

In the surrounding areas, as many as 20 *Panchayat* councils (known as *Gram Sabhas*) had refused to give consent for mining, although the village I had visited had given their consent. Many had received compensation from the Adani group, whose owner Gautam Adani enjoys a close relationship with Modi[87], while others subtly indicated that in just as many or

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[87] Vivashwan Singh 'The "Beneficiaries" of Modi's Globetrotters: Adani and Ambani' (April, 1, 2019). *Newsclick*. Retrieved from: https://www.newsclick.in/%E2%80%98Beneficiaries%E2%80%99-Modi%E2%80%99s-Globetrotting-Adani-Ambani

more cases, people had been coerced or threatened or bribed to consent and sell their lands[88]. Under the Panchayat Extension Scheduled Areas (PESA) Act, 1996, the *Panchayats* in Adivasi areas have autonomy over governance and state or central governments cannot force 'development' unless the residents, i.e. the Adivasis consent to it through their *Panchayat.* Even though this move towards greater decentralisation and participatory democracy is a step forward on paper, in practice, the large mining corporations in cahoots with the state governance machinery had worked out a set of strategies and ruses to gain 'consent' and to start mining. The surplus value that mining offered for the capitalist classes was simply too great for participatory democracy or debates about alternative conceptions of sustainability or alternative approaches to the environment to be taken seriously and allowed to hinder its progress.

The materiality of coal in northern Chhattisgarh, indeed of millions of metric tonnes of coal, overdetermine any considerations of how internet infrastructure or any other infrastructures are entangled with broader processes of governmentality and subjectivation. To analyse internet infrastructure in Adivasi areas, especially the areas that have been subject to mining, therefore requires a broader view of infrastructural and technological relations that have shaped and affected Adivasi societies and in these regions. Notwithstanding the long tradition of exploitation of indigenous lands and resources and subsequent forms of radical resistance (c.f. Simpson, 2017), I discuss a particularly significant case of *infrastructural control* exerted over Adivasis which stands in stark contrast to the direct physical violence against Adivasis (in the name of fighting Maoism or Naxalism) that marks southern Chhattisgarh. Take the case of the Parsa East and Kenta Basen (PEKB) block in Chhattisgarh which forms part of the Hasdeo-Arand coal field in South Surguja forest division – an area where I did part of my field work. A public sector company, namely the Rajasthan State Electricity Board (RSEB) won the license to mine coal from the PEKB block in 2007. The RSEB has contracted Adani Mining, a 100% subsidiary of the

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[88] Kanchi Kohli 'Historical injustice and "bogus" claims: Large infrastructure, conservation and forest rights in India (June 7, 2019). *Heinrich Boll Stiftung India*. Retrieved from: https://in.boell.org/en/2019/06/07/historical-injustice-and-bogus-claims-large-infrastructure-conservation-and-forest-rights

corporate behemoth, Adani group as Mine-Developer-cum-Operator (MDO)[89]. The South Surguja forest division has produced reports on the Hasdeo Arand region officially listing the region with 29 species of fish, 14 species of reptiles, 111 species of birds, 34 species of mammals, 51 species of medicinal plants, 86 species of trees, 38 species of shrubs and 19 species of herbs.

Notice how the institution of the forest department has epistemologically reconfigured a region with discrete categories such as fish, reptiles, trees, shrubs, herbs, medicinal plants etc. Once the region had been discursively reconstituted in such categories, its fate had already been sealed. From that point on, regardless of the presumably well-intentioned officials of the forest department, manipulation by vested interests would now be at the level of the specific categories of flora and fauna rather than focused on the larger question of Adivasi lifeworld in its holistic sense. It is this lifeworld that would disappear almost entirely due to the mining. In this sense there had already been a long chain of events and political decisions which led up to the point at which I was conducting my research.

On June 22, 2011, the Forest Advisory Committee (FAC) of the Union Ministry had produced a report that advised against mining in the region citing biodiversity and rich wildlife in the area, including the finding that over a 15-year period of mining, a total of 3,68, 217 trees would have to be cut down. However, on the very next day, June 23rd, 2011, the then Union Minister for Environment and Forests of the Congress government had rejected the Forest Advisory Committee report and given a 'stage-1' approval for mining in 3 areas – Tara, Parsa East and Kenta Basen block together an area of almost 5000 acres of land[90]. His reasoning was that mining would happen in the 'fringe' areas and not in the actual region with the biodiversity. It is very unusual for central government ministers to act with such speed but with powerful interests behind the operations (namely the Adani group), such speed was no surprise.

[89] 'Adanis begin operations in Chhattisgarh coal mine' (2013, April 08). *The Hindu.* Retrieved from https://www.thehindubusinessline.com/companies/adanis-begin-operations-in-chhattisgarh-coal-mine/article20599778.ece1

[90] '3 coal blocks in Chhattisgarh can be opened: Jairam Ramesh' (2011, June 23). *Money Control*. Retrieved from https://www.moneycontrol.com/news/trends/current-affairs-trends/-2058527.html.

In March 2012, the state of Chhattisgarh, then ruled by the BJP, provided the necessary additional permissions, compliances required and gave a 'stage-2' approval for mining in the PEKB block, crucially depending on a 'wildlife management plan' executed by non-profit organisations and public conservation/wildlife bodies such as Wildlife Institute of India, Nature Conservation Foundation and Wildlife Trust of India. These bodies either because of incompetence or wilful deceit failed to record the various instances of elephant incursions mentioned in the earlier section, that indicated clearly that the region is a significant elephant corridor. Whatever their intentions, it is worth noting that in cases like these, the 'state' often extends to specialist organisations, including non-governmental organisations who can offer scientific evidence that is acceptable to the 'parties' involved in the dispute. It could be argued that the Adivasis living in that region know the region better than anyone else, but that the ecological and holistic conceptual categories through which they articulated their knowledge were not be acceptable either to the government, to the mining corporations or to the courts.

In the event, anti-mining activists in Chhattisgarh tried to stop the mining by filing a case in March 2013 with the National Green Tribunal (NGT), an independent public judicial body adjudicating on environmental issues. In the proceedings of the case with the National Green Tribunal, the parties to the trial, i.e. state of Chhattisgarh and the central government (from the BJP and the Congress respectively) as well as the activists made arguments[91] that revealed the intersections of infrastructures and politics framed within the imaginaries of development, wildlife conservation and biodiversity.

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[91] National Green Tribunal Judgment, No. 73/2012, in the matter of Sudiep Shrivastava versus State of Chhattisgarh, Union of India, RSEB and Kente Basen Coilleries Co. Ltd. Retrieved from: www.ngtonline.nic.in/

Figure 14: Broken electricity police against a coal mine in Chhattisgarh

Even as the Adivasis residents themselves were completely ignored during the dispute, the government argued that the truth status of who or what actually lives in the region depended on what could be proved through Geographical Information Systems (GIS) mapping and satellite data. Using this data as 'evidence' the state argued that there is actually not much biodiversity of wildlife in the 'fringe' areas and therefore that mining should be allowed. In the context of satellites used in warfare it has been argued that

> …the overhead image provides an opportunity to think about knowledge practices and the materiality of communication in ways that do not rely exclusively upon the visibility of bodies or frames as 'purely representational' (Parks, 2012, p. 79)

The overhead images produced by the satellites and GIS data feed into pre-existing discourses of government that have already divided up nature into discrete and manageable categories such as wildlife, shrubs, mammals and so on. The materiality of communication

produced by satellite and other such infrastructure is co-produced with multiple discursive regimes – scientific (about which area is fringe and which is not for instance), nationalism (discovery of coal would boost capacity of the nation and reduce imports), technological environmentalism (cutting edge technologies can regenerate forests before mining is completed). Feeding into each other, the materiality of communicative technologies and discursive regimes bring to the fore often invisible relations between state and its subjects. In this example, the future lives and livelihoods of Adivasis hinged on whether their area was considered to be 'fringe', on whether there was acceptable proof of enough biodiversity, on the inspection visits of a sub-committee of the Forest Advisory Committee, on the negotiations between state government, central government, activists, National Green Tribunal and many other state and non-state actors. Only in this case, the Adivasis with their distinct forms of subjectivity, or even as a population, were glaringly absent from considerations of the state and mining corporations, and only marginally present in the considerations of the court and the activists (Dungdung, 2013).

Mining operations started in 2013, and when I visited the mining block in late 2018, local journalists and Adivasis who worked as daily wage labourers in the mines told me that the public company with the license to do mining, RSEB, would under-report the amount of coal excavated, while the 'excess' coal would then be appropriated by Adani enterprises (which is executing the license on behalf of RSEB) and sold off on the black market. Even as mining is going on at full, even a frenetic pace, destroying ecosystems, it still continues to be necessary for the company to evict the few Adivasis who stubbornly refuse to leave. While it is, even today, not possible just yet, to openly commit physical violence against an entire village in Northern Chhattisgarh[92], the Adani group that effectively controls the surplus value from the mining exerts total control over crucial aspects of self-reproduction through infrastructural relations. Saliently, communicative infrastructure was entirely missing from the region. Nonetheless, as the example of reconfiguring the Parsa East Kenta Basen (PEKB) area through a complex socio-technical assemblage of satellite imagery by the state and civil society institutions illustrate how infrastructural control can exercise power relations in pernicious ways.

[92] However, in southern Chhattisgarh, around 2006-7, hundreds of villages have been burnt by state-backed vigilante groups on the pretext of Maoist incursions (Shah, 2018; Sundar, 2016)

6.6 The politics of infrastructural control

Overdetermined by coal mining, internet infrastructure in Adivasi inhabited areas is absurdly visible in relation to the absence of other more vital infrastructure – including that which would supply potable drinking water. Although I have focused my research on internet infrastructure, in this section, using the example of water supply in a small Adivasi village, I demonstrate infrastructural control as a specific *mode* of the exertion of authority – in this case the Adani company exerting control over Adivasis. This section builds on and develops anthropological literature investigating the connections between water infrastructure and governmentality (Anand, 2011; Von Schnitzler, 2008). This attention to the *mode* of infrastructural control is important for scholars of internet infrastructure too, since a broader understanding of infrastructural control as a mode of governmentality gives us an insight into how control and domination need not always be exerted explicitly from the top, but even through apparently mundane procedural ways in and through the materiality of infrastructures.

The entire water supply for a village close to the coal mines had been adopted by the Adani Corporate Social Responsibility (CSR) unit. The water supply for these 125 people was managed through three borewells installed, with 10 horsepower motors for each borewell. The water from each of these borewells was routed to the village through a series of pipes which then terminated at two 'collection points' from where villagers could draw water. The Adani group had promised to install a water tank that would provide long term water access, but even after three years, there was no sign of the promised water tank. Instead, the daily water supply came through a network of thick water pipes which were connected to thinner pipes. If all three borewells were switched on at once, then the pipes simply burst. There was, therefore, no fixed pattern to water supply. On many occasions, there has been no water for days on end. On the day I visited the village, there had been no water for three days. One young local Adivasi boy who was hired to manage the water provision had been found dead two days prior to my visit, and the company alleged that his death was due to alcoholism while others in the village were convinced that he died in suspicious

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circumstances. Since the water operator was dead, the Adani CSR unit has simply not bothered to ensure that water continued to reach the residents.

One woman, B informed me, 'The company people come, ask us to open a pipe, then if it turns on for a minute, they take a photo and send it back to the general manager saying we have solved the problem or that it was a false complaint and everything is okay'. Another woman also revealed an intimate understanding of the infrastructural control by the Adanis:

> There are many valves, when one complaint comes in, they turn the valves off to nearby areas so the water is redirected to the area of the person who makes the complaint. They took my land by promising me employment but now I have to clean the toilets of the Adani company. Those who were 18 at the time of land acquisition were promised jobs but they said that the jobs would be according to our capacity. Now most of us have realised what our 'capacity' really is for the company. To them we are fit only for low grade jobs (*Interview with G, village near a coal mine, 20th July, 2018*)

The anthropologist Nikhil Anand (2011, p. 543) has argued that 'water supply can be curtailed as much by politics as by topography' in his study of water connections in the metropolitan city of Mumbai in India. In the city, Anand shows how *pressure* is a useful analytic tool to emphasise negotiations between engineers, settlers and politicians who have a stake in the water infrastructures of the city (I have discussed 'pressure' in greater detail in Chapter 1, Section 1.3). In this particular village of Chhattisgarh, with one of the largest coal mines as the backdrop, it became clear that *pressure* was indeed central to their concerns but there was absolutely no space for negotiation in spite of the residents' intimate knowledge of the water infrastructure. Water-related infrastructural practices of residents got entangled with communicative practices of Adani's employees, taking pictures as 'evidence' of problem-fixing and accountability.

Another instance of infrastructural control is the matter of starvation deaths, of which I encountered quite a few cases in the course of my field work. With the digitalisation and technologisation of the state-subject relationship, the starvation and deaths faced by the

Adivasis and Dalit societies is often taken to be 'merely' a technical issue – Aadhar-related so to speak. To frame starvation and deaths of Dalits and Adivasis as an issue of Aadhar card dysfunction is to miss the structural violence targeted at these most vulnerable groups. Infrastructural control leaves little or no space for negotiation when it comes to Adivasis and Dalits, especially the vulnerable amongst them – women, children and the elderly. With these groups, infrastructural control is a matter of life and death. So far, various state governments have provided subsidised food and other essential commodities either on a universal basis or on a selective aid based following the identification of extreme poverty. Only those below a 'poverty line' have been and remain eligible to receive these subsidies and in the past, they would have to show two documents – one a 'ration card' and the other a Below Poverty Line (BPL) card. In early 2017, the central BJP government made it mandatory to provide a biometric identification card (Aadhaar card) in order to receive subsidised food and other essentials through the Public Distribution System (PDS). Since 2017, more than 40 people have died of starvation. While the mainstream media and political discourse has focused on the deaths as 'Aadhar related' deaths[93] the matter is more complicated. It is significant that most if not all those affected are from Dalit and Adivasi families living in the Adivasi dominated states of Chhattisgarh, Jharkhand and Orissa. Based on the identity of those who have died of starvation it becomes clear that Aadhaar or infrastructural and technological relations in general seem disproportionately to affect Dalits and Adivasis compared to other social groups, leaving them with little or no space for negotiation.

Given the broader logics of expropriation mentioned earlier in this chapter, a majority of the families are dependent on daily wage labour, sanctioned by the central government through an employment guarantee scheme and dependent on food through the public distribution system. Under the ravages of increasing neoliberal capitalism across India, a majority of the Dalits and Adivasis are surviving with whatever remaining welfare mechanisms are available to them from the state. The digitalisation of state-subject relations in 2017 with the *Aadhaar* biometric card needs to be understood against this backdrop. Instead of discussing

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[93] 'Of 42 'hunger related' deaths since 2017, 25 'linked to Aadhaar issues' (2018, September 21). *The Wire.* Retrieved from https://thewire.in/rights/of-42-hunger-related-deaths-since-2017-25-linked-to-aadhaar-issues.

several similar instances from my field work (which will risk revealing their identity), let me take the already known example of a four-year old boy in Chhattisgarh who died of starvation in 2015[94]. His father had no documents and was surviving entirely on the daily wages earned from the National Rural Employment Guarantee Scheme (NREGS) launched by the Congress government in 2006. In Chhattisgarh, as in most other states in the country, work available through the NREGS scheme has been steadily declining under the BJP government and therefore the only source of livelihood has also been made unavailable.

Over the last decade successive Congress and BJP governments have referred to the NREGS scheme with pride in political discourse[95] but in practice the BJP and to a certain event even the Congress have tried to destroy the effectiveness of the scheme through subtle strategies – these include administrative bottlenecks such as delaying cash flows from central government to state government, reducing budget allocation every financial year, and keeping the daily labour wage of the scheme below the minimum daily market wage (therefore disincentivising beneficiaries to avail of the scheme)[96]. As long as state-subject relations are mediated through human representatives housed in institutions that are visible and accessible to the general population who are dependent on decisions made on these relationships, there is some scope for struggle, resistance and negotiation.

A large number of Adivasis across Chhattisgarh have obtained Aadhaar cards, have obtained mobile phones, and no doubt as the mechanisms of social reproduction are compulsorily linked to digital networked infrastructures, more and more Adivasis will adopt them. However, this does not mean that Adivasis accept digitalisation or that they are allowing their subjectivity to be reconfigured in conjunction along with various other social groups in other regions as part of the digital networked infrastructure rolling out across India. The infrastructural control discussed in this section is significant not only because it displaces

[94] 'Hunger deaths: Chhattisgarh govt orders probe, opposition up in arms' ((2015, May 31). *The Indian Express*. Retrieved from: https://indianexpress.com/article/india/india-others/hunger-deaths-chhattisgarh-govt-orders-probe-opposition-up-in-arms/
[95] Richard Mahapatra. 'Political economy of welfare' (2016, February 29). *Down to Earth.* Retrieved from: https://www.downtoearth.org.in/blog/governance/political-economy-of-welfare-52838/
[96] Himanshu Kumar. 'How MGNREGA transformed into a monument of failure' (2019, July 18). *Livemint.* Retrieved from https://www.livemint.com/opinion/columns/opinion-how-mgnrega-transformed-into-a-monument-of-failure-1563471851092.html

and obscures the target of resistance by producing a matrix of procedural infrastructural practices (mapping of mining areas, getting or not getting food subsidies linked to biometrics, water supply and so on), but also because symbolic violence without a face produces dynamics of social haunting which I address later in this chapter, in Section 6.8. Suffice it to say at this point that infrastructural control as a mode of governmentality works at different levels, reconfiguring epistemological categories (as I discussed in Section 6.5) *and* through the materiality of infrastructural practices (as I discussed in this section). Given that the effects of infrastructural control are experienced and understood without always the possibility of identifying who is responsible or whom to fight, processes of subjectivation are complex and appear inchoate. The case of *Pathalgarhi* will illustrate the complexities involved in the processes of Adivasi subjectivation in a time of digital roll-out.

6.7 Processes of Adivasi subjectivation: The curious case of *Pathalgarhi*

Since the 2000s, Adivasis in the states of Chhattisgarh, Jharkhand, Orissa have been subjected to (infra)structural violence due to the mining industry and the state backing of mining as development. The discourse and practice of Development[97] from the central government, state government and mainstream caste-structured society (controlled by the Hindu dominant castes) has appeared to the Adivasis as its very opposite – destruction in the form of violence, displacement, starvation, damage to livelihood and an assault on Adivasi subjectivity. After almost two decades, Adivasis are mobilising against mainstream society, although it would be a mistake to see this purely as 'resistance' as I elaborate below. Over hundreds of villages, across the central Indian states of Chhattisgarh, Jharkhand and Orissa since 2015-16, Adivasis have been putting up a stone foundation at the entrance of their village with the inscription of the Panchayat Extension Scheduled Areas (PESA) Act, 1996. The act of putting up a stone foundation is a traditional practice by the *Munda* Adivasis – a specific group who mostly live in the state of Jharkhand. The *Mundas* used to call it *sasandiri,* meaning stone at the graveyard. In the 1990s, a bureaucrat named B D Sharma worked with Adivasis across north and central India reclaiming the practice but

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[97] Development as an ideology began with imbibing the nationalist anticolonial struggle in the 1950s but since then has given way to various iterations such as inclusive development, participatory development, sustainable development etc. As each iteration falls by the wayside, Development with a capital D obstinately survives (Escobar, 1995; Nandy, 2002; Sparks, 2007)

through the lens of constitutional rights. In 2015, the practice has since been rechristened (by the media) as *Pathalgarhi* (the placing of stones) (Xaxa, 2019). Since 2015-16, Adivasis have been using this practice to not only to assert their rights but also their autonomy from the state and central government.

In the state of Chhattisgarh, *Pathalgarhi* was picking up steam with the practice of stone inscription spreading rapidly across the state. Most of the leaders of the move to inscribe the stones were retired bureaucrats who were imprisoned during the course of my field work. It became impossible to visit those areas since these areas were heavily cordoned off with armed police and army personnel and restricting any access to the Adivasi people – especially for journalists or others who could publicise the matter further. While *Pathalgarhi* sought to stop the physical presence of the state in terms of its institutions and human representatives, I wondered whether they wanted to and if so how they would keep out virtual and invisible infrastructure such as wireless telephony spectrum[98], Aadhaar cards and practices of biometric identification and verification linked to almost every interaction and transaction with the state? The sociologist Nandini Sundar observes during one of the *Pathalgarhi* gatherings in Jharkhand[99],

> One of the complaints raised in the meeting was that the administration was trying to flatten out their distinctive identity, by threatening to take away reservations or by subjecting them to uniform identity markers. Aadhar and voter IDs were problematic because they reduced adivasis to "*aam admi*" while in reality, the adivasis are "*khas admi*" – distinct people, protected by distinct laws.

This quote suggests that for the Adivasis, the old identification and verification system of the voter card prefigured the digital infrastructure of Aadhaar. The voting card already produces, or at least tries to produce local rural subjects as individual voter-citizens

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[98] As I have argued elsewhere (Bhat, 2012), although spectrum is treated as part of the commons, its current mode of allocation makes it into a scarce and valuable resource. In order to ensure that allocation is fair and in the public interest, spectrum management, according to the Supreme Court, is not just the duty but also the obligation of the State.

[99] Nandini Sundar. 'Pathalgadi is nothing but constitutional messianism so why is the BJP afraid of it?' (2018, May 16). *The Wire*. Retrieved from: https://thewire.in/rights/pathalgadi-is-nothing-but-constitutional-messianism-so-why-is-the-bjp-afraid-of-it

associated with a number, a photograph an address and so on – a fixed data point recorded in the system. In other words, a voter card is an infrastructural system induced by a non-Adivasi state in which Adivasis are forced to appear as reconfigured subjects – visible, enumerable and legible to the state (Scott, 1998). The *Aadhaar* card is not only a digitalised extension of the voter-card infrastructure, it is also now linked to their very social reproduction since the *Aadhaar* card needs to be linked to the rations disbursed under the Public Distribution System (PDS). The linkage of biometrics to social reproduction also works the other way around. The daily labour and mechanisms of social reproduction in turn aim to reproduce Adivasi subjects as uniquely identifiable numbers.

As my fieldwork was drawing to a close, in a protest against the murder of a journalist who exposed police brutality against *Pathalgarhi,* Adivasis burnt their voter cards and Aadhaar cards and set up an autonomous bank[100]. Internet infrastructure as well as older analogue infrastructure is clearly unwelcome for the Adivasis either in the context of governmental practices or as markers of an 'Indian' citizen-subject. The *Pathalgarhi* activists are explicit about rejecting the subject position offered by the state. However, what is this 'distinctive identity' referred to by Sundar in the above quote and what is its relationship to Adivasi subjectivity? As I have argued in Chapter 1, Section 1.4, rather than the notion of identity as a stable individualised unit of analysis, I have worked with the processes of subject construction, or subjectivation. Within this theoretical framework, the practices of *Pathalgarhi* pull together social groups under various subject positions. I argue that there are at least three broad *trajectories* at play coinciding in and shaping *Pathalgarhi,* and these trajectories enable different Adivasi groups to make claims about their 'Adivasi-identity' in different ways.

The first trajectory I call *anarchic constitutionalism* wherein Adivasis see *Pathalgarhi* as the latest political and social mobilisation in a long history of struggle for land rights that have been going on for centuries. In the last two decades, Adivasi political subjectivity has reactivated the land struggles by Adivasi movements in the colonial period (over the 18th and 19th century). A classic case is the revival of Birsa Munda, built on the life and struggle of

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[100] Santosh Kiro. Demands for justice for Amit Topno, who covered tribal resistance in Jharkhand (2018, December 16). *The Wire*. Retrieved from: https://thewire.in/rights/amit-topno-journalist-jharkhand-pathalgadi

a young Adivasi man born in Khunti district of Jharkhand. He led the Adivasis to revolt against the British and although he died young, his leadership of the Adivasi movement played a significant role in enabling landmark changes in legislation, including the Chota Nagpur Land Tenancy Act (CNLTA) in 1908 restricting transfer of Adivasi land to non-Adivasis (Singh, 2002). The Adivasi struggles to reclaim land were subsumed within the broader anticolonial 'nationalist' movement for independence. Since then, the major advance came about only in the mid-1990s with the 73rd amendment to the Indian constitution called the Panchayat Extension to Scheduled Areas (PESA) Act. At least on paper, the PESA Act provided autonomy to Adivasis and protected land, forests etc. deemed to be located in the 'scheduled' areas. If land under such a scheduled area was to be exploited either by private interests or by state and central government, then consent had to be gained from the local Adivasis through the authorisation of their local council meeting (similar to the idea of *Panchayat*). Asoka Kumar Sen has argued that forms of governance in Adivasi areas have shifted gradually from the traditional system of *Parha* to becoming slowly integrated into the *Panchayat* system (Roy, 1912; Sen, 2008; Singh, 2019; Verghese, 2016). Building on older forms of anti-colonial struggle and hard-won land rights, as well as more recent post-independence struggle for autonomy over their land and resources, Adivasis led by ex-teachers and ex-bureaucrats have used the language of constitutionalism to carve out a separate space for themselves.

The second trajectory is the history of *theological activism* by Christian missions in the states of central India. Ignored, excluded and oppressed by caste-structured Hindu society, Adivasis found that Christianity (however colonial and alien it may have appeared) appealed to them particularly because missionaries in the early part of the 20th century set up a network of schools, hospitals and other forms of support (including legal support and support from escaping debt and bonded labour) that could be a pathway to overcoming their destiny in an oppressive caste-structured society (Bara, 2007). Many of the Adivasis who benefited from the theological activism by Christian missionaries, were later able to obtain government jobs. The leaders of *Pathalgarhi* in Chhattisgarh were all Christian Adivasis who had served long careers as bureaucrats in the Chhattisgarh (and earlier Madhya Pradesh) state government. It should be noted that the Christian Adivasis who became my informants did not emphasise their Christianity but rather their *Adivasi-ness*. As

a result of the theological activism in central India, Adivasis have to some extent inhabited aspects of modernity. It is this hybrid subjectivity that has enabled some Adivasis in *Pathalgarhi* to oppose exploitation by the State. And they have done so precisely by using the language and provisions of the Indian constitution that they learnt about via their contact with missionary schooling. There is no paradox in rejecting voter cards and Aadhaar cards but in asking for the Panchayat Extension Scheduled Areas Act to be upheld. It is a hybrid political subjectivity that has enabled this form of anarchic constitutionalism.

The third trajectory refers to Adivasis being part of *social infrastructures* on which there is little or no scholarship, even in India, let alone the West. Many Adivasis who are involved in *Pathalgarhi* pledge loyalty to a group with mass following called *sati-pati*, founded by Dada Kunwar Keshari Singh in the state of Gujarat in 1934. *Sati-Pati* can be called a social infrastructure, much like how the states of Punjab and Haryana have *Deras* that have shaped subaltern subjectivity (Ram, 2008; Singh, 2013). In the early part of the 20th century, religious subjectivity was in flux. Many of the social groups had not yet fully consolidated behind a cohesive Hindu subject position. Charismatic individuals set up organisations that simultaneously provided spiritual and pastoral support in addition to providing much needed material support – food, lodging and fraternity for social reproduction. As with the theological activism mentioned above, groups like *sati-pati* are important because they catered to Adivasis at a time when caste-structured society ignored them, or worse oppressed and dominated them. The *sati-pati* movement is now headed by the Kunwar Keshari Singh's son Ravindra Singh and the movement derives its scriptural authority from a book called *Heavens Light, Our Guide*. The book is an assortment of letters and documents,

> some printed on 10 or 100-rupee non-judicial stamp paper, including the Gujarat revenue rules, a newspaper clipping reporting an Ahmedabad's court rejection of the Navjivan Trust's request to keep Mahatma Gandhi's will, and one particularly charming document titled: "Orderly Agree: Not to be dishonesty, Scorn, A Denial,

plundering, Breach of Trust, Misappropriation, A Theft, Defamation, No deed of sale Estate of 17/18/ 30-4-68 Crown's Discretion"[101]

Mainstream media discourse is transparent about its dismissal – questioning the sanity of Adivasis who belong to *Sati-Pati*[102]and to the best of my knowledge, the whole social infrastructure of *Sati-Pati* has not yet caught the attention of academics, and probably would never have entered the mainstream if not for *Pathalgarhi*. The state governments of Chhattisgarh and Jharkhand on the other hand have claimed that *Pathalgarhi* is active mostly in areas where opium is grown and then sold across India. Hence, for the government, the 'resistance' is a ploy for 'some' Adivasis to disguise their commercial interest behind safeguarding their opium produce (Singh, 2019). Further, the BJP leadership in Chhattisgarh and Jharkhand have also made allegations that *Pathalgarhi* is a sinister ploy by Adivasis who have converted to Christianity under the influence of Christian missionaries. Duped or seduced by these missionaries, the Adivasis are allegedly trying to subvert national interest.

Regardless of the truth or falsity of each of these views, it is significant to note that the state has a contradictory view of Adivasi groups – Adivasis are to be venerated and celebrated (given that the nearly 40% Adivasi population is a politically significant demographic bloc), but at the same time, Adivasis have to continue to submit to the pre-colonial caste-structured oppressive relationship with non-Adivasi society and also subject to colonially inherited stereotypes about Adivasis that range from primitive innocence and backwardness to inherent criminality and savagery. This is nothing but a reproduction of the colonial criminalisation of indigeneity (Abraham, 1999; Bates, 1995; Radhakrishna, 2008). The official responses from political parties and state and central government officials fall within this discursive regime and so inevitably reproduce the same falsehoods, lies and stereotypes (as outlined above, about addiction, madness and the disguising of commercial interests).

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[101] Nandini Sundar. 'Pathalgadi is nothing but constitutional messianism so why is the BJP afraid of it?' (2018, May 16). *The Wire*. Retrieved from: https://thewire.in/rights/pathalgadi-is-nothing-but-constitutional-messianism-so-why-is-the-bjp-afraid-of-it.
[102] Sudeep Chakravarti. 'The anatomy of a tribal uprising in Jharkhand'. (2019, July 11). *Livemint.* Retrieved from: https://www.livemint.com/opinion/columns/opinion-the-anatomy-of-a-tribal-uprising-in-jharkhand-1562777976997.html

However, people involved in *Pathalgarhi* have deep respect not only for their leader but also for the text *Heavens Light, Our Guide*, which to them is definitive proof that they have rights over their lands through direct award by Queen Victoria. Clearly, for the followers of this group, the nation-state of India came about only much later, and thus has no authority.

Pathalgarhi as a domain of conflict illustrates the struggles and contestations over Adivasi subjectivity, including a rejection of digital infrastructure such as the *Aadhaar* biometric card. Internet infrastructure, a wider umbrella term for various material and symbolic aspects, including biometric identification systems, operationalise at least two crucial ontologies, operates within the framework of the nation-state, reaffirming older infrastructural systems and digitalising them; and they provide a teleological vision or promise of secular progress for a population that is mapped within the nation state. Adivasis, having faced decades of exploitation in the name of development, nationalism and progress are now increasingly challenging the foundational political logics of the state within which infrastructures materialise and operate. In the face of fibre optic cables, biometric cards, satellite enabled mapping and various other digital media and communication infrastructure all in the name of development, it is fitting that Adivasis across central India have chosen the materiality of stone-inscription as their rejection of mainstream state and society, while simultaneously putting their own visions and aspirations forward. However, processes of subjectivation is a complex and contested process with multiple actors involved, and with high stakes for each of these actors.

The *Pathalgarhi* movement also demonstrates the complex temporalities at play when Adivasis engage in and with processes of subjectivity and governmentality. First there is the 'official' timeline favoured by activists and academics – from the anti-colonial land struggles of the late 19th century onwards to present day constitutional struggles (anarchic constitutionalism). Second, there is the invoking of ancient Munda practices of *Sasandiri (*authentic traditionalism). Finally, there is the citing of bequeathed rights by Queen Victoria to Kunwar Keshari Singh bypassing the entire apparatus and history of the postcolonial Indian state in favour of *Sati-Pati* (social infrastructures). All of these temporalities work in conjunction with local histories of theological activism and other political, cultural and economic networks.

Adivasis make no real distinction between the validity of these trajectories even as they mobilise different infrastructural networks and materialities (photocopies of papers, inscriptions on stone, WhatsApp groups to mobilise meetings, burning of biometric and voting cards) to emphasise their own subjective distinctiveness and refusal to 'blend in' with the state or with caste-structured society. Over the years, as many as 30,000 Adivasis have been imprisoned under various charges including sedition, for the crime of being associated or involved with *Pathalgarhi*[103]. In November 2019, in Khunti district of Jharkhand (the very district where revolutionary figure Birsa Munda was born and led struggle for land rights), 10,000 people have been arrested on sedition charges[104]. There are many other Adivasis outside the *Pathalgarhi* movement, working as daily wage labourers in the nearest town for various construction projects, or as agricultural labourers in nearby farms or as brick kiln labour and so on. Their lands are not immediately threatened by mining operations but at the same time, daily social reproduction itself seems to be an uphill task, barely manageable.

As the case of *Pathalgarhi* shows, internet infrastructure is ubiquitous. If not as fibre optic cables, there are biometric identification cards that cannot be evaded. However, just because these infrastructures are present does not mean that they have any real significance in the lives of Adivasis. Rather, ubiquitous presence of state-related internet infrastructure becomes a key marker for Adivasis to assert their own non-identification with such infrastructures, simultaneously asserting their own distinct Adivasi-ness *in relation* to the rejection of internet infrastructure. In other words, burning of biometric and voting cards by *Pathalgarhi* followers are practices of subjectivation that are linked (although not in direct causal relations) to broader infrastructural control associated with to mining operations.

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[103] Wire Staff. 'Activists protest repression of tribals engaged in Pathalgadi movement' (2019, July 22). *The Wire*. Retrieved from: https://thewire.in/rights/pathalgadi-movement-jharkhand-tribals

[104] Supriya Sharma. '10,000 people charged with sedition in one Jharkhand district. What does democracy mean here?' (2019, November 19). *Scroll.* Retrieved from: https://scroll.in/article/944116/10000-people-charged-with-sedition-in-one-jharkhand-district-what-does-democracy-mean-here

6.8 Internet infrastructure and social haunting

In Section 6.6 I had discussed the issue of infrastructural control as a particularly pernicious form of exerting authority. Through various strategies enabled through various kinds of media and communication (and other) infrastructures, power relations are reproduced without presenting a clear target to resist. I found that while impossible to theorise a direct causal link between such infrastructural control and any 'effects', there nonetheless exist a range of corresponding infrastructural practices that can only be called as dynamics of social haunting. I argue that when it comes to indigenous groups in India, internet infrastructures participate in haunting the landscape and life-worlds of Adivasis. When I use 'haunting' I refer to a way in which:

> abusive systems of power make themselves known and their impacts felt in everyday life. It is an animated state in which repressed or unresolved violence makes itself known. It renders the familiar strange and brings the unexpected into view. Haunting is the moment when things are not in their assigned places, when the cracks are exposed, when disturbed feelings won't go away, when the present seamlessly becoming the 'future' gets jammed up (Gordon, 2011, p. 2)

Since 2017, a rumour has been shared hundreds of thousands of times by social media users all over India, especially in the northern states of India. The rumour is that a stranger has been roaming around recently, and is known to be a child-kidnapper or a kidney snatcher (Banaji & Bhat, 2019, p. 45). The post or message warns that this 'stranger' is usually from a different part of India. For example, in Chhattisgarh, the child-kidnapping messages mentioned that the kidnapper is from Tamil Nadu, a state in south India[105]. The message usually concludes with a warning that the stranger has been observed roaming around the region and asks the receiver of the message to be vigilant, and usually ends with an urgent plea to catch this person so that (y)our children remain safe. This message is accompanied

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[105] In the central Indian state of Chhattisgarh, a stranger from the south Indian state of Tamil Nadu may as well be a stranger from another country, another planet. Most people had heard of major cities like Bangalore, Hyderabad, Chennai but couldn't place them on a map, had little or no knowledge about the southern part of the country, and were unfamiliar with any of the South Indian languages.

by an image of a group of children, presumably dead, with their bodies partially covered (see Figure 15 below).

Figure 15: Imaged used in WhatsApp rumours about child-kidnapping

The rumours have claimed more than 50 lives and dozens more have been injured[106]. On one of my visits to a village early in my field work, I was also accused of being a child-kidnapper and was saved from almost certain death-by-lynching (see Appendix 5 for more details). As grateful as I was to survive a near-lynching, I was now keen to find out whether these child-kidnapping/kidney-snatching rumours were widespread and whether all social groups believed in them equally. As I went back to Ambikapur, I found out that in a village

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[106] 'Child-lifting rumours caused 69 mob attacks, 33 deaths in last 18 months' (2018, July 9). *Business Standard*. Retrieved from: https://www.business-standard.com/article/current-affairs/69-mob-attacks-on-child-lifting-rumours-since-jan-17-only-one-before-that-118070900081_1.html

about three kilometres from where I had been, the police had conducted an 'awareness' event warning the people not to believe in such rumours, and assuring them that no children or kidneys had been reported missing anywhere in the region. Just two days after the 'awareness' event, a random stranger passing by had been lynched to death based on these rumours[107]. Clearly, the rumour was circulating in spite of very intermittent, patchy connectivity, and in spite of the fact that very few people had smartphones or could afford data.

As I discussed this with the people I knew in Ambikapur, they were shocked that this had happened to me. Clearly, they too were unaware of the scope of the rumours being circulated, nor did they have any idea how seriously the people outside Ambikapur were taking these rumours. Their shock was another indicator of the huge psychological and ideological, as well as class/caste difference between Ambikapur and the surrounding villages, between the urban and the rural, between the Adivasis and non-Adivasis. The 'upper-caste', upper middle-class people I met in Ambikapur had ready explanations for what had happened most of which centred around the notion that rural people were ignorant, prejudiced, narrow-minded, illiterate and had no business using modern technology by putting others in danger. However, the contempt was underscored with traces of fear.

The spreading of these rumours was perceived not just as ignorance or lack of development and of civilised behaviour and digital literacy, but also as the possibility of unpredictable and uncontrollable behaviour in which *anyone* could be harmed regardless of their status. If a person like me, a researcher who lived in the UK, a dominant caste English-speaking man could be targeted then it followed that those living in Ambikapur too were at risk. This was confirmed when I happened to chat with one middle aged 'upper-caste' man A, who was involved in real-estate business and owned several properties in Ambikapur as well as

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[107] Press Trust of India. 'Man, suspected to be child-lifter, lynched in Chhattisgarh village' (June 23, 2018). *NDTV*. Retrieved from: https://www.ndtv.com/india-news/chhattisgarh-news-man-suspected-to-be-child-lifter-lynched-in-chhattisgarh-village-1871947

across Surguja district, including land in villages where these rumours were circulating. He told me:

> You should not go into the villages to do your research. You stay in Ambikapur where you will be safe. I have my people all across this area, even in the villages. You tell me what information you want and I will ask my people to send it to you in a message or through photographs. Your research data will come to you while you're in Ambikapur so you don't have to take the risk. In fact, I own so much property but I am myself not going to these places. You see I recently changed my glasses. Everywhere because of these rumours, people have a strange look in their eyes. We cannot say what they will do when. If I go to the villages, because of my new glasses, they may think I am an impostor in disguise and lynch me (*Interview with A, Ambikapur, 28th June 2018*)

As a real estate businessman, he owned land and was politically well connected with the top politicians from all parties. But when he spoke about 'the strange look in their eyes', it was an ambiguous statement that signified more than just the usual contempt when referring to illiteracy or ignorance. It was fear that 'they' will now use the rumours as an excuse to take revenge on people like him who have over the years amassed huge amounts of land, wealth and political power. Others in Ambikapur were convinced that these rumours were either a political conspiracy to seed chaos and violence before the general elections (depending on whom I spoke to, the conspiracy was attributed to communists, Maoists, BJP, Congress or other political parties).

Almost every week, I heard that someone had been attacked or had died – all incidents in states across India, including in Chhattisgarh. Due to the physical risk of getting caught up in these child-kidnapping rumours, I could not stay for long in any of the villages. As a result, I had to resort to short visits and interactions with specific people and even these visits were accompanied by local people – journalists, activists, teachers who had generously taken responsibility for my safety. As I started visiting different villages conducting my fieldwork, I realised that these rumours had taken hold much more seriously and deeply than I had initially assumed. Everywhere I went, the men had stopped going out for daily wage work

for fear that while they were away on work, the dreaded stranger would come to harm their children or their family. After sunset, most people in the villages had stopped sleeping in their homes and had started sleeping outside in a common area. They had designated people to keep watch in turns while the others slept under guard. Clearly, this was not a conspiracy – at least not one hatched by local people, nor was it an instance of resistance/weapons of the weak (Scott, 1985) but rather an indicator that there was a startling and powerful mix of fear and anger that had taken hold of entire villages. As I have written elsewhere[108], the fear and anger did not arise out of a vacuum but rather stems from structural oppression for centuries combined with pre-existing commonly narrated stories that mothers would scare their children with - of *Udikka* (roughly translated as 'the one who flies away') a demon who would kidnap children and fly away. It is likely that these stories themselves have a basis in trafficking of Adivasi children to other parts of India for domestic work, prostitution and so on[109].

The speed with which these rumours spread indicated that even though such messages originated online, they quickly bled into offline networks. For instance, in the village where I faced the accusation of being a kidnapper, I had only the previous day, heard that a couple of people with smart phones had been showing the messages of child kidnapping to their neighbours and to their immediate family networks in the village. These people then shared it with their other networks, for instance women who go to the same handpump to draw water, or men who travel together for daily wage work. Through a mix of online and offline, the messages quickly spread to even the most remote areas where people who did not possess smart phones or know how to operate them became convinced of a stranger(s) on the prowl.

Social haunting is further exemplified by another account I heard in some villages I heard as explanation for the mediated appearance of this dangerous stranger. Apparently, earlier in

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108 Ram Bhat. 'Udikka the child snatcher' (July 8, 2018). *The Wire*. Retrieved from: https://thewire.in/society/udikka-child-snatcher-rumours-lynching-dhule-assam

[109] Peter Bille Larsen. 'Indigenous and Tribal Children: Assessing child labour and education challenges' (2003) *International Labour Organization.* Retrieved from: http://www.ilo.org/ipecinfo/product/download.do?type=document&id=1100

2018, the parents and relatives of a young couple had forbidden their love. Frustrated, the young man and woman committed suicide in their respective homes, unable to convince their respective families. Later that day, the families brought their dead bodies to the shore, where they were separated by a river. As the bodies were cremated across the opposing sides of the shore, the smoke from both the bodies rose up and entered into a union before disappearing into the sky. The elders of the village saw this as confirmation that the families and the villagers in general had committed a great wrong by preventing their love, and gave a dire warning – within the year, everyone would face the consequences for their wrongdoing and some terrible misfortune would fall upon the region. When the rumours of child-kidnapping and organ harvesting started circulating, many felt that it was obviously retribution for this previous mistake of theirs, and that they would now have to pay the price. It was a terribly high and violent price to pay, but the sight of the dead bodies of two young lovers was no less terrible.

Such instances of social haunting complicated any efforts to present processes of governmentality and subjectivation in simplistic binaries of structure and agency, domination and agency, rationality and irrationality, modernity and tradition. There is sufficient literature attesting to what Sahlins (2017) has called 'cosmic polities' in non-western societies that govern both personal and social daily life (Eaton, 1996; Singh, 2012; Strathern, 2019). My findings suggest that contemporary infrastructural efforts are giving rise to mixed polities. Across my field site(s), I found that for many Adivasis, their belief in the lovers' curse co-existed comfortably with retribution foretold on WhatsApp messages. The consequences and effects of such mixed polities (and governmentalities) need to be studied with more detailed longitudinal ethnographic research.

In general terms, the internet infrastructure including institutional, human personnel, administrative and technological systems, along with other substrates of infrastructure (such as electricity, backup, computers etc.) were either missing, broken, in progress or scheduled for future construction in most Adivasi societies in northern Chhattisgarh. Most of the people I met there had no relation to internet infrastructure except a complete non-cognition of its function or its meaning. The landscapes in Adivasi areas had only a fleeting presence of partial infrastructure as if someone had decided to build it once upon a time

but either lost their way or gave up mid-way. As seen in the pictures below, I saw fibre optic cables peeking out of the ground leading to nowhere. In other cases, some Adivasis had cut out cables and started using them as a clothesline (see Figure 16 below). Yet others were burning fibre optic cables as fuel to cook food on their stoves.

Figure 16: Ghostly infrastructure

In the face of the coal mining and destruction of livelihoods of Adivasis that I have mentioned previously in this chapter, internet infrastructures produce social haunting rather than any 'rational' subject construction practices. The examination of internet infrastructure in Chhattisgarh reveals much about the wider power relations between the state, groups such as Adani and Adivasis as a product of longer genealogies that need empirical attention.

6.9 Conclusion

In this chapter, in contrast with Chapter 5, where I focused mostly on Ambikapur and surrounding areas, I have focused on the extent to which internet infrastructures play a role in processes of governmentality and subjectivation of the Adivasi-inhabited areas of Chhattisgarh. In avoiding an essentialised Adivasi identity, I argue that Adivasis have diverse subject positions even within the category of indigeneity. There are several other factors that influence processes of subjectivation when it comes to the topic of internet

infrastructure – including spatial proximity to the nearest town, the presence or absence of mining, relationship of Adivasi-led *Panchayats* to the state and central governments, presence of other infrastructural substrates such as electricity and basic needs such as health and education services.

Thus, Adivasis engage in a wide range of infrastructural practices resulting in various subject positions although these are quite different from those of non-indigenous Indian subjects. I have illustrated cruel optimism, where some Adivasis continue to invest in the promise of infrastructure. As the scene of social action shifts closer to active mining areas, we see that Adivasis are engaged in practices of governmentality and subjectivation that appear inchoate as with the case of *Pathalgarhi*. In this as with so many other Adivasi mobilisations, there are multiple beliefs, experiences and histories that come into play, terminating into a single infrastructural practice – such as the burning of voter or *Aadhaar* cards. In the absence of direct presence of internet infrastructure, I have highlighted instances of infrastructural control as a *mode* of exerting authority both in epistemic terms (the ability of satellite enabled GIS systems to reconfigure rich life worlds into scientifically discrete and therefore categories subject to manipulation) and material terms (in the instance of water infrastructure controlling water supply through intimate control of images as photographic evidence, valves and pressure).

I argue that, in many of these areas, internet infrastructures (through the use of satellite imagery, for instance) in conjunction with (and often subordinate to) broader infrastructural projects (such as coal mining) overdetermine the specific object of research – in this instance infrastructural practices. Thus, it follows that internet infrastructure itself is incomprehensible without considering how internet infrastructure relates to broader infrastructures such as those involved in mining. Such other broader factors are unlikely to overdetermine dominant caste groups and middle classes living in urban areas such as the city of Ambikapur. It is this overdetermination of broader infrastructures that renders the familiar unfamiliar, producing a dynamic of social haunting. Silences and haunting are different registers of violence but it would be a mistake to stop with the empirical fact of violence (stubborn silence, tales of dead lovers plotting revenge, rumours on WhatsApp leading to lynchings and so on). Instead, such 'incomprehensibility' signifies an urgent call

for transforming the conditions of social reproduction including the processes of knowledge production where conceptual categories (such as my provisional category of mixed polities) are developed further.

Chapter 7 Conclusion

The development of internet infrastructures is undertaken with huge public investment because of the association of such infrastructure with a state of being developed and being modern in ways that are synchronised with the flows and logics of global financial capitalism. In such a vision, individual user-citizens join the international community of internet users participating in the digital global economy and the digital public sphere. The BJP government is complicit in crony capitalism and the prime driver of Hindutva ideology. In both cases, internet infrastructure has played a crucial role.

My research project revolves around the Indian National Optical Fibre Network (NOFN), one of the world's largest public connectivity projects. The NOFN constellates and institutionalises material and discursive elements to produce a set of practices – ranging from institutional practices of administration and maintenance to user practices of governance and daily life. In this concluding chapter I review the role played by internet infrastructures in the northern part of Chhattisgarh, answering research questions with which I conducted fieldwork:

1) Under what political, economic and discursive formations has internet infrastructurs emerged in India?
2) How and to what extent does the case of India shed light on how internet infrastructure is imbricated in processes of governmentality?
3) In contemporary India, how and to what extent does internet infrastructure play a role in processes of individual and group subjectivation?

7.1 Findings

In 2014, Narendra Modi of the BJP gave unprecedented legitimacy and resources to internet infrastructure under the flagship 'Digital India' programme, with the National Optical Fibre Network (NOFN) as its material backbone. Internet infrastructure is indispensable for the politics and governance of Modi's BJP government. I have adopted a historically situated palimpsestic approach to investigate the conditions under which communicative

infrastructure emerged in India since I argue that such infrastructure emerge in concomitance with socio-political contexts. Just as the telegraph was fundamental to the colonial control over commerce, military and politics it was justified as progress and part of the mission to civilise natives. Contemporary internet infrastructure too is fundamental to the expansion of extreme forms of capitalism into rural areas across the global south, as well as consolidating far-right Hindu ideology in India. It is not surprising that internet connectivity is justified in terms of economic and secular development, individual freedom, freedom of speech, better and cleaner governance.

I undertook a discourse analysis of the policy documents (from the 1980s to 2014) and discourses of politics and expertise on internet infrastructure in India. I found that various transformations in the economic, political, cultural and technological domains have shaped the discourse of communicative infrastructure after India's independence in 1947. The development of internet infrastructure took place in the context of neoliberalisation that involved the deliberate undermining of public sector undertakings and the promotion of largely unregulated private investment. Through the discourses of systems rationality, enumeration and digital governmentality, the increasing importance of communicative infrastructure was shown to be emphasised through policy with the twin objectives of economic and social development. The former connotes policy on industry and commerce while the latter connotes the welfare of subjects (as user/subscriber-citizens). The policy discourse has itself become increasingly technologised – quantifying political aspects of connectivity in terms of measuring access, and modelling economic growth. The material conditions for building the National Optical Fibre Network are achieved through a public corporation that in turn sub-contracts to private contractors, increasingly large corporations (such as Reliance and Tata) who are already owners of private fibre optic networks, wireless telecom networks, undersea cables as well as owners of broadcast media and other non-media industries.

Using the methods of ethnographic participant observation and semi-structured interviews I conducted fieldwork in Surguja district of Chhattisgarh in India. In the city of Ambikapur, I found that local elites uphold and reproduce the subject position assumed by the state in national policy discourses in their daily work and discourse - especially the policy discourses

of associating internet connectivity with development for rural populations in terms of efficient, transparent and accessible government services. In doing so, they view internet infrastructures as constitutive of a new and strong government with themselves at the frontline of public service. Various other social groups however have much more complex negotiations with internet infrastructures and resulting infrastructural practices. Upper and middle classes and dominant caste groups have strategies that accept the telos of digital governmentality in principle while they seek to subvert governmentality in practice. With the Modi-led BJP government, internet infrastructure has enabled a new architecture of political rule enabled by the view from above and systems rationality. Using a triad of bank account number, biometric number and mobile phone number, direct cash transfers are targeted at specific groups in the population. Such infrastructural politics has failed to win the BJP a third term in the Chhattisgarh state elections but played a significant role in the BJP's victory in 2019 national elections (including strong support from Chhattisgarh).

In the rural Adivasi inhabited areas, I found that the National Optical Fibre Network is absurdly visible (although almost completely dysfunctional) in relation to the absence of other critical infrastructure related to basic needs. In some villages, the network is rendered useless without the availability of electricity. In other villages, the village government buildings are of poor quality and on the verge of collapse thus making them unusable. In yet other villages, the problems are institutional – lack of personnel who are computer literate. Many of the villages in northern Chhattisgarh, as indeed large parts of central India, are bound to be demolished and make way for coal mining. Even in such villages that will disappear soon, fibre optic cables have made their way although the local Adivasis there have no idea who laid fibre optic cables in their village, or why they were laid.

In some of the Adivasi areas, especially nearest to the urban centres, I found that, following Berlant, that the Adivasis experienced a cruel optimism whereby they were very well aware of the discrimination and inequality that worked against them, but nonetheless believed in the promise of infrastructure. In most cases, Adivasis had a non-existent relationship with the internet. If there was an indirect relation, it was that satellite imagery and digital networks played a role in creating knowledge that reconfigured space – a holistic approach to space was replaced by institutionalised scientific knowledge that reconfigured that space

into biodiverse regions (with specific and quantifiable flora and fauna, elephant zones) and regions that were 'fringe' (thus open to mining). In such regions, internet infrastructure played a role in exerting indirect infrastructural control in epistemic terms and direct infrastructural control in material terms. As the Adivasi areas are further removed from the urban centres, their situation is more dire and violent. In such cases, Adivasis responded with silence, and in other cases, saw internet infrastructure and infrastructural practices as apparitions that disrupted their daily lives, producing a dynamic of social haunting.

7.2 Implications for theory and methods

I have used a broad definition of infrastructure as material and symbolic goods circulating to create institutionalised structures that bind people into collectivities. Since I have been concerned throughout with investigating processes of governmentality and subjectivation, I theorise the state and its subjects as relational entities, discursively articulated by individuals and groups, grounded in material and discursive practices. It is through a set of practices that authority is exerted over others. It is through a set of practices that the subject is configured and constituted. Infrastructural practices were thus a key object of my research where I could observe how such practices played a role in the exerting of authority and the construction of the subject. Infrastructural practices come into play already discursively embedded in specific socio-political contexts that are further inflected by the historical subject position of the individual or social group engaging in infrastructural practice.

The historically situated discursive analysis of internet infrastructure provided valuable insights into the 'long dureé' logics that infuse infrastructures with meaning. Policy discourses have not only enhanced the significance of connectivity as a public good, the discourses are now 'anchored' by the political discourse of the prime minister Modi and his cabinet. Modi's practices an American presidential-style politics centred on the media management of his personality and winning elections. Politics is now seen and understood primarily in electoral terms rather than in social terms. Internet infrastructure became and remains a crucial element for the BJP in governing from above, managed through cash transfers and the rhetoric of secular technologised development while repeatedly used to

encourage aggressive Hindutva values and behaviours. However, unlike previous governments, since 2014 the BJP government has increasingly conducted its politics outside and beyond the sites of policymaking, even while retaining tight control of that arena.

With the figures of Modi and his henchman Amit Shah taking centre stage, there are other non-government or non-state factors that drive politics. These factors include the influence of the far-right family of 'civil society' organisations headed by the Rashtriya Swayamsevak Sangh (RSS), the influence of large corporations (such as the Adani and Ambani group) who enjoy the confidence of Modi and have disproportionately benefited from corruption[110] that has impoverished the public exchequer, and the obsession of the Modi government with image management. In the time of populist politics, discourse analysis of policy documents and political discourse are useful but insufficient for grasping the complexity of discourse in other spaces. Future scholarship could usefully attempt to study discourse on internet infrastructure much more exhaustively including political discourse, mainstream media discourse, cultural discourse (in entertainment and arts), civil society discourse and so on. The proliferation of digital networks has in itself led to greater discourse about the internet and its infrastructure. The relations between these different kinds of discourse will be valuable in terms of getting a more detailed understanding of how social relations, state-subject relations and political developments are marked by power flows.

Infrastructural practices as the object of my research have yielded rich and detailed data for analysis. Using a combination of ethnographic participant observation (including field notes) and semi-structured interviews, I was able to get a sense of how people interact with internet infrastructures (i.e. infrastructural practices) on a daily basis as well as how people talk about such practices. There are various types of infrastructural practices for specific social groups (college or school students, teachers, beneficiaries of specific schemes and so on). As internet infrastructures become more ubiquitous and indispensable for governance

[110] Sten Widmalm. 'Under Modi Govt, a two-pronged attack on Indian democracy' (7 April, 2019). *The Wire.* Retrieved from: https://thewire.in/politics/india-democracy-modi-government. Sagar. 'Papers and Planes' (16 December, 2018) *The Caravan.* Retrieved from: https://caravanmagazine.in/government/hidden-story-doval-modi-cabinet-undermined-india-interests-rafale

and daily life, we will see an increase in the range and complexity of infrastructural practices that could be taken up by future research. I have not focused on any specific social group but have allowed the organic process of conducting fieldwork (snowballing and following the internet infrastructure of the National Optical Fibre Network) to lead me different groups and practices. While I have used the NOFN as a preliminary object of my research for the sake of analytic convenience, I found my research methods flexible enough to incorporate a sprawling and complex web of infrastructural relations enmeshed in social action. The absence of direct internet infrastructure in Adivasi areas made me attentive to broader infrastructural relations including the use of satellite-enabled GIS systems that acted upon Adivasi life worlds in unpredictable often adverse ways. In the course of writing this dissertation, I have separated urban centres (such as the city of Ambikapur) from indigenous rural areas. My research suggests that dominant caste groups, upper and middle classes find it more comfortable to negotiate with subject positions inherent in infrastructural practices. Given their secure social status, along with ownership of land, stable employment or other source of income, they were either indifferent to internet infrastructures or used it mostly for personal entertainment and sociality. However, these very groups (although I have not observed this personally in my fieldwork) are likely to spread disinformation against Muslims, Dalits and Adivasis during charged occasions such as elections, cross-border and religious conflicts.

When it comes to the Adivasi groups, I come to a difficult conclusion. My theoretical framework and the research methods did not yield data in the way that I expected. For instance there are three crucial 'moments' that I have referred to in Chapter 6 – my informant L's silence and my own inability to have a conversation; the story of the souls of two lovers putting a curse on the people as an explanation for child-kidnapping rumours circulating on WhatsApp; and finally, the encounters with fibre optic cables going nowhere, Adivasis cutting the cables and using them for domestic purposes (clothesline and cooking fuel for instance). In each of these instances, the infrastructural practices of Adivasis inadvertently revealed how Adivasis relate to the State. In order to theorise such moments, I was forced to go beyond my theoretical framework to arrive at moments of silence, non-recognition and social haunting that belong in a critical race studies and postcolonial tradition. One could hypothetically argue that perhaps other findings would be revealed if

other research methods gathered longitudinal qualitative or quantitative data. However, I argue that this is not a methodological issue but an epistemological one. My own caste-position and class privilege necessarily shape how I construct my research design; but equally my recognition of these positionings, allowed me to go beyond the initial design and theorisation.

Reflecting on such moments in my field work, one of the key arguments of my doctoral research is that internet infrastructure is *not* neutral and that there are different ways in which different groups in society engage with it, and that, ultimately, those ways of relating are shaped by and go on to shape historical power relations. The range of unexpected practices from Adivasis goes beyond class. Critical race studies scholars (Spillers, 2003; Weheliye, 2014; Wynter, 2003) have pointed out the weakness of such post-structuralist theorisation. Weheliye (2014, p. 4) aptly sums up the difference:

> Bare life and biopolitics discourse not only misconstrue how profoundly race and racism shape the modern idea of the human, it also overlooks or perfunctorily writes off theorizations of race, subjection, and humanity found in black and ethnic studies, allowing bare life and biopolitics discourse to imagine an *indivisible biological substance anterior to racialization*. The idea of racializing assemblages, in contrast, construes race not as a biological or cultural classification but as a set of socio-political processes that discipline humanity into full humans, not-quite-humans, and nonhumans. (emphasis added)

Critical caste and indigeneity scholars have been making similar arguments in the context of caste and indigeneity respectively (c.f. Aloysius, 1997; Dungdung, 2013; Xaxa, 2019). Partly, the blindness to subaltern subjectivity and processes of subjectivation is a broad problem about the extent to which academic knowledge production itself has been structured to exclude the position and perspective of the oppressed groups. There clearly exists a need to dismantle the epistemological hegemony which only reproduces research designs that cannot 'see' the social as marked ontologically by race, caste, indigeneity and gender (Banaji, 2017; Bodhi & Jojo, 2019; Grosfoguel, 2012; Willems, 2014). These very same questions would be designed and theorised ontologically and radically different from the

ways in which I have approached it, by inaugurating 'epistemologies of the south' (Santos, 2016) . From my subject position, the infrastructural practices yield silent subjects, caught up in cruel optimism and/or producing social haunting. As I grapple to make 'sense', I argue that future scholarship on such questions – namely questions of governmentality and subjectivation in connection with technology, need to be studied and theorised by Dalit, Adivasi and Bahujan scholars directly. It is in this way that use of research methods, including the ones I have used – ethnographic observation and interviews, will be transformed from within.

Re-centring the significance of caste and indigeneity would require that 'India' as a conceptual category has to undergo multiple refractions – refracted by caste, indigeneity, gender, class and so on, in the same way that 'Asia' can be a method (c.f. Chen, 2010). It is this precise dilemma of the question of 'subaltern subjectivity' which has sparked debate between scholars in subaltern studies and postcolonial theories (Chakrabarty, 2015; Chatterjee, 2012; Nixon, 2019). The debate has been unfortunately locked in binary terms whether the subaltern subject is beyond the limit of universal modernity, or is entangled in complex negotiations to form hybrid modernities. My research suggests that the subaltern subject is fundamentally different from universal modernity in some instances and is in the process of complex negotiations with modern governmentality to imbibe a modern hybridised subject position in other instances. There is no way of knowing in advance which of these will inhere until there is empirical investigation on specific subaltern subjects living in mixed polities (both cosmic and modern). Different kinds of encounters I have discussed in Chapter 6 illustrate the contingency and complexity of how Adivasis engage in infrastructural practices.

7.3 Implications for the future

As I have noted in my findings in Section 7.1, my research suggests a new architecture of rule by far-right Hindutva forces in India. This new architecture consists of reconfiguring citizens (most of them vulnerable) as a triangulation of three data points – biometric number, bank account number and mobile phone number (the so-called JAM trinity). This architecture enabled by internet infrastructure goes against the democratic decentralisation

process initiated by the 73rd amendment to the Indian constitution, namely to strengthen the *Panchayat* village government system and subsequently the Panchayat Extension Scheduled Areas (PESA) Act 1996 for extending protections to land, system of governance and in general a way of life for indigenous societies. The new architecture of rule has immediate political implications since the far-right forces control the state. Further, apparatuses of the state such as the police and the courts are being used to enable violence against the oppressed castes and Muslims. In such a situation, any political opposition, whether it is in the domain of electoral politics or whether it is opposition in more broad terms (politics as the terrain on which relations are forged, especially with the state) will have to contend with the hegemonic strategy of projecting the targeted welfare state system to offset communal and casteist violence and hate.

My doctoral research, through the provision of a critical account of the entanglement of internet infrastructures with processes of governmentality and subjectivation, has sought to provide a vantage point, a different way of 'reassembling the social' (Latour, 2005). In political terms, my research suggests that it is necessary to expand the current understanding of Hindutva as a political ideology. Technologising state-subject relations profoundly changes the terrain on which some groups get to be citizens and others do not. Although such centralised technologisation has been steadily gaining prominence in the art of governing since the mid-1980s, the BJP through Modi now governs through a dual matrix of politics. One is a matrix of religious majoritarianism where groups of different castes can be united under a Hindu subjectivity by othering Muslims. The other is a matrix of digital governmentality where targeted welfare reorganises the population as beneficiaries of different schemes so that the BJP can win elections and continue its democratic march to authoritarianism. The development of communicative infrastructure for daily life and digital governmentality follows the development of capitalism in the sense that it is easier to imagine the end of the world rather than roll back on digital technologisation (Jameson, 2003). I would argue that similar targeted welfare systems in conjunction with authoritarianism against minorities and/or vulnerable groups may soon become a common and naturalised feature in many countries across the globe (c.f. Ferguson & Gibson, 2015). Countering such dangerous tendencies is extremely challenging and requires unprecedented action at the global level. However, before acting it is important to critically

interrogate the knowledge, the epistemological foundations that enable the relentless development of technological infrastructure in the name of progress and development.

The political implications mentioned above should be considered alongside the economic implications. As I have noted, since the mid-1980s, conditions in India have been conducive for a distinctive media(ted) economy. Mobile telecommunication was one of the few sectors to have generated consistent growth since the early 2000s. However, through mismanagement of licensing procedures, overpricing of spectrum, broad definition of Aggregate Gross Revenue (AGR) in order to collect more revenue from telecom firms, favouritism towards Reliance-owned Jio[111] and many other such reasons, the government has forced the telecom sector into a crisis. The mobile telecommunications sector has now three major service providers of which two – Airtel and Vodafone-India are both heavily in debt to the government over payment of AGR[112].

By the end of 2020, it is likely that only Jio, a telecom provider owned by Mukesh Ambani of Reliance Industries Limited will have near monopoly control over the telecom market. This bodes very ill for the mediated economy since wireless mobile phone data is the primary communicative infrastructure for the majority of the population, especially in rural parts. In spite of the rhetoric of connectivity and development, the National Optical Fibre Network (NOFN) is primarily a backbone network, and the government has no financial resources or institutional capacity to deliver ongoing connectivity, maintenance and customer service to the majority of the population since from at least a decade, the government has deliberately undermined the public telecom provider BSNL[113]. Incidentally, the 'seed' fund of the Universal Service Obligation Fund (USOF) for the National Optical Fibre Network came

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[111] Since the inception of Jio network in 2016, prime minister Modi of the BJP has provided free publicity and legitimacy for the network by appearing in Jio advertisements. Further, the regulator Telecom Regulatory Authority of India (TRAI) allowed Jio to bundle mobile device along with free data for almost a year in the name of promotion, thereby creating an unequal playing field for competitors. Such anti-competitive practices have allowed Jio to grab a significant part of the market share in a very short period.

[112] Nellur Sethuraman. 'Factbox: India's telecom sector on the ropes after $13 billion levy ruling' (28 November, 2019). *Reuters*. Retrieved from: https://www.reuters.com/article/us-india-telecoms/factbox-indias-telecom-sector-on-the-ropes-after-13-billion-levy-ruling-idUSKBN1Y20TQ

[113] Shilpa Shaji. 'BSNL: No wages in 10 months, 7 contract workers kill themselves' (09 November, 2019). *Newsclick*. Retrieved from: https://www.newsclick.in/BSNL-Wages-10-months-7-Contract-Workers-Kill-Themselves

from the 5% of Aggregate Gross Revenue of the telecom service providers. The crisis does not bode well since so far, in a media economy, 'intangible modernity is invariably much cheaper to deliver than the old manufactured product' (Athique, 2018, p. 15). Such intangible modernity is cheaper to deliver and has a higher rate of profits (since reproduction of a digital file comes at little or no cost) but for the same reason, the Indian economy now depends to a large extent upon the media economy. The crisis of the telecom sector and the monopoly of Jio is metonymic of the broader structural crisis produced by corrupt neoliberal economics in India and deserves in-depth study by future scholars.

Theoretically, my research is a snapshot of how internet infrastructure plays a crucial role in the production of subject positions and exercise authority over individuals and groups. Correspondingly, I have also discussed the various ways in which different social groups (urban/rural, indigenous/non-indigenous, class-based groups) negotiate their own subject construction and respond to authority. Drawing upon literature from different disciplines has enabled me to overcome artificial binary distinctions such as structure and agency, material and discursive. My contribution to the emerging sub-field of infrastructure studies is to provide a new way of studying communicative infrastructures involving: a renewed emphasis on relationality (infrastructures, governmentality and subjectivation as relational processes and practices); situating internet infrastructures within broader infrastructures; and a historical analysis of how infrastructure is caught up in exercise of power relations.

With the focus on infrastructure, my research investigated processes of both subjectivation and governmentality. The theoretical implications of my research should be of direct relevance to scholars not only in media and communications, and Science and Technology studies (the obvious audiences), but also (social) anthropology and (political) sociology. For instance infrastructure allows for new ways of theorising state effects (Gupta & Sharma, 2006; Mitchell, 2011) since infrastructures are technological relations that blur the lines between public and private, policy and politics in terms of institutional and financial arrangements. In this context, it is not possible to study the state as a static tangible entity but rather as a dispersed set of practices where the state is visible in terms of the relations it constitutes and the effects (power/knowledge) brought about by such relations.

7.4 And finally

Internet infrastructure in India plays a role in processes of governmentality and subjectivation but in complex ways that defy straightforward narrativisation. In large parts of the country, processes of governmentality are rapidly transforming the ways in which individuals and groups become visible to the state. Technological and communicative infrastructure then becomes the mode within which specific struggles for political visibility are negotiated. However, if seen from the perspective of Dalits, Adivasis and Bahujans, then such infrastructures enter their lifeworld as objects without the sublime discourses of progress and development. As ghostly objects they bring about cruel optimism, silence, a refusal of cognition and social haunting depending on the context. It is not possible to translate these findings unproblematically to different spaces with different historical contexts and cultures.

Concluding his research on cinema theatres in Nigeria, Larkin (2008) wonders what would happen to theory if theorising began in the global south? My doctoral research has only studied a small set of practices in one district of India. More empirical work on different types of infrastructural practices, at different levels, with different scales, and in different field sites will together enrich and build better theory. The efforts at decolonising knowledge production need not be structured and framed as the 'other' of the West (Patel, 2006). Rather than insisting on alterity, future scholarship based on empirical research under diverse conditions will lead to de-centring Theory with a capital T. Under such diverse conditions, the work of theorising will often need to go beyond the neat boundaries of disciplines and epistemologies constructed in the confines of the colonial and imperial metropoles. In order to adequately theorise and thus represent complex societies, it will be necessary to build conceptual categories from the ground up. Until then, the indigenous and the oppressed castes' life-worlds can only appear in the academy as lack, as deviance from the universal.

A decolonial spirit of praxis both within the academy and outside will go a long way in bringing about an end to the relentless slide towards authoritarianism.

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Appendices

Appendix 1A Coding frame for internet infrastructure
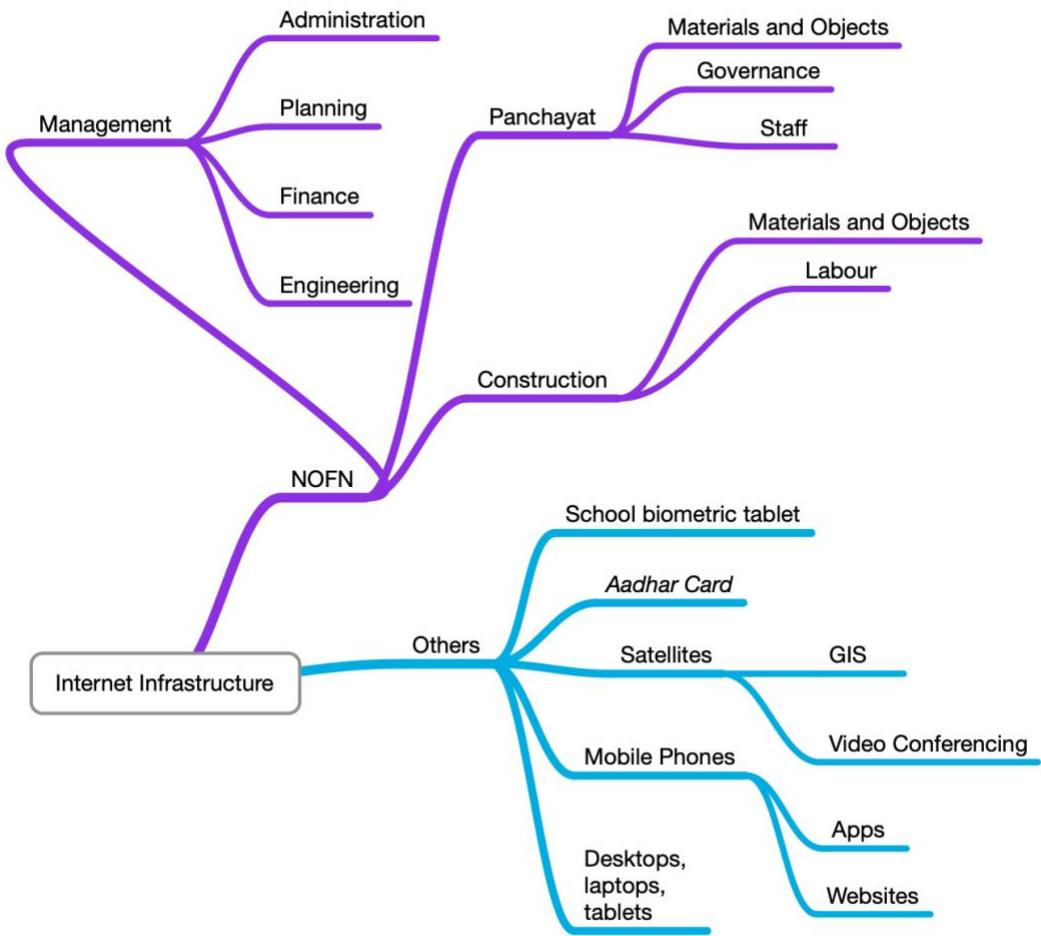
Appendix 1B Coding frame for other infrastructure
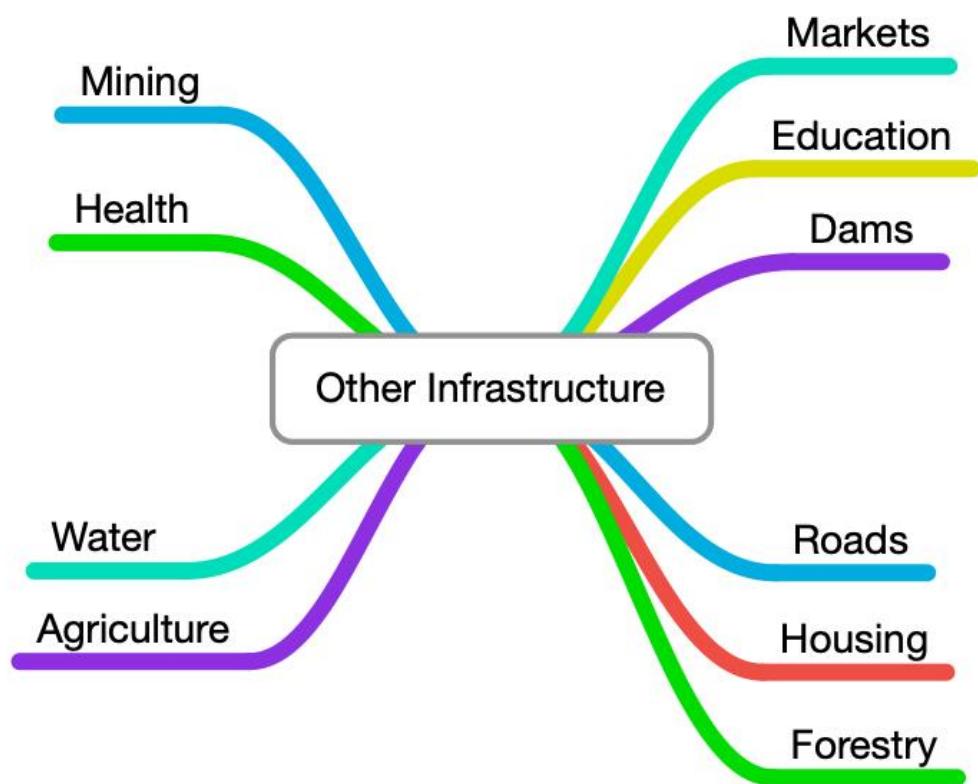
Appendix 1C Coding frame for governmentality and subjectivation
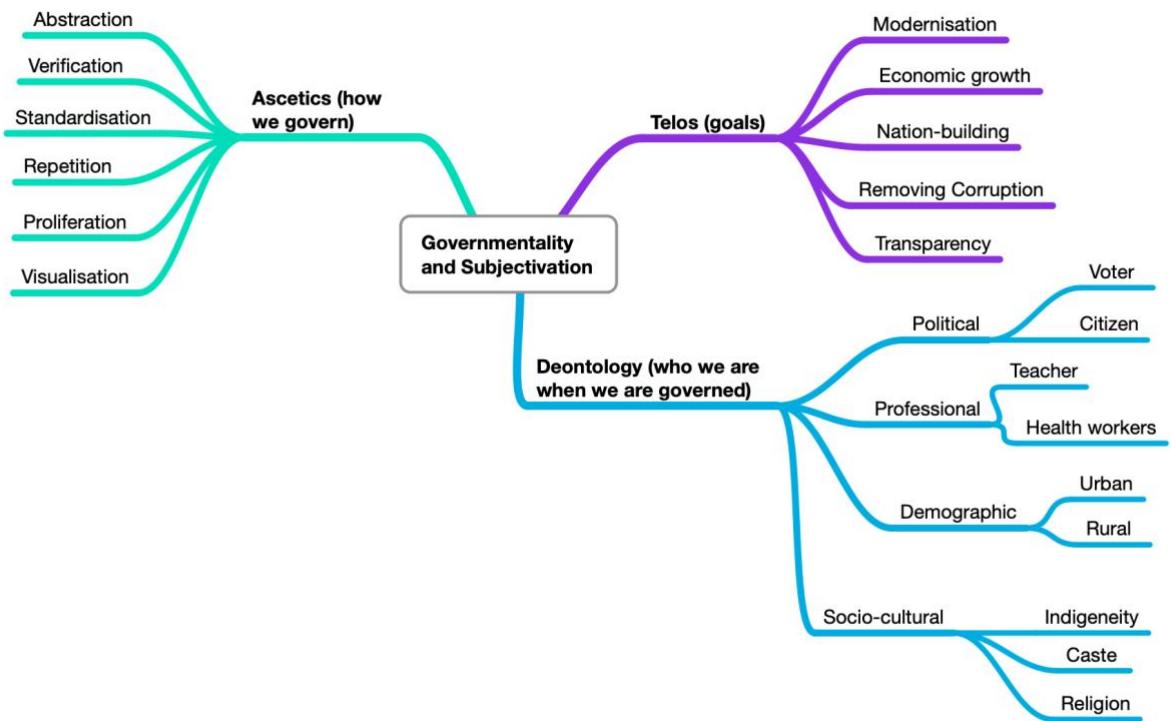
Note: I was attentive to relations, practices and processes with respect to all three coding frames above. I applied these coding frames to my field notes from ethnographic participant observation, the corpus of texts considered for discourse analysis, and transcripts of semi-structured interviews and conversations.

Title of document	Year of Publication	Institution/Source	Length
The Missing Link	1984	International Telecommunications Union (https://www.itu.int/en/history/Pages/MaitlandReport.aspx)	16 pages
Development, Democracy and the Village Telephone	1993	Harvard Business Review Nov/Dec 1993, Vol. 71(6), p.66	20 pages
National Telecom Policy 1994	1994	Department of Telecommunications, Government of India https://dot.gov.in/national-telecom-policy-1994	5 pages
National Democratic Alliance Manifesto 1999	1999	Bharatiya Janata Party (BJP)	18 pages
Vajpayee Independence Day Speech 2003	August 15th 2003	Prime Minister's Office Archive https://archivepmo.nic.in/abv/speech-details.php?nodeid=9239	11 pages
Broadband Policy 2004	2004	Department of Telecommunications, Government of India https://dot.gov.in/broadband-policy-2004	8 pages
Recommendations on National Broadband Plan	2010	Telecom Regulatory Authority of India https://trai.gov.in/sites/default/files/Rcommendation81210.pdf	117 pages
National Telecom Policy 2012	2012	Department of Telecommunications https://dot.gov.in/relatedlinks/national-telecom-policy-2012	28 pages
Narendra Modi speech in Lok Sabha (lower house of Parliament)	February 17th 2017	Narendra Modi website https://www.narendramodi.in/preliminary-text-of-pms-reply-to-motion-of-thanks-to-the-presidents-address-in-lok-sabha-534233	21 pages

Appendix 2B National Telecom Policy 1994

Introduction:

1.The new economic policy adopted by the Government aims at improving India's competitiveness in the global market and rapid growth of exports. Another element of the new economic policy is attracting foreign direct investment and stimulating domestic investment. Telecommunication services of world class quality are necessary for the success of this policy. It is, therefore, necessary to give the highest priority to the development of telecom services in the country.

Objectives:

2.The objectives of the New Telecom Policy will be as follows:

The focus of the Telecom Policy shall be telecommunication for all and telecommunication within the reach of all. This means ensuring the availability of telephone on demand as early as possible.

Another objective will be to achieve universal service covering all villages as early as possible. What is meant by the expression universal service is the provision of access to all people for certain basic telecom services at affordable and reasonable prices.

The quality of telecom services should be of world standard. Removal of consumer complaints, dispute resolution and public interface will receive special attention. The objective will also be to provide widest permissible range of services to meet the customer's demand at reasonable prices.

Taking into account India's size and development, it is necessary to ensure that India emerges as a major manufacturing base and major exporter of telecom equipment.

The defence and security interests of the country will be protected.

Present Status:

3. The present telephone density in India is about 0.8 per hundred persons as against the world average of 10 per hundred persons. It is also lower than that of many developing countries of Asia like China (1.7), Pakistan (2), Malaysia (13) etc. There are about 8 million lines with a waiting list of about 2.5 million. Nearly 1.4 lakh villages, out of a total of 5,76,490 villages in the country, are covered by telephone services. There are more than 1 lakh public call offices in the urban areas.

Revised Targets:

4. In view of the recent growth of the economy and the reassessed demand, it is necessary to revise the VIII Plan targets as follows:

Telephone should be available on demand by 1997.

All villages should be covered by 1997.

In the urban areas a PCO should be provided for every 500 persons by 1997.

All value-added services available internationally should be introduced in India to raise the telecom services in India to international standard well within the VIII Plan period, preferably by 1996.

Resources for the Revised Targets:

5. The rapid acceleration of Telecom services visualised above would require supplementing the resources allocated to this sector in the VIII plan. The total demand (working connections + waiting list) showed a rise of nearly 50% from 7.03 million on 1.4.1992 to 10.5 million on 1.4.1994 over a three-year period. If the demand grows at the same rate for the next three years, it would touch about 15.8 million by 1.4.1997. The actual rate of growth is likely to be higher as the economy is expected to grow at a faster pace. Achieving the target of giving telephone on demand by 1997 would thus imply releasing about 10 million connections during the VIII Plan as against the existing target of 7.5 million. Release of 2.5 million additional lines alone would require extra resources to the tune of Rs. 11,750 crores at a unit cost of Rs. 47,000 per line at 1993-94 prices. To this must be added the requirement on account of additional rural connections of Rs. 4,000 crores.

6. Even with the comparatively modest targets of the VIII Plan, as originally fixed, there is a resource gap of Rs. 7,500 crores. The additional resources required to achieve the revised targets would be well over Rs. 23,000 crores. Clearly this is beyond the capacity of Government funding and internal generation of resources. Private investment and association of the private sector would be needed in a big way to bridge the resource gap. Private initiative would be used to complement the Departmental efforts to raise additional resources both through increased international generation and adopting innovative means like leasing, deferred payments, BOT, BLT, BTO etc.

Hardware:

7. With the objective of meeting the telecom needs of the country the sector of manufacture of telecom equipment has been progressively re-licensed. Substantial capacity

has already been created for the manufacture of the necessary hardware within the country. The capacity for manufacture of switching equipment, for example, exceeded 1.7 million lines/year in 1993 and is projected to exceed 3 million line/year by 1997. The capacity for manufacture of telephone instruments at 8.4 million units per year is far in excess of the existing or the projected demand. Manufacturing capacities for wireless terminal equipment, Multi Access Radio Relay (MARR) for rural communication, optical fibre cables, underground cables etc. have also been established to take care of the requirements of the VIII Plan. With the revision of the targets demand would firm up and there would be an incentive to expand the capacities to meet the extra requirement.

Value Added Services:

8. In order to achieve standards comparable to the international facilities, the sub-sector of value-added services was opened up to private investment in July 1992 for the following services:

Electronic Mail

Voice Mail

Data Services

Audio Text Services

Video Text Services

Video Conferencing

Radio Paging

Cellular Mobile Telephone

9. In respect of the first six of these services companies registered in India are permitted to operate under license on non-exclusive basis. This policy would be continued. In view of the constraints on the number of companies that can be allowed to operate in the area of Radio Paging and Cellular Mobile Telephone Service, however, a policy of selection is being followed in grant of licenses through a system of tendering. This policy will also be continued and the following criteria will be applied for selection:

Track record of the company;

Compatibility of the technology;

Usefulness of the technology being offered for future development;

Protection of national security interests;

Ability to give the best quality of service to the consumer at the most competitive cost; and Attractiveness of the commercial terms to the Department of Telecommunications.

Basic Services:

10. With a view to supplement the effort of the Department of Telecommunications in providing telecommunication services to the people, companies registered in India will be allowed to participate in the expansion of the telecommunication network in the area of basic telephone services also. These companies will be required to maintain a balance in their coverage between urban and rural areas. Their conditions of operation will include agreed tariff and revenue sharing arrangements. Other terms applicable to such companies will be similar to those indicated above for value-added services.

Pilot Projects:

11. Pilot projects will be encouraged directly by the Government in order to access new technologies, new systems in both basic as well as value-added services.

Technology and Strategic Aspects:

12. Telecommunication is a vital infrastructure. It is also technology intensive. It is, therefore, necessary that the administration of the policy in the telecom sector is such that the inflow of technology is made easy and India does not lag behind in getting the full advantage of the emerging new technologies. An equally important aspect is the strategic aspect of telecom, which affects the national and public interests. It is, therefore, necessary to encourage indigenous technology, set up a suitable funding mechanism for indigenous R&D so that the Indian Technology can meet the national demand and also compete globally.

Implementation:

13. In order to implement the above policy, suitable arrangements will have to be made (a) protect and promote the interests of the consumers and (b) ensure fair competition.

Development, Democracy and the Village Telephone

By Sam Pitroda

Harvard Business Review, Nov/Dec 1993, Vol. 71(6), p. 66

I was born in 1942 and raised in a poor village in one of the poorest areas of rural India, a place with kerosene lamps and no running water. In 1980, at 38, I was a U.S. citizen and a self-made telecommunications millionaire. By 1990, I was 47 years old and nearing the end of nearly a decade back in India as leader of a controversial but largely successful effort to build an Indian information industry and begin the immense task of extending digital telecommunications to every corner of my native country, even to villages like the one where I was born.

That effort persists today at an increased pace, but it remains controversial. Some of the controversy has centred on me and my methods. Most of it focuses on the efficacy and logic of bringing information technology to people who are in global terms the poorest of the poor.

Common sense and accepted thinking about economic development have long held it ridiculous to supply Third-World villages with state-of-the-art technology. What subsistence farmers need is not high-tech science and complex systems, the argument goes, but immunizations, basic literacy, disease- and drought-resistant cereals and oilseeds, simple pumps, deep-drop toilets, two-phase electrification -- all the "appropriate" technologies that the unsophisticated rural poor can use and understand.

I agree with this argument as far as it goes. Third-World farming villages need water, hygiene, health, and power, and the need is usually great. But the argument falls short in its definition of "appropriate." It ignores technology's profound social implications. And it comes dangerously close to consigning the Third-World poor to a life of third-rate capacities and opportunity. The policies of development agencies like the World Bank too often limit

"appropriate technology" to the two-dimensional, two-penny solutions that bring the poor to the doorway of the modern world but not actually across the threshold.

For me, three facts about Third-World development stand out with great force. First, high technology is already an essential element in effective water sourcing, sanitation, construction, agriculture, and other development activities. Geohydrologic surveys are carried out from satellites. Bioengineering has revolutionized crop production. Appropriate technology has moved well beyond the water screw and the inclined plane.

Second, modern telecommunications and electronic information systems are thoroughly appropriate technologies even in those regions of the world that still lack adequate water, food, and power. The reason is simply that modern telecommunications is an indispensable aid in meeting basic needs. If a U.S. community needed, say, widespread immunizations or replacement of a power grid, would the telephone seem a vital or an irrelevant tool in getting the job done? Would the telephone seem more or less critical if the job were tied to a natural calamity such as flood or drought and required the mobilization of diverse resources over a broad area?

Third, as a great social leveller, information technology ranks second only to death. It can raze cultural barriers, overwhelm economic inequalities, even compensate for intellectual disparities. In short, high technology can put unequal human beings on an equal footing, and that makes it the most potent democratizing tool ever devised.

In 1942, the village of Titilagarh in the Indian state of Orissa, southwest of Calcutta, had a population of 6,000 or 7,000 and no electricity or telephones. My early education took place in one-room schools, and most of my classmates had no shoes or books. My family was of the suthar caste--lowly carpenters--yet my father was an ambitious man. He never learned English until I brought him to the United States to enjoy his retirement, but he did business with the English and used what opportunities he had to build a prosperous trade in lumber and hardware and to send most of his eight sons and daughters to high school and on to university. For 12 years, I lived with one or more of my brothers and sisters in towns and cities far from home and studied hard to get the kind of grades that would outweigh my origins. In 1964, I succeeded. I was only 21 years old, and I had never used a

telephone. But my master's degree in physics, specializing in electronics, from Maharaja Sayajirao University in the city of Baroda in Gujarat state, gave me membership in a new technological caste that superseded the one I was born to.

My older brother and I decided that I should apply to a university in the United States to do postgraduate work, and my father readily agreed to give me $400 toward this education, expecting me in return to bring my brothers and sisters to the United States one by one as I made my way in the world. I applied to the University of Oregon and the Illinois Institute of Technology but did not apply for scholarships, on the theory that an expression of need might reduce my chances of getting in. I was accepted at both schools and chose Illinois. The state of Orissa gave me a travel grant of $600, just enough for a taste of every form of transport: a boat to Genoa, a train to London, an airplane to New York, and a Greyhound bus to Chicago.

I arrived in December, 1964, with my father's $400 in my pocket. Tuition for the first semester was $700. I paid half on account, found a cheap apartment to share with another Indian, and landed a job in a physical chemistry lab to earn my keep and the rest of my tuition. A year later, I had a master's degree in electrical engineering. I had not only learned to use a telephone, I had, in essence, learned to make one. More important still, I had learned enough to design an electronic telephone switch.

Telephone switching is what operators used to do by hand in the early days of the century. Using a board with cords and plugs, the operator created a manual connection between the telephone in the caller's hand and the phone being called across town. Voice transmission then took place by means of analog electrical signals derived from a vibrating diaphragm in one handset and translated back into sound waves in the other. The system was marvellously simple, but, by technological standards, dreadfully labor intensive. If all the calls in the United States were handled that way today, every U.S. citizen would have to be a telephone operator.

Fortunately, electromechanical switching appeared in the 1920s, allowing the system to locate and connect two phones entirely by means of electrical signals opening and closing

metallic contacts. These switches were automatic, but they had moving parts, and any device that moves wears out. So, while they required no operators, they did need people to carry out routine maintenance and regular replacement.

Finally, in the 1960s, I myself was involved in the invention and evolution of digital electronic switching equipment, which has two huge advantages over its analog predecessor. First, without moving parts and able to perform its own automatic maintenance, it never wears out. Second, it uses microchips as its basic building blocks and therefore takes up very little space. A large metropolitan switching station for 50,000 phones once occupied a six-to-ten-floor building and needed hundreds of people to keep it operational. The same capacity can now be housed in one-tenth of the space and requires a staff of perhaps ten people to operate its computer and software controls. Indeed, the only serious remaining drawback is that digital switches still produce heat and must be air-conditioned to prevent overheating.

Over the next few years, I worked for GTE in Chicago, designing and refining digital switching equipment and analog-to-digital conversion technology. I was responsible for nearly 30 patents and enjoyed a prominent position at GTE's annual patents banquet in the late 1960s and early 1970s. I married an Indian girl I had met at the university in Baroda, started a family, brought my parents and most of my brothers and sisters to the States, and began to become a middle-class American.

But my father kept telling me I was too young to get into the habit of working for other people, and I was beginning to tire of pats on the back for the patents I'd won, so I quit. In 1974, with two local telecom entrepreneurs, I founded Wescom Switching Inc. -- their money, my technical expertise -- and we began manufacturing digital switching equipment that I designed. In 1980 -six years and more than a dozen patents later -- we sold out to Rockwell International. As part of the deal, I agreed to work for Rockwell for three years and undertook not to compete in telecommunications for five years. My 10% of the company came to roughly $3.5 million in cash.

I left Titilagarh in 1951 to go to boarding school in Gujarat; I left India in 1964 to go to graduate school in the United States; now, in 1980, I was a millionaire, and to my own surprise I felt nearly as much guilt as satisfaction. All my life, I had dreamed of wealth and success, but now I suddenly confronted the fact that I had walked out on India. The sheer immensity of India's problems, the huge gap between my luxurious U.S. suburb and the struggling poverty of villages like the one where I was raised, the selfishness of my own success so far, all of it weighed on my mind and set me off in pursuit of another American dream: the exploration of a new frontier and challenge. In my case, that challenge was to use telecommunications as an agent of change-a bridge between the First World and the Third.

As I began my new job as vice-president at Rockwell, I began observing telecommunications at work in underdeveloped countries. What I saw disturbed me. On the whole, telecommunications was not so much closing as widening the gap between the rich countries of the north and the poor countries of the south. The First World, inventing and deploying new technology as if it were fast food, seemed headed in the direction of unlimited and universal information access. Even in the Second World, information technology had penetrated far enough to destroy the information monopoly that supported totalitarianism and to launch Eastern Europe toward the West. However, in the Third World, telecommunications and information technology remained an urban luxury, and an unreliable one at that. India had fewer than 2,500,000 telephones in 1980, almost all of them in a handful of urban centres. In fact, 7% of the country's urban population had 55% of the nation's telephones. The country had only 12,000 public telephones for 700,000,000 people, and 97% of India's 600,000 villages had no telephones at all.

What was worse, India, like most of the Third World, was using its priceless foreign exchange to buy the West's abandoned technology and install obsolete equipment that doomed the poor to move like telecom snails where Europeans, Americans, and Japanese were beginning to move like information greyhounds. The technological disparity was getting bigger not smaller. India and countries like her were falling farther and farther behind not just in the ability to chat with relatives or call the doctor but, much more critically, in the capacity to coordinate development activities, pursue scientific study,

conduct business, operate markets, and participate more fully in the international community.

Worse still, I was perfectly certain that no large country entirely lacking an indigenous electronics industry could hope to compete economically in the coming century. To survive, India had to bring telecommunications to its towns and villages; to thrive, it had to do it with Indian talent and Indian technology. In other words, there were two goals to work toward: telecommunications and other information technologies could not only help Indians create wealth in every walk of life, a telecom and information industry could also create wealth of its own. Unless we had both, we had no future as a nation.

Worst of all, I began to see that information technology played an indispensable role in promoting openness, accessibility, accountability, connectivity, democracy, decentralization--all the "soft" qualities so essential to effective social, economic, and political development. India needed the capacity to network people, ideas, and initiatives. Telecommunications was as critical and fundamental to nation building as water, agriculture, health, and housing, and without it, India's democracy could founder.

I began looking for an entry into Indian telecommunications, a rigid bureaucracy with about a quarter of a million employees: one for every ten telephones.

In 1981, a friend in Bombay sent me a newspaper clipping reporting that Prime Minister Indira Gandhi had set up a high-level committee to review telecom development. I wrote to its chairman and asked for an interview. From my name and location, he concluded that I was an Italian-American with telecom products to peddle. I wrote back at greater length to say I had nothing at all to sell except the conviction that India possessed all the talent necessary to pursue telecommunications modernization on her own. He invited me to India. He could not absolutely promise me an appointment -- and I would have to pay my own way -- but he did ask me to come. Ultimately, I spent two hours with the entire high-level committee.

My message was that India should abandon electromechanical switching and move immediately toward digital systems for switching and transmission. My reasoning was twofold. First, electromechanical switching was ill-suited to the Indian climate and to Indian

conditions. With few available telephones, most lines were intensively used, and electromechanical equipment was much more likely than digital to malfunction from overuse. (We later discovered that some public phones in India generate as many as 36 calls per hour at peak volume, compared with maybe 10 to 12 in the United States.) Electromechanical switches are also more vulnerable to dust and moisture. Analog transmission, finally, suffers over distance, while digital transmission is what gives those astonishingly intimate connections halfway around the world. In a country with low telephone density like India, distance -- and therefore static -- were nearly unavoidable. Second, the development of digital technology would help build native industries in electronics, software, and related fields. Moreover, India needed one piece of digital equipment that no other country manufactured but that many developing nations could use: a small rural exchange. In the United States and Europe, the smallest exchanges built will accommodate 4,000 to 10,000 lines, and, in small towns and rural areas, these exchanges are installed and then deliberately underutilized. This kind of waste may be tolerable in a country where the number of small exchanges is tiny. In India, exchanges with a vast overcapacity would have to be installed in hundreds of thousands of villages, and waste on such a scale was unthinkable. Development of an efficient exchange for 100 to 200 telephones would not only solve India's problem, it would give the country a valuable high-tech export.

The committee was impressed -- by my enthusiasm if nothing else -- and suggested I meet the prime minister. Two weeks later, Mrs. Gandhi's office agreed to give me ten minutes of her time. Because I needed at least an hour to get my message across, however, I turned the offer down. New Delhi was full of people who had been waiting years to get ten minutes with the prime minister, but I really did need an hour. By pushing what few connections I could muster, I eventually got my background papers into the hands of two advisers to Mrs. Gandhi's son Rajiv. One of them spent several hours studying the file, and in November, after five months of trying, I got an hour with Mrs. Gandhi, her senior cabinet colleagues, the chief ministers of several Indian states, and Rajiv, whom I met for the first time that day but who was already an advocate for my point of view.

I began my slide presentation almost as soon as Mrs. Gandhi walked into the room. There was a lot of ground to cover, and I covered it as swiftly as I could. I summarized world telecom statistics and correlated telephone density to productivity, efficiency, prosperity, and gross national product in about 50 countries. I pointed out that only a handful of countries had achieved universal service and raised the possibility that it was not so much wealth that created telephone density as telephone density that created wealth. I reminded them that Indian telecom was characterized by high unsatisfied demand, low accessibility as well as density, poor connectivity, lack of dependability, substandard maintenance, superannuated technology, over centralisation, bureaucracy, bad management, and limited capital. I underlined India's reliance on imported equipment of traditional, not to say obsolete, design, and tied that equipment to poor service and system inflexibility. I laid out a program that emphasized rural accessibility, customer service, digital switching, and large-scale technological innovation and integration, all of it accompanied by privatization, deregulation, and organizational restructuring. I outlined plans for design, production, installation, networks, fax, E-mail, telex, and more. At the end, I spoke of resources and management and then offered three alternatives.

The first alternative -- obviously unacceptable -- was to do nothing at all and let the system limp along until it failed completely. The second was to pursue the present development plan, using imported technology to address some problems and ignore others. But the present policies meant that India would fall steadily farther and farther behind the developed world, with dire consequences for India's economy, government, and people.

My third alternative was to adopt radical new technologies, products, and programs, hire new people-in particular, a core group of young research-and-development engineers to develop new hardware and software -- and set India on the path to universal telecommunications accessibility by the turn of the century. I suggested the creation of new organizations with the power to issue bonds and sell stock to raise massive sums of capital. I talked about large-scale manufacturing plants to meet domestic and export demand. I proposed a telecom commission to oversee regulatory requirements. I spoke of the need for a generational change in telecommunications thinking.

Prime Minister Gandhi listened attentively to the entire presentation, and when it was over, I answered a number of questions. In the days that followed, the word went out that the prime minister was interested in a plan to modernize Indian telecom, and I began three years of commuting between Chicago and New Delhi to put together a strategic framework, plan the program, give shape to an R&D entity for developing human resources and new technology, and lobby it all through India's parliament and intricate governmental bureaucracies.

Living in the United States for the most productive years of my life had altered my values and perceptions beyond recognition. My approach to business, and for that matter to life, had become performance oriented. But every few weeks I left Chicago for New Delhi and a set of standards and values that were feudal, hierarchical, and complex beyond belief. From my now thoroughly American point of view, India was in desperate need of modernization. And my frustrating efforts to install some of the modernizing mechanisms only underscored how badly the country needed technology to organize, simplify, economize, and create the infrastructure to meet basic human needs. I saw so much potential for technology's problem-solving capacity that even as I struggled through quagmires of social and political confusion, I was near to drowning in ideas and excitement.

Through all of it, Rajiv Gandhi was my ally. I saw in him a young, energetic, modern man, direct and honest, eager to explore telecom's role in Indian development. He and I had clicked at our first meeting and quickly became friends. Over the next few years, we fought together for dozens of administrative experiments and reforms using information technology -- computerization of railways, for example, and of land records, which was vital to the progress of land reform. At the moment, however, we worked together for the creation of the Centre for Development of Telematics, C-DOT as it came to be known. The battle was uphill. Every important decision had a political as well as an economic impact. For example, a few months after my meeting with Mrs. Gandhi, India signed a deal with a French multinational to manufacture a digital switching system, so those who stood to profit from this arrangement opposed our concept of an indigenous digital industry and labelled it redundant. One European CEO wrote a strongly worded letter to Mrs. Gandhi

pointing out that his company had already spent $1 billion developing digital technology and questioning the wisdom of so massive an investment by the Indian government. Given India's limited resources and the vast needs of its people, that argument had wide political support.

In 1984, the breakup of the U.S. Bell System set in motion a process of deregulation and privatization around the world and gave our proposals the extra boost they needed. In August, C-DOT was registered as a non-profit society funded by the government but enjoying complete autonomy. Parliament agreed to give us $36 million over 36 months to develop a digital switching system suited to the Indian network. An executive director was appointed, we found five rooms in a rundown government hotel, and we went to work using beds as desks.

A few months later, in October, 1984, Indira Gandhi was assassinated, and her son Rajiv became prime minister. He and I decided that I should press the initiative for all it was worth. Since I could not simply pull up stakes and move to Delhi -- back in Chicago, my father was dying of cancer -- I began spending about half my time in each city. I did not finally move to India with my wife and children until August, 1986, after my father's death. In the meantime, I continued to commute, now more often than ever.

From 1984 on, I was a principal adviser to C-DOT with a salary of one rupee per year, an arrangement I modelled on Roosevelt's dollar-a-year men during the New Deal. I wanted the chance to work for a cause, an Indian cause in particular, and I knew that in order to succeed, I had to place myself above the suspicion of greed or self-interest. In any case, what could I have earned? The top government salary at that time was 5,000 rupees per month -- then about $400 -- and I was spending more than ten times that amount of my own money just on plane fare and hotels. In any case, it was an arrangement that no one in New Delhi understood. One day the deputy minister for electronics took me aside and said, "Mr. Pitroda, what is it you really want out of this?" My answer, "Nothing," puzzled him. Whether or not he believed me, my motives remained a subject of discussion in New Delhi for the next six years, with eventual dire results for me.

For the moment, however, activity was bliss. Our engineers were conspicuously young, and they never seemed to sleep or rest. Most had been ready to leave India when this opportunity came along. Now they threw themselves into India's future and worked with an energy that the underdeveloped world is not commonly supposed to generate.

From the outset, C-DOT was much more than an engineering project. It did of course test the technical ability of our young engineers to design a whole family of digital switching systems and associated software suited to India's peculiar conditions. But it was also an exercise in national self-assurance. Years earlier, India's space and nuclear programs had given the country pride in its scientific capability. Now C-DOT had the chance to resurrect that pride.

From the outset, consequently, I was interested in process as well as product. Technology may be complex, but human motivations and interactions are even more so. I knew India had great young engineers, and I believed there was nothing they couldn't accomplish if we challenged them and gave them a proper environment to work in. Part of our mission was to inspire a whole generation of young talent and thumb our noses at the nay-sayers, the political reactionaries, and the vested interests whose prosperity rested entirely on imports. I set impossible targets. I cheered people on. Knowing as I did that young Indians did well in the United States, I tried to create an American work environment. I set about instilling a bias toward action, teamwork, risk, flexibility, simplicity, and openness. I was almost brutal in my determination to root out hierarchy and bureaucracy: I once shouted and made a thoroughly mortifying scene in order to get typists to stop leaping to their feet every time a manager entered their work space to use one of the two telephones we started out with. I did my best to shield our young engineers from bureaucrats, politicians, and business interests. At the same time, I opened our doors to the media, which responded with excitement, optimism, and the kind of hero worship that we hoped would attract more young people to technology careers.

By 1986, C-DOT had sprawling, chaotic offices, 425 employees (average age 25), and the drive, activity, and optimism of a U.S. presidential campaign. My methods had been highly unconventional for India and highly unpopular with a lot of the old guard, but within C-DOT

we had accomplished wonders. By 1987, within our three-year limit, we had delivered a 128-line rural exchange, a 128-line private automatic branch exchange for businesses, a small central exchange with a capacity of 512 lines, and we were ready with field trials of a 10,000-line exchange. Better yet, the components for all these exchanges were interchangeable for maximum flexibility in design, installation, and repairs, and all of it was being manufactured in India to the international standard: a guaranteed maximum of one hour's downtime in 20 years of service. We had fallen short on one goal-our large urban exchange was well behind schedule -- but, overall, C-DOT had proved itself a colossal, resounding success. In addition to the four exchanges, we had licensed some 40 public and private companies to manufacture and market C-DOT products, and more than 100 businesses had sprung up to manufacture ancillary parts and components.

Moreover, these rural exchanges were small masterpieces of "appropriate" design. As I mentioned earlier, even digital switching produces heat, so switching equipment has to be air-conditioned in order to function dependably. But in the countryside, the Indian electrical grid is notoriously undependable, and we couldn't give villages exchanges that were certain to overheat the first time the electrical system went down. The solution was simple but ingenious. First, to produce less heat, we used low-power microprocessors and other devices that made the exchanges work just slightly slower. Second, we spread out the circuitry to give it a little more opportunity to "breathe." The cabinet had to be sealed against dust, of course, but by making the whole assembly a little larger than necessary, we created an opportunity for heat to rise internally to the cabinet cover and dissipate. The final product was a metal container about three feet by two feet by three feet, costing about $8,000, that required no air-conditioning and could be installed in a protected space somewhere in the village and switch phone calls more or less indefinitely in the heat and dust of an Indian summer as well as through the torrential Indian monsoon.

Our 512-line exchange was designed for the somewhat larger market town nearby, where it could handle intervillage and long-distance calls for a dozen villages or more. What now remained was to disseminate this new technology through the Indian telecommunications system and actually reach out to the towns and villages that needed it.

In 1987, I chaired a national conference that proposed the establishment of a new, streamlined, semiautonomous Telecom Commission to replace the old, heavily bureaucratic Department of Telecommunications. Before the government could act on that proposal, however, Rajiv Gandhi appointed me adviser to the prime minister on National Technology Missions, with the rank of minister of state. I had to give up my U.S. passport to take the job, but I couldn't turn down such a marvellous opportunity. The Technology Missions existed to marshal, motivate, and manage the efforts of more than ten-million people and lots of technology involved in meeting six basic human needs: drinking water, immunization, literacy, oilseeds, dairy production, and telecommunications.

Our specific goals were straightforward. Make clean, potable water available to about 100,000 problem villages in the amount of 40 liters a day per person and 30 liters a day per head of livestock. Immunize 20-million pregnant women and 20-million children every year. Teach 80-million people in the 15 to 35 age group -- about 75% of adult illiterates -- to read and write at a rate of 10 million each year. Increase oilseed production by as much as 18-million tons and reduce, eliminate, or reverse India's annual 10-billion-rupee import bill for edible oils. In. crease dairy production from 44- to 61-million metric tons per year over eight years, raise dairy employment and incomes, and expand the number of dairy cooperatives by 42%. Last but hardly least, improve service, dependability, and accessibility of telecommunications all across the country, including rural areas.

The six mission directors worked for different ministries, so my job was to cheerlead, set agendas, and integrate the activities of ministries, state governments, national laboratories, and voluntary agencies. For two years, I travelled the country visiting tribal areas, villages, towns, cities, and state capitals. Every day I made two or three speeches, took part in half a dozen meetings, talked to scores of people, made dozens of phone calls (if a telephone could be found). I was doing my best to generate ideas, communicate goals and enthusiasm, fight red tape, clear obstacles, tie up loose ends, assess progress, mend bureaucratic fences, and bridge bureaucratic ravines. It became by far the most hectic period of my life, but I got swept up in the romance of making a difference and began working and traveling nearly around the clock. I saw enormous commitment from tens of thousands of people and solid resistance to change from entrenched interests. I began to sense an unholy alliance among

many politicians, bureaucrats, and businessmen to stop people from taking power into their own hands through literacy and community-based programs -- and through communication.

I was learning the ropes of development in action, and everything I saw strengthened my conviction that telecommunications lies at the very heart of progress. This is true in the political and social sense -- people must be able to reach out to government, media, institutions, and allies if they're to make their voices heard-and it is true in the more practical sense that development depends on communication for logistical efficiency. Let me give two examples of what I mean.

One of our greatest assets in the oilseed and dairy missions was Dr. Verghese Kurien, chairman of the National Dairy Development Board and winner of the World Food Prize in 1989. In the 1950s, Dr. Kurien started the farm cooperative movement in India and in 30 years built it into a multimillion-dollar enterprise with a membership of one-million farmers in 50,000 villages. Forgetting for the moment the added years and extra toil it took to build such an organisation by word of mouth and personal recruitment, aided only by a postal system famous for incompetence, just imagine the task of galvanizing this organization into concerted action without the ability to computerise membership roles or to contact members by phone or telegraph. In spite of that limitation, Dr. Kurien has succeeded in stabilizing oilseed prices by buffer-stocking large quantities of oil and in building a cooperative milk-distribution system that reaches 170-million people. Telecommunications makes the efforts of men and women like Dr. Kurien incalculably less onerous and more effective, which is one of the reasons a dozen agribusiness lobbies in New Delhi oppose the spread of rural telephones.

Another example comes from the drinking-water mission. One group in the Rural Development Ministry was pushing for the purchase of 40 imported drilling rigs at a cost of several million dollars. Unfortunately, there were two vital pieces of information that no one seemed to possess: first, the number of drilling rigs already in the country, and second, the length of time it took to drill a well and how long it took to move a drill from one village to another.

We found a UNICEF official who was able to tell us that India already owned 1,200 drilling rigs, and several weeks of research revealed that, on average, it took about ten hours to drill a well and roughly ten days to move a rig. These were not ten days of travel time but ten days of bureaucratic wrangling and communication disarray in picking a site, negotiating political priorities, and getting the equipment on the road for a trip of a day or two. If a proper telecommunications network allowed the ministry to improve its planning and coordination even enough to cut that time to five days, India would gain the equivalent of 1,200 new water-drilling rigs without importing a single one.

Yet many of those who asked such questions and argued in favour of such solutions were accused of promoting technology at the expense of development and, to add insult to injury, of not understanding the plight of the drought-affected poor.

The fact was that no one in India had previously investigated and articulated the role that information systems play in development. Once we started, the practice and the insight grew and grew. After two years at the Technology Missions, I was given a chance to shape that practice even more directly.

In 1989, after two years of debate and study, the government decided to reorganize Indian telecommunications and create the Telecom Commission recommended in our 1987 report. Rajiv Gandhi appointed me the commission's chairman.

I met for three days with the heads of all telecom companies in the country: service providers, manufacturers, laboratories, C-DOT, and others. Then I met with the leaders of 37 telecom unions and the telephone white-collar bureaucracy. At the moment I took over, Telecom had 500,000 employees managing five-million lines, and it took me nine months to get their leaders to buy into my plan to quadruple the lines by the year 2000 without adding to the work force.

Once the unions were on board, we faced three fundamental challenges: connectivity, accessibility, and rural expansion.

First, we replaced all our existing electromechanical long-distance exchanges with digital equipment manufactured in India on license from a French company. We set up two factories to manufacture fibre optics and built high-speed fibre-optic highways to connect the four largest metropolitan areas: Bombay, Delhi, Calcutta, and Madras. We connected 400 district headquarters to automatic dialling, increased our population of digital switching exchanges by 50%, expanded the capacity of switching-system manufacturers, and increased automation at the operator level. We launched a multimillion-dollar program to computerize telecommunications operations nationwide. We introduced international direct dialling to more than 120 countries.

In a country the size of India with only five-million phones, it is difficult to have a significant impact on telephone density. Quadrupling the number of lines still means only one telephone for every 50 people, compared with more than one phone for every two people in the United States. Accessibility is another matter. By providing more phones in public places, we could put millions of people within reach of telecommunications.

In most areas, coin-operated phones seemed a poor idea for any number of reasons, including the fact that they cost a great deal to manufacture. Instead, we equip ordinary instruments with small meters, then put these phones into the hands of entrepreneurs who set them up on tables in bazaars, on street corners, or in cafes or shops whose owners feel they attract customers. These telephone "owners," frequently the handicapped, take in cash from their customers but are billed only six times a year, with 20% to 25% discounted as their commission. The phones are in such constant use that, in most cases, the revenue is enough to support a family. We launched a drive to install 200,000 such phones in public places nationwide, creating more than 100,000 jobs along the way. Today, the small yellow signs indicating a public telephone can be seen all across India.

The third piece of the program was rural communication, close to my heart because of my own background, and I now set in motion an ambitious program that envisioned nothing less than universal telecommunications accessibility by the year 2000. For us, accessibility was to mean that every Indian citizen should live within three or four kilometres of a

dependable instrument, a goal that may strike Westerners as trivial, though I believe it will alter the face of India.

Several years earlier, C-DOT had run a test in Karnataka state with hugely encouraging results. In one town of 5,000 people with almost no previous telephone service, business activity rose many times following installation of an automatic digital exchange for 100 lines. Suddenly, it was possible for a truck owner to chase his drivers, line up goods and labour by telephone, and monitor the movement of his vehicles. Local farmers could call nearby cities and get real prices for their produce. Artisans could speak to customers, machine operators could arrange for service and repairs, shopkeepers could order goods -- all by phone and in real time. In the six months after the introduction of service, total bank deposits in the town rose by an impressive 80%.

There were also social benefits. The townspeople could call doctors and ambulances, order pumps and textbooks, call newspapers, speak to politicians, share experiences with colleagues, and organize community ceremonies and functions. One villager told me that when his father died seven years earlier, he'd had to send 20 messengers on trains and buses to inform relatives in nearby villages. More recently when his mother followed, the villager went to the local tea shop and phoned all 20 villages -- instant, certain, and far less expensive.

One-hundred phones in a town of 5,000 is a laughable density to an American and a miracle by Indian standards. Among other surprises, we found considerable long-distance traffic not just to Delhi and Bombay but also to London and New York. The villagers, it seems, have relatives and friends in all four cities.

In 1989, we set a goal of installing one rural exchange a day. By 1993, Telecom was installing 25 rural exchanges every day, and the rate continues to accelerate. By 1995, 100,000 villages will have telephone service. By the turn of the century or very shortly after, almost all of India's 600,000 villages will be covered. Once in place, the village telephone becomes as critical as water, food, shelter, and health services. Once exposed, people in rural areas want a village telephone more than they want any other community service.

Of nearly equal importance for me, the community phone becomes an instrument of social change, fundamental to the process of democratization. With telecommunications networks now spreading across the Second and Third Worlds, I believe that no amount of effort can put information back in the hands of the few, to be isolated, concentrated, and controlled. My own effectiveness with the Indian Telecom Commission ended in 1990. Rajiv Gandhi was defeated in parliamentary elections in November, 1989, and I came under political attack a short time later. Eventually I was accused of corruption. Businesses owned by my family in the United States were said to have profited by contracts I awarded while at C-DOT. A thorough investigation by the Comptroller and Auditor General of India turned up no evidence to support this allegation. Moreover, to my gratification, hundreds of scientists, colleagues, academics, and thousands of citizens came to my defense. But the strain was very great. My family moved back to the United States, and in October, 1990, I had a heart attack. A few months after quadruple bypass surgery in Delhi, I went back to work as chairman of the Telecom Commission, with high hopes that Rajiv Gandhi would be returned to office in the 1991 elections. When Rajiv was assassinated in May of 1991, I resigned from my job as chairman and rejoined my wife and children in Illinois. The only post I now held was adviser to the new prime minister on Technology Missions, the same position I had held under Rajiv Gandhi but resigned when he left office.

Though I don't think of my telecom work in India as finished, I have begun to alter my focus somewhat over the last two years. Specifically, I've been struck by the preconditions that the First World has set for Third-World development. Europe and North America built their economies with the help of coercion, work-force exploitation, child labor, and environmental plunder, but the First World has announced to the Third that these and other violations of human and ecological rights are quite unacceptable.

The developed countries are forcing human rights and environmental sensitivity on the world's poor, setting all kinds of new conditions and restrictions on economic growth. This is not fair, of course, but it is an excellent policy. Still, the First World must understand that it is not likely to achieve this policy goal except with the help of telecommunications and other information technologies, for two simple reasons.

First, telecom makes abuses infinitely easier to monitor. It gives watchdog groups as well as the victims and witnesses of human and environmental outrage access to one another. Local stories become international news, and local events become global events. Just as information technologies helped make totalitarianism impossible in Eastern Europe, they can help destroy exploitation in the developing world.

Second, telecom helps to create wealth, and prosperity is everywhere a force for civilized behaviour. Take child labour. It is poverty that puts children to work, and it is unskilled labour that children are able to perform. When telecommunications comes to the Third World, it brings with it new economic activity, new higher-paying jobs for parents, and new technologies that reduce the utility of unskilled child labour. Countless towns and villages in India can bear witness to telecommunications' electrifying effect on entrepreneurialism, employment, and the overall standard of living. On top of all that, of course, information technologies create their own skilled jobs.

The dreadful human and physical conditions that the industrial revolution created in the West are now avoidable. But it is not some fundamental improvement in human nature that makes such progress possible. Growth without freedom and responsibility can still take place. It is technology, and information technology in particular, that makes humane development feasible.

The fact is, the telecom revolution has hardly begun. In addition to new products, systems, and integrated services, we will soon have new information-based relationships with our society and environment. But if sustainable progress of this kind is not to be limited to the developed world, then there is one initial hurdle still to clear.

The Third World still lacks adequate investment in telecommunications. Telecom in the developing world needs about $30 billion a year, of which only $3 billion is presently available. The World Bank devotes only 2% of all its funding to telecommunications. Corporations are attracted by the prospect of immense long-term profit but frightened by political risk and the certainty of social and economic experimentation.

Along with a number of fellow telecom engineers and executives, I am now working to organise a special funding agency, similar to the World Bank, to support Third-World telecommunications. Without proper telecom institutions and infrastructure, sustainable development with freedom will be difficult to achieve. Without telecom development, we will never deliver 75 % of the world's people to the civilisation of the information age.

Appendix 2D National Broadband Policy 2004

Preamble

Recognising the potential of ubiquitous Broadband service in growth of GDP and enhancement in quality of life through societal applications including tele-education, tele-medicine, e-governance, entertainment as well as employment generation by way of high-speed access to information and web-based communication, Government have finalised a policy to accelerate the growth of Broadband services.

Demand for Broadband is primarily conditioned and driven by Internet and PC penetration. It is recognised that the current level of Internet and Broadband access in the country is low as compared to many Asian countries. Penetration of Broadband, Internet and Personal Computer (PC) in the country was 0.02%, 0.4% and 0.8% respectively at the end of December, 2003. Currently, high speed Internet access is available at various speeds from 64 kilobits per second (kbps) onwards and presently an always-on high speed Internet access at 128 kbps is considered as 'Broadband'. There are no uniform standards for Broadband connectivity and various countries follow various standards.

Government envision an accelerated growth in Internet penetration and PC as the success of Broadband would largely be dependent on their spread. It has been decided that following shall be the framework of the policy.

1.0 Broadband connectivity:

Keeping in view the present status, Broadband connectivity is defined at present as

'An 'always-on' data connection that is able to support interactive services including Internet access and has the capability of the minimum download speed of 256 kilo bits per second (kbps) to an individual subscriber from the Point Of Presence (POP) of the service provider intending to provide Broadband service where multiple such individual Broadband connections are aggregated and the subscriber is able to access these interactive services including the Internet through this POP. The interactive services will exclude any services for which a separate licence is specifically required, for example, real-time voice transmission, except to the extent that it is presently permitted under ISP licence with Internet Telephony.'

2.0 The estimated growth for Broadband and Internet subscribers in the country envisaged through various technologies is as follows.

The estimated growth for Broadband and Internet subscribers		
Year Ending	Internet Subscribers	Broadband Subscribers
2005	6 million	3 million
2007	18 million	9 million
2010	40 million	20 million

3.0 Technology Options for Broadband Services

The Broadband Policy Framework visualises creation of infrastructure through various access technologies which can contribute to growth and can mutually coexist. Spread of infrastructure is a must for healthy competition and therefore it would be the endeavour of the Government that the telecommunication infrastructure growth in the country is not compromised in any manner.

3.1 Various access technologies, inter-alia, are:

(a) Optical Fibre Technologies

The fibre optics technology can provide nearly unlimited bandwidth potential and is steadily replacing copper network specially in intra-city backbone networks. This is being deployed in commercial buildings and complexes and some metros / big cities having high-density potential broadband subscribers. Hybrid Fibre Coaxial (HFC), Fibre to the Curb (FTTC) and Fibre to the Home (FTTH) networks make use of fibre cabling into the last mile. The fibre-based models are future proof as they are able to provide huge amounts of bandwidth in the last mile as well as provide a true IP and converged network that can deliver high quality voice, data and video.

There are more than 4.5 lakh route kms. of optical fibre laid by BSNL / MTNL and more than 1 lakh route kms laid by private operators. The spread of the networks of private service

providers have to play an important role in bringing the fibre to homes as well as the rural areas and they are expected to focus on it.

With the increase in commercial availability of fibre technologies, the cost of fibre rollout is approaching the cost of other wired networks. Spread of optical fibre networks shall be emphasised keeping in view the long-term perspective.

(b) Digital Subscriber Lines (DSL) on copper loop:

DSL has proved to be an important technology for provisioning of Broadband services through the copper loop. The owners of copper loop have to be given a high priority because their role is critical as key drivers in the Broadband service market using DSL.

Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL) as well as other access providers are expected to aggressively use their copper loop infrastructure for providing Broadband services through this technology.

Recognising that last mile copper loop is not a 'bottleneck facility' for broadband services, access providers shall be free to enter into mutually agreed commercial arrangements for utilization of available copper loop for expansion of broadband services. The owner of local loop shall be free to decide the areas in which investment is to be made to upgrade the infrastructure for Broadband services. The information regarding the areas in which Broadband services are being offered by a service provider shall be available in the public domain.

Further, use of brand-name being treated as a part of the value shall be permitted in such commercial arrangements.

There are more than 40 million copper loops in the country available with BSNL and MTNL out of which 14 million loops are in rural areas. Copper cable network of these operators is a combination of old and new cable and this makes provisioning of Broadband on all the available copper loop technically unfit. Therefore, around 25-30% of the remaining 26 million loops, i.e. approximately 7 million loops can be leveraged for broadband service by BSNL and MTNL taking into account the condition / life of copper cable and demand potential.

Management of BSNL and MTNL has decided to provide 1.5 million connections by the end of 2005.

The corporate / work plans of these PSUs have been drawn up for this purpose. Thereafter, annual plan for expansion of Broadband services by BSNL and MTNL will be determined in consultation with them. A quarterly review of their performance by the Government in the Department of Telecommunications (DoT) shall be undertaken to evaluate the achievement and redefine the future roadmap, if necessary.

It is hoped that other access service providers would also provide broadband connections using their copper in a targeted manner. A constructive review of their performance shall also be undertaken.

(c) Cable TV Network

It is noted that cable TV connection as last mile infrastructure reaches more people than even the telephone copper infrastructure and can be leveraged in providing cable operators a new business model while giving a stimulus to Broadband penetration. Therefore, Cable TV network can be used as franchisee network of the service provider for provisioning Broadband services. However, all responsibilities for ensuring compliance of terms & conditions of the licence shall vest with the Licensee. The terms of franchise agreement between Licensee and his franchisee shall be settled mutually by negotiation between the two parties involved.

(d) Satellite Media

Very Small Aperture Terminals (VSAT) and Direct-to-Home (DTH) services would be encouraged for penetration of Broadband and Internet services with the added advantage to serve remote and inaccessible areas.

It is the intention of the Government to make available transponder capacity for VSAT services at competitive rates after taking into consideration the security requirements. Department of Space is already interacting with VSAT service providers. Department of Telecommunications, in consultation with the concerned Ministries, will soon propose

measures in the direction of Open Sky Policy for VSAT operators. The role of Department of Space is critical in such an endeavour.

VSAT service providers are permitted to transmit data up to 2Mbps instead of earlier limit of 512 kbps in a Closed User Group domestic VSAT network. The increased data rate allows new applications like bulk data transfer for software industry, high-speed backhaul links, in-house training using audio-visual etc. Reduction in antenna size enables easy installation, lower space occupancy, lower cost of hardware etc. Accordingly, the antenna size has been reduced to 1.2 metres and 2.4 metres for star network and mesh network respectively in extended C-band. In Ku-band also, 1 metre diameter antenna in star network has been permitted. To keep pace with technological advances, this shall be periodically reviewed.

Commercial VSAT service providers having ISP licence shall be permitted use of same hub station and remote station to provide Internet service directly to the subscribers. Further, this remote station shall be permitted to be used as a distribution point to provide Internet services to multiple independent subscribers. Necessary amendments in the licence agreement shall be carried out immediately.
DTH service providers shall be permitted to provide Receive Only Internet Service after obtaining ISP licence from Department of Telecommunications. Further, ISP licensees shall be permitted to allow customers for downloading data through DTH after obtaining necessary permission from the competent authority. DTH Service providers will also be permitted to provide bidirectional Internet services after obtaining VSAT and ISP licence from DoT.

(e) Terrestrial Wireless
Recognising that terrestrial wireless is another upcoming technology platform for Broadband, it has been decided in principle to de-licence 2.40-2.48 GHz band for low-power outdoor use on non-protection, non-interference and non-exclusive basis. Necessary notification shall be issued. Further, notification regarding delicensing 2.40-2.4835 MHz band for low power indoor permitting use of all technologies, which inter-alia include those based on IEEE 802.11b and 802.11g standards, has been issued.

To accelerate penetration of Broadband and Internet, the 5.15-5.35 GHz band shall be de-licensed for the indoor use of low power Wi-Fi systems. For outdoor use, the band 5.25-5.35 GHz shall be de-licensed in consultation with DoS and delicensing in the band 5.15-5.25 GHz would be considered after the process of vacation. Alternative spectrum bands which are not in high usage and could be deployed for Broadband services, shall also be explored and identified.

(f) Future Technologies

In the changing technology scenario, there is a possibility of new options being used for provisioning of Broadband services. These technologies can also be utilised for provisioning of such services within the licensing framework of the service provider and the spectrum management policy of DoT.

3.2 Quality of Service (QoS)

As per TRAI Act, 1997, TRAI has to prescribe QoS parameters. Government recognises that QoS parameters are extremely important and have an impact on investment and roll-out decisions of operators. TRAI would be requested to prescribe QoS parameters for provisioning of broadband service using various access technologies at an early date.

3.3 Simplification of SACFA / WPC clearance

The VSAT operators shall be allowed to start the installation process for VSAT terminals after a period of one month of submitting all relevant documents to WPC for SACFA / WPC clearance wherever the total height of such installation is less than 5 meters above the rooftop of an authorised building.

In the case of Receive Only VSAT terminals and DTH with Receive Only Internet, no SACFA / WPC clearance will be required wherever the total height of such installation is less than 5 meters above the rooftop of an authorised building.

Government have decided that the reference to WLL in IND49 of NFAP-2002 shall be deleted to promote use of indigenously developed technologies. This would enable service providers, other than basic service operators, to use the 1880-1900 MHz band for provision of various services under their licence.

A transparent scheme is being outlined separately for time-bound frequency allocation, siting clearance and wireless licensing by removing the cumbersome procedures, computerisation and by setting predetermined standards.

4.0 Other Issues

4.1 Bandwidth availability including international bandwidth is a major driver for broadband services.

In a competitive environment, service providers are expected to take appropriate steps for making required bandwidth available in a time bound manner within their licence framework. Cost of bandwidth constitutes a major cost component for Broadband services. Government and TRAI would address this issue on priority. TRAI has already issued a consultation paper for international bandwidth leased line cost and is expected to address the issue shortly.

Government have recently decided to reduce the licence fee for Infrastructure Provider category-II, who provides end to end bandwidth, to 6% of Adjusted Gross Revenue (AGR). Further, the amount of bank guarantee for such service provider has also been reduced to Rs.5 crores from Rs.100 crores.

4.2 National Internet Exchange of India (NIXI) has been set up by DIT, Government of India to ensure that Internet traffic, originating and destined for India, should be routed within India. It is expected that NIXI will take appropriate steps for increasing the utilization of such facilities.

4.3 Role of other Agencies

PCs, content and applications are important constituents for overall growth of Internet and Broadband services. Broadband services will accelerate decentralised governance at Panchayat level.

The role of other facilitators such as electricity authorities, Departments of ITs of various State Governments, Departments of Local Self Governments, Panchayats, Department of Health and Family Welfare, Department of Education is very important to carry the advantage of Broadband services to the users particularly in rural areas.

4.4 Fiscal Issues

The Department of Telecommunications assigns a very high priority to indigenous manufacture of Broadband related equipment. It shall endeavour to work closely with the concerned Ministries and Manufacturers' Associations so that the equipment is available at an affordable price. The department is conscious of the fact that Broadband services can reach the urban and rural consumers only if services are offered at affordable and easy terms. Department of Telecommunications will work out a package in consultation with Ministry of Finance and related Departments as well as concerned service providers to achieve this.

Appendix 3A Topic guide for semi-structured interviews

Themes	Typical questions
Warming up	- Could you tell me a little bit about yourself, what do you do? - Tell me about your family - Have you heard about the National Optical Fibre Network? (if unfamiliar then) Have you see some people digging cables? - Do you use the internet? How often and for what?
Administering internet infrastructure	- How is your work connected to the NOFN and what is it that you do exactly? - What are your daily responsibilities? - What are some of the challenges? - What are some of the objects and/or technical standards that are involved in your work? How are they important for your work? - According to you, why is the central government investing in internet infrastructure? - How would you design and implement internet infrastructure differently if you could? - Who will use this NOFN and how? - What will come out of investing in and implementing the NOFN?
Using internet infrastructure through organised practices	- Describe the infrastructural practice that you engage in (*Either voluntarily or because you are required to*) - What are the objects and/or technical standards that you need to know about in order to engage in this practice? - How is this infrastructural practice part of your work or your life? - Who are the other people connected to your infrastructural practice? - Where and how is money involved in this practice? (*Either getting paid for a practice, or practice linked to*

	receiving payments or in-kind resources, or paying for or through an infrastructural practice) • How and when did such an infrastructural practice begin and who started it? • What happens if you stop or refuse the practice? • How would you do things differently if you could?
Miscellaneous (pertaining to broad infrastructural relations, technologies of self, lived histories and social relations)	• How are things arranged here and by whom? (*depending on context, question applies to different infrastructure such as water, electricity, roads, dams and so on*) • What is your daily routine, how do you spend your typical day? • How do you remember things earlier and how is that different from how you live today? • Who controls things here, since when and how? (*depending on context, question applies to place, sector, institution or social group*)

Method	Place	Date
4 Interview with administrative staff of NOFN	Ambikapur	5th , 6th, 10th, 17th August, 2018
5 Interview with technical staff of NOFN	Ambikapur	1st, 2nd, 4th, 8th, 15th August, 2018
8 Interviews with urban residents	Ambikapur	3rd, 7th, 7th,23rd, 27th July, 2018; 2nd, 5th, 9th August, 2018
8 Interviews with rural residents and local government officials	Various towns and Villages in Surguja District	3rd, 4th, 5th,7th June, 2018; 10th, 11th, 12th, 13th July
Participant Observation	Ambikapur	17th to 30th June, 2018; 3rd to 10th July, 2018; 2nd to 20th August
Participant Observation and Conversations	Various towns and Villages in Surguja District	1st to 15th June, 2018; 15th to 30th July, 2018; 1st to 15th September, 2018

All interview transcripts have been redacted in some places to preserve the anonymity of my informants' identities.

Unrecorded interview conducted on 17th August, 2018 with BSNL employee

Which are the active projects and status of fibre optics?

The technical matter – [redacted] you will have to ask him. Whether they are live or dead infrastructure is a very complicated matter. Three years ago, when we were ducting and trenching, cabling etc. we did not know whether there would be a road laid there or someone would build a house there. Supposing this person in the process of building a house dug up the land, and broke the cable. Out of fear he did not tell anyone since he may get fined with a penalty, so he just built a house and started living there. From here, we see that the network is down and we go there to check and see that the fault is below this person's house. Now the house is built and completed. Now what do we do? We have to dig in a different place and alter the route of the cable. These complications exist.

The main motto is that the optical fibre network consists of enormous potential bandwidth. That means more than a terabyte. Satellite and other systems of communication have very low bandwidth. They also suffer from high loss. As far as the satellite communication is concerned. So the only reason for fibre optic is high bandwidth – that's the only reason. In only one fibre cable – the GPON system that we use. In the GSM system, there is a TX cable and the RX cable – one for transmission and one for reception. That means two fibres will be used up. In the GPON system, in the same cable there will be TX and RX. I can split the same cable – 1 by 2, 1 by 4, 1 by 8 up to 1 by 28 subject to limitation of loss which can bear the optical receiver device, that means ONT. Suppose 27 DBM is our threshold level to run the ONT, and if it goes beyond that the ONT will not be stable, and if that is not stable, then Fibre to the Home (FTTH) internet will not work so we will have to maintain the power level and continue the work.

With the NOFN terminating in the Panchayat, there are 26 pairs of fibre?

There is no relevance to the number of pairs. With one pair, I can connect even ten villages. I can split one cable, one can be made into four parts, one can be made into 8 parts, one into 32 parts and one into 128 parts but as I split, the power loss will go on increasing. And my limit is 27 DBM on which the ONT is working – Optical Networking Terminal.

One pair for Panchayat, one pair for school and one pair for health care centre, and remaining pairs to be auctioned?

Yes agree, it is on a revenue sharing basis. BBNL that has set up the network, it will sell the network on a revenue sharing basis. It will auction the network for hire. Out of the 24, 4 pairs are owned by BSNL. The remaining 20 pairs that are owned by BBNL – they have to see how to use it. In the old phase, there were 24 pairs, in the new phase, there are 48 pairs and in some places 96 pairs. In many places we have only terminated one pair. Let us suppose that the healthcare centre or high school is only 200 metres from the Gram Panchayat. So there, we have to give them connectivity. For e-education or for telemedicine, video conferencing with super specialist doctors so that for the patient he can talk to the doctor there itself, the symptoms and diagnosis can be explained by the doctor – who can sit in his own place and explain – now these things will take 4-5 years to go into effect. By then 5G will be introduced. In my person experience and personal view, this project will not be successful

Will not the optical fibre be auctioned to the telecom industry itself?
Even others can buy it. Now Tata is buying it and distributing it to others at 64 kbps. Even individual households can take a connection from the Panchayat.

Pricing – we are taking 150 rupees per month for the ONT and 500 rupees as security deposit. But the main thing is that there should be feasibility for the fibre in that place.

What about BSNL's own wireless telecom section?
Yes, we are already testing 5G in Bhopal. Yes, once 5G is operational, then no one will opt for fibre.

So you are competing with yourself?

No we (BSNL) are just a vendor for BBNL. We are just the executing agency.

So BBNL will go into a loss?

That BBNL will have to see – laughter..

See we are already upset over this BBNL matter. Because leaving our main business aside, we are just involved in all this fibre optics. Our main thing is CFA segment, 2G, 3G or whatever. Even our 2G network you don't get good coverage everywhere and leaving that aside we are doing this fibre work. Our main power, about 60% is involved in doing this fibre work. And we don't get compensation for this. Assume DoT (Department of Telecommunications) uses our building electricity etc., then they pay us for it. BBNL is using our main power and they are not giving us anything for it.

Why?

What to do? If a younger brother acts up what can the elder brother do? *Laughter*
One can't do anything about the actions of a younger brother
Silence

The educated VLEs you can get more information from there. But there are a lot of VLEs who don't know anything. The Wi-Fi Choupals are operational – some of them. There is a separate tariff designed for wi-fi. They are managed by VLEs and they are trained by NIC Chhattisgarh and CHIPS, and there are dedicated people in Ambikapur. You can meet Mr. [redacted] and [redacted]

Why would you want to talk to them about something they do not understand? They will just laugh it off because they have nothing to say. Our rural people are very simple and innocent and they do not understand all these things. The introduction of this infrastructure will convert the rural populations into 'e-citizens' – because this infrastructure will help in e-medicine, e-education and e-governance. Life will become online since all facilities will be available directly at the village level itself. Wifi choupal is in [redacted] – and also in 25-30 locations nearby. The concept of Wi-fi Choupal is that like how some people sit under the *peepal* tree and do brainstorming, i.e. general discussion on burning issues, they do timepass. It is actually just timepass. So once they access the wi-fi choupal whatever they

can get benefit, they have to see. If someone chooses to use the internet to download films and watch them, what can we do?

The literacy here is slowly increasing. Awareness of video, audio technology, Whatsapp are being used. Free rice is being given. So the basic point is that you stay at the same level where you are – just by taking the rice that you are given by the state, and become lazy. That is the main objective of the government. And now they are distributing mobile phones also. It is being bundled with Jio, a Reliance product.

Why is the phone not bundled with BSNL sim card, since it is a government offering?
Because we cannot do a grassroots social responsibility. It is the election related agenda. So they are offering it as a gift. If you want to use public money for public interest, then you can do this.
Is it possible for the state to partner with a private telecom company for such a scheme? Yes why not, if you get along with this company, and if you get a good commission (*laughter*), then why not? In any case, Adani and Ambani are the left and right hand of this government.

The discussion moves elsewhere.

The latest is the announcement of lateral recruitment of civil servants – not just through an entrance examination but the government can directly co-opt any experienced person from the corporate or civil society sector.

So there will no longer be reservations? Actually, it is a different kind of reservation. Amit Shah [the BJP chief] will only take the people he favours. Only those who are favouring Modi will now be selected for civil service. As far as I know, Modi is very corporate minded. I have been in [redacted] and have seen how his government has exploited government education workers at 1500 rupees per month salary for years on end. Even today, the teachers are exhausted, oppressed and demotivated [redacted]. You can check even today – they were crushed. That time, more than others. Today, it has been made 5000 rupees.

I saw an old interview of Raman Singh (current chief minister of CG) where the interviewer asks Raman Singh – you keep talking of Gujarat model all the time, when will you bring CG to the level of Gujarat. Raman Singh says he will bring CG to Gujarat level in 5 years. The interviewer then takes him to task saying Raman Singh works like a maintenance manager. Maintenance Manager! R.S is working like that only – just getting the infrastructure together and maintaining it.

The infrastructure of sustainable development – that is not happening. The infrastructure we are building that will not be sustainable. People's expectations are growing, they are building homes along the road. We have to dig through the fields.

Do you have to obtain right of way to dig through private property?
See we did not give much attention to right of way earlier. See we are working in Madhya Pradesh and it is giving us a lot of headache. We are tired of getting permissions. In Chhattisgarh they don't oppose much, they are straightforward. In Madhya Pradesh, we have given up hope, we have lost the game. In planning, I am exhausted, since I don't have even a single clerk to support me.

I heard that the pilot in Tripura have shut down now because the maintenance contracts were not figured out.

This is natural because if you charge more for bandwidth then no one will pay. They will expect it for free. How much money does the government have and how long can it give you all these things for free? Once the villager has all the documents and he is not falling ill even, suppose. Then what will happen? Then with all this infrastructure on which you have invested – what will happen to it, what is the meaning of it? Instead of this, they should have planned it differently. In an easily reachable place, within a 20 kilometer radius

That is interesting…

Anyway, it could be interpreted that supposing there's a market survey situation when two products are surveyed. Now you have our product and you have the products of the

wireless telecom companies. You go there and do a survey about our product, and then you go and tell our business rivals that we have x number of connections, then they can adapt their strategy accordingly and do marketing. Could it be the case that you are an agent of a business rival? Don't mind *(laughs)*

Supposing I give you a list of sites with the status – what is live and what is dead, what will be your next step? I say that I will talk to people, what is their expectations of this infrastructure, what is their usage, what is their understanding of it? Also, if there is already wireless telecom networks present then why will they see the utility of this fibre optic infrastructure?

I'm not able to understand how you can do research on optical fibre cables. I think you are doing research on the wrong subject. Now if you look at the Digital India programme, what is its impact on the rural population – this should be your research. Now this optical fibre, we know it should be this type or that type of cable, it should be 6 feet, there should be fibre in it, this kind of identification marks etc. – all this is just a medium of data transmission.

Unrecorded Interview conducted on 27th July, 2018

What do you remember about Ambikapur?

My own father was posted in the Forest Department as an officer. In those days, he was provided with an elephant to inspect and move around in the forests, along with a mahout and a caretaker for the elephant. Later, he got tired of the job and moved into the education sector. There he was in charge of inspecting the schools, and since he was quite well educated, he later got promoted as a principal of a college. Originally, we are from Daltonganj in Jharkhand and since my father worked for a long time in Ambikapur, we decided to settle down here.

Before there was an ITI (technical institute) which later got converted into a polytechnic college. There was a massive jungle where the campus is currently located. The government took out a tender and some company from Delhi came to cut down the whole jungle. They brought a machine which would cut the tree (leaving a short stump), and a device that would push the tree away from the machine operator. Since the trees belonged to the Forest Department, they would send away the wood in trucks and lot of people bought the wood for cheap and resold it at a higher price. A lot of people became rich in a very short period of time. Then the stump remained and some of the tribals would come down to cut the stump and sell it to the residents of Ambikapur. They would get a bullock cart full of wood and that time – one full cart of wood, along with the transport charge would be 3 rupees. Since we knew the people, we did not have to pay for the wood – we just paid the 1 rupee for the bullock cart transportation charge (*laughs*). There was no gas cylinder in those days (1960s), we had wood from these stumps and later even the roots.

Who about the people living here, where do they come from?

The business class, petty traders and businessmen, came even before us in the 50s or even before. They also used to come from Jharkhand. For example, 90% of the Muslim families in Ambikapur would have originally migrated from Jharkhand. In the 50s or earlier, there was a barter system. The traders would bring salt which would originally come from Calcutta and

then be transported through the Indian Railways to major junctions – Ranchi in Jharkhand and Jharsguda in Orissa. For the traders who would come to Ambikapur, they preferred to bring their salt to Ranchi junction. Then they would load bags of salt on local horses. During that time there was no concept of precise weight, but the amount of salt that could be loaded on one horse was itself taken as a unit – a Dhalni. In fact families used to get their daughters married off to other families based on these kind of units – how many horse-loads they were worth.

What about the Adivasis?

See, Ambikapur is a very mixed place. First there are the Oraon Adivasis who migrated from Jharkhand, a nearby state, many of them have converted to Christianity. Then there are Brahmins – Sub-castes or *Jatis* being Dwivedi, Trivedi and Chaturvedi. Gupta *jati* people are primarily involved in the alcohol business, common names being Teli or Sahoo. Kayasths *Jatis* are Verma, Srivastav, Saxena, Nigam, Sinha, Bhatnagar, Mathur. Then there are Sindhis, Sardars (Sikhs) and Muslims. The Muslims control the cloth related business here. The business *jatis* of Agarwal, Sindhi, Sardar…apparently there is a shortage of women and hence the Agarwal men are marrying Gupta women out of desperation!

The castes of Rajputs, the *Gond* Adivasis, the Kanwar and Rajwaar control most of the land, while the Brahmins and Rajputs who have migrated from Uttar Pradesh and Bihar dominate government service jobs. Muslim weavers from Bihar migrated here and their primary income was from transporting clothes. Even now they are called *Jhulahas*. Another 'backward caste' (commonly grouped under the moniker Other Backward Castes, or OBC) are the Pannika with *jatis* of Das, Mahant or Das Mahant work on weaving and transporting cotton and tussar silk.

Once the traders would come to Ambikapur, they would create a barter system with the tribals here – mostly Gonds and Kanwars along with some OBC classes like Rajwades – the erstwhile revenue collectors for the princle states around here. The Rajas and Maharajas themselves came from other places and established kingdoms by usurping the tribal chiefs – mostly Gonds who have traditionally controlled most of the land and reigned supreme. This shift in power would have occurred sometime during the late 1800s or early 1900s. In the

initial trading period, the barter system was proportionate – for example, one kilogram of salt was bartered for one kilogram of mahua flowers or one kilogram of other kinds of forest produce. In reality, the forest produce was, in monetary terms, worth a lot more, maybe two or even three times more than the salt they gave to the tribals.

In Jharkhand, the dominant tribe that has also migrated in fair numbers to Chhattisgarh are the Uraon tribe. They know how to work the land very well, so they are always in demand. In Jharkhand they converted in large numbers to Christianity. This is because in the old days, Ranchi used to the be 'capital' of this entire region. So, the missionaries naturally came to Ranchi. There after coming into contact with the Uraon tribe, they made a few changes. They retained the basic tribal culture but removed a lot of the time-wasting useless festivals and ceremonies. They also built churches, hospitals and schools and encouraged the Uraons to develop themselves. Every Sunday the tribals started coming to church. After the service, there would be an informal meeting where problems would be discussed. The missionaries developed a culture of mutual aid and cooperation which has helped the Uraon people a lot over the years. Take for example, a Uraon boy will apply for a public university admission in Delhi. Now that boy will have no idea in which direction lies Delhi, he has no clue whether it is a big city or a small city, he knows no one there. So he will go to the Church. Then the pastor will make enquiries next Sunday. Someone from the village will say, oh my relative is working in Delhi. They will take the address from him. Now it has become even easier since there is the mobile number. They will call that fellow in Delhi, and once that fellow in Delhi receives a call, he will just say, this boy will come and live with me. That's it. In return that boy will do a lot of the household labour so it is mutual aid. Further, the Church sends a letter to all its members who have got good jobs or stable jobs anywhere across the country, and tell them to come to the church later in the year at a given date. Without fail, they will all land up – someone may be a judge, someone a peon, someone a lawyer, someone a banker, someone a soldier. There they will tell the other boys and girls how they got the job, how to apply, what is the salary, and they will also give their contact details. The rest will soon follow and the mutual cooperation network continues through generations. The Church has been instrumental in development of Uraon.

The Gonds and the Kanwars, then there are the Paikras (who drink a lot of alcohol – they have alcohol for almost every significant social ceremony whether it is a birth or a death in the family) – all the tribes here close to Ambikapur, they are all not bothered about modernity. Anyone can fool them. They are not interested in education, they are not interested in scholarships, jobs, computers nothing. They love to talk and they can talk very well – many of them reminisce about how life used to be under this or that Gond king. But these days, they easily fall prey to fraud, this is because under the old tribal society they used to have a lot of land, really a lot of land – sometimes 50 or even 100 acres of land. Many of them still do. Now a businessman will come along and say, I want to buy a tractor for my land, but to take a loan I need an introducer with some guarantee. Why don't you come along with me? Now this businessman would have loaned the Gond tribal some money or occasionally plied him with alcohol etc. So the tribal will readily accompany him, and without his knowledge, his land will become the guarantee for the businessman's tractor loan. Of course, the businessman will not repay the loan for the tractor, while the bank manager who is often involved in the scam, will start pursuing the tribal. The tribal will then put up a fuss saying it's not my business, and eventually the bank will write off the whole matter as a bad loan if the tribal agrees to pay some small amount. This happens all the time here (*long silence*)

Ambikapur was like this, a small village, not even a town and then gradually became a town once people from outside started settling in – mostly from surrounding states like Jharkhand, Bihar, Madhya Pradesh, Orissa etc. It has been less than two decades that Ambikapur has got itself a city municipal which implies that the population has crossed 100,000 people. Now the municipal has an elected mayor, and a commissioner

How has your own work taught you about Ambikapur?
As a [redacted], you have to acquaint yourself with the nature of local businesses. So for example, once a poultry farmer who only sold eggs and had a farm just outside Ambikapur approached me for a small loan. It was a perfectly legit request and I could have sanctioned it in 5 minutes. The amount requested was also small. But out of interest, I had a glance at his project report and balance sheets. To my surprise, his production peaked during summers and monsoons – when usually poultry farms sell less. So I asked him and he told

me that in Ambikapur market, most of the eggs come from Rajnandgaon and elsewhere. In the monsoons, the roads become so bad, that the eggs reach late or get destroyed in the trucks transporting them. So they radically downgrade supply or stop supply altogether. It is precisely then that demand for his eggs go up. So it was an interesting lesson for me on how apart from economics, even the state of roads can sometimes be a significant factor in shaping a business! (*laughs*)

Unrecorded interview conducted on 1st August, 2018 with a private contractor building the National Optical Fibre Network.

Could you tell me a little bit about the administrative structure of the optical fibre network?

Do you mean the execution or the implementation of the fibre network?

Why don't you tell me about both?

This started in Kerala. During Manmohan Singh's government, or even earlier, around 2004-05, if you see in Kerala there are internet cyber cafes there. The atmosphere is completely that of a village. And there you will find a cyber café. You will find a very nice shop, you will get Coke, Bisleri (bottled mineral water brand). So this thing was made into a model for the whole of India. For those who migrate from their villages, why do they migrate to the cities? They migrate and come for employment. But when he leaves his village, then who will be our farmers? We are an agricultural nation, and when there are less farmers, it becomes a failure of government. In the village, what is needed? If there are good health facilities, if there is a cyber café, if there are all the necessary and good facilities, meaning that the administration should go there, not that they should come here for things. So there [Kerala] an experiment took place. Earlier there was a scheme for employment [MNREGS]. Lot of people criticised it saying it will not be successful. Why will it not be successful? For this reason, they made BBNL, that the whole country will be connected through optical fibre. What will happen then? All the things will be computerized. So the bank will remain where it is. ATM will get installed there. You can take a FTTH (Fibre To The Home) line, you can take a lease line, get a ISDN – so many things will be there.

So BBNL made their norms [to build the optical fibre network], in terms of who will be the *thekedaars* [contractors]? That there will be video shooting to prevent theft of cables. With an app, you will have to measure latitude and longitude. I'm getting so stressed out since I have to make a bill since the last two months. I have done the work but I'm not able to get

the payment. There are so many formalities. They have made so many norms for us contractors.

You got a set of norms straight from Delhi [central government] or was it the Chhattisgarh state government?

No, it was BBNL that provided the norms. I mean BBNL, Delhi. So whatever work we do, it has to conform to certain standards. If there is a bridge, then you have to put GI. You have to do this much by this much CC, or do clamping, the pit should be this deep here or else there will be other conditions and you have to draw the whole structure and submit the diagram. You have to write it in a particular way. For example, my site is in [redacted]. What is the code? They will recognise my block only through the code, nothing else. So all these norms BBNL gave us. So now BBNL got the power. Now BBNL needs to get this implemented, get the work done. So what did they do? So for example in Chhattisgarh and in Madhya Pradesh, they gave the job to BSNL, and told them they have to get it [optical fibre network] implemented. So for example, BBNL would have said to BSNL that we will give you 450 rupees per meter of cable laid. Now BSNL put that work out on tender. So we contractors, some of us get 115 rupees, someone gets 125 rupees competing for that work. So BSNL is getting that profit by being the middleman.

So BBNL authorised BSNL to build the network, are they allowed to do that as per procedure?

As per procedure! They of course will do it. But in Jharkhand they gave it to the Power Grid corporation. In Uttar Pradesh they gave it to Airtel. BBNL can give it to anyone.

I thought they could give it only to three companies all public – BSNL, Railtel and I can't remember the third one

The ones that are PSUs (Public Sector Units) they can get.

But Airtel is not a PSU…

Yes, but they got a contract anyway. Now for example they have given it to Tata in Chhattisgarh. Now BSNL will not get any further work. But BBNL have not 'given' it to Tata, they made a tender and I believe Tata has progressed in the tender. We know the inside news, I keep myself acquainted with such kinds of information (*laughs).*

Now there are two ways, one is open tender. In open tender, BSNL may also compete to get the job and could get it too, there is no problem. But BSNL will say we will not put the tender. If they get direct work through the government, then they will do it, otherwise no. In the first phase…don't you know sometimes that the whole work will not be given to a government agency? Some work could be given to NGOs, some work was given to Power Grid which is the government's own agency. BSNL is also the government's agency. So similarly, some work was given to Airtel too. What rules exactly apply to this, it will need some investigation. They may have got it by tender.

Now BBNL has put pressure on BSNL, that all the things have to be in the correct format and as per the procedures, so BSNL people are following it on a very strict basis. So that was Phase One. Now Phase One is almost complete, across India. Now Phase Two is beginning. Now in Phase 2, BSNL was told that they will not be given direct work, they will have to compete in a tender process. And BSNL people replied that they will not participate in tender. Then Tata put in a tender, then Larsen & Toubro also put in a tender and so on. Tata has put in a good bid. This time they have given it to CHIPS [Chhattisgarh Information Promotion Society]. This is managed by the family of a very big politician [redacted]. This is a very big long-term game.

So what work happened in Phase One of the fibre network?
Around 2014 I think it was, I used to take small contracts, like building a 15 kilometer stretch of cable. Now what they have done with Phase One is to give a huge job in one shot. See here [shows me some documents], it's a job for 23,000,000 rupees. Its all like this. Big tenders. All of these were NOFN tenders – this is what Modi did in 2016 with NOFN. Its all a scam. He keeps saying Digital India Digital India everywhere. The objective is to give broadband connection to every Panchayat. Now see my tender document. The full list of

villages is given here, what is the rate in every village. So in competition, we put sometimes 30% below the rate, sometimes 35% below the rate. The competition is so high in small places like this, we get very little. [shows me the maps of villages where he is supposed to build the network cables].

They also tell you in which format they want me to submit bills, what you have to sign, all of this they tell you in this 90-page document which they have made. So this tender document is iron-clad. All the rules will be according to this document. See in fact it is more than 90 pages, it is 114 pages. See you have to dig up and place route indicators like in this diagram, along the cable. In the wire mesh, there will be a chamber, it has to be written "OFC, BBNL". Interestingly, now those who have got the tender, on the cable it will be written, "OFC, CHIPS". Now for example, if there is a police station, then you have to give a symbol on the cable. We call this diagram ABD. We have to draw everything and given them, more than 1500 pages. Then we will get paid for the bill. Our condition gets bad when we try to do it. I feel like its my exam. Yes, I have done the work, they have reduced us to this situation. Such strict rules.

For example if it's a tar road, you cannot cut it. Per meter charge, if you do SDD with a machine then its 330 rupees. If you lay a pipe then you give 3 rupees 65 paise, if you lay an iron pipe then per meter it is 13 rupees like this the full rate is here. Splicing joints etc – this is the tender document. So like this I have given it to BSNL a quote of 450 rupees. BSNL gave it to us vendors. So BSNL is itself a contractor, but they will be in charge of the whole thing. So the BSNL person will have a double post. So they one title from BBNL and their original post title from BSNL. They are doing double work.

So then do they get double the salary as well?
No nothing, that is the problem with them. For example, there is a DE - Broadband – District Engineer for Broadband in BSNL, but with BBNL, he might be AGM. It seems like a big title , Assistant General Manager, but it will be a small post. So when this person will sign on my bill, he will sign it as a BBNL person. You have to understand the hierarchy of the organisation [BBNL]. At the top there is CGM, below him there is GM. There are many GMs – GM Planning, GM Finance, GM Telecommunication and so on. And they have jurisdiction

based on the telecom maps, what they call telecom district. They don't work with political and administrative boundaries. They have their own maps. So each telecom district will have its own manager, TDM. But if you go to Bhilai for example, his post will be GMTD. It is a little tough to understand, but you have to understand the hierarchy. There is no difference between TDM and GMTD. So AGM is in fact below TDM! Then there are SDEs then there are JTOs (Junior Telecom Officers), then there are TTA, then there are clerks, then there are linemen. BSNL also has a very similar structure.

So now we as contractors come under both of these organisations! You met him [redacted], he's a good man. But on the other hand, there is so much corruption also in this game.

How?

This is a little bit off-topic, but since you are doing research, you should know this also, that how corruption happens. Now take this village, [redacted]. For this village, I have made the ABD. I'm showing you how much I made in this ABD. See the total length. I made 4020, and see what is the approved length he is allowing me to do. 5200.

So you make something on the difference?

See, we did a survey of 5200. Actual survey was not done. He sat in his car and went, he saw on paper. So now you tell me, I may very well have put 35% below the rate in the tender, so I have made 4020 actual bill, minus 5200. 1180 and you multiply this with 125 and you have 147500. Now if I distribute even 50% of this profit in the government department – I'm just talking about one village. Now like this, if I have total 250 villages. Now this is a game of millions! Who will check? If someone checks, he will do this only. He will see my signature. Now let me tell you the real thing. JTO will take 4% commission *(laughs).* SD – 3%, AGM-DE 2%, TDM – 2%. Then if you go to the department, there are officials. Now don't think this is just about BBNL or BSNL. There is PWD (Public Works Department), Irrigation, everything. This is the same system – for all government offices. In total, BSNL, there is 18% commission. Now for a million rupees, you calculate 18% I have to give them, think about it. I underpriced my competition to win the tender, gave commission and still they tortured me with so many rules so many formalities, that this time I have decided I will not pay them one cent. When I came to the business initially, I was naïve. I asked why the lower officers get 4$

while the higher ups get only 2%? I was told that the lower officers have fewer sites, three or four, whereas the higher ups may get only 2% but they get 2% from 35-40 sites. So he is actually getting 80% *(laughs)*. It is an impressive game. Lot of people talk about honesty and civic duty and all this nonsense. Even I have spoken many times about this. But when you come to the field you know its all nonsense.

What about the tenders?

See there are two types of tenders. One is the BSNL's own tender, which they give out from time to time. But with BBNL, they have a full manual. You have to take a video while doing the trench. How will the contractors make money by under-reporting etc? You have to make a pit so deep that a man can stand in it. So we will save money. We have 125 rupees. After commission etc, I will have say 30 rupees. But if I do not dig so deep, then I can save 100 rupees per metre. Now think how much money can be saved? But BBNL said full videography is required.

So they want video of every metre dug for the network? That must be a lot of video they handle!

Yes, totally. See my entire hard disk on my computer is full, all videos of trench work. But back to the big picture. First the government makes and estimate and provides funds to BBNL, which then gives some budget to BSNL Chhattisgarh. BSNL will then do a survey to find out how many villages are to be covered in which zones. So for the first three four months there will be survey work. This survey will include information on where the connection will be given – the distances from each administrative node to the next administrative node – the exchange of the old telephone system of BSNL. There may be a tower there already. So there is a cable there already. From there the nearest village, it has to be calculated.

So do the officials of BSNL really do these surveys themselves?

Yes, they distribute the work amongst themselves they take their vehicles and go for the survey. Actually they don't really do the survey. They just make an estimate. [*Imitating a BSNL employee]:* "Hey how many kilometres is that place from here? Oh five kilometres, okay I'll just write five kilometres then". So on the paper there is some figure, but in reality

the distance will be totally different. In some places, it is so bad that they have written the distance as 6 kilometres, but in reality the distance is only 300 metres! Now using the estimate of 6 kilometres, the contractor would make a budget and submit some security money. But when he goes to the site, there is no work to be done. If I tell you the full details, we will be talking the whole night, that too about just one department. If I tell you about the irrigation department, I have taken contractor work from them also, you will think I am exaggerating. This state government is finished. Even today, there is some standard of the central government. If you do work connected to the Railways, you won't worry about commission. He will say I don't want it. If you are very scared you can give 5% commission its up to you, but he won't bother, because the railway equipment has to be good quality, it's a matter of life and death for passengers. In BSNL they will take commission, but they won't compromise on the quality of the work.

So like this the employee will ask his friend, how far some place is. The friend will say something based on his knowledge. The officer will just write that. He won't even bother going to the site. He will quietly pocket the money for travel to the site!

So now they will do the survey, he will write for such and such code (region), the length is 5200 and depth is 165. Now this fool will write it. Enough for a man to drown, 5 feet 5 inches. What if there is a stone while digging? The survey says some depth on paper, but when I go to dig I will find obstacles. Then I will need more money to dig, which means that the higher ups from BBNL will need to provide some relaxation on the formalities allowing for the discrepancy in depth so I can still make some money. But obviously if he is relaxing the depth, he will take the commission from that, so I will obviously report the difficulty in digging and ask for relaxation keeping his commission included. People ask me you talk of principles but you are a contractor, which means you are also corrupt. But I tell them I am the hunted, there is a hunter above me. There is a difference between the two. This time, I got lucky, my sites are all on plain land, there will be no problem with digging at all. So perhaps I won't have to give commission.

So any way after the survey, the report is sent to BBNL, they sanction a budget and give it to BSNL which will then call for tender. There are so many norms for even participating. You should have experience of working on at least 300 kilometres, you should have two JCB machines, you should have at least ten labour with the right APF certificates. I don't have all

these documents now. So I speak to [redacted] who has all this and has given me power of attorney, so I work using his name.

The competition is so heavy, it is already designed to keep non-serious players out. You have to deposit 10 lakhs for a job of one crore. Tomorrow if a contractor says I have changed my mind, then he will lose that money. Today you need to have roughly 10 crore rupees worth of machinery ready. You have to pay the labour. It moves in stages, L1, L2 and so on. All this happens in the monsoon in 3-4 months.

Then there is the problem with the land. In some cases, the land is with Railways or Forest department. Then I cannot take the risk of construction because both of them are central government agencies. They can just confiscate my equipment.

Now after everything I get a work order. Now the work begins for specific area. My documentation is 100% in order, unlike other contractors. See here I have my acceptance letter. Now my meter starts! See here in the letter it says you have to complete the work in 15 weeks. In 15 weeks! How long have I spent working on this? About 2 years.

Why so long?

First, in my old letters I wrote that the survey was wrong with all the details, and that's why work is getting delayed. But really I do not have so much capacity. There are so many hindrances. You cannot just go to any land and dig it up. Sometimes, people's houses are there on the land, you cannot just dig up below their house. Then he will ask for compensation. So for example when Modi announced demonetisation. Then I immediately wrote to BSNL saying during demonetisation I cannot do work since I do not have cash to pay the labour. The technical things about this network is a whole other story, that I will explain to you next time we talk.

This extract has been redacted in some places to preserve the identity of my informants.

12ᵗʰ July 2018

I get on an extremely crowded bus to headed to [redacted] block. The so-called road has more potholes and dust than tar, and after a bumpy hour-long ride, I reach [redacted] town. If it can be called a town. Basically [redacted] is characterised by a couple of kilometres of shops, two public banks, and a few government offices. Before and after this main road are forests on either side. On either side of the main road, there are houses that are spaced apart, unlike the close density of housing and population (along caste lines) that marks other villages that I have visited in other parts of the country. Like Ambikapur, [redacted] is populated by outsiders from nearby Jharkhand, Uttar Pradesh, Madhya Pradesh and Bihar. A few people have come from other states as well. Again, like Ambikapur, there are older outsiders (either they or their fathers – for women remained and largely continue to remain indoors, were in government service, and were posted in [redacted] and then chose to settle down here) and then there are newer outsiders who have all come here to work for one of the big guys – Adani enterprises. He runs several coal mines close by. I learn that the road is in such a pitiable condition because Adani's mining operation involves hundreds of large trucks ferrying coal out of Ambikapur to the coal refinery in Rajasthan, to the Rajasthan Electricity Power Department (that has the license to mine coal). Incidentally, since mining began here in [redacted] about six years ago, there have been close to 1500 deaths on this road – mostly because of these coal-laden trucks killing motorists. The road is narrow, full of dust and the trucks are in a hurry. Adani is in a hurry. The mining operations have been restricted to the initial area because of a stay by the Supreme Court, even as Adani has begun public hearings (illegally) in some of the surrounding villages biding his time.

The reporter, [redacted] who is my host in [redacted], tells me that Adani's mining operations, if extended beyond the current area, will mean that an additional 100,000 trees will be cut. I'm quite frankly shocked. When [redacted] passed an order for cutting of about 15000 trees in Delhi there was a huge ruckus about it on national media and on social media. Eventually the government backed down in the face of middle-class pressure. New

environmental heroes were born, the middle class satiated with its temporary victory. However, in [redacted] here, in a small part of Northern Chhattisgarh, here is a journalist telling me calmly and with certainty that 100,000 trees will be cut and there is hardly a whisper about it in public discourse.

By way of welcome, [redacted] takes me to [redacted] (a village right behind [redacted], hardly two to three kilometres by road). The area is well known as a tourist spot because it [redacted]. [redacted] has no hotels, and [redacted] house is full (it is a joint family and some other relatives are visiting). A friend from Ambikapur happens to be in charge of a government guest house in [redacted] and has kindly offered to put me up in the guest house here for as long as I want. He himself, along with his family, although officially stationed to work in [redacted] stays in Ambikapur and only comes to [redacted] as and when needed. [redacted] and I land up at the guest house and find that both rooms of the government guest house are occupied. They are both block-level government officers who have been living in the guest house since the last few months. Posted to [redacted], and not willing or inclined to find a house in this town, they have decided to stay put in the guest house. I prepare to return to Ambikapur and promise to return as and when I manage to find a place to stay. However, our friend in charge of the guest house miraculously gets one person to vacate the guest house and I come back from the bus stand. That night at the guest house, there is no power. That whole night, the power cut continues and I am bitten thoroughly by the mosquitoes.

13th July 2018

I am tired, sleep deprived and a bit irritable, and I ask [redacted] about the electricity or the lack of it. [redacted] tells me that Chhattisgarh is an electricity surplus state since it was formed in 2000 (a fact that everyone here seems to know and relishes telling me with some pride). However, the problem comes with the size of the state and more importantly, the difficulty of distributing electricity through an extremely challenging landscape. Again, we come to infrastructure. [redacted] is convinced that a small 'insulator' breaks down due to rainfall or lightning, or the transformer is affected, or the high-tension wires that transport electricity across the state gets affected and the entire town of [redacted] suffers a blackout.

We start doing the rounds of the villages on the list. [redacted] decides that we should first check out the villages that are closest to [redacted], just to get a sense of what is happening with the NOFN. We first visit [redacted], which is also 3-4 kilometres from [redacted] and find the Panchayat locked. I can see the fibre optic going into the Panchayat building. [redacted] calls the head of the Panchayat – the Sarpanch, and he tells us that the internet is not operational. Some people have installed it a few months ago, but he has no idea what to do with it, when it will be operational. He seems to be talking about this infrastructure as if it has nothing to do with him or his work – can't say I'm surprised to hear it.

We went to visit the block headquarters in [redacted], and the Chief Executive Officer is away on a meeting. However, we do meet the pensions department officer Mr[redacted]. He is about to leave but is kind enough to stay back and chat to us – courtesy [redacted] – who seems to know just about everybody in town. I ask him about the optical fibre and to my surprise he says we don't have it. It is then that I see the optical fibre box and a cable trailing out of the window. I point to it and tell him that I am interested in that box and how they're using it. Apparently, it was only a month ago that some people from BSNL came and installed the infrastructure. Until now, they have been working with a system called SWAN – basically internet provided via satellite through cooperation with the Indian Satellite Research Organisation (ISRO). He and his assistant, a young man eager to chat about it, complain about the satellite connectivity saying it is too slow and only barely manageable for video conferencing – which they do with their administrative headquarters – both in Ambikapur and the state headquarters Raipur, on a weekly basis. However, the block headquarters also has a lot of other administrative work which they struggle to do because of patchy connectivity. They also struggle with more basic infrastructure – electricity. They had a huge generator but it has given way because of some fault, and there is no one who is willing to or knows how to repair it, so they have given up. Now if it is an emergency, they hire a generator from the market. They seem to look forward to the optical fibre internet – a sense of hope that with fast internet, a lot of administrative work can be accomplished. We later meet the block president (elected) Mr. [redacted] and his erstwhile colleague Mr. [redacted]. Mr. [redacted] is initially very positive about the infrastructure, saying the people will make excellent use of it, and it will greatly help in e-governance, e-education

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and e-medicine, thereby saving people the time, effort and money of coming to bigger places. All the critical requirements will now come to them via the internet. Also he seemed positive that more and more people have smartphones and they can make use of the internet for various other things that they may need. Gradually the conversation moves to the latest scheme introduced by the Chief Minister Dr. Raman Singh – an ambitious move to distribute 50 lakh mobile phones.

He cautiously asks me what I think about this move. I tell him it is a shrewd move ahead of the state elections since the State is virtually creating a new database of 50 lakh voters and knows their mobile numbers. It is likely that the State will do some kind of targeted propaganda to appeal to these voters. After this point, [redacted] is much more pointed about the failures of the BJP. He lists every single scheme of the Modi government and the Raman Singh government and tells me in detail that on the ground, these schemes are a total failure. The people have woken up to the ground realities and will definitely vote the BJP out of power in Chhattisgarh. Clearly, he is a supporter of the local Congress candidate commonly known here as [redacted]. For example, he says that while it is good that villagers have got a LPG cylinder at a subsidy, no one is using them anywhere because a refill of the cylinder costs Rs. 800 and no one has that kind of money to spare on LPG cylinders. He says that when middle class people like him think twice of spending 800 rupees then how can poor people afford it? [redacted] then joins in to ask – why is the government investing in fibre optic when the commercial telecom companies are already present even in the villages, especially the Reliance owned Jio, with their wireless 4G services? What good will a wired connection do when wireless has already arrived? It's a good question and I have often wondered about the same question. I consider how to answer this. Clearly, both of them are against the BJP, and this is not just an attack against the current government but also a test to see how I will respond – whether I will defend or critique the initiative. I decide to tell them what I have heard from others. A bifurcation of internet usage. Wireless services provided by commercial players will be like private internet – for entertainment and myriad personal uses. However, the fibre optic connected to the local Panchayat, school, and health centre, will connect citizens to government, and more centred on services. I know this is an inadequate answer, but it seems to placate them momentarily.

However, soon enough, they are back to government bashing and soon [redacted]and I start exchanging glances. Both of us have heard enough and are finding ways to escape.

I then meet [redacted], who is [redacted] partner in crime. Both of them are local journalists. Stringers to be precise. They send stories to a wide range of newspapers headquartered in Raipur. They also are asked to contribute advertisements from that region. They are paid a small amount for the stories and if they can get adverts then they get a 15% commission on that advert. [redacted] also manages a shop on the [redacted] main road – along with his brother. He is also building an eight-room housing block which is already booked in advance. Some companies (including the Railways) have booked it. [redacted] has taken a loan and is supervising the construction. He hopes that it will serve as a reliable and steady source of income in about 6-7 years from now, mostly for his child and his later age. [redacted] on the other hand seems more vulnerable to the market, and is generally more brooding as a character. Both of them tell me that they have documented reams of evidence – of malfeasance, illegality and violation of procedure with respect to coal mining in [redacted]. They also have seen how the mining has destroyed the tribal way of life – spoiling them with money. The claim, and I have heard it before, is that the tribal has no idea what to do with money. He (why is the tribal always referred to as he?) is rooted in activity to do with his land, with forests – whether it is to pluck tendu leaves that will then be sold to beedi manufacturers, or to pluck mahua leaves (out of which they make their own liquor). When he is dispossessed of his land and given some capital, he doesn't know what to do with it. Soon he squanders away the money or is swindled out of it, and soon enough, ends up as a labourer on the mines, or ends up homeless or a migrant to other places. Many of them die in accidents (check notes on conversation with [redacted] !!!) that I referred to earlier as well.

At [redacted] shop, someone tells us that he recently saw some people digging up and laying the fibre optic cable on the way to [redacted] village – which is on the list. So [redacted] and I dutifully head off to [redacted]. We can see that the cable has been recently laid but there are no labourers. It looks like the work has been completed. I was looking forward to chat with the labourers who are building the network. They are mostly from outside, since the companies and contractors who are in charge of completing the

network will not hire local labour. They do not want the hassle of dealing with local people reluctant to work with overtime, the risk of locals unionising or demanding wages, or if someone gets hurt, then local labour will organise and demand compensation and so on. Outside labour is safer since they work longer hours, don't ask too many questions about payment and can be managed more easily in case of accidents, injury or even death.

At [redacted] village, it has started raining heavily as soon as we arrive. So we take refuge in the local school. There are about 40 students and it is lunch time, so the students have all sat down for their mid-day meal. The teacher is supervising the students, all sitting in a net row and the mid-day meal is being served to them by the woman who has ostensibly cooked the meal for them. After the meal, one of the girl students (and it is always one of the girls) is asked to sweep the floor. All the students have to wash their own plates thankfully. We then sit down with the teacher to ask her about the adjacent Panchayat and whether she knows anything about the internet connection. She smiles uneasily says she doesn't know much about it. I then ask her about the school and whether, hypothetically speaking, if there is connectivity, it will help the school and her teaching. She smiles some more, is quiet and then asks, but will the internet not require that we have a computer? We don't have a computer yet. I feel like an idiot!

With Ambikapur as my base, I decided to visit nearby villages to identify a suitable place where I could conduct ethnography over the coming months. I was introduced to a local government school teacher [redacted] who was teaching in a primary school in a village about [redacted] kilometres from Ambikapur. I started going with him to this village. There were about 10 households - all of them excluded by the village and forced to live on the outskirts of this village because of their caste status as Dalits. It should be noted that the village consisted of Adivasis, Other Backward Castes (OBCs) and upper castes, and together, they all kept the Dalits out. These Dalit families had settled on the outskirts of the village, but on government land. When the village demanded a school, it was this very land which was allocated for a school. Both the school authorities and the Dalits were next to each other - each seeing the other as trespassers. When I asked [redacted] if we could go to the settlements, he said it would be better for me to wait in the school premises and he would request someone to come to the school to talk to me. Soon enough I met a young man, [redacted], who came to the school with his nephew, a boy approximately five years old. I started enquiring about his job, about the settlements, about the village and whether he knew about the fibre optic cables. During the course of this short conversation, I ruffled the young boy's hair as he was walking around both of us, bored while the adults were talking.

Soon after, [redacted] and I went on a motorbike to explore other parts of the village. In about 20 minutes, [redacted] got a phone call from another teacher saying this young man was back at the school, and he was insisting that I had put a spell on the child and the child had fainted. He wanted us to come back to the school. We were puzzled at this and we rushed back to the school. [redacted] came back from the settlement and started shouting abuses at me saying I had come to steal his nephew's kidneys and take them back to the city. He kept asking me why I had touched the child and that he would surely kill me. By then others from the settlement had also gathered at the school. It was quickly becoming a mob and they had sticks in their hands. They claimed that the child had fainted and it was definitive proof of my intentions. [redacted] tried to reason with them but they did not even look at him. Clearly rattled, [redacted] called the police while I kept quiet, fearing that

anything I said in my defence would only make it worse. It was my luck that most of the younger people from the settlements had left for daily wage work in the day, and most of the mob were older people. It was also my luck that I was near a Dalit settlement and that other people in the village had not gathered as quickly, or perhaps they would not come to express their solidarity with Dalits. Either way, before the situation got worse, the police came and everyone absconded as soon as they heard the jeep.

It was only then I realised that I had become caught up in what was quickly becoming known as the series of Whatsapp lynchings. From mid-2017 to late 2018, there were more than 60 documented cases of mob violence across the length and breadth of India. More than 35 people have died and hundreds injured. In this tragic situation, in most cases, both the perpetrators as well as the victims were often poor and/or from Dalit or Adivasi communities. It was only two or three days later that I realised the whole state was firmly in the grip of these fantastic rumours of child organ kidnappers. In a nearby village of [redacted], the local police had conducted an awareness camp requesting people to not believe in such rumours. Two days later, a man was brutally beaten to death in that village. My visit happened roughly ten days after this incident. It became immediately clear that even visiting villages was a clear and tangible risk to my life, let alone undertaking intensive ethnographic study. The police warned me that I was lucky and next time, it was entirely possible that they may get delayed. All my contacts in Ambikapur also warned me to not visit any villages since they were unable to guarantee my protection. Similar incidents of mob violence had occurred in states all across the country, making it very hard to think about an alternative site for field research. It was impossible to 'test' whether a particular site was safe to conduct research. Even if there was no prior incident of violence, clearly people were aware of these rumours and were very wary of strangers entering their village.

Given these challenges, I wrote to my supervisors with an update and to seek advice on how I should proceed. After consulting with my supervisors and with contacts in Chhattisgarh and with other networks in other states, I decided that the best way to utilise my time would be to restrict myself to the city of Ambikapur. Intermittently, I would undertake rapid and brief field visits to various villages always accompanied by people who lived in those villages and were well known. I would not stay in any village but only briefly interact with

people in public spaces or government institutions (Panchayat offices, schools, health centres). In the later months of my field work, I went into villages further from any cities or even towns, and closer to the forests and mining areas. In these areas, very few individuals or even households had smartphones, and in many places, there was no phone signal. This meant that rumours on WhatsApp would circulate less in such areas, although there was always a risk since rumours went online to offline very quickly.

National Optical Fibre Network in India: Governmentality and Subjectivity
Name of researcher: Ramnath Bhat
Department of Media and Communications, LSE

Information for participants

Thank you for considering participating in this study which will take place from April to September 2018

This information sheet outlines the purpose of the study and provides a description of your involvement and rights as a participant, if you agree to take part.

1. What is the research about?

I am studying different kinds of internet infrastructures, especially with focus on National Optical Fibre Network (NOFN) which is a part of the Digital India initiative. As part of this research, I will observe and interact with a wide variety of people who are associated with this infrastructure. This includes engineers and bureaucrats who are involved in the planning for technical standards, to everyday users of internet. I will be using interviews and ethnographic research to conduct my study in India.

2. Do I have to take part?

It is up to you to decide whether or not to take part. You do not have to take part if you do not want to. If you do decide to take part I will ask you to sign a consent form which you can sign and return in advance of the interview.

3. What will my involvement be?

I will ask you some questions about your possible association, involvement or opinion about the National Optical Fibre Network in India. At a later point, some of what you say may be included in my final PhD thesis document. However, your name, occupation and other details revealing your identity will be anonymised.

4. How do I withdraw from the study?

You can withdraw at any point of the study, without having to give a reason. If any questions during the interview make you feel uncomfortable, you do not have to answer them and you can withdraw from the interview at any time for any reason. Withdrawing will have no effect on you. If you withdraw from the study I will not retain the information you have given thus far, unless you are happy for me to do so.

5. What will my information be used for?

I will use the collected information to write a PhD thesis document. Some of the information may also be used to write journal articles.

6. Will my taking part and my data be kept confidential? Will it be anonymised?

The records from this study will be kept as confidential as possible. Only my supervisor and I will have access to the files and any audio tapes. Your data will be anonymised – your name will not be used in any reports or publications resulting from the study. All digital files, transcripts and summaries will be given codes and stored separately from any names or other direct identification of participants. Any hard copies of research information will be kept in locked files at all times.

7. What if I have a question or complaint?

If you have any questions regarding this study please contact the researcher, Ramnath Bhat on his email address [redacted]

If you have any concerns or complaints regarding the conduct of this research, please contact the LSE Research Governance Manager via research.ethics@lse.ac.uk.

To request a copy of the data held about you please contact: glpd.info.rights@lse.ac.uk

If you are happy to take part in this study, please sign the consent sheet attached.

राष्ट्रीय ऑप्टिकल फाइबर नेटवर्क: शासन और पहचान

शोधकर्ता का नाम: रामनाथ भट

संचार विभाग, लंदन स्कूल ऑफ़ इकोनॉमिक्स

सहभागियों के लिए जानकारी

इस रिसर्च में भाग लेने के लिए आपका धन्यवाद। मेरा रिसर्च अप्रैल से सितम्बर २०१८ में किया जाएगा। यहां पे मेरे रिसर्च के बारे में जानकारी है एंड अगर आप भाग लेना चाहते हैं तो आपके भागिता पर भी जानकारी है।

१. यह रिसर्च किसके बारे मैं है ?

मेरा रिसर्च राष्ट्रीय ऑप्टिकल फाइबर नेटवर्क पर है, जो डिजिटल इंडिया का हिस्सा है। इस रिसर्च के दौरान में कुछ लोगों से बात करूंगा जो इस राष्ट्रीय आप्टिकल फाइबर नेटवर्क में काम करते हैं. नेटवर्क इंजीनियर से दफ्तरी अधिकारी से आम जनता जो इसका इस्तेमाल करे। इस रिसर्च को पूरा करने के लिए मैं इंटरनेट प्रयोग करना वालों के गतिविधियों की समीक्षा करूंगा और बाकी लोगों का साक्षात्कार करूंगा।

२. क्या इस रिसर्च में भाग लेना अनिवार्य है ?

यदि आप भाग लेना चाहते हैं या नहीं ये पूरी तरह से आप की मर्ज़ी है। अगर आप न चाहे तो भाग लेने की ज़रुरत नहीं है। अगर आप ने भाग लेने का फैसला किया है तो मैं आपको और एक पत्र दूंगा। उस पत्र को पड़के आपकी सहमति हस्ताक्षर द्वारा दे सकते हैं. उसके बाद ही मैं आपका साक्षात्कार लूँगा।

३. इस रिसर्च को लेके मेरा क्या जुड़ाव रहेगा ?

मैं आपको कुछ सवाल पूछूंगा - यह राष्ट्रीय ऑप्टिकल फाइबर नेटवर्क के बारे में जानकारी या आपकी राय होगी। जो आपने कहा है, उसमे से कुछ चीज़ें मैं अपने अंतिम लेख में शामिल कर सकता हूँ. अगर मैंने शामिल किया तो आपका नाम, आपका पेशा, आपकी नौकरी इत्यादि सब अनामिक तरीके से लिखा जाएगा।

४. मैं इस रिसर्च से कैसे बाहर निकल सकता हूँ ?

आप किसी भी समय अपनी भागिता इस रिसर्च से निकाल सकते हैं। आपको वजह देने की ज़रुरत नहीं है। अगर साक्षात्कार के समय आपको किसी भी वजह से असुविधा महसूस हो तो जवाब देने की ज़रुरत नहीं और आप साक्षात्कार को उसी समय समाप्त कर सकते हैं। इससे आप पे कोई असर नहीं होगा। अगर आपने बहार निकलने का फैसला किया तो आपसे मिली जानकारी को भी मिटा दिया जाएगा।

५. मैंने जो जानकारी दी है, उसका आप क्या करेंगे ?

आपके दी गयी जानकारी (और बाकी रिसर्च के साथ) मैं कप्लना पीएचडी (PhD) थीसिस लिखूंगा। इस जानकारी से मैं कुछ विद्वानिक पत्रिका के लिए भी लिख सकता हूँ।

६. मेरी भागिता एंड मेरी जानकारी गोपनीय राखी जाएगी? क्या जानकारी अनामिक रहेगी ?

इस रिसर्च से सभी जानकारी गोपनीय राखी जायेगी। सिर्फ मैं और मेरे अध्यक्षक को इस जानकारी तक पहुँच होगी। आपकी सभी जानकारी अनामिक तरह से राखी जायेगी। आपका नाम इत्यादि किसी भी लेख में नहीं आएगा। हर डिजिटल फाइल के लिए सांकेतिक अंक दिए जाएंगे ताकि कोई उस जानकारी से किसी व्यक्तो को नहीं जोड़ पाएं। जो भी जानकारी कागज़ पे होगी उस जानकारी को ताला समेत अल्मिराह में सुरक्षित रखा जाएगा।

७. अगर सवाल या शिकायत है तो ?

अगर आप को इस रिसर्च से जुड़ा कोई भी सवाल है तो कृपया मुझे संपर्क करें। मेरा नाम रामनाथ भट है और मेरा ईमेल [redacted] है। अगर आप को इस रिसर्च से कोई चिंता या शिकायत है तो मेरे विश्वविद्यालय के अधिकारी से संपर्क करें : research.ethics@lse.ac.uk
अगर आपकी जानकारी की कॉपी चाहते हैं तो कृपया सम्पर्क करें : glpd.info.rights@lse.ac.uk

अगर आप भाग लेने के लिए सहमत हैं तो कृपया सहमति पत्र पे हस्ताक्षर करें। धन्यवाद।

National Optical Fibre Network in India: Governmentality and Subjectivity

Name of researcher: Ramnath Bhat

PARTICIPATION IN THIS RESEARCH STUDY IS VOLUNTARY.

I confirm that I have read and understood the information sheet provided for the above study. I have had the opportunity to consider the information and ask any questions I have.	YES / NO
I understand that I am free to decline to participate in this research study, or I may withdraw my participation at any point without penalty. My decision whether or not to participate in this research study will have no negative impacts on me either personally or professionally.	YES / NO
I agree to taking part in the study	YES / NO
I understand that my data will be anonymised and stored securely for the duration of my PhD for a period of five years and stored additionally (only digital copy) for an additional five years after which it will be destroyed.	YES / NO
I agree to the interview being audio recorded (this is purely for transcription purposes – i.e. to ensure that I have represented your views and words accurately). This audio will not be released to any other individual under any circumstances.	YES / NO

Please retain a copy of this consent form.

Participant name:

Signature: _____   Date _____

Interviewer name:

Signature: _____   Date _____

For information please contact: Ramnath Bhat, [redacted]
UK number: [redacted]
India number: [redacted]

सहमति अर्ज़ी

राष्ट्रीय ऑप्टिकल फाइबर नेटवर्क: शासन और पहचान

इसमें भाग लेना स्वैच्छिक है

इस पत्र में दी गई जानकारी को मैंने पढ़ा है और समझा है. इसके बारे में कोई भी सवाल पूछने का मौका भी मिला है	हाँ / नहीं
मैं समझता हूँ की किसी भी समय पर अपनी भागिता इस रिसर्च से निकाल सकता हूँ - बिना किसी दंड के	मैं यह भी समझता हूँ की इस रिसर्च में भाग लेने या ना लेने से मेरे निजी और व्यावसायिक जीवन पर कोई असर नहीं पड़ेगा	हाँ / नहीं
मैं इस शोध में भाग लेने के लिए सहमत हूँ	हाँ / नहीं
मैं समझता हूँ की मेरे द्वारा दी गई जानकारी पांच साल के लिए अनामिक और सुरक्षित रहेगी। उसके बाद और पांच साल के लिए केवल कंप्यूटर पे यह जानकारी अनामिक एंड सुरक्षित रहेगी। इसके बाद यह जानकारी मिटा दी जायेगी।	हाँ / नहीं
हमारी बातचीत की रिकॉर्डिंग से मैं सहमत हूँ (यह रिकॉर्डिंग सिर्फ इसलिए ली जा रही है की जो बात आप कर रहे हैं उसको बिना गलती से लिखी जा सके। यह रिकॉर्डिंग मेरे सिवाय किसी और व्यक्ति के साथ किसी भी हालत में नहीं बांटी जायेगी।	हाँ / नहीं

इस सहमति अर्ज़ी की एक कॉपी आपके साथ रखिये

इस सहमति अर्ज़ी की एक कॉपी आपके साथ रखिये

सहभागी का नाम:

हस्ताक्षर: दिनांक:

साक्षारकर्ता का नाम:

हस्ताक्षर: दिनांक:

और जानकारी के लियस कृपया संपर्क करें : रामनाथ भट
फोन : [redacted]
ईमेल : [redacted]