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INVESTIGATING INFRASTRUCTURE

Ecology, Sustainability and Society

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INVESTIGATING INFRASTRUCTURE

ECOLOGY, SUSTAINABILITY AND SOCIETY

Edited by

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Introduction

How to think differently about infrastructures?

Writing the introduction to this book for us, also means to bring to a conclusion an activity that has accompanied and enriched our work at the Heinrich Böll Stiftung in India for over four years. The collection of contributions in this printed volume essentially belongs to an online dossier on our website in.boell.org . The dossier with the same name – "Investigating Infrastructure: Ecologies, Sustainability and Society" – was initiated in 2018. It was born out of many good conversations and collaborations with academics, activists, artists, community leaders, journalists, researchers, friends and colleagues. Until the summer of 2022, we have discussed and curated their contributions, and our dossier has grown into a rich collection of analysis, reviews, data collection and stories. It began to sketch out a multitude of perspectives and knowledge on the theme of infrastructure and grew into a constant process of learning and new discoveries for us, the contributors and the readers.

This publication now comprises this rich collection. It aims to document these multiple perspectives and views in a more "traditional" format – that of a book and a work of reference. We likewise would like to invite a wider circle of readers for a journey of investigating various infrastructures and accordingly hope to enrich views and analysis of a theme that is often understood from mere technical or economic terms.

The back conversation to our online dossier started at a time when China's ambitious infrastructure project, the Belt and Road Initiative (BRI), was shaping up in Asia, Africa and Europe. It was also a time when many offices of the Heinrich Böll Stiftung and many of our local partners suddenly found themselves drawn into questions and impacts of the BRI initiative. For us, questions around infrastructure were also particularly intriguing because countries hastened to plan and develop big and bigger infrastructure projects. Of course, infrastructure dimensions had always been set as urgent national priorities, supporting economic growth and following an idea of prosperity for the people. The BRI induced drive, however, introduced a larger, global scale. It set the grounds for aspects that became even more important after the cut backs faced by many nations due to the Coronavirus disease (COVID-19) pandemic. Regionally, infrastructures serve multiple aims, from connectivity over trade to questions of regional stabilisation. Globally infrastructure developments are considered vitally crucial to meet the 2030 Agenda for Sustainable Development. Infrastructure for us thus becomes a powerful lens from which to take a "green perspective": Making a critical analysis of the opportunities and challenges, especially in relation to global commitments towards shifts to low-carbon, socio-ecologically resilient futures.

In India's neighbourhood, the unfolding of the BRI was triggering security, connectivity, economic and trade concerns. India responded with assigning billions to improve border connectivity and to end the long history of geographic alienation of its Northeast region. Under the Government's "Look East" and "Act East" policies enhancing of trade and connectivity were initiated through multiple infrastructure initiatives such as massive highway corridors or expansion of water ways.

The Government of India's dominant development mantra is that of "infrastructure fueled growth" with a spate of infrastructure projects redefining India in myriad ways.

Mega projects dot the country in between various stages of envisioning and implementation. The most visible manifestation of projects is in roads, railways, ports and power plants. The blueprints are massively ambitious, even 'world-scale', such as the industrial corridor, extending over thousands of square kilometres from Delhi to Mumbai and including a high-speed railway line, a six-lane highway and six airports, besides 23 manufacturing centres and 24 new Smart Cities each planned to house three million people. All of this being powered by two coal fired power plants.

Likewise India's budget for 2022-23 includes a massive release of public funds for infrastructure projects with a staggering rise of 83 per cent in two years to Rs 7.5 lakh crore, equivalent to EUR 90 billion approximately. Such upgrades arguably have a significant multiplier effect on the larger economy and will create jobs and boost economic demands. These ambitions are accompanied by India's vision of becoming a steady actor and influential decision maker on the world stage of finance, economy and trade. While a look at the same budget also shows that planned spending on environment and actual sustainable development projects is not even reaching 1 per cent .

As suggestive as the book's title, the topics covered pick up these diverse aspects of India's Infrastructure push: Significant ramifications, risks and challenges associated with extreme and unviable forms of infrastructure. The contributors critically discuss about the actual potential of infrastructure projects, especially terms of their sustainability. They shed light not only on some controversial financial instruments and models such as public-private partnerships, but also other infrastructure formats such as tourism. Local perspectives over construction of roads and dams, or on energy exploitation, that have cut through pristine lakes, rivers and sacred forests, show devastating environmental impacts and discuss how lives and livelihoods of (indigenous) communities are put at risk. A special focus is given to often unseen impacts of infrastructure projects on the "beyond than human" world, through sharing the experiences of endangered bee colonies in Bangalore, the venerated Asian elephants of Assam and the natural habitats of (sacred) forest landscapes.

The authors overall question the explosive era of capitalist production and consumption fuelled and promoted by infrastructure outreach, and interrogate how far it actually provides the underpinnings of a modern society. And they ask for other ways, perspectives and frameworks, more conducive to fostering a solidarity economy, in which sharing and cooperation between humans as well as between the human and more than human world are signals of development and consumption, re-configured to make more judicious use of resources.

Structured into nine thematic sections the authors suggest to perceive Infrastructure in their contributions beyond the standard parameters of hard facts and figures wrapped up in terminologies of sustainable development. In particular, the reflections about the Northeast of India suggest us to take a fresh look at regional diversities and ecologies based on community experiences and knowledges.

We invite the readers to reflect on infrastructural impacts on our present and on a possible collective future. And we ask the questions on who is benefitting and what are the risks entailed. We also would like to encourage our readers to follow a different imagination and (re)definition of infrastructure; recognition and acknowledgement of natural or traditional infrastructures that not only underpin society's social and ecological systems but also hold sacred and fundamental to existence in certain geographies for local communities and the natural world to thrive.

We hope that this volume throws up fascinating ways to re-imagine civic infrastructure, picking up on abandoned legacies that scaffold societal functioning, some of them

found deep in the forests, others in collective and shared ways of our existence. Our effort is to critically advance the understandings of "infrastructure- based futures"', to envision and enact contextually enabled transformative approaches and likewise to harness synergies between a healthy planet and its people.

Many of the contributors to this book are activists first. They share their expertise, experience and stories with us, in a concerted effort of non-academic writings. Through this we want to (re)build connections to the policy makers and people at large, equally important for commoning collaborations across themes, geographies, economies and cultures.

We would like to express our gratitude to our colleagues, in alphabetic order: Abhishek Chauhan, Chok Tsering, Mirza Zulfiqur Rahman, Sadia Sohail and Sarah Weiss for the overall coordination of the web dossier, for providing a lot of creativity, expertise and valuable comments on all the contributions. We also thank all our other colleagues at the Heinrich Böll Stiftung, Regional Office, New Delhi: K.V. Raghavan, Madhusudan Bharadwaj, Shikha Gulati, Vinay Singh and Yasmeen Khatoon.

The transformation of the web dossier into this book would not have been possible without the input of Rakesh Kalshian in succinctly laying out the sections of the book and without Priya Ranjan Sahu's continuous copyediting support.

Our gratitude, of course, also goes out to all the contributors: Arjun Phillips, Ashish Khandalikar, Avantika Haflongbar, Axel Brockmann, Chaoba Phuritsabam, Chinmayi Sarma, C.P. Chandrasekhar, Dolly Kikon, Gaurav Dwivedi, Jabin Jacob, Jyoti Awasthi, Kanchi Kohli, Kaustubh Deka, Kim Arora, K.M. Gopakumar, Manju Menon, Marlise Richter, Mirza Zulfiqur Rahman, Mukesh Shende, Neema Pathak Broome, Nena Seitz, Nandini Thockchom, Raile Rocky Ziipao, Rajni Bakshi, Ranjan Panda, Salam Rajesh, Sebastian Walter, Seema Bhatt, Seema Lokhandwala, Shristee Bajpai, Sonal Jain, Thoko Madonko and Vippin KP for making the dossier and this book rich with their perspectives.

Overall, it is all these efforts, thoughts, analysis and stories that, brought together, are building up a new structure itself. Four years after the start of our work of creating new meanings around the theme, a look out to our pandemic-induced and conflict-ridden world brings up an angle of geopolitical infrastructures that will yet have to be investigated for the years to come. We hope that our work will contribute to such future investigations, support to initiate alternative dialogues and likewise enable the rise and fostering of green and sustainable infrastructures that truly value ecology and a peaceful coexistence at their core.

June, 2022
Shalini Yog Shah and
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A.

India's Infrastructural Pathways: The Development Crossroad

Over the last three decades, most large economies of the world have embraced the model of financing mega-infrastructure as the primary impetus of economic development. The Indian government too has jumped on the bandwagon. This section lays out the broad contours of the infrastructure landscape in India. C P Chandrashekhar's piece presents a genealogy of the current push for mega infrastructure projects while at the same time exposing the ethical, social and environmental potholes, so to speak, that are derailing many of these projects. Arjun Phillips argues that quality infrastructure could be the right plug for these pot holes and that it could be an effective lever for "achieving sustainable development." Raile Rocky Ziipao views the massive infrastructure push in Northeast India, mainly highways and large dams, as yet another form of "securitization of development" apathetic to people's real needs and concerns and that it is a recipe for an ecological disaster. Jabin Jacob explains the geopolitical dimensions and repercussions, especially for India, of China's global push for mega infrastructure corridors and how it contradicts social and environmental norms. Rajni Bakshi in her critique of sustainable infrastructure argues that GDP as a marker of a nation's progress is a flawed and dangerous idea and that it should be replaced with the idea of degrowth that ensures Sarvodaya, or well-being of all.

India's infrastructure push loses momentum. An Overview on infrastructure investments in India

C.P. CHANDRASEKHAR

STATE AS BACKER OF PRIVATE INTERESTS

The state has entered these areas not just as an investor, but as a facilitator and backer of private investment through public-private partnerships or pure private sector projects, helping with land acquisition, environmental and social safeguard clearances, innovative means of financing, a reformed pricing environment, and 'viability gap funding'. The motivation here is not just "need", or the presence of infrastructural gaps. Rather, across the so-called "emerging markets" large infrastructure projects in a subset of areas, such as airports, ports, roads, telecommunications and power, are being presented as the means to "brand" the country concerned as a destination of choice for foreign investors, who are seen as the levers of successful growth through liberalisation. In the event, government policy is being changed to hasten the launch and completion of infrastructural projects to encourage private participation in the infrastructural area, to attract foreign investors into this domain, and to direct finance to infrastructure, including through ostensibly "innovative" means. This effort is often backed with finance from publicly owned or sponsored banks and financial institutions, even bypassing appropriate due diligence mechanisms relating to financial viability and environment and social impact.

However, the ambitious infrastructure agenda of the government has run into multiple constraints. Projects have run into difficulties at inception, in the course of execution or after commissioning. The reasons for these difficulties are varied: Inability to acquire the required land due to farmer resistance, failure to obtain environmental clearances, cost overruns, disputes over pricing with consumers or regulatory agencies, and sheer non-viability of badly designed projects.

DISPOSSESSION AND DISPLACEMENT

While all of these issues have been highlighted in the public debate, two have not received the attention that is their due. One is the effect of asymmetric power relations, between the government with its power of eminent domain and large private investors on the one hand and small and medium landowners on the other, on the terms of land acquisition for these projects. The other is the damaging impact that many of these projects have on the environment. In the effort to push ahead with the expansion agenda and render the process private-

investor friendly, environmental concerns, critics argue, have been given short shrift.

Displacement and disputes over land acquisition and weak environmental regulation, shortfalls in compliance with prevalent laws, and poor monitoring and enforcement have plagued the infrastructure landscape. While instances of violation abound, discussions have focused on particular cases of investor withdrawal such as the POSCO steel project in Odisha or the Tata small car project in Singur, West Bengal. Using such cases, the government, worried by the loss of momentum on the infrastructure front, has presented land acquisition problems and delays in provision of environmental clearances as an impediment to development. In the event, the effort has been to dilute laws and relax monitoring, rather than strengthen regulation.

Examples of projects euphemistically labelled as "stalled" are many. In the case of the infamous 316-mile, Mumbai to Ahmedabad, "bullet train" project launched in 2017, only 78 per cent of 1,400 hectares of land needed has been acquired thus far. In the event, the 2023 deadline for completion – which the government claimed would be brought forward by a year – is unlikely to be met. The Delhi-Mumbai industrial corridor project too is way behind schedule, with the completion of phase 1, that was to have happened by 2012, now slated for 2022. This has been the fate of many a mega project. According to a recent study by Care Ratings[1], 71 per cent of 1,361 infrastructure projects under implementation, of which 400 are mega projects with investment of over Rs.10 billion, are delayed and a majority have no definitive timeline. In the case of 358 affected by cost overruns, the additional investment requirement amounts to as much as a fifth of the original cost estimate.[2]

INFRASTRUCTURAL INVESTMENT TRENDS

But investment in infrastructure has been proceeding apace, till recently. According to the G20's Global Infrastructure Outlook[3], the cumulative investment in infrastructure in India increased by 66 per cent over the eight year period 2007-2015 from $49.5 billion to $82.1 billion in 2015. But this pace of expansion is clearly not seen as enough. If this trend continues the cumulative investment over 2016-2040 is projected at $3.93 trillion at constant 2015 prices and exchange rates, which is short of an estimated actual requirement of $4.45 trillion, leaving a gap of $526 billion. This does not include the $880 billion at 2015 prices needed to meet additional investments in the electricity and water sectors if the SDG goals are to be realised.

While definitions of what constitutes infrastructure vary in the literature, it is accepted that a wide variety of projects in sectors varying from transportation through urban development, water and sanitation to petroleum, telecommunications and power are to be counted as part of infrastructure. But not all sectors receive the same degree of

1 (Madan Sabnavia and Ashish K Nainan, "Status of Central Infrastructure Projects", CARE Ratings Research Report, 21 November, 2018, https://www.careratings.com/uploads/newsfiles/Infra%20Sectors%20and%20Performance%20November%202018.pdf)

2 https://indianexpress.com/article/business/economy/358-central-infra-projects-face-rs-3-38-lakh-crore-cost-overrun-5462039/

3 https://s3-ap-southeast-2.amazonaws.com/global-infrastructure-outlook/countrypages/GIH_Outlook+Flyer_India.pdf

attention. Judging by allocations in the central budget, the main areas of infrastructural expansion are roads and highways, railways, urban development, water and sanitation, petroleum and natural gas, telecommunications and power (Chart 1). These were sectors that received between Rs.100 billion to a little more than Rs.500 billion in the budget for 2016-2017.
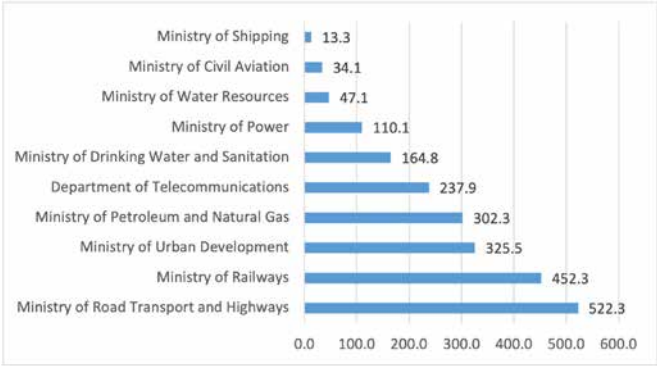
Chart 1:
Budgetary Allocation for
2016-17 (Rs Billion)

Ministry	Rs Billion
Ministry of Shipping	13.3
Ministry of Civil Aviation	34.1
Ministry of Water Resources	47.1
Ministry of Power	110.1
Ministry of Drinking Water and Sanitation	164.8
Department of Telecommunications	237.9
Ministry of Petroleum and Natural Gas	302.3
Ministry of Urban Development	325.5
Ministry of Railways	452.3
Ministry of Road Transport and Highways	522.3

Investment in many of these areas had been substantially enhanced since the early 2000s, though there are signs of year-to-year volatility. For example, if we consider one area of accelerated expansion, which is national highways, investment rose significantly in the year 2011-12 and then fell and stagnated, before rising sharply in 2015-16 and 2016-17 (Chart 2). The factors underlying this trend speak to the manner of evolution of the financing of infrastructure. Initially, highways expenditures were financed largely from the budget with private investment in the highways sector being extremely small even after liberalisation. However, over time two trends are visible. First, a sharp increase in the share of "internal and extra-budgetary resources (IEBR)" in the financing of public sector investment, from less than 10 per cent to as much as a quarter and a third in 2015-16 and 2016-17. This was largely borrowing by institutions such as the National Highways Authority of India (NHAI). Second, an increase in the share of the private sector in total highways expenditure to levels amounting to 30-40 per cent of the total (Chart 3). What the official figures do not show is that private investment too was substantially financed with debt, often from public banks or "government sponsored entities" like the now bankrupt IL&FS.
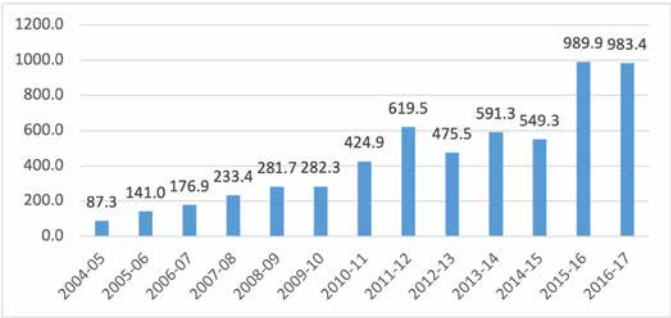
Chart 2:
Long - Term Trends of Investment
in Highways(Rs Bilions)

Year	Rs Billion
2004-05	87.3
2005-06	141.0
2006-07	176.9
2007-08	233.4
2008-09	281.7
2009-10	282.3
2010-11	424.9
2011-12	619.5
2012-13	475.5
2013-14	591.3
2014-15	549.3
2015-16	989.9
2016-17	983.4

Chart 3:
IEBR and Private Financing in
Highways Expenditure (%)

DEPENDENCE ON DEBT

Thus, in post-liberalisation India, the financing of the infrastructure thrust has taken an unexpected route. In the past, in the absence of active long-term bond markets, the funding for capital intensive, long gestation projects came either from the government's budget or from specialised, publicly owned or promoted development finance institutions (DFIs) supported by the government and the central bank. However, the principal, publicly-owned DFIs were closed or transformed into commercial banks as part of liberalisation, and fiscal reform limited the contribution that the budget could make to infrastructure development. In the event, the financing of infrastructure came to depend on credit from the public banking system, from international financial institutions (like World Bank, ADB, AIIB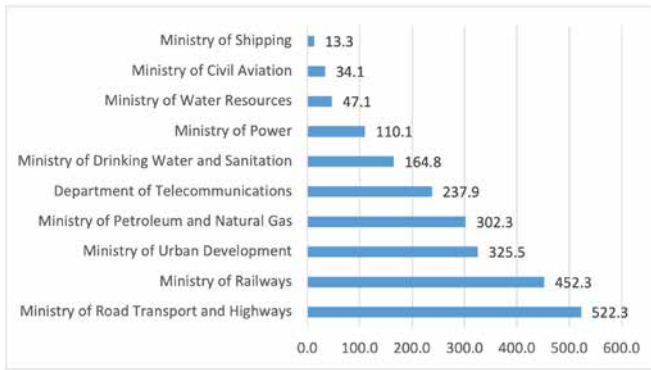 and NDB), and from new government sponsored entities like the Infrastructure Leasing & Financial Services (IL&FS) or the National Infrastructure Investment Fund (NIIF). Mandated to drive infrastructure investment, the exposure to infrastructure of banks, which do not have the necessary expertise to assess risk in the area, increased, and the specialised institutions such as the IL&FS and NIIF sacrificed "due diligence" in the pursuit of lending volumes. Infrastructure expansion became heavily dependent on both public and private borrowing.

Since borrowing from financial institutions was on fully commercial terms, the projects had to be designed to yield returns that can ensure that the debt incurred could be serviced and repaid. Policy has partly sought to ensure such yields by allowing greater flexibility in the setting of tariffs or user charges. Besides the increase in tariffs due to the withdrawal of explicit or implicit government subsidies, this flexibility has also led to complaints of overcharging. Even where regulatory authorities are involved in computing costs and setting remunerative prices, complaints abound that costs, especially capital costs, have been "gold-plated" to the benefit of private infrastructure providers.

Meanwhile, the reliance on debt from banks has led to defaults and non-performing assets (NPAs). Often these long term loans that are relatively illiquid are funded with short term capital, leading to maturity and liquidity mismatches. That can prove a problem if the projects do not perform as expected. This has been the case in India in recent years. Thus while a sharp rise in bank lending to infrastructure since the early 2000s has taken the share of that sector in lending to industry to more than a third, according to the June 2018 edition of the Reserve Bank of India's Financial Stability Report, close to 23 per cent of those advances are stressed.

A typical case here is the power sector. According to an analysis by Bank Of America-Merrill Lynch (BofA-ML), total stressed assets in the power sector stood in August 2018 at $51.6 billion, of which banks held $36.1 billion and non-bank lenders like the Power Finance Corporation and Rural Electrification Corporation $15.5 billion.[4] This has precipitated a crisis with the Reserve Bank of India requiring banks to take these unresolved bad debts to the National Company Law Tribunal for quick resolution or liquidation. That would mean that the power producers may have to suspend operations, with effects on the rest of the economy. It would also mean that the banks would have to provision for losses resulting from the "haircuts" they are forced to accept, requiring additional capital if they are to stay in business. To address this twin problem in a crucial sector, the government is mulling the possibility of creating an asset reconstruction corporation to take over the distressed assets, and of recapitalising banks to compensate for their losses. Meanwhile, lending to the power (and other infrastructural sectors) is frozen, slowing down the process of infrastructural expansion. Even the assumption that the trend in infrastructural investment observed during 2007-2015 would continue may be optimistic.

GROWTH SLOWDOWN

This would aggravate a slowdown that is already underway. According to the current series of the Index of Industrial Production, with base 2011-12, growth in the infrastructural and construction sector, which exceeded the overall industrial growth rate during 2011-12 to 2014-15, has slowed considerably in the two years ending 2016-17, and remains sluggish (Chart 4). This is because in certain infrastructural areas, the rapid expansion since 2010 is now proving to be unsustainable. Consider the roads and highways network, which, given India's geographical size, is the second largest in the world. That network having grown by an average of 0.1 million kilometres (from 2.33 million km to 3.37 million km) over the 1990s and 0.13 million km a year (to 4.68 million) over the 2000s, expanded at a much higher 0.24 million km a year (to 5.40 million) over the next three years to 2013-14. The acceleration of road expansion in the first half of the second decade of the 21st century was substantially on account of the roll out of rural roads, including those constructed under employment schemes. But growth has slowed dramatically to 0.1 million km a year over the two years ending 2015-16.

The recent deceleration in road length expansion appears to be occurring despite

Chart 4:
Annual growth of Index of Industrial Production (Base 2011-2012) (%)

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4 economictimes.indiatimes.com/articleshow/65579824.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst.

substantial increases in fund allocations for investment in the sector. As Chart 5 shows, central budgetary allocations for capital expenditure by the Union Ministry of Road Transport and Highways rose from around Rs.100 billion during 2012-13 to Rs.500 billion in 2017-18 and a projected Rs.600 billion in 2018-19. Moreover, to meet its ambitious declared goals the government has been encouraging private investments through public-private partnerships (PPPs) of various kinds. Yet the total length of roadways in place has increased by only 0.1 million km a year since 2013-14.
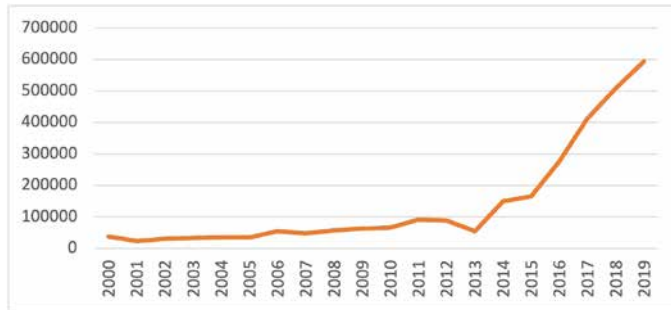
Chart 5:
Budgetary Capital Expenditure: Ministry of Road Transport & Highways (Rs. mn)

The official Economic Survey, 2017-18 attributes this mess in the infrastructural sector to the "collapse of Public Private Partnership (PPP) especially in power and telecom projects; stressed balance sheet of private companies; (and) issues related to land and forest clearances." This way of posing the issue does not highlight the inadequacies and failure inherent in the design and implementation of the government's infrastructural push. Given the growing opposition to and resulting difficulties in land acquisition, and the increased sensitivity with regard to deforestation and environmental pollution, planning multiple projects that require large and/or locationally concentrated land acquisition is clearly wrong policy. It is a blunder if in addition credit is provided and work on the project begun before all clearances are obtained.

Evidence of failure due to poor design and implementation is rife in the power sector. According to industry sources, 86.12 giga watt (GW) of constructed thermal power capacity is under different degree of stress. The stress is reportedly due to "under-recovery", or revenue accruals lower than cost, in the case of 11.7 GW, absence of a stable power purchase agreement that ensures offtake in the case of 19.7 GW, and the higher cost of imported coal in the case of 9.8 GW. In the rush to expand infrastructure and in the belief that the government would bail them out in case of difficulties, investors in and managers of power infrastructure have been creating capacities that are now unviable. Among the reasons cited by the Parliamentary Standing Committee on Energy for financial stress of these projects are: non-availability of fuel, absence of PPAs, delays in implementation, and aggressive bidding in PPA auctions leading to "under-recovery". In the view of the Standing Committee, rather than acting rationally while quoting tariffs, private players bidding for projects submitted irrational quotes that underestimated costs. With losses incurred on every unit of electricity generated, they find themselves unable to service their loans. Project non-viability and the credit conundrum are the results of failure of the strategy to induct private players into the financing of power projects and into the creation and management of generation and distribution facilities.

FOREIGN BORROWING

A related issue is that borrowing for infrastructure includes a significant and rising share of foreign borrowing. Fiscal conservatism combined with infrastructural ambition has necessitated reliance on multiple sources of international financing for infrastructure, such as private international financial markets, bilateral donors and multilateral lenders such as the World Bank and Asian Development Bank, and new ones like the Asian Infrastructure Investment Bank (AIIB) and the New Development Bank (NDB). These institutions too exert influence on policies relating to infrastructural development and provision. Of the $4.4 billion investments in 25 projects approved by the AIIB between its establishment in 2016 and mid-2018, $1.2 billion has been for six infrastructure projects in India. The AIIB has also sanctioned $200 million investment in India's National Investment and Infrastructure Fund. Since infrastructure output is largely non-tradable, borrowing of this kind requires generation of foreign exchange for financing debt servicing. Moreover, such borrowing carries considerable foreign exchange risk given the long term tendency for depreciation of the rupee relative to the dollar. So foreign financing, that appears an effective option, increases vulnerability.

A collateral effect of such inherent vulnerability is the unwillingness of project promoters to meet acceptable norms of compensation for land acquisition or undertake essential expenditures aimed at mitigating adverse environmental impacts. This makes government regulation, monitoring and enforcement crucial. India has a range of laws and subordinate legislation in these areas, not all of which are adequate to the task in different infrastructural sectors. What is more, the evidence is that monitoring and enforcement leave much to be desired and often work only when there is third party intervention by civil society organisations. A study by the Centre for Policy Research[5] on the effectiveness of monitoring protocols concluded thus: "First they are mostly practised as one off inspections rather than ongoing efforts by the regulators for collaborative monitoring along with the affected parties. Second, they do not act as deterrents against non-compliance. Checking the boxes after site inspections and giving warnings through notices as components of these protocols have not been able to instill a commitment to comply amongst project developers. Third is the focus on standards rather than effects of pollution."

All this has happened despite the government's claim that it has put in place a robust regulatory apparatus in the infrastructural sectors. The government's role as facilitator was to be combined with the creation of relatively 'independent' regulatory bodies to prescribe rules for and monitor implementation of rules relating to social safeguards during project implementation and operation, environmental norms and standards, pricing and quality of service provision. In the event, the infrastructural 'boom' has been accompanied by the emergence of multiple and confusing levels of governance of the infrastructural space. But most stakeholders are unhappy with the outcomes of the government's push.

Meanwhile, progress in social infrastructure, such as health and educational infrastructure, has been extremely slow and way short of the government's own target. Moreover, private provision and the share of private facilities in the total have risen sharply, raising questions with regard to access, besides quality. This difference, pointing

5 https://in.boell.org/sites/default/files/how_effective_are_environmental_
regulations_to_address_impacts_of_industrial_and_infrastructure_projects_in_
india.pdf

to significant inequalities in the distribution of benefits from the infrastructure boom, is in keeping with the increase in inequalities in wealth and income that have been characteristic of the liberalisation year.

Quality Infrastructure and civil society

ARJUN PHILLIPS

The G20, an economically decisive grouping, has paved the way for achieving sustainable development by leveraging quality infrastructure to alleviate inequality, climate change, underdevelopment, social exclusion and other growth bottlenecks plaguing the planet. Five years ago, in a meeting held in the Chinese city of Hangzhou, G20 leaders agreed to act on a recommendation submitted by 11 multilateral development banks (MDB)—known as the Joint Declaration of Aspirations on Actions to Support Infrastructure Investmen—to encourage and promote Quality Infrastructure Investment (QII) as a catalyst for sustainable and inclusive growth outcomes.QII has since moved notches up on G20's priority list with previous and current presidencies of Argentina and Japan conferring infrastructure as an asset class in 2018 and endorsing QII principles to legitimise it as a serious global commitment in 2019. The purpose: Making infrastructure a quality-driven normative in opposition to excessive and inferior production that runs a high risk of running into debt, and thereby triggering financial volatility. The main objective of Quality Infrastructure is to scale up investment that lays a strong foundation for achieving national and local development priorities. Already, the global infrastructure gap stands at a whopping $1 trillion annual investment, which is deeply interwoven with achieving Sustainable Development Goals by 2030.

Pressed by the necessity to channelise finances into sound investments, the G20 envisages QII as an enabler that will maximise impact and produce positive spillovers by stimulating demand that can unlock supply side bottlenecks and produce employment opportunities in construction, manufacturing, operations and maintenance, and so on. Similarly, QII focuses on raising economic efficiency of infrastructure measures implemented and provide Value for Money (VfM) on investments while remaining affordable and accessible. The major groundswell for QII is improved productivity, effective allocation of resources, augmenting capacities and upgrading skills for the utilisation of local economies. However, the key to QII's success is taking note of socio-development realities that emerge in project lifecycles of large-scale infrastructures. These have been adequately addressed in the QII principles, which include integrating environmental and social considerations, promoting women's economic empowerment, creating resilient infrastructure against natural disasters, and strengthening infrastructure governance, which hinges on multi-stakeholder participation with civil society and being open and transparent during project lifecycles. Considering the adoption of all the principles and declarations, the G20 needs to quickly take concerted policy actions that tackle the burgeoning development challenges by assimilating them into their laws and practice. With the steady rise in global temperatures, which may even breach the threshold of 1.5 degrees

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Celsius, communities may incur a loss of USD314 million as a result of natural disasters. A slew of mega-infrastructure projects/ measures is bound the make things worse for them. Hence, it is crucial for QII to be effective at the ground level and produce transformative shifts in the socio-economic landscape.

In the Indian context, Quality Infrastructure can be an effective policy tool that triggers economic development and in turn reaps a myriad of social benefits. Given the mammoth infrastructure investment required for the next 40 years, almost bordering at $526 billion (Economic Survey, 2018), it will be a challenge for India to reach the desired target. Since the last two G20s, Prime Minister Narendra Modi has ensured India's commitment to developing infrastructure that helps in promoting world economic growth[1]. Concurrently, his government has been forthcoming in inviting potential investors to invest heavily in Indian infrastructure. This has been crystalised via various bilateral MoUs with various G20 nations, foreign institutional investors, and multilateral bodies such as World Bank, AIIB and NDB. To increase infrastructure investment, India launched the ambitious National Infrastructure Investment Fund (NIIF) for garnering dedicated financial support. However, there is a chance that the current infrastructure push may only result in quantitative creation of physical assets minus the qualitative social benefits. But by embedding Quality Infrastructure approach, desirable investment can be ensured to address the various socio-development laggards that do not get the required attention. QII is important because there is no legitimate channel for citizenry to participate in decision making and governance of infrastructure investment because of the domination exercised by government and private sector that are swayed by accentuating commercial objectives without due consideration to social development. For example, a recent Down To Earth report[2] highlighted that 400 infrastructure projects would directly destroy major tiger corridors. Similarly, the ongoing struggle of tribal population in mineral rich belts of Chhattisgarh[3] and fishing communities, whose livelihoods are directly affected by the ambitious port linking commerce facilitating Sagarmala project[4], lack official channels where people can directly influence decision making in infrastructure development. It is against this backdrop that QII seeks to fill the gap and make government provide for representation of communities, civil society, groups and others that allow participation, policy influencing and public monitoring of projects.

QII AS LEVERAGE FOR ENSURING SPACE OF CIVIL SOCIETY

The Civil 20 or C20- one of G20's engagement groups consisting of global civil society actors welcomed QII and underscored on its transformative ability to facilitate change and reduce infrastructure inefficiency that has direct impacts over many socio-development

1 https://www.livemint.com/news/india/rs-100-trillion-will-be-spent-on-infrastructure-creation-modi-1565844842535.html

2 https://www.downtoearth.org.in/news/wildlife-biodiversity/about-400-proposed-infrastructure-projects-will-destroy-tiger-corridors-report-61318

3 https://www.downtoearth.org.in/news/wildlife-biodiversity/about-400-proposed-infrastructure-projects-will-destroy-tiger-corridors-report-61318
tisgarh-stops-mining-in-bailadila-hills/articleshow/69743955.cms?from=mdr

4 https://www.thehindu.com/news/national/tamil-nadu/sagarmala-project-will-hurt-fishers/article19376274.ece

facets. This is reflected in the official C20 policy pack[5] as part of the recommendations in which some of them were successfully imbibed in the QII principles by the G20[6]

- **Alignment of QII with key international agreements and goals:** In terms of reducing poverty, inequality and safeguarding human rights, QII can deliver international commitments such as the SDGs and the Paris Agreement. This demands inclusion of safeguards on economic, social and environmental impacts of investments at all stages of projects and delivery cycles.

- **QII delivering on national strategies and priorities:** It can assist governments in making right infrastructure investment decisions that involve civil society and citizens at all decision-making stages, invite public scrutiny and adopt a clean, transparent approach.

-**Creating large-scale benefit and inclusion:** Organising meaningful multi-stakeholder participation, which includes the voices of the marginalised, vulnerable and affected communities. QII needs to adopt an integrated approach which delivers benefits to the people from the design, construction, operation and maintenance of infrastructure.

-**Adopting social and environmental safeguards:** The key to quality and sustainable infrastructure is its implementation via participatory processes to identify, mitigate and manage social, environmental impacts. It is suggested that all financial institutions should adopt these safeguards and strengthen the procedural modalities in regulators and banks. The social standards come to include compliance with labour standards for construction workers, managing corruption in infrastructure investments, promoting transparency and accountability in the project lifecycles and finding adequate public financing through progressive taxation policies.

Despite G20's focus to graduate QII as the next level of global infrastructure development, civil society has flagged concerns on its keenness to rely on private investment to finance projects[7]. To make QII more accessible and affordable it is imperative to strengthen the stake of public financing. Public financing guarantees sustainability through public accountability in comparison to private financing. Public-private partnerships (PPP) are the desirable routes and it is welcoming in treating infrastructure as an asset class. But the 'private first' approach, which gives precedence to private financing over public financing, needs to be toned down. This is because infrastructure is subject to inherent risks, unprofitability, and may result in dampening prospective investors. There is need for gearing QII to be effectively financed from sound public investments by streamlining taxation architectures to bolster financial inclusion for raising public debt.

5 C20 Policy Pack https://civil-20.org/2019/wp-content/uploads/2019/04/C20-POLICY-PACK-2019_web.pdf

6 G20 Principles for Quality Infrastructure Investmenthttps://www.mof.go.jp/english/international_policy/convention/g20/annex6_1.pdf

7 G20 Agenda on Infrastructure Financing https://civil-20.org/c20/wp-content/uploads/2018/07/C20-policy-paper_infrastructure-financing_.pdf

According the World Economic Forum's report, Recycling our Infrastructure for Future Generations, adopting an asset-recycling approach can be an innovative way of raising capital by divesting old government assets and utilising its revenue for new projects despite lacking latter social-environmental impact assessment. In effect this reiterates the position on public financing, which is long-term, sustainable and can be subjected to public auditing and scrutiny in cases of corruption.

Corruption has a deleterious effect on infrastructure. An estimated US$6 trillion loss to infrastructure is attributed to corruption, mismanagement and inefficiency. Additionally, the G20 under the Japanese Presidency has taken to action debt sustainability as a key metric for ensuring financial efficacy of infrastructure assets. Japan's pitch for QII is in response to the aggressive Chinese infrastructure spree in Asia and Africa that holds deep political economy ramifications. Commentators have remarked on Japan's encouragement for QII is towards countering the Belt and Road Initiative and deflect the debt-trap countries may face by defaulting on Chinese loans.

UTILISING QII TO ADDRESS HUMAN RIGHTS

There is ample evidence and documentation, which describe the negative impact of inefficient infrastructure on the lives of local communities, women, children, disabled, elderly and so on. Fundamental to the rationale of encouraging QII is the need to adopt a human rights framework that is present all along the supply chain of projects. QII's focus should take further steps in ensuring due diligence, risk analysis, monitoring compliance and be transparent in procurements. Globally, there is a demand to align QII with Universal Declaration of Human Rights principles to produce infrastructure that balances human prerequisites with investment commitments. The G20 should also promote operationalisation of country mechanisms to ensure that local implementation does not infringe on human rights of affected populations.

QII should integrate aspects of Free and Prior Informed Consent (FPIC) protocols in infrastructure investments to allow communities and groups to actively engage with investors. This is imperative for safeguarding communities from unwarranted risks of displacement, livelihood breakdown and forced migrations. Adequate redressal mechanisms by state should be given to protect the rights of communities and ensure speedy justice when wronged. Additionally, FPIC processes need to be strengthened across all spectrums of infrastructure investments and linked to QII objectives. The QII principles adopted during the Osaka G20, 2019 have addressed the inclusion of women and marginalised groups, which should be adopted at the country level national policies determining infrastructure investments. Adopting gendered and marginalised lens will ensure that projects and investments do not dilute their specific concerns and have a wider participatory planning process.

ADDRESSING COUNTRY LEVEL STRUCTURAL GAPS

A flashback to March 2019 can remind us of a clear infrastructure failure, which took place in Mumbai. A pedestrian bridge over the Chhatrapati Shivaji Terminus, one of the oldest railway terminals in the world, came crashing down with six people killed and 34 sustaining grievous injuries. Amidst the authorities passing the buck, the collapse was a clear quality control issue, which was further intensified by lackadaisical factors. At the

end, the authorities admitted that lack of proper auditing, corruption and opacity in procedural processes led to such an unfortunate event.

Such examples of human devastation caused by infrastructure failings are in preponderance across the globe. In order to mitigate such risks, QII should be embedded within the policy framework of the country to act as a bulwark against such failings that emerge mostly from governance slippages. This will ensure that infrastructure creation is controlled and monitored right from its inception to the final stages and subjected to periodic checks and assessments by independent agencies, civil society organisations and evaluators.

Concurrently, for an effective QII, the G20, MDBs, development financial institutions (DFIs), Global Infrastructure Hub along with private sector and global civil society community need to evolve a common pool of standards that can be customised and adopted at the country level for all types of infrastructure investments. These QII specific standards can help countries, especially the middle and lower income segment, to produce infrastructure that are qualitative and make populations reap its benefits.

Possible integration can be via official development assistance (ODA) mechanisms where development cooperation includes QII as an agreed instrument for facilitating development in aid-recipient countries. As a start, civil society should influence G20 to create QII mechanisms on funding of projects by MDBs in geographies that are infrastructurally deficient. Additionally, country level mechanisms should focus on creating infrastructure that helps in exploiting the low-hanging fruits of specific regions, which create positive multipliers along the supply chain and tackle the impending growth bottlenecks from further expanding.

MAKING INDIA IMPLEMENT QII

At India's level, the Prime Minister ambitiously set the vision of $5 trillion economy by 2022. India stands at the cusp of structural transformation witnessed by the series of intensive actions taken to increase the economic backbone of India by opening avenues for investment, liberalisation of regulatory regimes, rate cuts in borrowing in efforts to reach the goal of maturing into a developed nation. The recent affirmation provided by the Indian government towards the adoption of QII principles signaled its future roadmap for its infrastructure expansion. However, to achieve this vision it is vital that it integrates this at the policy level most notably in its PPP projects under the Ministry of Road, Transport and Highways. QII will be better placed in this segment considering that large-scale mega infra developed under this route involves displacement of communities, limitation on local livelihoods and disturbance of local ecology. The same is applicable for Ministry of Housing and Urban Affairs in the context of developing Smart Cities, an urban renewal programme of the government that aims to make selected cities sustainable and citizen friendly. Here Quality Infrastructure will play a dominant role in facilitating key developmental features associated with the state-of-the-art cities. Another ministry that should imbibe QII approach is the Ministry of Environment, Forests and Climate Change. The quantum of clearances required for large scale infrastructure in ecologically sensitive zones need to promote a balanced framework where environment, human displacement and biodiversity are given utmost precedence before commercial interests. In the past, corruption induced industry clearances have been awarded contracts which threaten environment and human development. This needs urgent rectification through structural reform. To make QII workable, it is suggested that concerned

line ministries that are involved in infrastructure development commonly create an institutional mechanism that acts as a check and balance for the stream of investments. Not only will QII benefit the scale and scope of investment but will follow a process-based approach that is open, transparent and participatory rather than unilateral action visited in decision-making for infrastructure projects.

STRENGTHENING THE MEANS OF PARTICIPATION WITH CIVIL SOCIETY

Civil society forms an important pillar for inputting citizen-centric concerns into infrastructure decisions. Because of its strategic position of working at the ground and grassroots, civil society is informed on the lacunae in delivery systems and can amplify issues that are most often overlooked by investors. By carving channels where data from the grassroots reaches decision-makers, civil society can increase its participation ability by sensitising them to see the business advantage of addressing socio-economic disruptions. This will assist civil society in increasing its collaborative space and strengthen its negotiating power with investors. Further, policy coherence will be initiated where investment objectives match ground level realities voiced by civil society. Importantly, civil society can help investors find suitable geographies where infrastructure investment has not blossomed and utilise on its opposition power against projects, which jeopardise local ecology, human safety and livelihood.

Moreover, QII is an opportunity that allows civil society an entry point in decision-making. There are discernible gaps in public delivery systems of infrastructure investments where services do not reach people. Civil society can play an extremely important role in providing the needed capacity building for utilising infrastructure and expand the scope of delivery and achieve much needed inclusion. Crucial to QII is promoting accountability and bringing transparency in infrastructure, which is reeling under opacity. As a measure, civil society can be an enabler in knowledge dissemination and empower people to approach investors and decision-makers for course correction in project pipelines. Already civil society initiatives such as 'Open Contracting'[8] have gained traction, which provide digital monitoring and tracking of infrastructure investments.

Civil society will need to converge with the G20 on Quality Infrastructure on similar lines of its engagement with MDBs. By synthesis of various environmental, social safeguards and stakeholder participation strategies of various MDB policies, the G20 can be

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8 The Open Contracting for Infrastructure Development Standard (OC4IDS) provides clear guidance to governments on what information to disclose and more importantly how to disclose, at each stage of an infrastructure project. This will help ensure public money is spent well from inception to completion, and in the future, potentially operation, maintenance and beyond. It provides information at
- the project level, which moves through identification, preparation, implementation and completion phases – with important items to disclose at each point;
- the contracting summary level – which captures key information about the contracts that deliver design, construction and supervision;
- the contract process detail level – where each update and variation to a contract can be monitored, and justifications and explanations for change sought.

influenced in moving towards an effective roadmap that allows civil society to be part of decision-making tiers. At the India level, civil society will have to be actively collectivised to influence the government on QII through convening negotiation tracks with different ministries and line departments. For a start, collating diverse MDB practices in India for evolving a customised Indian standard for QII can be a possible area for policy advocacy.

WAY FORWARD

Civil society's demand is constructed on a simple premise: Make infrastructure sustainable, green, affordable and productive and QII presents this opportune moment to make the necessary push. Globally, it needs to advance on the achievement of critical development indicators requiring dire attention. With the SDGs already nearing and hardly a decade left to achieve them, the world will need to calibrate strategies to create quality and sustainable infrastructure, which will solve a half of the global development challenges. The next G20 will be under the presidency of Saudi Arabia for which civil society will require fleshing out a way forward that advances and builds on the achievements gained under Argentine and Japanese presidencies[9].

A lot of ground requires coverage and as a start civil society organisations in G20 countries can collectivise to appeal their governments, private sector and DFIs to make Quality Infrastructure a practice for achieving sustainable development. Global multilaterals involved in the investment and creation of physical development should recognise the value of civil society as an important development partner, and solicit its engagement. As such, civil society participation needs to be inbuilt into the QII framework by making it involved right from the planning, implementation to the impact assessment phase. This will ensure that QII does not lose sight of its delivery goals. The C20 will make all efforts to utilise the channels for communication and pressure-building to elevate QII as the new normative for driving growth and development. At the same time, India's civil society should immediately strive for policy influencing on institutionalising QII under which premier projects utilising this approach can be showcased as successful models before the world during the Indian presidency of G20 in 2022.

9 G20 Osaka Leaders Declaration https://www.japantimes.co.jp/news/2019/06/29/national/full-text-g20-osaka-leaders-declaration/

Politicking Infrastructure Development in Northeast India

RAILE ROCKY ZIIPAO

Sikkim Road. Photo by Raile Rocky Ziipao, 2020

Northeast India, in a touristic lexicon, is popularly known as seven sisters. However, Sikkim state became part of Northeast India in 2002, and it became seven sisters (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura) and one brother (Sikkim). Northeast India is a geo-politically sensitive region. It shares 98 per cent of its international boundary with China, Bangladesh, Bhutan and Myanmar, and only 2 per cent with other states of India. What distinguishes Northeast India from other parts of the country is its unique geopolitical terrain, binary of hills-valleys divides or in other words tribal vs non-tribal tensions, chronic social conflicts, ethnic movements, insurgency, infrastructural deficits, rich flora and fauna and so on (Ziipao, forthcoming).The region is home to above 220 ethnic communities spread across eight states (262,179 square km). It contributes 3.76 per cent of India's population (45 million). The region is not a homogenous category. Each state has its distinct history, varied ethnic communities, structural inequality and power relation dynamics. Northeast India is lacking in infrastructural development index compared to other parts of the country even though it fares well in the human development index.

Infrastructure development is disproportionately distributed within and across the region's respective states. There is poverty and crumbling of infrastructure wherever the ethnic minorities (tribals in Manipur, tribes of Eastern Nagaland, Naga tribes in Arunachal Pradesh, among others) predominately reside. In contrast, infrastructural facilities are fairly developed in in urban con-

glomeration where dominant ethnic communities reside – Imphal, Guwahati, Itanagar, Shillong, among others. Against this backdrop, one can infer the correlation between ethnicity and infrastructure development in the region on the one hand and the Indian state's engagement in the overall development policies on the other. Kikon and McDuie-Ra (2021) ably demonstrate another dimension of infrastructural disparity in the region i.e., military vs civilian space. In militarised frontier, the binary of civilian infrastructure (underdeveloped, un-modern) and military infrastructure (developed, modern) is sharply visible. This stems from the security-centric development policy of the Indian state towards the region. Thus, the socio-political processes of investing and building infrastructure in Northeast India reveal an interesting theorisation terrain.

CONTEXTUALISING INFRASTRUCTURE DEVELOPMENT

Infrastructure occupies a special place in Northeast India's development discourse. The state of infrastructure in the region refracts the ideology of development and governmentality (Arora and Ziipao, 2020). However, the fundamental question remains: What is infrastructure? For Howe et.al (2015), "infrastructure is material (roads, pipes, sewers, and grids); it is social (institutions, economic systems, and media forms); and it is philosophical (intellectual trajectories: dreamt up by human ingenuity and nailed down in concrete forms)" (: 549). Star and Ruhleder (1996) conceptualised infrastructure as relational to organised practices. Echoing from this perspective, road becomes an infrastructure only when it is motorable and maintained regularly. There are empirical data from Northeast India where some roads are not motorable, there are electrified villages but without electricity supply, primary healthcare centres without doctors and nurses, schools without classrooms and teachers, etc. Hence, it is problematic to conceptualise those material structures without utility as infrastructure from a socio-anthropological lens. Larkin (2013) theorised infrastructures as the built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space. He theorised,

> "Infrastructures are matter that enables the movement of other matter. Their peculiar ontology lies in the facts that they are things and also the relation between things (:329). As things, they are present to the senses, yet they are also displaced in the focus on the matter they move around (:329)."

The multi-dimensionality of infrastructure i.e. materiality, poetics, politics and aesthetic reveals an interesting domain in contemporaneous development practice. Infrastructure's material and political lives reveal fragile relations between people, things, and the public and private institutions that seek to govern them (Appel et al, 2015). This is more so in Northeast India where the emerging discourse revolves around the infrastructure of injustice and infrastructural injustice embedded in an infrastructural deficit region. Broadly, infrastructure includes roads, dams, bridges, pipelines, sewages, electric grid, multi stadia, schools, hospitals, electricity, railways, IT infrastructure, telecommunication and airports. In Northeast India, many of these infrastructures are either poorly developed or disproportionately distributed within and across the region's respective states. The dichotomy of built-environment is such that basic infrastructures are not available where needed the most, resulting in infrastructural injustice. Again, where mega infrastructures are located,

for instance , hydropower projects or national/ international highways, it foregrounds injustice since there is no fairness in the distribution and benefit to local communities of such infrastructure projects. Thus, infrastructure, as much as it connects and builds networks, also destroys community structure and identity. When land is turned into a commodity and the state and dominant community appropriate such land for infrastructure development, the original inhabitant's lose control over their land, leading to injustice. More so, when the benefits from such infrastructure development are not accrued to indigenous people, which is often the case, it perpetuates injustice or what I have named infrastructure of injustice (Ziipao, 2020). With such development, a new governance system comes into play and indigenous people are forever dispossessed of their land (:175).

From the perspective of justice frameworks as fairness, equitable access and availability among varied communities and across the states, infrastructure development in Northeast India entails injustice to both people and the environment. Hence, it is imperative to locate infrastructure development from the sustainable development as well as justice framework. Contextualising infrastructure development is the key to development with justice (TICI, 2019 as cited in Bodhi and Ziipao, 2019) in Northeast India rather than a state-centric security approach and a neoliberal framework of extractive rent. Hence, the imperative of identifying those states and areas where there is poverty of infrastructure and accordingly invest and built resilient infrastructures for peace and progress.

POLITICKING INFRASTRUCTURE POLICIES

Historically, what is today called Northeastern states were part of various kingdoms such as Ahom, Dimasa, Kangleipak, Twipra, etc. and numerous tribal village republics during the pre-colonial period. With the onset of colonial rule, many of these kingdoms and villages lost their autonomy and were annexed by the British. Subsequently, they were made part of various administrative set ups under the British rule. At the dawn of India's independence, Northeast India comprised Assam Province, Assam Tribal areas, Manipur, Tripura, and Khasi states. Interestingly, within the Assam Province, British India created various administrative categories: The normal areas, partially excluded and excluded areas[1]. The normal areas include Goalpara, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur and Cachar district of present Assam state. The partially excluded areas include Garo Hills, Khasi and Jaintia Hills i.e. the present state of Meghalaya. The excluded areas include the Lushai Hills and Naga Hills i.e., the present state of Mizoram and parts of Nagaland state (Bodhi and Jojo, 2019).

It is interesting to note that most of the region's hilly terrains where indigenous people predominately reside were categorised as either partially excluded or excluded areas during the colonial period. This has a ramification on infrastructure development. There was a sharp difference in infrastructure availability between normal areas and those under the administrative category of partially and excluded areas. This stemmed from co-

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1 According to the Government of India Act, 1935, those areas which are declared as either partially excluded or excluded areas, no Act of the federal legislature or the provincial legislature shall apply unless the Governor in giving such a direction with respect to any Act may direct that the Act shall in its application to the areas, or to a specified part thereof. For instance, till today, whatever Acts passed by the Parliament of India does not apply to the state of Nagaland until it is passed or rectify by the Nagaland Legislative Assembly.

lonial infrastructure policies and panoply of laws in place. The poverty and crumbling of infrastructure in contemporary Northeast India are mostly experienced in the partially excluded and excluded areas. This entails that colonial legacy still finds its place in contemporaneous development practices of the region. The binary of normal-excluded areas, hills-valleys, tribal- non-tribal, military-civilian became the basic framework of infrastructure development in post-independent Northeast India. And yet, the overarching approach of the Indian state continues to be a security-centric development framework due to geopolitical sensitivity and various self-determination/ secessionist movements[2] by varied ethnic communities from the region.

Post-independence, the Indian state's immediate concern was to address the issue of political integration, especially those princely states and excluded areas into the union of India. Hence, the policy focus was primarily on addressing law and order issues, national integration, securitisation[3], territorialisation among other and not so much on infrastructure development per se. Former Union minister Jairam Ramesh succinctly summed up the Indian state approach to the region in four different paradigms: 1) cultural paradigm in the 1940s and 1950s, where the region was taken as a mosaic of cultures – exotic, endangered and best to be left alone and untouched; 2) security paradigm in 1960s, where the region witnessed the mushrooming of insurgent movements and its geo-strategic importance was realised after the Indo-China war of 1962; 3) political paradigm in 1970s and 1980s, where various states were formed and given political representation to accommodate the demand of multiple ethnic communities; 4)

Friendship Gate. Photo by Raile Rocky Ziipao

Landscape. Photo by Raile Rocky Ziipao

2 To illustrate, the Naga, Mizo, and Assam movement resorted to an armed insurgency that continued to fight for the self-determination of its ethnic community.

3 For instance, in 1958, the Government of India passed the Armed Forces Special Power Act (AFSPA) to deal the law and order issues in Northeast India where it gives special power (even to fire upon or otherwise use force, to the causing of death) and impunity to armed forces.

development paradigm from 1990s onwards, where the Northeast is perceived as development deficit and development is the only answer to the persistent issues plaguing the region (Ramesh, 2011).

It is in the development paradigm that the Northeast witnessed various policies that include infrastructure development. The Look East Policy of 1990, rechristened in 2014 as Act East Policy by the Narendra Modi government, is a pointer in case. This policy envisaged building a stagnant trade relation with South East Asian countries where Northeast India acts as the gateway. One of the prerequisites is to build connectivity infrastructure like road/ highways given the landlocked and inhospitable terrain in many parts of the region. Hence, various infrastructural projects were formulated and implemented. This includes the trilateral highway (1,360 km) connecting India (Moreh, Manipur), Myanmar, and Thailand; the frontier highway (to build 1,044 km trans-Arunachal highways); Asian Highway No. 1 (supposedly to be the longest highway in Asia that would connect Northeast India with South East Asia); the North-South and East-West Corridor; the Special Accelerated Road Development Project-Northeast; the North Eastern State Roads Investment Programme and the North-East Special Infrastructure Development Scheme. The list goes on. Srikanth (2016) pointed out that "the roads are built not so much to connect villages, towns, and cities, but to facilitate speedy movement of goods and services within and across the countries by conceiving the shortest road and train routes possible, linking cities with industrial corridors, seaports and airports" (:46). Against this backdrop, infrastructural projects such as highways that bypassed local people and economy and hydropower projects that did not accrue benefits to indigenous people amount to infrastructure of injustice.

In Northeast India, there are massive infrastructural projects in the pipeline. To illustrate, Union Minister for Road Transport, and Highways, Nitin Gadkari announced in 2017 that the Government of India planned to invest a Rs.1.45 lakh crores in Northeast India for the development of national highways[4]. Besides, the Government of India has commissioned a large number of mega hydropower projects. From an ecological point of view, this would amount to ecological disaster as the region is already prone to frequent landslides and falls under the Seismic Zone III. Construction of highways and hydropower projects in large numbers would entail destruction of fragile ecosystems, dispossession of land and displacement of indigenous peoples and species. As pointed out by Virginius Xaxa, a renowned sociologist, the state's approach to development on indigenous/ tribal people has often been to use coercion and bypass the ethos of local communities. He posits that if cooperation from tribals are not forthcoming, coercive and violence are the means through which the state's development agenda is pursued. He termed this process as coercive development (2018). This finds relevance even on the context of Northeast India development experience. The region is experiencing a new form of securitisation of development wherein the voices of the local people remain unheard.

In the light of the new environmental impact assessment (EIA) notification of the Government of India, the policy explicitly defined "border area" as those areas falling within 100 km aerial distance from the Line of Actual Control with bordering countries of India. All linear projects in border areas are exempted from public hearings. Literally, the whole of the Northeastern states would fall under this category of border

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4 Retrieved from https://www.business-standard.com/article/pti-stories/govt-plans-to-invest-rs-1-45-lakh-cr-in-north-east-road-infra-117102300859_1.html (Accessed on 10 November 2021).

areas, which can ignite a fresh conflict between state and indigenous communities of Northeast India.[5] This entails an undermining of democratic, environmental justice and participatory forms of development. Often, infrastructure development is located within the neoliberal and security-centric approach that overshadows the needs of the local communities. Against this backdrop, there is an urgent need to seriously engage in infrastructural research in Northeast India to seek an alternative resilient infrastructure that adheres to sustainable development goals.

5 Retrieved from https://mittalsouthasiainstitute.harvard.edu/2020/08/ infrastructural-revolution-along-indo-china-border/ (Accessed on 12 November 2021).

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China's Belt and Road Initiative and its implications for India

JABIN JACOB

WHAT THE WORLD GETS WRONG ABOUT THE BRI

The BRI is often perceived to be a multilateral project, but it is far from the case. In fact, it is a series of opaque bilateral arrangements where even though the host country appears to be the main beneficiary, China retains the upper hand in negotiations. China, therefore, does not have to try to lay down any broad principles for its dealings with recipient countries; it simply tailors them to the given circumstances. This makes it difficult for those attempting to undertake an empirical analysis of the nature and overall goals of BRI, including economic feasibility or otherwise, from the Chinese perspective. Analysts must, therefore, approach the exercise from disparate and variable data points available in the host countries making it difficult to arrive at uniform measures for analysis. And because neutral observers or those trying to study the situation in good faith will refuse to draw clear conclusions on the back of limited evidence, they are also unable to state unequivocally, except in the face of overwhelming evidence such as in the case of the Hambantota port in Sri Lanka, that the BRI not just imposes costs on host countries but it also boosts China's strategic leverage. This only works to China's advantage, which is why an examination of the BRI and its objectives from the perspective of China's internal political dynamics is absolutely essential.

That said, observers of China's domestic politics and analysts of Chinese foreign policy have seldom doubted the intrinsically grand strategic nature of the BRI. But the challenges of communicating this reality to the rest of the world, including nations and governments hosting BRI projects, have been manifold.

For one, the Chinese have understood, and accurately so, that for vast parts of the world, simply achieving the basics – overcoming thirst and hunger, having a roof over one's head, a decent road – are much more immediate concerns than political rights and civil liberties, or even, any long-term Chinese political and military goals. The BRI's hard infrastructure elements play on this reality. It is also the Chinese argument that the premium countries pay for their risks as parties to the BRI projects are inevitable given that China is the only country that is willing to invest in what are arguably some of the most politically unstable, economic underdeveloped areas of the world. China is, after all, expending treasure at considerable risk to itself to build up infrastructure in countries that have not received adequate attention from the developed West or from international development agencies. This is a powerful argument that democracies like India, the EU or the US have little answer for, given their own record in infrastructure development in the Third World.

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Indeed, Western countries and agencies have over the decades chosen to convert their ability to provide economic development support into subtler forms of imperialism, Orientalism and the white man's burden by imposing impossible standards of what is termed 'accountability' in underdeveloped economies and democratically immature polities. There is little thought or consideration for local realities and the need for a gradual approach suitable to contexts that are vastly different from that of North America or Western Europe. Nor has it been the case until quite recently that the developed West has thought of partnering with or letting more mature and non-Western democracies such as Japan or India, which are also sensitive to developing world realities, take the lead in the Third World. It is this political incompetence of the developed West that the Chinese have long observed and are exploiting with the BRI. It remains to be seen if new Western alternatives and even non-Western ones such as the Indo-Japanese Asia-Africa Growth Corridor might have come too late to displace the BRI altogether.

Two, Chinese foreign policy is often interpreted by most non-specialist analysts, international media and other governments in the same terms as that of any other country. This is a fundamental mistake. Even considering China's rising economic, political and military might and the structural realities of international politics, China's foreign policy is considerably different from that of other countries in intent for one simple reason – its foreign policy is not that of something called a Chinese nation-state but that of one political party, in this case the CPC. While there might be an overlap of interests between the two, the CPC is also an entity that is devoted primarily to its own survival in power. Thus, behaviour that might look irrational or illogical from a state's long-term point of view – non-transparent deal-making, lining the pockets of local elites, transferring old technology, which are important elements of the BRI in different countries – are all above board for a regime that seeks to perpetuate its ruling status than a country that seeks to protect its image. This is why Chinese foreign policy is marked by such tone-deafness as evident in its "wolf-warrior" diplomacy.

But it is this nature of the CPC that explains why Beijing also has the wit and the willingness to engage in a no-questions-asked approach to Third World governments and elites in its push to promote the BRI. Smaller countries have less qualms about signing on to China's pet themes of a one-China policy or turning a blind eye to its repression of ethnic minorities because they both have much more to lose in the process and might themselves be engaged in similar suppression of minority groups.

Indeed, one reason for the CPC's longevity and incumbency – it celebrated its 100th anniversary in July 2021 and has been in power for over 70 years as the ruling party in China – has been a healthy skepticism of the intentions of its own domestic population and of the international community. The CPC's worldview is a Hobbesian one or a zero-sum one in which it believes that co-existence in the long run is not possible, that it has to undermine alternative political systems that appear to compete with its own.

Three and related, this general lack of understanding of the nature of the Chinese political system means that there is also not enough effort put into challenging China's propaganda efforts. There is sufficient evidence by now of the rather wide gap between China's rhetoric and its practice. Take, for example, its frequent claims that BRI projects are 'win-win' for all parties concerned. Since the launch of the BRI, China's assiduous propaganda to paint the BRI as a mere economic project aimed at fulfilling a crucial development need for infrastructure in Asia, Africa and Europe and at increasing people-to-people contacts has been punctured by several unflattering reports of the nature of these projects. In the main, these revolve around the high costs of Chinese projects that have led many nations into debt traps, the lack of transparency on their terms,

alleged bribery of host government officials, the use of Chinese labour and the use of old, polluting technologies or at the very least potential concerns and implications for recipient states (Jacob 2017a, b; Hurley, Morris, and Portelance 2018; Kratz, Feng, and Wright 2019; Dollar 2020).

Chinese state and CPC agencies have, however, spared no effort even using social media platforms such as Twitter and Facebook (which are banned in China itself) and paid advertisements in foreign news publications to sell the message of the BRI. Practically every Chinese project or foreign policy exercise abroad is now part of the BRI framework or has a BRI theme from investments in technology startups to people-to-people exchanges. Further, in the manner of all imperial projects, the BRI too has become closely associated with legacy-building for one individual, namely CPC General Secretary Xi Jinping. What is more, it also dovetails with the ongoing centralization of power under Xi and the recentering of the CPC in the daily lives of ordinary Chinese – an effort not seen since the days of Mao Zedong.

THE 'CHINESE MODEL'

The structure of BRI-related events - conferences, delegation exchanges, high-level leadership visits – and the language used by Chinese scholars, diplomats and Party officials as well as the actions of the Chinese government have all been about promoting a 'Chinese model' of development and politics. Bland and innocuous-sounding as they may be, such stock phrases as 'win-win' or 'a community of shared destiny' used by the Chinese in all BRI-related announcements and documents are intended to counter dominant Western narratives in international relations and to offer alternative ideas and values for countries to espouse. In the main, the Chinese seek to undermine the relevance and legitimacy of democracy, including of elections by universal franchise. The narrative is of China working together with a country rather than attempting to impose its values on it like the West apparently does.

But this is a false narrative and the reason that this is not challenged enough is simply the lack of attention paid to internal Chinese discourses. At the 19th CPC National Congress held in October 2017, for example, Xi stated in his report, 'We respect the right of the people of all countries to choose their own development path'. This is boilerplate but what is notable is that he followed this up with the declaration that this process would involve 'contributing Chinese wisdom and strength to global governance' (Xi 2017). The reference to 'Chinese wisdom' is a clear articulation of the perceived strengths of a Chinese model of development, which the CPC sees as being ideal for everyone. While it might say that it does not seek to export its model outside and even if one were to set aside the history of CPC activity during the Cold War when it sought to export 'revolution' to the developing world, it would be illogical for the CPC given its worldview and the constant sense of siege it operates under to want anything but the export of its model as a guarantee of stability of its regime.

Consider for instance, Xi Jinping's remarks at the celebrations the CPC organized for Karl Marx's 200th birth anniversary in 2018 and at the Party's own centenary celebrations. His remarks on the Marx anniversary appeared to suggest that the CPC's ability to creatively transform and innovate in the development of Marxism was also the result of using elements of what he called "excellent Chinese traditional culture" which it is implied also can provide inspiration for solving problems faced by the contemporary world (Xi 2018). Thus, even Marxism and the communist world have not been spared the

spectre of Chinese exceptionalism – a credo that the BRI represents in full measure by its constant claim of 'win-win' or in other words suggesting that other (Western) development or infrastructure projects in history have not been 'win-win' for recipient countries. Similarly, in the CPC centenary speech in July, while Xi would say 'we are also eager to learn what lessons we can from the achievements of other cultures' he would immediately follow this up with a strident call against 'sanctimonious preaching from those who feel they have the right to lecture us' (Xi 2021).

Thus, China has actually not hesitated to intervene in the internal affairs of countries when it has felt that BRI projects were threatened. The most prominent case has to be Pakistan, the site of the China-Pakistan Economic Corridor (CPEC) that is considered the BRI's flagship project. The so-called Joint Coordination Committee of the CPEC is practically speaking an institutionalized form of Chinese oversight over Pakistani management and administration of the CPEC and the Chinese embassy actively meets with not just central government officials in Pakistan but also with provincial government officials as a way of smoothening the path of their pet project.

Elsewhere, in the world BRI projects have led to conflicts between Chinese supervisors and local workers, political protests and even dethroning of ruling party in power (as in Sri Lanka). In other words, the Chinese model might not be so much an 'alternative' to the West as more of the same – suffused with imperial ambition without the mitigating factors of attractive cultural aspirations or an appealing political ideal for ordinary citizens in host countries.

THE INDIAN RESPONSE

Since its inception, the general Indian view about the nature of the BRI– represented in both the academic and strategic community as well as the government – has been that the BRI is less about economic development and more about larger political and strategic goals (Jacob 2017a). This particular insight came from multiple sources – conferences that the academics and think-tankers attended in China promoting the BRI in which the Chinese consistently tried to run down Indian contributions to the ancient Silk Roads while promoting the 'new Silk Roads' of the Silk Road Economic Belt and the Maritime Silk Road.

There were also other signals. While maps from Chinese sources – though never officially sanctioned – always showed India as part of both the Silk Road Economic Belt (in the form of the Bangladesh-China-India-Myanmar Economic Corridor) and the Maritime Silk Road, there was seldom any acknowledgment of the weight of India in economic and political terms in any Chinese discussions of the BRI in general or of BRI in South Asia in particular. Further, China's BRI conferences that focused on South Asia were often occasions for speakers from the smaller countries to take pot shots at Indian policies in the region, a useful opportunity for Beijing to both delegitimize India's centrality in the region and legitimize its own growing role.

If this does not speak of strategy, what does? This author has, in fact, stated elsewhere that the BRI is the closest thing to a 'grand strategy' that the Chinese have come up with since the waning years of the Qing dynasty in the 19th century. Much of the 20th century saw China under various forms of pressure both external as well as self-created – from the fall of the Qing, the lack of capacity of the successor Republic of China regime, civil war, and the Japanese invasion and subsequently World War II, the fall of the Republic, the economic and humanitarian disaster of the Great Leap Forward under the

Communist Party, and the Cultural Revolution. And despite the economic reforms having started in the late 1970s, it has not been until now under the powerful and centralizing leadership of Xi, backed by an over US$15 trillion economy, adequate military might and a large diplomatic corps among other factors that China has begun to pay sufficient attention to not just maintaining and protecting its interests abroad but expanding them and pushing a 'Chinese model' of development and politics. For Indian interlocutors, there is no doubt that the BRI is the platform to achieve these goals.

For Indian government officials, and its diplomats, in particular, what they saw was going on in Sri Lanka under the Mahinda Rajapaksa regime, whch favoured Chinese projects almost as a way of spiting 'big brother' India, left no doubts in their minds that the 'Chinese model' involved unscrupulous practices in promoting projects that the Sri Lankans would find unsustainable. And it turned out exactly so, with Rajapaksa's successors having to give up the southern Sri Lankan port of Hambantota and thousands of acres of agricultural land around it on a 99-year lease to the Chinese in 2017 (Abi-Habib 2018).

And as mentioned briefly, even China's 'all-weather friend' Pakistan has seen complaints against the CPEC from a variety of sources – political parties, provincial governments, economists and the media, and businessmen and entrepreneurs (Jacob 2017a, b). Indian analysts cannot afford to ignore opposition or concerns in Pakistan over the CPEC, for this has implications also for India-Pakistan relations. If China's contention is that its investments in Pakistan are designed among other things to ensure that the ensuing economic development would reduce the chances of Pakistani youth taking up terrorism, then the flip side of the argument is that the failure of the CPEC would only complicate Pakistan's internal security situation still further, that there would be greater likelihood of Pakistanis taking to terrorism for lack of better opportunities. Therefore, the conditions that affect the progress of the CPEC – including its economic sustainability and its democratic governance or the lack thereof are also of concern to India. Further, if the Chinese were to depend on the Pakistan Army to carry the CPEC through to fruition in case of the inability of or opposition from the civilian government, then this risks also further aggravating tensions in the India-Pakistan relationship given the Pakistani security establishment's well-known antagonism towards India.

The Indian government might justifiably claim as being the first anywhere in the world to highlight the many shortcomings of the BRI. This it did in a brief note by its foreign ministry spokesperson outlining its reasons why it was not attending the grand Belt and Road Initiative Forum that Beijing was organizing in May 2017. The Indian foreign ministry statement highlighted issues of transparency, environmental protection, economic feasibility and technology transfer associated with the BRI (Ministry of External Affairs, Government of India 2017).

However, the problem as always with India has been one of little action following up the talk. Indeed, New Delhi has lost much goodwill over the years for its inability to implement promised projects despite these originating several years, even decades, before the Chinese or the BRI appeared on the scene. In many instances, the Chinese have simply filled a vaccum left by New Delhi's inability to meet its promises because of limited financial capabilities or strategic vision or both. The case of New Delhi turning down the offer to develop and run Hambantota is a case in point. While the Indians were perfectly right in suggesting that the port was not economically feasible, it must be asked whether ways could not have been found to offer alternatives or to bear some of the cost in anticipation of precisely the current reality of the Chinese occupying for 99 years a prime piece of strategic real estate.

One counter argument might be that India's neighbours who have played the 'China card' can only learn by their own experiences the costs of doing business with Beijing. However, this is perhap a short-sighted argument in that for governments in power economics is not everything. The political value of being seen as standing up to India and indeed of using the alternatives provided by China can sometimes outweigh the economic consequences. Pakistan is a case in point in the face of its declining relationship with the US and its (particularly, the military establishment's) hardline stance on economic ties and political opening up to India. These set of conditions are only set to harden with the American withdrawal from Afghanistan.

India has tried to make up in other ways by engaging in greater cooperation with the Japanese especially, for instance, through the Asia-Africa Growth Corridor. However, while this initiative was announced in 2017, it is yet to show concrete results. For now India's focus appears to be more on its own neighbourhood and its greatest area of concern insofar as Chinese ingress is concerned. While several initiatives are in play, progress has not been spectacular and is often held up the lack of adequate connectivity-related infrastructure, including physical, legal and digital, both in India and its neighbours.[1]

Indian government officials and some analysts do make the point that India cannot and should not compete directly with the Chinese in their areas of strength such as infrastructure projects and that India should focus on its strengths in the field of sharing expertise in developing medium- and small-scale enterprises in other countries, for example. This, however, is a strangely small-minded approach if India is to actually protect its neighbours from the BRI's ill-effects. Indeed, India cannot both highlight the security and economic challenges of the BRI's mega-infrastructure projects and not offer a direct alternative to them. In other words, New Delhi might not have the option of only working in its comfort zone and not developing the capacity or making the necessary investments in competing directly with the Chinese.

Even going specifically by the 13 May 2017 MEA statement, New Delhi has to do a better job of offering support to BRI host countries to build up their competence and expertise in the legal, economic and legislative domains to help them preempt as far as possible the negative effects of BRI projects that have been highlighted. This could be in the form of helping these countries formulate governance norms to various infrastructure projects such as the formulation of environmental impact assessments, financial and legal accountability standards, and so on.

And if lack of economic resources is the reason for India's inability to do something about China, then at least New Delhi should be up front about this reality rather than cover it up in confused logic that only does long-term damage to its reputation. Being honest about its limitations would at least allow other countries an opportunity to be patient with India, attempt to play for time with the Chinese or seek alternatives elsewhere rather than be disappointed by unmet expectations.

Indeed, India has been open working with like-minded countries to counter the BRI. The AAGC has been mentioned but there is also the Quadrilateral Security Dialogue with the US, Japan and Australia and the Free and Open Indo-Pacific concept that India has attempted to use to provide various forms of connectivity and to counter at least the maritime dimension of the BRI. This then draws attention to the clear element of Chinese power competition with the United States that the BRI represents for the

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1 For more on these aspects, see the Centre for Social and Economic Progress' Sambandh: Regional Connectivity Initiative. https://csep.org/sambandh-initiative/

reasons outlined in the first section. It is a fact that BRI projects in many countries are also accompanied by a robust military relationship that the Chinese have promoted in the form of equipment sales and delegation visits. This includes for example, the actual operationalization of a Chinese 'support base' at Djibouti in 2016 (Manson 2016) besides the potential of dual use that surrounds such Chinese-controlled ports as Gwadar in Pakistan and Hambantota in Sri Lanka (Dutta 2017). India must then assume that whatever it does by way of connectivity projects either by itself or with the United States will inevitably be seen as a matter of India competing with China. For this reason, New Delhi, therefore, must abandon its rather coy positioning at times of its projects or foreign policy as not being aimed at China. Its projects and foreign policies have to be aimed against China and this needs to be said so openly for there is nothing to be gained by underplaying the existential challenge that the CPC regime in China represents.

CONCLUSION

The BRI might run into hurdles, miscalculate, and make missteps but the Chinese also possess the ability to adjust, reorient and learn from their mistakes and so to recover lost ground fairly quickly. Else, there is the ability to wait out a situation – Sri Lanka being a case in point again with the return of the Rajapaksas to power in 2019. This is because despite whatever other problems they might have, the whole-of-the-body politic approach of the Chinese is unmatched by other governments, including the United States, which is passing through an especially dysfunctional period in its political life. Such an approach involves considerable synergy between various government and CPC institutions including between government officials and the academic and research community. The latter have been funded generously for decades by central, provincial and city governments in China to develop regional expertise of various parts of the world consisting of linguistic, cultural, political and economic knowhow. What is particularly striking and somewhat less noticed by observers, is the role of Chinese provinces bordering foreign countries that have inevitably developed local expertise on those countries that even the central government depends on and has used in promoting the BRI.

If one were to consider the Bangladesh-China-India-Myanmar Regional Economic Forum that began as an initiative of the Yunnan provincial government in 1999, and the idea BCIM Economic Corridor that was put forward in May 2013 (Ministry of External Affairs, Government of India 2013), it could also be argued that the BRI was in many ways a further scaling up of these initiatives. While the BCIM has not been without its problems, some of which, in fact, anticipate problems now being faced by the BRI, too, what is notable is the level of agency that sub-national entities in China have, which is not replicated in full measure in India even though it is a federal state.

China's BRI, therefore, challenges India to reconsider the whole gamut of its foreign policy objectives, strategies, and structures as well as its internal structures of administration. This includes, especially the paradigm of its centre-state relations, which has come under particular challenge in recent years. Clearly, while India is not short of ideas, it is short of both resources and capabilities. Some of these can be mended by greater inter-ministerial coordination and synergy in the implementation of foreign development projects. Others require a mindset change in which, for example, the central government is willing to tap the creativity of India's states, universities and think-tank communities and military as well as invests far more than it does in developing capacities in these institutions.

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For an alternative paradigm of development

RAJNI BAKSHI

A charkha graces the cover of the United Nations Environment Programme's handbook on Sustainable Consumption and Production. Spinning on the charkha is an aging woman of Northeastern India. She is seated on a meticulously woven, soothingly neat, mat probably made from bamboo shavings or a reed. Displayed in the background are traditional handloom fabrics – which she presumably sells for a living. This image marks an ironic, not iconic, entry point to a handbook addressed to policy makers across the world and dedicated to these tag-lines: "Seven Billion Dreams. One Planet. Consume with Care." [1]

SUSTAINABLE INFRASTRUCTURE?

What is the view of life and materiality that manifests in that photo? How does it differ from the implication that the seven billion dreams are essentially and primarily about consuming more? If that is the case, then will 'care' be enough to save the 'one planet'? Such questions are a necessary preamble to any discussion on sustainable infrastructure.

One way of exploring these specific questions is to view the image of the old woman spinning a charkha through the lens of just four of the 17 Sustainable Development Goals (SDGs). Hand spun thread and handloom cloth production are probably the oldest form of Goal 12, namely 'Sustainable Consumption and Production'. It is more than likely the woman in the photo grew up in a human settlement that was 'inclusive, safe, resilient and sustainable' which is SDG 11. She would also be closely familiar with diverse forms of water management systems and other facilities which would qualify as 'resilient infrastructure' – SDG 9.[2] Like most crafts persons she appears to be working in the comfort of her home, thus fulfilling a part of SDG 8 'decent work'.

It is the second part of SDG 8 that causes her, despite all of the above, to be labelled as under-developed. For SDG 8 is 'Decent work and economic growth' (emphasis added). People in the crafts sector have traditionally either been in

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1 http://wedocs.unep.org/bitstream/handle/20.500.11822/9660/-
   Sustainable_Consumption_and_Production_a_Handbook_for_
   PolicymakersSustainable_Consumptio.pdf

2 http://www.bbc.com/travel/story/20150218-indias-amazing-living-
   root-bridges

some form of a steady-state [3] or gradual and limited growth. But SDG 8 assumes that economic growth is a must, that it can be made 'sustainable', and this is the only route by which societies can create the conditions that allow people to have quality jobs.[4]

In part, the combining of 'decent work and economic growth' is an acknowledgement of the 'jobless growth' phenomenon. More significantly, it signals how the term 'sustainable' is more often used to actually mean 'sustained' as in ever-growing rather than a balance that ensures continuity. Herein lies a possibly fatal paradox – we cannot have ever-increasing growth on a finite planet. Even though the limits of the earth's eco systems are now widely acknowledged – from corridors of political power, to board rooms of corporations and classrooms of academia – the orthodoxy of our times still holds that sustained (as perpetual) economic growth and ecological sustainability can somehow be made compatible.

It is in this context that 'sustainable infrastructure' is now an established buzzword in international policy making circles – involving governments, private corporations, universities and think tanks. Within this realm, the discourse on sustainable infrastructure emphasises the need to account for, and minimise, social and environmental externalities. Much of the attention, in mainstream discourse, is on encouraging governments and corporations to create infrastructure that is less resource intensive and serves the masses rather than a relatively small segment of society.[5] There is little or no room in this discourse for asking fundamental questions about how growth is defined and whether the nature of growth should itself be redirected.

By contrast, the emerging discourse on 'Degrowth' calls for a new framework in which the emphasis shifts from gross domestic product (GDP) to that which generates actual social, material and ecological well-being. It also prioritises the values of sufficiency and subsistence rather than equating development with the fulfilment of endless wants.[6] For instance, the Hindi equivalent for degrowth has been identified as 'Sarvodaya' or well-being of all attained in a manner that also restores and nurtures natural eco-systems. In this case sustainable transportation infrastructure would not be equated with highway networks that can be built with more efficient use of resources and made affordable for more people. Instead, development would be equated with ease of mobility, which may be facilitated by a variety of means. This alternative approach would also aim to create circumstances in which most people are not compelled to travel long distances on a daily basis just to earn their livelihood.

This aspiration for degrowth as Sarvodaya has to contend with the reality that there is a groundswell of demands and aspirations, which equates development with highways and more consumer goods.

How then does one foster a way of seeing that neither romanticises the woman with the charkha, described above, nor dismisses her as an irrelevant relic, a museum piece?

3 https://steadystate.org/discover/steady-state-economy-definition/

4 http://www.undp.org/content/undp/en/home/sustainable-development-goals.html

5 https://www.eurasiareview.com/30112015-creating-sustainable-infrastructure-analysis/

6 https://www.gatewayhouse.in/rich-should-degrow-so-poor-can-prosper/

DEGROWTH: MORE THAN A 'BOMB-WORD'

To begin with, degrowth was deliberately deployed by its advocates as a 'bomb-word' drawing attention to the absurdity of believing that indefinite growth is possible.[7] On closer examination, it is better understood as 're-growth' because it calls for a redefinition of not just growth but also of material value.

Degrowth or re-growth has broadly five dimensions:

· Development is equated with actual well-being, not just throughput of materials
· Steady-state economics are prioritised, instead of systems in which growth is a survival imperative
· The aim is to foster a solidarity economy through sharing and cooperation so that the same resources can serve far more people
· Consumption is reconfigured to make more judicious use of resources with social pressure and laws to discourage or prevent business models based on planned obsolescence. Instead products are designed to last and be reused.
· Value is redefined so that the value of anything is not just what it is worth to a potential buyer in monetary terms, but rather in terms of the actual well-being it generates immediately as well as in the long term.[8]

Over the last ten years, the Europe based Research and Degrowth network of academics has assembled an impressive array of academic papers on what degrowth would mean in several spheres of the economy.[9] In India, given the fact that hundreds of millions of people still lack the basics of life re-growth might be a better term than degrowth. This may be why the first book on the topic out of India is called 'Post-Growth Thinking in India: Towards Sustainable Egalitarian Alternatives'.

Edited by Julien-Francois Gerber and Rajeswari S. Raina, this book traverses a wide range of issues – from 'Energy and Sustainability', 'GDP and its Discontent', 'Articulating Green Growth and Degrowth', 'Degrowth as Economy of Permanence' to 'Localisation: the post-growth path to genuine prosperity'. [10] The essence of the re-growth agenda for India is conveyed by these words of the legendary expert on water systems, Ramaswamy R. Iyer, to whom the book is dedicated:

"What I want is India to be a sharing, caring, nurturing and sustainable place, with a civilisation that ensures an average standard of living for everyone." [11]

7 https://www.gatewayhouse.in/degrowth-a-bomb-word-comes-of-age/

8 https://www.gatewayhouse.in/wp-content/uploads/2016/07/Rajni-Bakshi-Degrowth-Report_Final.pdf, p. 2

9 https://degrowth.org/publications/

10 Post-Growth Thinking in India: Towards Sustainable Egalitarian Alternatives. Editors Julien-Francois Gerber and Rajeswari S. Raina, Foreword by Stephen A. Marglin; Orient BlackSwan, Hyderbad, 2018.

11 Ibid, dedication page.

Is this a pipe-dream or can it be a vision that informs individual actions, public policies and private investments in the real world? However difficult it may be to identify tangible steps that would make this vision a reality one thing is clear – it is time to stop equating 'development' with growth of GDP and focus instead on multiple other ways to attain the end goal articulated by Iyer.

In terms of tangible steps forward, perhaps, the most notable one is to make regeneration of local economies the cornerstone of Sarvodaya.

HUNDRED MILE COMMUNITIES

When Mahatma Gandhi made the charkha an icon of the Indian struggle for freedom it was a literal manifestation of the need to revitalise the grassroots economy that had been decimated by colonial extraction and the forced imposition of mass produced goods.

Even in Gandhi's time the charkha was wrongly seen as harking back into the past and denying the importance of modern industry. This was a complete misrepresentation of Gandhi's emphasis on the need to combine dignity of labour, creativity and innovation – making these the basis of a dynamic local economy. Economic planners of post-Independence India did exactly the opposite – they equated innovation with big modern industry with almost no care for dignity of labour and individual or community level creativity. Consequently, the charkha and handlooms were regarded as a sunset industry deserving of government sops only because millions of people were still 'stuck' in that realm.[12] This was symptomatic of an overall neglect of local economies with all the attention focused on growth in terms of GDP.

In a degrowth frame, the emphasis shifts from growing the size of the economy in terms of how much money changes hands to that which actually enhances the sense of agency of people with diverse abilities by enabling them to engage in both the bazaar and social spaces from a position of strength. Take, for example, the issue of local watershed management versus large dams and canal networks. While local infrastructure such as watershed management schemes has not been completely neglected, the broad policy direction in India has been to treat the informal, the so-called unorganised and local economy as the periphery. Thus the major investments have been in large systems that serve the macro economy.

Ela Bhatt, the founder of the famous Self Employed Women's Association (SEWA)[13], has spent decades trying to improve the livelihoods of women through a variety of institutions. In the last few years, Bhatt has concluded it was the lack of local resources to meet the primary needs of life that has made people vulnerable to poverty. In a book titled 'Anubandh: Building Hundred Mile Communities', Bhatt has proposed that the answer lies in meeting local needs with locally generated resources in ways that benefit the local economy, the local ecology, and the local community.[14]

This is not a prescription for isolationism. On the contrary 'Anubandh', says Bhatt,

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12 See essay by Uzramma, 'Crafts show the way for Indian industrialization' in
    Alternative Futures: India Unshackled, edited by Ashish Kothari and K. J. Joy,
    Authors Upfront: New Delhi, 2017

13 SEWA has over a million members. http://www.sewa.org/

14 https://www.thehindu.com/features/%E2%80%98Everything-is-
    connected%E2%80%99/article14308333.ece

is an ancient Indian word which means that everything is connected – each one of us to each other and the air and water and soil: "Over five decades of organising poor women of SEWA, I have realised how this endless web of connection exists, what potential it offers for promoting mutuality and how we neglect it more and more in our so-called development process as we strive to 'remove' poverty and grab prosperity." Bhatt is not saying that 'Anubandh' is a magic solution. Rather it is a perspective, which encourages us to be more conscious of the choices we make. For instance, what is the effect on our economy and society when we buy vegetables from a street vendor rather than a corporate retailer?

From this perspective the type and scale of infrastructure required will change accordingly. For instance, cotton instead of being baled and carried off to distant spinning mills could be processed and turned into thread locally. Even if the spinning is not entirely done on hand-operated charkhas, the volume of electricity and transport infrastructure required would alter significantly. At the same time, the variety and volume of livelihoods generated within the local economy would increase – thus altering the dominant assumption of policy makers that concentration of large populations in cities is inevitable and unalterable. [15]

Let us now review possible scenarios in the sphere of water which, along with sanitation, is perhaps the most vital of all our infrastructure needs.

WATER

> "Traditional systems were often conceptualised for permanence.
> Inscriptions at temple water tanks would start with '...as long as
> Sun and moon rise in their respective places'. Population pressures,
> leading to zero opportunities, coupled with democratic aspirations
> to be free of exploitative hierarchical social structures drove people
> to get out of such systems. The hope of modern technologies
> promising freedom and upward mobility has been the major drive in
> people accepting unsustainable technologies."
> -- Uma Shankari[16]

This observation captures the essential challenge of sustainable water systems in India in the 21st century. Uma Shankari is a farmer and a scholar who has watched this process unfold at close quarters on the ground in Southern India over three and a half decades. Having herself struggled with water-to-crop ratios, Shankari is painfully aware that traditional systems are now incompatible with what most people, even the poorest of the poor, believe is 'progress'.

How then do we work for 'sustainable infrastructure' in the sphere of water in India today? The first step is to acknowledge that there is no ready-made model that can be applied at the macro level; it will have to be forged over a period of time by trial and

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15 http://www.thealternative.in/business/why-do-we-continue-to-beat-our-cotton-and-punish-its-growers/

16 https://www.gatewayhouse.in/wp-content/uploads/2016/09/WaterDegrowth_RBakshi-22-09-2016-PDF.pdf

error. This process can be aided by recognising some essential features of the traditional systems. Firstly, that they falsify a basic assumption of modern market economics – namely that scarcity will inevitably lead to fierce competition. Instead, as documentation of traditional systems in arid zones of India shows, scarcity led to the most intense and creative forms of cooperation.[17] Social norms and physical infrastructure were melded to ensure two things: One, human-made structures that captured and stored the scarce rainfall, and two, cooperation to ensure that the water was used in a judicious manner – thus discouraging over-use by any individual or family. But all of this was possible because sufficiency was embraced as a value. Sufficiency was not, as modern economists often wrongly assume, adopted out of compulsion.

Such cultures facilitated the accumulation of scientific knowledge over generations and consequently produced three-dimensional innovations that simultaneously sustained natural ecosystems fostered supporting social beliefs and behaviour patterns, and gave rise to technical skills for catching, storing and sharing water. All of the above was done without depending on the individual profit motive, whether in cash or kind. In a nutshell, homo economicus was conspicuously absent in these settings.[18]

Granted that over the last two decades, rejuvenation of local water systems has found some government support. But the big government project on water infrastructure is inter-linking of rivers.[19] This project aims to link rivers with surplus water with those that are water deficient – to provide water, both for drinking and industrial use. Apart from the enormous cost of such a project there is in addition the spectre of changing rainfall patterns, which could drastically alter the water levels in many rivers. In addition, there are concerns about vast forest tracts being submerged along with displacement of communities in the project affected zones. Above all, this approach is anchored not in the needs of local economies and societies but on macro data and assumptions, about projected increase in water demand, that are based on a perpetual-growth scenario.

There are broadly three dimensions on which a re-growth water discourse can be built.

One, there is more and more scientific work to show that merely improving water efficiency is not enough. It is far more important, if not imperative, to map how a business or development project affects the wider environment of which water is only one part. For example, check dams for recharge on a particular plot of land can sometimes deprive those downstream of water – both humans and other living systems. Likewise, more efficient use of water to increase volume of yield is laudable but not if the total volume of water used is still rising exponentially. There is no substitute for a holistic eco-system approach.

Two, efforts are being made to 'decouple' water from GDP growth – this essentially means squeezing more GDP points out of every drop of water. For instance, technological innovations have reduced the amount of water used in industries like mining and steel. But as the UNEP has cautioned there is a simultaneous need to map 'impact decoupling' – namely the reduction of adverse environmental impacts.

17 http://www.indiawaterportal.org/articles/aaj-bhi-khare-hain-talaab, and http://www.indiawaterportal.org/articles/rajasthan-ki-rajat-boondein-book-anupam-mishra

18 https://www.gatewayhouse.in/wp-content/uploads/2016/09/WaterDegrowth_RBakshi-22-09-2016-PDF.pdf

19 http://mowr.gov.in/schemes-projects-programmes/schemes/interlinking-rivers

Three, there is no substitute for sifting needs from wants. This takes us back to why the image on the cover of the UNEP document, mentioned at the beginning, is ironic. The distinction between needs and wants, which has been inherent to cultures of the kind depicted by that photo, is now considered backward. In India, thirty years of economic growth have been accompanied by jettisoning of an old norm which lauded 'simple living, high thinking'. It is now commonly believed that this was not actually a norm but an excuse people used to feel good in a time of scarcity. [20]

REALITY CHECK

Let us now return to the question posed at the beginning, namely how to foster new ways of seeing that neither romanticise the woman with the charkha nor dismiss her as an irrelevant relic, a museum piece.

The first step might be to acknowledge that democracy and rising material aspirations are now inextricably inter-linked. However, it should be possible to celebrate the spaces for dignity and freedom, that democracy has enabled, while also asserting that both India and the world have no future unless happiness is decoupled from more and more consumption.

It is true that the person who is walking wants a cycle, the cyclist wants a motor-bike, the person on a two-wheeler wants a car, the motorist wants a bigger or more expensive car, and so on. At the same time, it is also true that this reality is not a fact of nature, like photosynthesis. To a large extent these aspirations have been fostered and expanded by a broad range of economic and cultural factors – above all by the positing of Western style urbanisation, with its associated notions of what is adequate infrastructure, at the pinnacle of progress. This is why the woman with the charkha is equated with backwardness – as the relic of a sunset industry, a burden to the welfare state or at best manufacturer of a niche-consumer product patronised by elites.

However, seen from a different vantage point, the spinner and handloom weaver represent a radically different knowledge system and therefore also market culture. What the spinner and weaver participated in was bazaar, an ancient mechanism of human societies across the world. These pre-modern forms of exchange in the bazaar were embedded in diverse forms of social, cultural and moral norms, which by and large discouraged greed and almost never gave rise to a model of endless growth in either production or profits. It is with the rise of 'the market' in Western Europe from the 18th century onwards that greed came to be treated as a positive human tendency, which fosters dynamism and the idea of linear 'progress' of societies and economies becomes all powerful.[21] In a paper about innovations in Indian handlooms, published in the journal Technology and Culture, two scholars have argued that it is the dominant accounts of technology and innovation which assume linear development and a movement of societies towards modernity:

20 https://www.gatewayhouse.in/wp-content/uploads/2016/09/WaterDegrowth_
RBakshi-22-09-2016-PDF.pdf

21 Bazaars Conversations and Freedom: For a market culture beyond greed and
fear by Rajni Bakshi, Penguin: Delhi, 2009.

"Alternative views offer ways to grasp innovations that circulate in time, in contrast to innovations as ever progressing way from the past in linear time.
... Building on a broadened conception of innovation and a symmetrical engagement of scholars and practitioners, we thus have an opportunity to recast the technologically backward and vulnerable weaver from the past into a convivial companion for the journey to a sustainable future."[22]

Such perspectives are difficult for policy makers to engage with because they threaten entrenched notions of what is progress and who is backward. The task of cultivating new forms of 'seeing' is made still more difficult by the fact that many activist interventions tend to be based on knowledge of only some pieces of the puzzle or are focussed on specific, sometimes narrow, demands – thus not being able to present a coherent over-arching framework. In addition, both public and private sector investments are still predominantly driven by the quest for monetary profits – regardless of avowed commitments to the triple bottom line of "people, planet and profit."

At the same time, the staggering scale of the agrarian crisis is drawing attention to difficult questions about the kind of infrastructure that has been promoted over the last half century. The unbreathable air of most Indian cities is another powerful incentive for rethinking the model of development rather than seeing the pollution as a problem that can be fixed by better management of the situation. Above all, water is a life or death issue with unavoidable immediacy. At the time of writing, in November 2018, there are reports of some villages in Maharashtra emptying out due to lack of water. Over more than half a century some of the most intense investment in dams, canals and borewells has happened in Maharashtra – and it is now annually afflicted with a severe water crisis.

For the last four decades, the advocates of alternative paradigms of development visions have tended to assume that such crises would eventually widen the space for alternative perspectives on growth, development and progress. Now, the realities of accelerating climate change give rise to the very real possibility that the required transition to a re-growth or post-growth Sarvodaya economy may not happen at a speed and on a scale that can prevent catastrophic suffering.

Since pessimism is for better times, a luxury we cannot afford, where do we go from here?

First and foremost – refuse to play along when the term 'sustainable' is attached to what today constitutes 'development', with its promotion of endless wants in an economy of perpetual growth.

Secondly, use all possible forums for dialogue between diverse perspectives aimed at co-creating the tangible details of a post-growth Sarvodaya model of society and bazaar – for this will necessarily and indefinitely be a work-in-progress.

The first condition is already being fulfilled by activist groups who tend to remain on the margins of both the political discourse and economic activity. An overview of such groups can be found on the platform of Vikalp Sangam.[23] However, there is little or no

22 Innovation in Indian Handloom Weaving by Annapurna Mamidipudi, Wiebe E. Bijker
    Technology and Culture, Volume 59, Number 3, July 2018, pp. 509-545

23 http://www.vikalpsangam.org/

work on the second condition – of dialogue between policy makers and investors on the one side and votaries of alternative paradigms on the other.

As long as this situation persists the term 'sustainable infrastructure' will mean little more than resource efficiency, i.e., building more roads with less cement, steel and water consumption. And living examples of self-sustained and creative livelihoods, like the spinner on the UNEP handbook's cover, will be reduced to serving as token poster figures while the global economy hurtles down the opposite direction.

B.

India's Connectivity Conundrum: Infrastructure as Panacea

This section gets into the workings of infrastructure by focusing on a few prominent projects. Gaurav Dwivedi gets inside the Delhi-Mumbai Industrial Corridor, billed as one of the largest infrastructure projects in the world, and sketches out its operational and financial architecture—the current status of the project, the major investors, and the bottlenecks in acquiring land, among other things. He argues that while mega infrastructure projects might be good optics for the government, "they have serious implications for the lives of the local people, democratic governance processes, natural resources, wildlife habitats and the delicate ecological systems." Mirza Zulfiqur Rahman tries to unpack the popular purpose and meaning of infrastructures in the highly securitized northeast region of India through the metaphor of the pickle. He argues that while the state may have built a wide network of roads and bridges, it has given scant attention to the social infrastructure needs of the region, such as healthcare, education, and business opportunities. Hence, people in the northeast look at physical infrastructure as "pickled", or of no immediate use. As one resident of Arunachal Pradesh remarked about a rickety road, "we should make pickles of these roads and keep them, they are of no use." Ashish Khandalikar's infographics on the status of roads and bridges in the Northeast underscores Rahman's point. For instance, of the 103 projects initiated since 2000, only 39 projects or 37.86 % have been completed so far. Kim Arora looks at India's ambitious project to cast the Internet over its vast and diverse geography and discovers a secret known to all governments—that the promise of all infrastructure is riddled with glitches, both inherent and unforeseen. She describes how the Bharatnet project, which was kickstarted in 2011 and has missed many deadlines since, was hit particularly hard in 2019 by the double whammy of the Covid pandemic and military skirmishes with China, the main supplier of raw materials for the project. Unless alternatives are found quickly, those living on the margins are likely to miss the digital bus.

Mega industrial infrastructure projects and their impact on people, Delhi Mumbai Industrial Corridor

GAURAV DWIVEDI

The infrastructure sector is often touted as a key driver of the Indian economy. Responsible for propelling India's overall development, the sector enjoys intense focus from the government as well as international financial institutions, bilateral agencies and private investors for initiating policies that would ensure a time-bound creation of world class infrastructure in the country. It would also boost manufacturing, employment generation and higher economic growth rates.

Some of the major infrastructure projects in the country comprise industrial corridors, smart cities including urban infrastructure such as water and sewerage systems, transport, metro systems, solid waste management, traffic management, digital infrastructure and urban housing. These are closely linked with national projects for power generation and transmission, roads and highways called Bharatmala Pariyojana, shipping and port modernisation, and coastal industrialisation projects named Sagarmala Programme, power and energy projects, civil aviation, logistics sector and housing for all.

In 2018-19 financial year, the Government of India had allocated INR.5970 million (USD 92.22 billion) to provide a massive boost to the infrastructure sector. This included allocations to railways, household level electrification scheme, green energy corridor, telecom infrastructure, metro rail systems, highway projects, among others. Similar announcements have been made in 2019-20 financial year with an allocation of INR.4560 million (USD 63.20 billion) for the sector. INR 386,37 million (USD 5.36 billion) have been allotted to communication and Rs.83,015.97 (USD 11.51 billion) towards road transport and highway, and investments in piped water supply to be provided to all households in 500 cities.[1]

For mega infrastructure programmes like industrial corridors and Smart Cities Mission, it has been further emphasised that the need of the hour is to fill the infrastructure investment gap by financing from private investment – institutions dedicated for infrastructure financing like National Infrastructure Investment Bank (NIIB) and also global institutions like Asian Infrastructure Investment Bank (AIIB) and New Development Bank (erstwhile BRICS Bank), focused more on sustainable development projects and infrastructure projects[2]. Various public financing options and marker based mechanisms have been proposed to raise finances for infrastructure projects.

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1 IBEF, Infrastructure Sector in India, Source URL - https://www.ibef.org/industry/
   infrastructure-sector-india.aspx

2 http://mofapp.nic.in:8080/economicsurvey/

INDUSTRIAL CORRIDORS IN INDIA

An industrial corridor is generally defined as a set of linear projects designed for an area to promote infrastructure and industrial development. Its broad objectives include creating areas for urban, manufacturing or other industry clusters. Industrial corridors are planned in such a way that there are arterial links like a highway or railway line that receives feeder roads or railway tracks.

The Government of India has envisaged five industrial and economic corridors: Delhi-Mumbai Industrial Corridor (DMIC), Bengaluru-Mumbai Economic Corridor (BMEC), Chennai-Bengaluru Industrial Corridor (CBIC), Amritsar-Kolkata Industrial Corridor (AKIC) and Visakhapatnam-Chennai Industrial Corridor (VCIC), which is a part of the longer East Coast Economic Corridor (ECEC).

DELHI-MUMBAI INDUSTRIAL CORRIDOR (DMIC)

DMIC has been envisaged as one of the largest infrastructure projects being implemented in India, along with Smart Cities Mission, Bharatmala and Sagarmala – both in financial as well as geographical terms. The project is expected to transform India into a global manufacturing and logistics hub with planned urban centres and manufacturing facilities. The initial financing for DMIC is estimated to be around USD 100 billion and, geographically, it would have influence areas spread across six states in the country, alongside a freight corridor including projects such as investment regions, industrial areas, logistics hubs, airports and urban centres. Each state has a nodal agency to coordinate the project implementation under DMIC. Special purpose vehicles (SPVs), which are limited liability companies under the Companies Act, 2013, have been formed at different levels to implement the plans through public private partnership (PPP) projects. Though initial financing for DMIC has come from the public sources, it is expected that a majority of it – around USD 90 billion – would come from private investors in the form of share capital, equity investment as well as through sale of land parcels. The other source of funds would be through PPP projects as well as investments by development finance institutions like the World Bank, Asian Development Bank (ADB) and others.

However, there are critical concerns that appear not to have been addressed while proposing these lofty plans. They include the impacts of large scale land acquisition on local communities and their agriculture based livelihoods, resulting in displacement and violation of their resettlement rights, loss of ecological spaces and stress on water resources. Decision-making processes, wider public consultations and considering the opinions shared, role of people's representatives and local governments as well as the increased push for profit making for domestic and international investors are other vital concerns left unaddressed.

In 2007, DMIC was announced as the first industrial corridor project in the country by the Government of India. The project was launched after an agreement was signed between the Government of India and the Government of Japan in 2006. The Delhi Mumbai Industrial Corridor Development Corporation (DMICDC) was formed in 2008 for developing and implementing the project.

The equity shareholders in the company are Government of India (49 per cent), through the Department of Industrial Policy and Promotion (DIPP), Japan Bank for International Cooperation (JBIC) (26 per cent) and financial institutions such as Housing and Urban Development Corporation (HUDCO) (19.9 per cent), India

Infrastructure Finance Company Limited (IIFCL) (4.1 per cent) and Life Insurance Corporation (LIC) (1.0 per cent).[3]

The Government of Japan had also announced financial support for the project for an amount of USD 4.5 billion in the first phase for the projects with Japanese participation.[4]
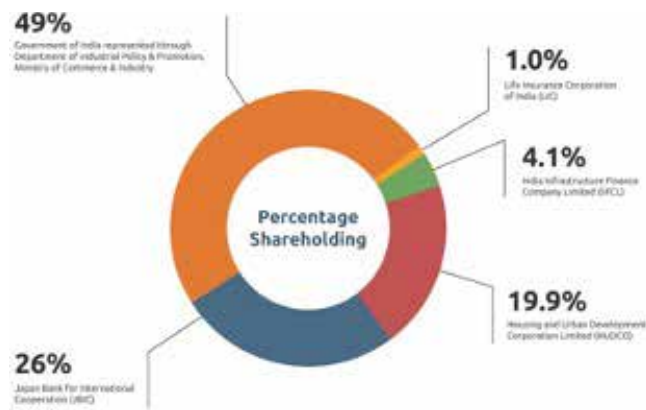
Figure 1: Equity Shareholders in DMIC, Source DMICDC

The project influence area run through six states – Uttar Pradesh, Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra. The project runs along the Western Dedicated Freight Corridor (WDFC) of the railways and looks to utilise the high speed and capacity connectivity provided by DFC to reduce logistics costs.[5] A strip of 150 km to 200 km has been selected on both the sides of WDFC to be developed as industrial corridor. It would also develop feeder rail/ road connectivity to hinterland/ markets and select ports along the western coast.[6]

As part of the implementation work under DMIC, 24 special investment nodes – 13 investment areas and 11 investment regions – have been identified under the project across the six project states. An investment region would have a minimum area of over 200 square kilometres (20,000 hectares), while an industrial area would have a minimum area of over 100 sq km (10,000 ha). As part of Phase-1, eight urban-industrial nodes in the states have been taken up for implementation work.[7]

PROJECTS UNDER DMIC

The following table gives the details of the investment/ industrial regions that are being

3 Annual Report of DMICDC for the financial year 2018-19, Source URL - http://dmicdc.com/Uploads/Files/60df_11thAnnualReport_2018-19.pdf

4 Department for Promotion of Industry and Internal Trade, Source URL - https://dipp.gov.in/japan-plus/delhi-mumbai-industrial-corridor-dmic

5 Department for Promotion of Industry and Internal Trade, Source URL - https://dipp.gov.in/programmes-and-schemes/infrastructure/industrial-corridors

6 https://dmicdc.com/DMIC-projects/project-influence-area

7 https://dmicdc.com/DMIC-projects/project-influence-area

developed under Phase-1 in DMIC:[8]

	Name of the Node	State	Area (in Sq km)
	Dadri-Noida-Ghaziabad Investment Region	Uttar Pradesh	210
	Manesar-Bawal Investment Region	Haryana	402
	Khushkhera-Bhiwadi-Neemrana Investment Region	Rajasthan	160
	Pithampur-Dhar-Mhow Investment Region	Madhya Pradesh	372
	Ahmedabad-Dholera Investment Region	Gujarat	920
	Shendra Bidkin Investment Region	Maharashtra	84
	Dighi Port Industrial Area	Maharashtra	253
	Jodhpur Pali Marwar Industrial Area	Rajasthan	155

Among the above, construction related activities have begun at Dholera Special Inverstment Region, Shendra Bidkin Industrial Area, Integrated Industrial Township Project at Greater Noida and Integrated Industrial Township Project at Ujjain.

In each state, a nodal agency has been appointed, which is responsible for coordinating the work on various projects as well as approvals, clearances, monitoring, commissioning and financing arrangements for the projects, among others. The state nodal agencies are as follows:

	Sr. No.	State	Nodal Agency
	1.	Haryana	Haryana State Industrial and Infrastructure Development Corporation
	2.	Uttar Pradesh	Greater Noida Industrial Development Authority
	3.	Rajasthan	Bureau of Investment Promotion
	4.	Madhya Pradesh	Trade and Investment Facilitation Corporation Limited
	5.	Gujarat	Gujarat Infrastructure Development Board
	6.	Maharashtra	Maharashtra Industrial Development Corporation

8 Department for Promotion of Industry and Internal Trade, Source URL - https://dipp.gov.in/programmes-and-schemes/infrastructure/industrial-corridors

PROJECT IMPLEMENTATION STATUS

The annual report notes that these projects are in various stages of implementation – from the project approval, formation of SPVs and land acquisition to undertaking the construction work. For instance, in Uttar Pradesh the works for Integrated Industrial Township Project at Greater Noida have begun. An SPV named 'DMIC Integrated Industrial Township Greater Noida Limited' has been registered and an area of 747.5 acres transferred to it. Shapoorji Pallonji Group has been awarded a contract worth INR 4.26 billion for construction works while Siemens has got another contract worth INR 1.21 billion for developing internal power infrastructure works. Works related to transmission network worth INR 1,5 billion have been awarded to Uttar Pradesh Power Transmission Corporation Limited.

For the Global City Project in Haryana, an SPV, 'DMIC Haryana Global City Project Limited' was formed. The master plan for the project has been approved and the land is in possession of the state government. However, in April 2019, the state government said that it had terminated the joint venture agreement and the project would be implemented by the Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) on its own.

In Rajasthan, the Ministry of Civil Aviation has granted site clearance for a greenfield international airport. The Airports Authority of India (AAI) is finalising the detailed project report and environmental clearance from the Ministry of Environment, Forest and Climate Change (MOEF&CC) is under process.

In Madhya Pradesh, to implement Integrated Industrial Township Vikram Udyogpuri Project in Ujjain, an SPV named 'DMIC Integrated Industrial Township Vikram Udyogpuri Limited' has been formed. The state government has transferred 1,100 acres to the SPV for the project and Subhash Projects and Marketing Limited (SPML) has been awarded contract for various infrastructure works.

In Maharashtra, for Shendra Bidkin Industrial Area, an SPV, 'Aurangabad Industrial Township Limited', has been formed. The Maharashtra government has transferred to the SPV 8.39 sq km for Shendra Industrial Area and 13.76 sq km for Bidkin Industrial Area. For Shendra Industrial Area, the Cabinet Committee on Economic Affairs (CCEA) has approved tender packages amounting to INR 15.33 billion for various contracts that have been awarded to private companies such as Shapoorji Pallonji, Patil Construction and Infrastructure Limited, Honeywell and Passavant Energy. For Bidkin Industrial Area, the CCEA has approved tender packages worth INR 64.14 billion. Under the approved tender packages, L&T has been awarded the contract for constructing roads and underground utilities and KEC appointed for ICT Master System Integrator (MSI) works. Hyosung Group of Korea has been allotted an industrial plot measuring 100 acres for setting up a 'Spandex' manufacturing unit.

In Gujarat, for Dholera Special Investment Region (DSIR), an SPV, 'Dholera Industrial City Development Limited', has been formed. The Gujarat government has transferred 30.27 sq km of land to the SPV and matching equity amounting to INR 17.45 billion has been released by National Industrial Corridor Development and Implementation Trust (NICDIT). The CCEA has approved tender packages worth INR 27.85 billion for various infrastructure works. L&T has been selected to implement roads and services contract, sewage treatment plant (STP) and central effluent treatment plant (CETP). Cube Construction Engineering Limited has been awarded building contract and SPML the water treatment plant (WTP) contract.

The India International Convention and Expo Centre Project has been approved by

the central government at a cost of INR 257.03 billion. A fully government owned company, India International Convention and Exhibition Centre Limited has been registered to implement the project. Land measuring around 89 ha has been transferred on lease to the company for the project. L&T has been appointed as engineering, procurement, construction (EPC) contractor for constructing the trunk infrastructure. Korea International Exhibition Centre and eSang Networks Company Limited (KINEXIN) has been appointed as the operator for the convention and exhibition centre. IDBI Capital Markets and Securities Limited has been appointed as the financial advisor for raising loans for IICC. BSES Rajdhani Power Limited will supply bulk power to IICC. A term loan of INR 21.50 billion is being finalised by the State Bank of India to IICC. DMRC has been appointed EPC contractor for metro link to IICC via Airport Line Express.

The other investors in DMIC projects include Tata Chemicals, Haier Appliances and AMUL.

DMICDC has also extended the services of its Logistics Data Bank to southern and eastern regions that include container freight stations, port terminal operators and inland container depots.

DMICDC AS KNOWLEDGE PARTNER

DMICDC acts as a knowledge partner to National Industrial Corridor Development and Implementation Trust (NICDIT) in respect of all the industrial corridor projects for undertaking various project development activities.

FINANCING PROJECTS UNDER DMIC

In 2011, the Government of India approved the institutional and financial structure of DMIC along with a budgetary support of INR 175 billion at an average of INR 25 billion for each of the seven nodes over a period of five years for the work on industrial cities in Phase-1. The support goes to DMIC-Project Implementation Trust Fund (PITF) and it provides equity or debt or both to SPVs and joint ventures between the Government of India and the respective state governments for DMIC projects. A revolving Project Development Fund (PDF) has also been created to meet the expenditure of various project related activities and INR 10 billion would be given as grant-in-aid to DMICDC Limited. The allocation of funds against PDF is made in the form of annual grant from the Department of Industrial Policy and Promotion (DIPP). A city-level SPV would be responsible for implementing specific projects.[9]

It has been estimated that projects under DMIC, as well as those developed through budgetary allocation, require an investment of USD 90 billion through PPP mode. It is broadly assessed that projects of around 75 per cent of the estimated overall investment can be implemented through PPP.[10]

It appears that the funds for PDF would come from various financial institutions

9 Annual Report of DMICDC for the financial year 2018-19, Source URL - http://dmicdc.com/Uploads/Files/60df_11thAnnualReport_2018-19.pdf

10 Centre for Urban Research, DMIC, Source URL - http://delhimumbaiindustrialcorridor.com/financial-analysis-of-dmic-project.html

including multi-lateral banks, commercial banks, foreign institutional investors, state governments, apart from the Government of India and Government of Japan. A loan agreement between India Infrastructure Finance Company Limited (IIFCL) and Japan Bank for International Cooperation (JBIC) will be signed for DMIC PDF. Government of India will be providing sovereign guarantee to this loan. Preparation of development plans, master plans, and feasibility studies would be financed by PDF. It can also be used for creating SPV companies for projects approved by DMICDC board in the form of providing share capital, unsecured loans, convertible debt or other equity arrangements. Japan External Trade Organisation (JETRO) can also recommend to the investment committee for using funds from the Government of Japan.[11]

The Government of India has also approved setting up of a Project Implementation Fund (PIF) for various activities for DMIC. The grant received from the Government of India is used as capital reserves and the interest, dividend or any other income that will be earned on PIF is added to it. If any part of the fund becomes refundable, it will be reduced from capital reserves.[12]

INTERNATIONAL INSTITUTIONS FINANCING DMIC PROJECTS

In addition to Japanese bilateral agencies, financial institutions like ADB, International Finance Corporation (IFC) and others have been financing projects that are part of the overall DMIC plan. These specific projects are in states like Rajasthan, Gujarat and Maharashtra. For instance, ADB is financing two technical assistance projects in Rajasthan – Supporting Rajasthan's Productive Clusters in the Delhi-Mumbai Industrial Corridor and Advanced Project Preparedness for Poverty Reduction - Capacity Development of Institutions in the Urban Sector in Rajasthan.

The former would support industrial cluster development in Rajasthan around Delhi-Mumbai Industrial Corridor. Majority of the area of the state falls within the project influence area and the dedicated freight corridor passes through the state as well. The project looks to improve the state's competitiveness by creating productive industrial clusters, which is a group of firms closely linked by common product markets, labour pools, similar technologies, supply chains, infrastructure and other economic links[13]. The latter would look to establish corporatised state-level and city-level agencies to manage water and wastewater services, as well as promote PPPs, rationalise urban property tax, develop a long-term urban development policy, and improve revenue realisation from water and sewerage charges, among others[14].

IFC is also investing in creating warehousing facilities for industrial corridors including DMIC through investments in Continental Warehousing Corporation (Nhava Sheva)

11 Ibid

12 Annual Report of DMICDC for the financial year 2018-19, Source URL - http://dmicdc.com/Uploads/Files/60df_11thAnnualReport_2018-19.pdf

13 Asian Development Bank, Supporting Rajasthan's Productive Clusters in the Delhi–Mumbai Industrial Corridor, Source URL - https://www.adb.org/projects/49276-001/main#project-pds

14 Asian Development Bank, Advanced Project Preparedness for Poverty Reduction - Capacity Development of Institutions in the Urban Sector in Rajasthan, Source URL - https://www.adb.org/projects/43166-216/main#project-pds

Limited. The IFC is investing USD 25 million in equity and another USD 35 million as loan for a project costing a total amount of USD 90 million.[15]

AIIB has also proposed financing for an integrated multi-modal logistics hub at Nangal Chaudhary in Haryana as part of DMIC.[16]

It has also been reported that DMIC is looking to raise funds from the international equity funds as well as the pension funds in case of shortfall in funding requirements.[17]

CRITICAL ISSUES FACING DMIC

Since the inception of DMIC, concerns have been raised by the local communities in different states about the large projects being implemented under it and their serious impacts on ecology, land acquisition, local economy and livelihoods. DMIC faces scrutiny about the operational mechanisms being used for implementation of projects like creation of multiple SPVs and PPPs. Concerns have also been raised about the role of national and international financial institutions in pushing the projects further, the conditions these institutions impose for driving profits and their impacts on local communities. Issues of wider public consultations and the role of people's representatives within local governments in decision-making processes have been sidelined.

Concerns over environmental degradation, land acquisition, dispossession and loss of agricultur-based livelihoods have been voiced by various groups including grassroots organisations, farmers, academics and researchers. Rather than applying the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act of 2013, projects implemented under DMIC use land-pooling mechanisms for procuring land.It has been argued that the land-pooling mechanism is ambiguous and misleads land owners into handing over their lands for project implementation.

For instance, in Dholera Special Investment Region, the land-pooling mechanism works by taking 50 per cent of the land of each owner "deducted" at market price, and the rest returned to the original owners as "developed" plots in re-designated zones under the new plan criteria. A betterment charge would be levied on the original owners for the provision of new infrastructure facilities, deducted from the compensation award for 50 per cent of the land. In addition, each affected family is promised one job per family in the Dholera SIR. It also includes Dholera Smart City,[18] claimed to be the first smart city in the country with a size twice of Delhi and six times of Shanghai. It has already received INR 30 billion in funding from the government and looks forward to

15 International Finance Corporation, Continental Warehousing Corporation (Nhava Seva) Limited, Source URL - https://disclosures.ifc.org/#/projectDetail/SII/36727

16 AIIB, Source URL - https://www.aiib.org/en/projects/proposed/2019/nangal-chaudhary-integrated.html

17 DMICDC looks to tap pension, equity funds, The Economic Times, Source URL - https://economictimes.indiatimes.com/news/economy/infrastructure/dmicdc-looks-to-tap-pension-equity-funds/articleshow/62991939.cms

18 Dholera Smart City, Source URL - https://www.dholera-smart-city.com/

attract more from private investors.[19]

Land pooling is done under Gujarat Town Planning and Urban Development Act (GTPUDA), 1976 as enabled under the Gujarat Special Investment Region Act, 2009. While the town planning law contains provisions for the participation of local bodies and residents in the determination of compensation and award, it makes no provisions for ascertaining consent to land pooling for the project.

The re-zoning under the new plan also sacrifices agricultural land by categorising the land as industrial or urban space. Hence the land owners who are supposed to benefit from this practice lose their ability to farm or provide for themselves as they had done before. Another concern with the land-pooling scheme is the time-frame that the redevelopment requires. The owners will not receive their newly developed land within a year and thus must wait until development is completed.[20]

The Dighi Port and Industrial Area in Maharashtra and Dharuhera Industrial Estate in Haryana have seen protests from local people against land acquisition and setting up of industries in the region.[21]

Concerns have also been raised that the immense land requirements of the projects under DMIC maycreate land speculation and social conflicts. The potential for social unrest becomes very high when public investments are channelled into real estate and industrial projects without providing basic infrastructure for local industries and population centres. Evidence suggests that large-scale infrastructure projects exacerbate, directly or indirectly, household and regional inequalities.[22]

Another major criticism of DMIC is the environmental impact of the proposed large-scale urbanisation and industrialisation. The land for the greenfield projects will require deforestation in the states that are part of the project. For instance, 70 per cent of mangroves around Mumbai have been lost to land reclamation and other development projects and less than 45 sq km of mangrove forests remain.[23] Land will not only be taken from farmers but also from the natural environments of various types of Indian wildlife. For example, Dholera is planned to be built close to the Velavadar National Park that has a blackbuck sanctuary. Concerns have been raised about how the industrial city will impact the national park that is home to many endangered species like blackbucks,

19 Smart Cities Mission in India – Footprints of International Financial Institutions by Gaurav Dwivedi, Source URL - https://www.cenfa.org/publications/booklet-smart-cities-mission-in-india-footprints-of-ifis/

20 The Emperor's New City by Preeti Sampat, Source URL - https://www.thehinducentre.com/multimedia/archive/02878/Dholera-_The_Emper_2878422a.pdf

21 Delhi-Mumbai Industrial Corridor: people oppose Manesar-Bawal segment of project at public hearing by Soundaram Ramanathan, Source URL -https://www.downtoearth.org.in/news/delhimumbai-industrial-corridor-people-oppose-manesarbawal-segment-of-project-at-public-hearing-42655

22 Infrastructure, Institutions and Industrialisation: The Delhi-Mumbai Industrial Corridor and Regional Development in Gujarat and Uttar Pradesh by Shahana Chattarraj, Source URL - https://www.orfonline.org/wp-content/uploads/2018/12/ORF_Issue_Brief_272_DMIC.pdf

23 India lost 40 per cent of its mangroves in the last century. And it's putting communities at risk by Soumya Sarkar, Source URL - https://www.thehindu.com/sci-tech/energy-and-environment/india-lost-40-of-its-mangroves-in-the-last-century-and-its-putting-communities-at-risk/article22999935.ece

wintering harriers, wolves and Lesser Florican among other species of birds. It has also been noted that Dholera will sit within the migratory route of wintering birds to India.[24] The risks associated with deforestation are well known, notably wildfires, drought like conditions, and depleted groundwater.[25]

The large-scale industrialisation that the DMIC envisions will also require immense amounts of water, which will be taken away from farmers and domestic users alike. In areas of Madhya Pradesh and Gujarat already suffering from severe water stress, the implementation of large-scale industry will make conditions only worse. It is estimated that DMIC will have to extract two-thirds of the total water needed from rivers while the rest will be extracted from severely stressed groundwater aquifers, which are already polluted and overexploited. It is suggested that the regions where DMIC is being planned face groundwater deficit, hence the water would be diverted from the rivers. The utilisable flow in the rivers of the region is already fully utilised by current users, so developing DMIC will further worsen the health of the rivers.[26]

A majority of DMIC projects are being implemented through PPP mode with SPVs being created to execute specific projects. Several instances have shown that the track record of PPPs in India is not encouraging, and many of these projects have looked for public support to make them financially viable in terms of grants, loans and concessions.[27] While discussing SPVs, it is important to note that DMIC initially had Infrastructure Leasing and Financial Services (IL&FS) as an equity shareholder in the project, though it appears that equity stake held by it was subsequently replaced by public sector backed entities HUDCO, IIFCL and LIC.

IL&FS was mired in legal issues due to its irregular business practices that were revealed in 2010. It was able to use SPVs to skirt checks and balances concerning its business dealings. It managed to allocate project funds to its subsidiaries, which allowed money to be taken from the projects they were intended to fund. SPVs are registered as private entities with near full autonomy. They are tasked with regulating themselves within the scope of what projects they are established for. Using SPVs, IL&FS was able to misallocate huge funds that were supposed to go to projects they were in charge of. It handled many DMIC projects until it was forced to divest from the DMIC in 2013.[28] It is a matter of grave concern that such malpractices can happen again given majority of the projects are now implemented through a SPV based model.

24 Delhi –Mumbai Industrial Corridor A Hype-Busting analysis, A Study initiated by National Alliance of People's Movements, Source URL - https://file.ejatlas.org/docs/DMIC_Report_I_Rishit.pdf

25 23,716 Industrial Projects Replace Forests Over 30 Years by Himadri Ghosh, Source URL - https://archive.indiaspend.com/cover-story/23716-industrial-projects-replace-forests-over-30-years-82665

26 Delhi-Mumbai Corridor A Water Disaster in Making? By Romi Khosla, Vikram Soni, Economic & Political Weekly, March 10, 2012, VOL XLVII No 10

27 IL&FS Scam: Justice DK Jain Approves Transfer of Gurgaon Metro Link to HUDA by Moneylife Digital Team, Source URL - https://www.moneylife.in/article/ilfs-scam-justice-dk-jain-approves-transfer-of-gurgaon-metro-link-to-huda/58124.html

28 A many layered circus: Riddled with conflict of interest, IL&FS exposes the underbelly of our governance by Gajendra Haldea, Source URL - https://timesofindia.indiatimes.com/blogs/toi-edit-page/a-many-layered-circus-riddled-with-conflict-of-interest-ilfs-exposes-the-underbelly-of-our-governance/

CONCLUDING REMARKS

Over the past couple of decades, India has witnessed a surge in the construction of mega infrastructure projects across the country. These projects were envisaged to accelerate economic growth and also provide investment opportunities to attract private investors and FDI. Simultaneously, policies and regulations that made it easier to do business in the India were brought in by scrapping several land, labour and environmental regulations in the past few years. PPPs are being promoted in various sectors with claim that they will make project implementation more efficient and bring in private investments. However, the experience of PPP projects in different sectors doesn't bear out the claim. It has been well documented that PPPs raise funds for their investments from public sources as well as other forms of public support for their projects. Besides, SPVs and PPPs lack government oversight and accountability mechanisms and bypass local governments and people's representatives in the decision-making process.

The entire emphasis so far has been on how to secure the huge capital needed to implement these mega projects in order to accelerated India's economic growth. There has been little public debate about the implications of these massive projects and investments for rural and urban communities, agriculture, land and water commons as well as ecology. Besides, several financial institutions looking to invest in infrastructure projects lack appropriate environment and social safeguard policies as well as transparency and accountability mechanisms. Such mechanisms are imperative in order to hold these myriad institutions accountable not only for the integrity for their investments but also their impacts on the local communities in terms of loss of livelihood, displacement, environment damage. In addition, they should be also held to their claims and promises of appropriate resettlement and rehabilitation of displaced people. Making all such investments accountable is all the more important as increasing number of private investors and market-based instruments are being used finance these projects for creating revenue streams and extracting profits.

Mega infrastructure projects might look good on paper but ground realities suggest that they have serious implications for the lives of the local people, democratic governance processes, natural resources, wildlife habitats and the delicate ecological systems.

"Pickled" Infrastructure and Connectivity: Locating Community Engagement in Northeast India's Infrastructural Transformation

MIRZA ZULFIQUR RAHMAN

'Pickled' Roads and Connectivity. The road between Tezu, in Lohit district and Roing, in Lower Dibang Valley district, of Eastern Arunachal Pradesh. Photo by Mirza Zulfiqur Rahman

'PICKLED' INFRASTRUCTURE AND CONNECTIVITY IN NORTHEAST INDIA

The distant rumblings of a raging thunderstorm in this far-eastern corner of Arunachal Pradesh, nestled in the Eastern Himalayas, were drawing to a close by early morning. As we were driving from Tezu, the headquarters of the Lohit district, making our way to Roing, the headquarters of the Lower Dibang Valley district, the ravages of the storm from the earlier night was evident. The wide, freshly minted road through the undulating forests was covered in layers of fallen leaves and broken branches of trees, almost making a beautiful carpet. This was a new road alignment cut through the forests, a harbinger of connectivity between the two district capitals, built under the Trans-Arunachal Highway project, envisioned by planners of the central government in New Delhi to provide internal connectivity in Arunachal Pradesh, various parts of which were for decades connected by an arterial network of roads crisscrossing through Assam.

It was still weeks to go before the monsoon of 2016, and after driving for 40 minutes from Tezu, we had to stop at the yet-unfinished bridge over the Diffo river. While assessing if we could take our vehicle through the temporary arrangement underneath the bridge – a platform thrown together from metal and wood over the main channel of the river – two young men arrived on their car. The water level had risen considerably from the rains last night, and there were

Scan for Listening Article

now multiple channels of the river, which had to be crossed under the unfinished bridge, apart from the main channel. The men were from Roing, both from the Idu-Mishmi community, travelling back from Tezu after attending a marriage. After a quick assessment of the river water, they decided to return and take the old road through Sadiya in Assam, advising us to follow the same.

It was only about 30 minutes' drive from across the bridge to Roing, but now we had to make a turn, drive back almost all the way to Tezu, take a narrow rickety state public works department (PWD) maintained road through to Sadiya, cross an inter-province border check-gate to enter Assam, drive for about 40 minutes in Assam, and cross another inter-province border check-gate to enter Arunachal Pradesh, and then finally reach Roing after about three hours in total. We caught up again with the two young men at a tea stall on the way, and struck up a conversation. One of them emphatically declared in Hindi, 'Iss raaste ka achhar banake rakh dena chahiye, koi kaamka nahi hai' (we should make pickles of these roads and keep them, they are of no use), clearly underlining his frustration at having to make the long journey back to Roing. His statement instantly struck me of how we in the region loved to make pickles out of items we had less use of at present.

The art of making pickles is not new to people of Northeast India, and we make it out of every possible thing we eat. It also rings true of the

A makeshift crossing made of wooden planks under the Diffo bridge and a makeshift steel platform crossing under the Diffo bridge. Such platforms were regularly washed away during the monsoons, as the river streams swelled up.
Photo by Mirza Zulfiqur Rahman

Left, A local Idu-Mishmi lady looks on at the construction of the Diffo bridge in May 2017. This bridge took a total of 7 years and 9 months to complete construction; right, Construction workers on the main structural scaffolding of the Diffo bridge. The workers keep shifting to other projects, when there are significant delays.   Photo by Mirza Zulfiqur Rahman

rush of infrastructure projects we have seen in the region over the past decade. At one level it has definitely created a lot of physical connectivity infrastructure in the form of bridges and roads, which the government has portrayed as its successes, but has not been able to take forward simultaneously the region's social infrastructure priorities/needs. It is in context of the (in)ability of local communities to meaningfully use built physical infrastructure, and their participation in decision-making on such infrastructural development aspects, that 'pickled' infrastructure and connectivity is used as a metaphor. It denotes future or intermittent use of built physical infrastructure and connectivity, hence, is 'pickled'.

'PICKLED' INFRASTRUCTURE AND CONNECTIVITY WITHIN THE NATION-STATE CONTAINER

The world that we live in modern times is compartmentalised into states and regions, and territorial borders are the defining characteristics of such compartmentalisation (Newman 2010). Political map-making in the modern nation-state system depict nation-states as confined to fixed drawn lines of territory, to such an extent that they seem to be 'natural' formations (Anderson 1995). Nation-states have been described as a container in terms of territoriality (Taylor 1994), as 'bordered power containers' (Giddens 1985), lending context to territorial border fixities, to the 'nation-state container'. It is within this nation-state container, where the rush of infrastructure development and connectivity projects are being executed by New Delhi in Northeast India. The boxed-in external borders are hard in nature, given the past history of insurgency and ethnic conflict in Northeast India[1].

After the end of the Cold War in the early 1990s, the emergence of globalisation and its challenge to territorial sovereignty of nation-states around the world has been the pivot of international relations, cross-border flows and exchanges. Over time, the practice of geopolitics has been closely associated with the territorialisation of political space, building and performing states as definitive bounded territories, constructing domestic order through different methods of government, constituting the 'international' as the 'inter-state' (Moisio and Paasi 2016). New Delhi initiated its Look/Act East Policy in the early 1990s, deployed it in Northeast India by 2004-05 as a driver of infrastructure development and connectivity projects, with a promise of opening up the region as a springboard to Southeast Asia along the continental route[2].

The complexity of the layered flavours of 'pickled' infrastructure and connectivity

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1 For more on the history of insurgency and ethnic conflict in Northeast India, please see Sanjoy Hazarika, Strangers of the Mist: Tales of War and Peace from India's Northeast (New Delhi: Penguin, 2000); Sanjib Baruah, Durable Disorder: Understanding the Politics of Northeast India (New Delhi: Oxford University Press, 2005); and Udayon Misra, India's Northeast: Identity Movements, State and Civil Society (New Delhi: Oxford University Press, 2014).

2 For more on India's Look/ Act East Policy and Northeast India please see Mirza Zulfiqur Rahman, 'India's Look East Policy: Focus on Northeast India', in India's Foreign Policy: Old Problems, New Challenges, D Suba Chandran and Jabin T Jacob (eds.), (New Delhi: MacMillan, 2011); Thongkholal Haokip, India's Look East Policy and the Northeast, (New Delhi: Sage Publications, 2015); and Gurudas Das and C. Joshua Thomas (eds.), Look East to Act East Policy: Implications for India's Northeast, (South Asia Edition: Routledge, 2016).

in Northeast India lies within the nation-state container characterised by hard external borders, primarily based on the decades-long and continuing security dilemma of New Delhi over its borderlands. At one level, a lot of built infrastructures are evident within the nation-state container in Northeast India, which is fragmented and piecemeal in nature, without a grand connecting vision or critical mass internally. At another level, the promise of opening up Northeast India through the Look/Act East Policy has not gained meaningful traction on the ground, with selective and controlled opening-up[3], intermittent grand car rallies, with very little people-to-people connectivity. This lag in opening-up adds to the overall sense of 'pickled' infrastructure and connectivity.

The visibility of built infrastructure such as roads and bridges by the borderland communities of Northeast India makes for their strong imaginations of connectivity, both within and across the borders of the nation-state container. It is not that the borderland communities do not see or understand the future promise of built infrastructure and connectivity; however, they also realise that they live in a long shadow of infrastructure and connectivity to be meaningfully utilised by them, the impacts in their daily life, the sheer futility for the time-being, and hence the sense of 'pickled' infrastructure and connectivity. The potential and long shadow of the infrastructure built and connectivity promised to the borderland communities looms large and somewhat unpredictable in the horizon, wrapped in speculation, 'pickled' in the nation-state container.

UNPACKING AND SCAFFOLDING NORTHEAST INDIA: MAKING SENSE OF INFRASTRUCTURING

Moving away from the broad-brushed nature of engagement of India's Look East/Act East Policy with Northeast India, and the accompanying infrastructure development push in the past decade, it is pertinent to examine the role and positioning of states that constitute the region of Northeast India, in the larger development and connectivity discourse. This will enable understanding of the nature, strength and weaknesses of the intra-Northeast social, economic, political and institutional scaffolding that the Look East/Act East Policy needs to take into account to make infrastructure meaningful, participative and sustainable for communities across the region. New Delhi simply cannot hope to join A and B together with bridges and roads and hope that such built infrastructure will talk to communities automatically, and ensure peace, progress and prosperity in Northeast India.

The core questions that provinces and communities in Northeast India face are related to the reconciliation of different trajectories of socio-economic growth and indicators from past development to minimise the impact of big infrastructural interventions and the conflict that it can create. An example of this is the ecological conflict owing to large hydropower infrastructure planned for the region, accompanied by weak social and environmental impact assessment standards and practices. Such reconciliation of inequality will require robust social-economic, political and institutional scaffolding, which will

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3 For instance, the Stilwell Road opening has been long in the aspirations of the local communities inhabiting parts of Upper Assam and Eastern Arunachal Pradesh. For more on this please see Mirza Zulfiqur Rahman, 'The abandoned route through India, Myanmar and China: why the Stilwell Road should be restored', The Conversation, 11 October 2016. URL: https://theconversation.com/the-abandoned-route-through-india-myanmar-and-china-why-the-stilwell-road-should-be-restored-65497

The pace of life in rural Arunachal Pradesh, where local people use such bamboo suspension bridges to connect from their remote villages to the main road.   Photo by Mirza Zulfiqur Rahman

prepare communities to be able to meaningfully participate in the gains from any large scale infrastructural development and connectivity that grand visions of Look East/Act East Policy brings to Northeast India. Community participation in the decision-making process, importance accorded to traditional knowledge systems and community institutions, and its capacity building to be able to absorb the benefits of such infrastructure development is the necessary social scaffolding to ensure sustainable development.

Infrastructure development in Northeast India without proper socio-economic, political and institutional scaffolding can lead to creating potential chokepoints, where local communities are unable to participate meaningfully and sustainably, instead of the mandated vision of promoting connectivity. The mandated vision is of connecting Northeast India to Southeast Asia through the continental route and beyond, words such as 'springboard' and 'bridgehead' have been used to describe the connectivity vision for the larger region, but a meaningful opening-up is not yet seen on the ground. The pattern of development through the mindless and rushed sense of infrastructure creation in the region is already having social and environmental concerns and impact in many parts of Northeast India, for instance the Kaladan Multimodal Transport and Transit Project in Mizoram, Trans-Arunachal Highway Project in Arunachal Pradesh and Dhola-Sadiya bridge over the Lohit river in Assam. The new trajectories of development in Northeast India can create newer layers of conflicts, as communities try to grapple with them[4].

We all seem to know what physical road infrastructures are and what they do. They are meant for connecting spaces, ensure mobility, and are seemingly innocuous, but can easily take many trajectories and can indeed have surprising effects and histories. It is important to look at the systemic efforts of governments to stabilise the symbolic logic

4 For more on this, please see Mirza Zulfiqur Rahman, 'Bridges and Roads in Northeast India may drive small tribes away from development', The Conversation, 6 June 2017. URL: https://theconversation.com/bridges-and-roads-in-north-east-india-may-drive-small-tribes-away-from-development-78636

of infrastructure (Larkin 2008), and analyse the deployment of such infrastructure as modes of control, rule, accumulation politics, resource extraction and even underlining territorial presence within the nation-state container[5]. The manner and method of infrastructure development and connectivity can bring intended and unintended outcomes for communities in Northeast India, given the contrasting frames through which the symbolic logic of infrastructure is deployed in the region.

INFRASTRUCTURING NORTHEAST INDIA THROUGH THE SYMBOLIC LOGIC OF NATIONAL SECURITY

The invoking of national security by New Delhi in the infrastructural development discourse in Northeast India makes for the framing of the frontier region as an essentially strategic space in the larger national imagination. Northeast India is seen primarily as a national security and strategic geography, which is in direct contestation with the socio-spatial sacred geography consciousness of communities inhabiting this space. The strategic construction of Northeast India as a national security dominated space versus the social construction of spaces in Northeast India by the communities characterises the clash of logics in the process of infrastructuring Northeast India's frontier spaces. Infrastructure development for national security goals is an attempt towards the coupling of community spaces within Northeast India. This is evidenced by the central government's urgency to rush through large infrastructure projects, both roads and hydropower dams, projected as potentially transforming Northeast India's economy, but at the same time have the potential to disrupt the sensitive ecology and social fabric of Northeast India.

Such coupling of community spaces brings forward the coupling of unequal spaces within Northeast India, which makes communities vulnerable to the intended and unin-

The image of the symbolic logic of infrastructure being pushed by the government, the Dhola-Sadiya bridge, also known as the Bhupen Hazarika Setu.
Photo by Mirza Zulfiqur Rahman

The road to the India-Myanmar border, the Stilwell Road. Connectivity aspirations of local communities remain confined well within the nation-state box.
Photo by Mirza Zulfiqur Rahman

5 For a detailed analysis of these aspects in the context of Arunachal Pradesh, please see Mirza Zulfiqur Rahman, 'Territory, Tribes, Turbines: Local Community Perceptions and Responses to Infrastructure Development along the Sino-Indian Border in Arunachal Pradesh', Institute of Chinese Studies Occasional Paper Series, No. 7, June 2014, Institute of Chinese Studies, Delhi, India. URL: http://www.icsin.org/uploads/2015/04/12/dc44619f98243f09109da6867923a56a.pdf

tended effects of such linking, especially when such community spaces include common resources such as forests, rivers and sacred ecology. The national security discourse is deployed to push through infrastructural interventions in frontier areas of Northeast India, which includes road projects and hydropower dam projects of military and exploitative scale, and communities fail to grasp fully the implications of such grand scales of infrastructural intervention in their relatively smaller and traditionally sustainable spaces. The terms of reference for such scales to be deployed is not based upon a community participative process of decision-making. The environmental and social impact assessments of large infrastructure projects are seen as hurriedly done and without proper social and scientific data being collected; and when local communities raise objections, the national security logic is employed by the government, even branding protestors as anti-national.

The invoking of the national security discourse essentially means that the community is expected to undertake significant risks[6] to their socio-spatial and sacred spaces, forego a process of democratic decision-making on the parameters, terms of reference, equity, sustainability and the scale of infrastructural interventions. This is directly linked to a larger sense of democratic deficit that characterises the space of Northeast India and its communities within the larger national space of India. Northeast India sends a cumulative total of 25 members to the Lok Sabha, the lower house of Parliament of India; the province of Assam alone sends 14. None of the other seven states that comprise Northeast India sends more than two members, and this reflects a sense of democratic deficit for communities in the region. Additionally, the elected representatives are seen as fragmented politically within Northeast India, enabling New Delhi to employ the classic colonial strategy of divide and rule, affecting consensus on issues related to ecology, livelihood and in regional policy institutions such as the North Eastern Council (NEC).

The social impact assessment and the environmental impact assessment processes in the context of infrastructural interventions in Northeast India are not done in a manner that regulates the potential social and environmental costs and risks to communities involved. The bypassing of such assessments is done in a two-pronged strategy by the government departments, one by invoking national security, which necessitates the urgency of the infrastructural intervention, and the other by fulfilling on a fast-track basis the development lag that Northeast India has seen over the decades. This has the effect of pitting one community against the other, one province against the other within Northeast India, and in the process takes forward the symbolic logic of infrastructure through national security, without framing a sustainable engagement policy with the communities. The infrastructure is meant towards coupling of spaces within Northeast India, but the cumulative impact assessment of such coupling is thus bypassed, and not even seen as a necessary condition.

WHAT, WHERE AND WHEN OF INFRASTRUCTURE AND CONNECTIVITY?

Northeast India has been infrastructure-deficient for many decades following India's

6 For more on the aspect of risks for communities in Northeast India from large-scale infrastructure, especially hydropower, please see Amelie Huber, Hydropower in the Himalayan Hazardscape: Strategic Ignorance and the Production of Unequal Risks, Water (2019), 11, 414; doi:10.3390/w11030414

Independence, and bureaucrats sitting in New Delhi largely determined the content and nature of infrastructure in the region, and local community consultations were never the norm. It was a frontier region to be administered and there was a sense of trust deficit between New Delhi and local communities. It was the conflict with China in 1962 that forced India to take greater notice of the significance of the Northeast as a critical frontier in its national security calculations. Chinese troops had advanced as far as Tezpur in Assam and India was clearly on the defensive regarding critical infrastructure required for faster troop deployment. After the war was over, India pushed towards building a basic level artery system of roads and military infrastructure on its borders.

At the same time, however, New Delhi was wary of developing a strong infrastructural presence in Arunachal Pradesh and, till the end of the past decade, followed a deliberate policy of continuing to neglect the development of Arunachal Pradesh and parts of the upper banks of the Brahmaputra in Assam, lest Chinese troops roll down the hills again (Verghese 2012). The roads built immediately after the 1962 war and in subsequent times were only targeted at cosmetic development and geared towards meeting India's troop deployment needs. It was never going to be enough for the genuine development of the people of Arunachal Pradesh, and it was not meant for purposes of cross-border trade. It is evident now in the closed border policy with China, and the defunct Stilwell Road. Even for the targeted troop deployment purpose, India clearly lagged China (Pandit 2009) as the latter made rapid strides in building infrastructure all along its critical border areas, especially in Tibet (Chansoria 2011), in sync with its Western Development Strategy through the 1990s, developing roads and hydropower dams.

The sense of infrastructural scrambling by New Delhi in Northeast India happened around the year 2008, when the Trans-Arunachal Highway project, Kaladan Multi-Modal Trade and Transit project in Mizoram, and Dhola-Sadiya bridge project in Assam were announced/ initiated. Rippa et al (2019) discusses Star and Ruhleder's (1996) concept of the 'when' of infrastructure, which posits that infrastructure is a fundamentally relational concept and emerges for people in practice, connected to their daily activities. The content of infrastructure is important, so is its use by the people in their daily life. The rush of physical infrastructure and connectivity projects in Northeast India without adequate social infrastructure and the capacity for the local people to use them keeps them 'pickled'.

The power of infrastructure to achieve political aims (Larkin 2013), and the multi-temporality, in terms of spectacular profiles and discursive power, that the striking visibility of built and planned infrastructure and connectivity projects implies (Rippa et al. 2019) explain and underline the symbolic logic of infrastructure being pushed by New Delhi in Northeast India. The image of Prime Minister Narendra Modi, as he walks alone along the Dhola-Sadiya bridge during its inauguration in May 2017, patting the railings of the bridge is the spectacular profile and discursive power of the infrastructure that is leveraged for political aims. However, a compartmentalised view of physical infrastructure and connectivity by New Delhi, and inability to use local communities as cultural connectors[7], defeats the symbolism.

7 For more on local communities as cultural connectors in the context of Northeast India and its international neighbourhood, please see Mirza Zulfiqur Rahman, 'Mizoram as "Cultural Connector" in India's Look East/ Act East Policy', Eleventh Course, Border Bites, 15 January 2019, Border Briefings Series of the Kyushu University Border Studies (KUBS), Kyushu University, Fukuoka, Japan. URL: http://cafs.kyushu-u.ac.jp/borders/kanri/wp-content/uploads/Border-Bites-11_Rahman_Mizoram-1.pdf

THE LINEAR AND MEANDERS OF INFRASTRUCTURE AND CONNECTIVITY

The symbolic logic of infrastructure in Northeast India is not to be seen in an overtly simplistic 'linear' manner of peace progressing to prosperity. It has to essentially 'meander' the social, political, ethnic, economic, cultural, physical and ecological landscape of Northeast India, in order to make meaningful and sustainable connections with and across communities inhabiting this diverse frontier region. The understanding of meandering pathways to peace, progress and prosperity comes from the idea of imitating the natural geographical patterns of the many rivers in the region, which fits into the traditional worldview and understanding of communities living and moving along meandering rivers from time immemorial. Infrastructure development therefore needs to be organically linked and understood by communities.

The meanders of the natural landscape of the region, imitating the geography and the meandering rivers, instead of linear straight lines of development. Photo by Mirza Zulfiqur Rahman

The intense scrambling for infrastructure and connectivity projects in Northeast India can be explained by the term 'hyperstructures' (Rippa et al. 2019), which is infrastructure associated with a scale and symbolism that exceeds their economic rationality (ibid). In the context of Northeast India, local communities are unable to use such 'hyperstructures' meaningfully, at present kept 'pickled', accompanied by a sheer incalculability of social and environmental costs and risks of such projects. The symbolic logic of infrastructure pushed by the government in Northeast India in terms of protecting the nation-state container from external threats helps promote a speculative logic of infrastructure[8], directed at creating newer sites and reinforcing old sites of accumulation politics and resource extraction within the nation-state container.

Therefore, the meandering pathways of peace, reconciliation and development is what I invoke to help understand the dynamics of infrastructure and connectivity in Northeast India, which is not homogeneous in nature but has many overlapping facets of interaction and is largely interdependent. The interconnectedness and

8 For more on the speculative logic of infrastructure development in the context of Northeast India, please see Mirza Zulfiqur Rahman, 'A Speculative River: Why Communities along Brahmaputra need much more research-backed information', Scroll, 18 October 2018. URL: https://scroll.in/article/894189/a-speculative-river-why-communities-along-brahmaputra-need-much-more-research-backed-information

the diverse ethnic claims, contestations and development aspirations of communities in Northeast India, require an understanding of the conflict dynamics, political, social, economic and ecological. A concerted, coherent and connected vision of peace, progress and prosperity for the entire region cannot be achieved in a piecemeal, symbolic and speculative manner. The inability to address inequality and sustainability aspects leads to a sense of infrastructural chaos and futility in developing the region.

As we drive along the same road in February 2019, this time going from Tezu to Roing, the construction of the bridge over the Diffo river is finally complete[9]. However, there are few vehicles on the roads, and long stretches of the road wear a deserted look. As we move towards Chowkham, crossing the newly-constructed Alubari bridge over the Lohit river, a group of local Tai-Khamti youth block the road, on account of their anti-Permanent Residence Certificate (PRC) protests[10]. I ask the protestors if they work in shifts to blockade the road over two long days. They laughingly point out that earlier they had to simply squat in the middle of the narrow road to ensure the blockade, now they also have to line up vehicles across the wide road. As we turn around to take the long old road back through Tezu via Parshuram Kund and Wakro towards Chowkham, the taste of 'pickled' roads linger.

The information stone on the Diffo bridge, after it was finally completed in December 2018 and inaugurated by India's Defence Minister in January 2019.
Photo by Mirza Zulfiqur Rahman

The vehicles neatly lined up by the Tai-Khamti youth across the road to Chowkham, enforcing the road blockade during the anti-PRC protests, February 2019.
Photo by Mirza Zulfiqur Rahman

9 The bridge of the Diffo river is 426.60 mts long, just under half a kilometre long, and the construction started in March 2011 and completed in December 2018, taking a long 7 years 9 months.

10 For more on the anti-Permanent Residence Certificate protests in Arunachal Pradesh, please see ArunabhSaikia, 'What is behind the violent protests in Arunachal Pradesh?' Scroll, 25 February 2019. URL: https://scroll.in/article/910254/arunachal-pradesh-hit-by-economic-blockade-as-six-minority-groups-demand-permanent-resident-status

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Netting India's villages

KIM ARORA

Early this August, India's Andaman and Nicobar islands got their first taste of high-speed Internet[1] after years of patchy, low-speed connectivity. The 2,312 kilometres (km) long submarine optical fibre link facilitating this runs from Chennai in the southern mainland to the capital of the group of 572 islands, Port Blair. Only 37 of these islands are inhabited. The optical fibre further connects the capital to seven other major islands of the archipelago. Situated eastwards of the Indian peninsula, Port Blair is 1,362 km away from Chennai. The island capital is, by contrast, just 876 km away from Bangkok in Thailand. During the British colonial rule in the 19th century, it was the chosen site of the infamously isolated Cellular Jail, where political activists and freedom fighters would be imprisoned. In the 21st century, it advertises luxury holidays to pristine beaches.

On 15 August 2020 – India's Independence Day – Prime Minister Narendra Modi announced that the union territory of the Lakshadweep[2] islands to the west of the peninsula would also get a similar optical fibre connection within 1,000 days.

These two projects are parts of a larger, almost decade-long Indian programme to connect the most remote parts of the country with broadband internet using optical fibre cables. Over the years, the connectivity programme, called BharatNet, has faced slowdowns, hit roadblocks, missed targets, and finally managed to meet some goals under repeatedly revised deadlines as communication technologies made steady advances globally. The issues and events impacting this programme are as numerous as they are complex. They include a rapidly growing online market, private sector investment and a complex regulatory matrix of ministries, central government departments, and state-controlled service providers.

In 2020, the project was hit by the double whammy of a raging global pandemic, and a military escalation along India's northern border with China, the source of the bulk of India's telecom and internet infrastructure equipment. Here, we'll look at a brief history of BharatNet, issues leading to its delays, how India's hostilities with China are influencing India's broadband internet ambitions, and what it all means for the average internet user on the ground.

Scan for Listening Article

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1 https://www.livemint.com/news/india/what-internet-means-to-an-island-economy-11598278668106.html

2 https://timesofindia.indiatimes.com/india/in-next-1000-days-lakshadweep-will-be-connected-to-submarine-optical-fibre-cable-pm-modi/articleshow/77558772.cms

THE STORY SO FAR

The inception of India's broadband expansion programme dates back to 2011, when it was called National Optical Fibre Network or NOFN. It was renamed BharatNet in 2015 (Bharat is the name for India in several Indian languages). At the time of the programme's inception nearly a decade ago, it was the norm for the average Indian mobile phone owner to turn off data services when not in use to save money. Much has changed in the consumer tech landscape since. The world leapt from 2G mobile internet connections to 3G, which has now been replaced by 4G, even as trials for 5G are underway. Video calling, earlier a fancy nice-to-have, is today's essential. The Internet of Things (IoT) has become a reality, as have voice-based home assistants. Augmented Reality technology became part of a viral mobile game while Virtual Reality headsets went on sale online.

The number of India's internet subscribers kept up with these changes. According to the Indian government's own data[3], the percentage of internet subscribers among Indian inhabitants went up from 13.45 per cent in March 2013 to 48.48 per cent in March 2019.

Cheap smartphones that filled the domestic market in recent years spurred these developments on. Many of these mobile phones would either be manufactured in China or have components sourced from China and assembled in India. Chinese mobile devices dominate the Indian market even today, with manufacturers such as Oppo, Vivo and Xiaomi cornering[4] 72 per cent of the market share in India in 2019.

Mobile internet saw a significant boom in September 2016, after the launch of a new telecom company called Jio from business behemoth Reliance Industries Limited. This started a nationwide price war among internet service providers in India, who gave data away nearly for free just to stay afloat. While lowering prices for the consumer, such competitive pricing exacerbated the already deteriorating financial situation of private telecom players.

As of May 2020, the country's top three telecom companies were under a collective debt of Rs.3.9 trillion (EUR 45.37 billion). At least 16 telecom companies have shuttered[5] India operations in the last ten years. The capacity of telecommunication companies (Telcos) to invest in fibre expansion was adversely impacted.

On the political front for India, its relationship with neighbouring China has rapidly deteriorated in the last few years. After the last major flashpoint[6] in 2017, the simmering tensions along the Indo-Chinese border escalated[7] to a full blown physical confrontation on 15 June 2020. Troops of the two countries clashed in the strategically significant border region of the Galwan valley in Northern India's Ladakh. Many soldiers died on both sides of the border.

This escalation has had a direct consequence on India's broadband and 5G expansion

3 https://dot.gov.in/sites/default/files/Telecom%20Statistics%20India-2019.pdf?download=1

4 https://www.counterpointresearch.com/india-surpassed-usa-become-second-largest-smartphone-market-world-reaching-158-million-shipments-2019/

5 http://www.millenniumpost.in/opinion/indias-telecom-despair-387430

6 https://www.indiatoday.in/magazine/cover-story/story/20170717-india-china-bhutan-border-dispute-doklam-beijing-siliguri-corridor-1022690-2017-07-07

7 https://www.bbc.com/news/world-asia-india-53076781

plans. Much of the equipment for the same, such as optical fibres[8], microwave antennae or "hops"[9] have come from China in the past – something the Indian federal government is now approaching with caution. Apart from this, other kinds of telecom equipment[10] like base transceiver stations currently deployed in India have also come from Chinese manufacturers.

Thrown into this mix of business and politics is the novel coronavirus disease (COVID-19) pandemic, which has intensified the already growing demand for stable, high speed internet. Increasing numbers have taken to remote work, with school classes to big-ticket conferences all shifting online for the foreseeable future.

This is the outer framework of events and developments within which BharatNet has made its slow and arduous progress over the last decade. As for the programme itself, its evolution is a tedious labyrinth of inter-departmental operations, albeit comprehensible when one starts from the very beginning.

THE BHARATNET PROJECT – ORIGINS, DELAYS AND PROGRESS

The programme as envisaged in 2011 was meant to connect 250,000 Gram Panchayats, which are village-level administrative units or village councils, with optical fibre cables capable of delivering 100 megabytes per second (mbps) broadband internet connections within two years. Under the Union government, an organisation called Bharat Broadband Network Limited or BBNL was created with the exclusive function of coordinating with other state-run organisations responsible for laying the optical fibre and operationalising broadband internet in the Indian hinterland.

The programme could not[11] meet its initial two-year target for completion. By the end of 2013, it was clear that deadlines would have to be extended by another two years.

In March 2015, a government-instituted review committee assessing the programme issued a report diagnosing its delays and making recommendations[12] to bring it back on track.

It identified lack of planning and coordination between departments as a key problem hindering implementation. Yet another roadblock was the basic lack of electric power in some of the regions the programme targeted. "Lack of skilled manpower", and not adequately taking into account the topography and geographical conditions of the areas where the fibre was to be laid, were some of the other roadblocks identified in the report along with "near absence of any inter-linkage with the providers of content and services" and "excessive emphasis on cost controls".

8   https://tradingeconomics.com/india/imports/china/optical-fibers-bundles-polarising-sheets-unmounted-optical-elements

9   https://economictimes.indiatimes.com/industry/telecom/telecom-news/airtel-deploys-100-hops-of-huaweis-5g-technology/articleshow/71381861.cms?from=mdr

10 https://www.firstpost.com/tech/news-analysis/bsnl-to-invest-rs-6000-crore-on-new-base-transceiver-stations-nokia-and-zte-emerge-top-bidders-4024035.html

11 https://www.business-standard.com/article/economy-policy/govt-s-ambitious-broadband-internet-plan-misses-deadline-113112600559_1.html

12 https://dot.gov.in/sites/default/files/Report%20of%20the%20Committee%20on%20NOFN.pdf

However, the most talked about hurdle in BharatNet's path was "Right of Way" or RoW approvals. These are required to lay fibre on government land. A go-ahead is typically required from state and/or central departments overseeing the land that has to be dug for the cables. In 2016, the Department of Telecommunications (DoT) attempted to streamline this process by introducing new central RoW Rules. Individual state and union territory governments were required to align their local RoW rules with the central rules. However, by February 2020, only 16 of 37[13] states and union territories had done that.

As a result, RoW issues continued to persist. In one such RoW conflict[14] in 2018, the Union Ministry of Road Transport and Highways refused permission to the DoT to carry on fibre-laying work until it paid up license fees as prescribed by a central law governing the use of national highways, while DoT cited the 2016 Rules, saying only a one-time fee needed to be paid. The two reached such a state of stalemate that the case had to be escalated to the Prime Minister's Office.

By Juky 2015[15], optical fibre cables had been laid in 23,604 Gram Panchayats. After the review committee's recommendations that year, the deadlines and numbers stood rejigged. The programme was rebranded "BharatNet". Now Phase I of the programme would aim to reach 100,000 Gram Panchayats, Phase II would account for the remaining Gram Panchayats, and Phase III would focus on upgrading existing infrastructure.

Phase I reached completion[16] by December 2017, connecting 109,926 Gram Panchayats with optical fibre. Of these, 101,370 were claimed to be "service ready" at the time. In 2018, non-profit Digital Empowerment Foundation independently audited 269 of these "service ready" Gram Panchayats and found[17] that barely 11.5 per cent of these had functional but slow internet. The same year, a report[18] from news website The Wire showed that the number of Gram Panchayats with functioning commercial broadband connections was a humble 5,010. Progress on this front was slow. In January 2020, newspaper The Indian Express accessed[19] internal documents pertaining to Phase II of BharatNet from the Union Ministry of Electronics and Information Technology (MeitY). It found that only 7.45 per cent of Phase II's 150,000 Gram Panchayats were "service ready" at the time.

Despite the programme's recalibrated avatar, Phase II remained on a rocky road.

13 https://www.outlookindia.com/

14 https://www.hindustantimes.com/india-news/govt-s-optical-fibre-cable-project-bharatnet-entangled-in-turf-war/story-4zB7QTblxG0zvaXAvs2iXO.html

15 https://economictimes.indiatimes.com/industry/telecom/bharatnet-project-optic-fibre-laid-in-23604-gram-panchayats-till-july-2015/articleshow/48873490.cms?from=mdr

16 https://pib.gov.in/PressReleasePage.aspx?PRID=1515906

17 https://www.livemint.com/Opinion/5THaiuocuuIhQxZeClVs4K/Has-BharatNet-fulfilled-its-end-task-of-providing-functional.html

18 https://thewire.in/government/narendra-modi-government-digital-india-village-broadband-connections

19 https://indianexpress.com/article/technology/tech-news-technology/bharatnet-phase-two-only-7-45-per-cent-of-1-5-lakh-gram-panchayats-service-ready-6225281/

Delays and anomalies with issuing tenders cropped up. In the southern state of Tamil Nadu, for example, an optical fibre cable project worth Rs.2,441 crore was put on hold[20] in May this year after an anti-corruption activist flagged irregularities in the tendering process. Terrain obstacles were unaddressed still. In the Northeastern region of the country in particular, the central government cited[21] hilly terrain and prolonged monsoon as reasons for delay in cable laying work. In 2017, a fresh deadline of March 2019[22] was set for Phase II, which was later pushed to August 2021.

At the time of writing, the latest official update was that completion of Phase II would be further delayed[23] due to the COVID-19 pandemic.

Given the current exigencies, further delays, though undesirable, are inevitable. That leaves a couple of significant factors to look out for: The first is the technological advancements that the programme will have to keep up with, with every year of delay; the second is the extent to which BharatNet's future iterations will depend on international markets in general and imports from neighbouring China in particular.

NEIGHBOURS AND FENCES

After the Galwan valley clash in June 2020, the Indian political class reacted with appealing to nationalistic passions, calling for a boycott[24] of Chinese goods. Electronic equipment and the internet turned out to be the turf where this quasi battle against Chinese goods would be fought, although, at the time of writing, there isn't an outright blanket ban.

For the layperson, this stance was most clearly felt with the government banning[25] over 200 popular Chinese apps including TikTok, PubG, and CamScanner over the course of a few weeks. Until the ban, TikTok's parent company Bytedance had been on an aggressive hiring spree in India. The number of subscribers of its flagship app had swiftly overtaken that of incumbent Alphabet's video-sharing app YouTube. Things were looking good for them. However, by August 2020, TikTok's India operations began to see a chunk of its senior management leave[26]– many of them for similar short-video platforms built in India.

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20 https://www.theweek.in/news/biz-tech/2020/05/03/centre-puts-bharatnet-tender-on-hold-citing-anomalies.html

21 https://www.thehindubusinessline.com/economy/all-panchayats-to-be-connected-with-broadband-under-bharatnet-by-march-2020/article28187374.ece

22 https://economictimes.indiatimes.com/news/economy/policy/second-phase-of-bharatnet-okayed-deadline-extended-by-a-quarter-to-march-2019/articleshow/59672230.cms

23 https://www.business-standard.com/article/current-affairs/bharatnet-s-phase-2-completion-timeline-to-be-extended-due-to-covid-dhotre-120091701226_1.html

24 https://www.reuters.com/article/india-china-procurement/india-moves-to-curb-sales-of-chinese-products-to-government-agencies-idINKBN23U1I8?edition-redirect=in

25 https://www.medianama.com/2020/09/223-india-bans-118-chinese-apps/

26 https://economictimes.indiatimes.com/tech/internet/tiktok-parent-company-bytedance-halts-hiring-in-india-tries-to-retain-employees/articleshow/77491369.cms

Figure 1. NOFN/
BharatNet
timeline

October 2011: NOFN project approved[1] by the Union Cabinet. Aim[2] for completion by 2013

February 2012: A special government undertaking called the Bharat Broadband Network Limited or BBNL[3] incorporated to manage and implement the NOFN programme across the country

2013: Deadline missed, internal projections estimate[4] reaching 100,000 Gram Panchayats by March 2015
December 2013: Definition of broadband changed[5] to minimum download speed of 512 kilobytes per second (kbps)

Jan 2015: NOFN review committee instituted
March 2015: NOFN review committee recommends 2017 deadline and renames project BharatNet. Suggests improvements in project

September 2016: Reliance Jio launched
November 2016: Central government notifies[6] new Right of Way rules

December 2017: BharatNet Phase I complete, overshoots target of 1,00,000 Gram Panchayats to reach 1,22,908

August 2018: Vodafone-Idea merger

August 2019: Internet services cut off in Jammu & Kashmir after the region is stripped of statehood. 2G and fixed line services restored in January 2020. 4G still suspended in the region barring two districts (situation[7] as of 21 September 2020)

March 2020: Deadline for Phase II missed, new deadline[8] for August 2021 set
September 2020: MeitY says Phase II will be further delayed due to the pandemic

(Key: Developments pertaining to BharatNet Other key events and developments concerning the internet in India)

1 https://www.medianama.com/wp-content/uploads/NOFN-Creation-25.10.2011.pdf

2 https://www.thehindu.com/news/national//article59968851.ece

3 www.bbnl.nic.in/FAQ.aspx?pid=52#68

4 https://www.business-standard.com/article/economy-policy/govt-s-ambitious-broadband-internet-plan-misses-deadline-113112600559_1.html

5 https://www.medianama.com/2013/12/223-india-reclassifies-broadband-as-512kbps-6-yrs-after-dayanidhi-maran-wanted-2mbps/

6 https://dot.gov.in/sites/default/files/ROW_2016.pdf?download=1

7 https://scroll.in/latest/973651/jammu-and-kashmir-2g-internet-is-enough-for-learning-public-services-centre-tells-parliament

8 https://www.communicationstoday.co.in/gram-panchayat-net-connectivity-project-deadline-pushed-by-17-months/

There was more action when it came to backhaul infrastructure that makes access to these apps possible. Following a probe into allegations that China had been "dumping"[27] aggressively cheaper optical fibre cable in India to harm local manufacturers, Indian authorities decided[28] to impose a 10 per cent "safeguard duty" on single mode optical fibre. As opposed to multimode optical fibre cables, single mode optical fibre cables are used to carry signals over long distances, which is exactly what BharatNet needs. It didn't end there. A few weeks after the Galwan valley clash, DoT barred[29] government-owned telecom operator Bharat Sanchar Nigam Limited (BSNL) from procuring Chinese-made equipment for its 4G expansion, citing security concerns.

The app bans, calls for boycott, and the security concerns expressed over BSNL's 4G equipment created an environment of doubt and caution when it came to sourcing electronics. Given this atmosphere, there was talk, and even expectation, of further directives from the DoT to bar Chinese equipment for other internet and telecom infrastructure projects. In this political climate, BSNL found no bidders[30] for its tender pertaining to maintenance work for optical fibre cables laid under BharatNet.

While the intent of making a political statement with these actions is well-understood, their potential for actual financial impact has been contested[31]. For starters, India has a massive trade deficit[32] with China. In the financial year 2019-20, China accounted for 5 per cent of total Indian exports. Imports from the country, by contrast, stood at 14 per cent.

Indian telecom companies already deploy a fair amount of equipment imported from China. By the Ministry of Electronics and Information Technology's own admission[33], 10 per cent of the mobile network equipment of state-run Mahanagar Telephone Nigam Limited (MTNL) is from "Chinese equipment manufacturers" while BSNL has 44 per cent of its mobile network equipment from ZTE and 9 per cent from Huawei.

It isn't just about internet and telecom. Chinese venture funds have made massive investments in a broad range of Indian startups and online businesses in the last few years. A February 2020 report[34] from think-tank Gateway House points out that 18 out of 30 Indian "unicorns" – tech startups with over USD 1 billion valuation – have Chinese investors, who are believed to have invested nearly USD 4 billion (EUR 3.4 billion) in

27 https://www.hindustantimes.com/india-news/china-dumps-large-scale-optic-fibre-cables-from-india-tariff-wars-expected/story-7KoR9raunhmoWvhh7Vh25J.html

28 https://www.moneycontrol.com/news/business/dgtr-recommends-a-10-safeguard-duty-on-single-mode-optical-fibre-imports-5750661.html

29 https://www.hindustantimes.com/india-news/bsnl-4g-tender-cancelled-after-dot-excludes-chinese-companies/story-heXvPzkfYDKju3ZZHSK1sM.html

30 https://indianexpress.com/article/business/for-2nd-time-no-bidders-for-bharatnet-optical-fibre-cable-maintenance-work/

31 https://www.thehindubusinessline.com/opinion/atmanirbharta-from-china-easier-said-than-done/article31758424.ece

32 https://www.bloombergquint.com/economy-finance/six-things-to-know-about-india-china-economic-relations

33 https://pqars.nic.in/annex/252/Au497.pdf

34 https://www.gatewayhouse.in/wp-content/uploads/2020/03/Chinese-Investments-in-India-Report_2020_Final.pdf

Indian startups.

The foreign investment story took an important turn this year when it came to an establishment player in the Indian market. In April 2020, Facebook invested Rs.437.5 billion (EUR 5.07 billion) into Jio Platforms – the internet and digital services arm of Mukesh Ambani's Reliance Industries Limited. This gave the social media giant a 9.99 per cent stake in the company owned by India's richest man. Google followed suit in July 2020, announcing an investment of Rs.337.37 billion (EUR 3.9 billion) into Jio Platforms. Market watchers are looking[35] at these investments in the light of India's attempt to consolidate with other economies against Chinese domination of the sector.

Governments too appear to be keen to forge international alliances to similar effect. To counter China's growing influence in the technology infrastructure space, the UK recently decided[36] to form a "5G club" of ten democracies. Called the "D10", the grouping includes G7 countries along with South Korea, Australia, and India, and has the stated aim of cooperating to create and maintain alternative sources of 5G equipment manufacture. There are still unanswered questions[37] about the exact mechanism of cooperation of the D10, and how the focus on "democracies" would ultimately manifest itself in the use and deployment of technology. However, the move has formalised the countries' positions with respect to China.

To fit in with these peers, India would not only have to step up its game in the sphere of equipment manufacture, but also in efficient bureaucracy and an empathetic and socially inclusive determination of access. Self-reliance for manufacturing optical fibre and laying it across the country would count for little if different administrative departments can't coordinate well enough or if the internet doesn't reach the most vulnerable and the most marginalised.

WHO IS CONNECTED?

There is already a heavy appetite for the internet and online services in India's rural regions. But as with most other resources, socio-political factors can be powerful determinants of access.

The situation is complex in Jammu and Kashmir, where the Union government temporarily disabled internet access in August 2019, following a decision to convert[38] the militarily sensitive region into two union territories of Jammu and Kashmir, and Ladakh. The 2G mobile internet services and fixed line internet were restored[39] in January 2020. According to the Union government, these measures were put in place due to "national security" concerns. At the time of writing, 4G mobile data was not yet restored in the

35 https://foreignpolicy.com/2020/07/16/google-facebook-invest-india-reliance-jio-smartphone-tech-china/

36 https://www.financialexpress.com/industry/technology/uk-plans-new-5g-club-of-10-democracies-including-india-report/1975298/

37 https://www.globaltimes.cn/content/1190107.shtml

38 https://indianexpress.com/article/explained/explained-article-370-has-not-been-scrapped-but-kashmirs-special-status-has-gone-5880390/

39 https://telecom.economictimes.indiatimes.com/news/no-restriction-on-accessing-any-website-in-jammu-and-kashmir-centre/78226362

region, save for two districts.

When assessing social aspects of internet access in India, the gender divide and the urban-rural divide are routinely tracked and measured. Similar research and surveys on other kinds of social divides such as caste[40] are not as frequent.

The divide between urban and rural users is stark. According to official government data[41] for the quarter January-March 2020 released in September 2020 by the Telecom Regulatory Authority of India (TRAI), total rural internet subscribers in India stood at 285.97 million, while their urban counterparts numbered 457.23 million.

On another count, rural India fared better. An external report[42] by industry lobby group Internet and Mobile Association of India (IAMAI) and data analytics firm Nielsen suggests there were more "monthly active" rural internet users (227 million) than urban ones (205 million) at the end of November 2019. "Users" are distinct from "subscribers", as a household can have one subscription used by multiple people. This is true of internet usage on mobile phones as well.

The amount of data consumed adds more details to this picture. After the nationwide lockdown in March in the wake of the COVID-19 crisis, rural internet usage in India saw a sharp increase. This was on account of daily wage migrant workers returning to their villages from the cities. Reports accessed by The Indian Express[43] show that data usage under BharatNet rose to 0.55 million gigabytes (GB) in the annual quarter April-June 2020 from 0.25 million GB in the previous quarter.

Following the global stay-at-home norms of the year 2020, the gap between the digital appetite and availability was even more palpable – especially when it came to schooling and education.

Most schools have moved online, as have some exams. In a matter of weeks, access to the internet became the basic minimum requirement for access to education. A widely cited report[44] from India's National Statistical Office (NSO), which surveyed household consumption on education in 2017-18, provides the context in which to see students' access to the internet, and thereby education. The survey found that only 15 per cent of the rural households had access to the internet as opposed to 42 per cent in urban areas. Not all of these students would attend their classes on a swanky, fast desktop or laptop. A mere 4.4 per cent of the rural households had a computer. Students attending school remotely ended up borrowing[45] phones from adults in the house. Urban areas fared better by comparison, but still had gaps. The survey found that only 23.4 per cent of the urban households had computers.

We see the limited access to devices and the internet manifest itself in the burdens

40 https://www.tandfonline.com/doi/abs/10.1080/14672715.2018.1479192

41 https://www.trai.gov.in/sites/default/files/PIR_17092020_0.pdf

42 https://cms.iamai.in/Content/ResearchPapers/2286f4d7-424f-4bde-be88-6415fe5021d5.pdf

43 https://indianexpress.com/article/india/migrant-workers-rural-data-consumption-bharatnet-scheme-6506117/

44 http://mospi.nic.in/sites/default/files/publication_reports/KI_Education_75th_Final.pdf

45 https://www.tribuneindia.com/news/haryana/power-cuts-poor-net-hamper-online-education-in-villages-135375

students have had to take on. There were reports of schoolchildren in an Uttrakhand[46] district trekking a few kilometres away to catch a signal when they needed to attend classes or submit assignments. In the more poorly connected rural areas of the Northeastern state of Sikkim, teachers took to visiting[47] students one-by-one, and teaching them in person. In the national capital, New Delhi, where things are significantly better, only 60 per cent of the students of Delhi government schools are restored[48] to have been able to attend online classes in the first two months of the lockdown.

Apart from the rural-urban divide, a key factor determining digital access is gender. The number of women accessing the internet has increased in absolute terms over the years, though in relative terms, they still lag behind. Needless to say, women in rural areas face double the barriers. The IAMAI report mentioned above measures internet usage along the binary ideation of gender. In November 2019, it found the nationwide ratio of male to female internet users to be 65:35. In rural areas, this was 69:31 while in urban areas it was 60:40.

The gap translates into smartphone ownership as well. According to a 2020 report[49] on the "Mobile Gender Gap" from the Global System for Mobile Communication Association (GSMA) – where again, gender was considered along a normative binary – 31 per cent men owned mobile phones as opposed to 14 per cent women in India.

Despite prevailing social divides more or less transplanted into internet access patterns, there is room for cautious optimism going forward. Rural connectivity and women's internet usage today is much higher than it was 10 years ago. Content and services in local Indian languages have already found a promising number[50] of takers in recent years. With more inclusive strategies, one can expect to find opportunities to close these gaps in India, be they in a landlocked state or a far-flung island.

"Views expressed here are the author's own and do not represent those of her employer, Proto"

46 https://www.hindustantimes.com/education/education-in-lockdown-poor-internet-connectivity-shadows-online-classes-many-students-walking-to-reception-areas/story-YixpW2WHFoyOgNxxK3GxBO.html

47 https://indianexpress.com/article/india/no-internet-school-comes-home-in-rural-sikkim-6567160/

48 https://www.hindustantimes.com/cities/only-6-of-10-students-in-delhi-govt-schools-joined-online-classes-during-lockdown-shows-govt-data/story-t8uCLHbiAy0PUWrUOn5BJI.html

49 https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf

50 https://inc42.com/buzz/90-new-internet-users-in-india-consume-content-in-regional-languages-google/

Infographic on roads and bridges in Northeast India

ASHISH KHANDALIKAR

Infrastructure projects in the North Eastern States of India are primarily carried out under the Non Lapsable Central Pool of Resource (NLCPR) scheme directly located under the Ministry of Development of North Eastern Region. Objective of the scheme is to fill the gap in the infrastructure sector of the North East Region by sanctioning the projects prioritised through the respective state governments. The construction and maintenance of roads and bridges (apart from National Highways) too is sanctioned by the NLCPR scheme.

The infographic on the next page show the existing length of National Highways in eight states of Northeast India along with related measures of expenditure by the Ministry of Road Transport and Highways, Length in km/1000 sq km and Length in km/100,000 population.

One of the interesting things to note here is that although Assam ranks first in the absolute length of National Highways with a total length of 3909 km, it ranks second last in terms of length per 1000 sq km at 49.80km/1000 sq km and last in terms of length per 100,000 people at just 12.5 km/100,000 people.

Scan for accessing more charts

Overview of National Highways in North East India

Length of National Highways

States — Existing NH length in km

State	Length
Assam	3,909
Arunachal Pradesh	2,537
Manipur	1,750
Nagaland	1,548
Mizoram	1,423
Meghalaya	1,156
Tripura	854
Sikkim	463

Total area in sq km

State	Area
Arunachal Pradesh	83,743
Assam	78,438
Meghalaya	22,429
Manipur	22,327
Mizoram	21,087
Nagaland	16,579
Tripura	10,492
Sikkim	7,096

Population

Population 2018 projected

State	Population
Assam	34,586,234
Tripura	4,057,847
Meghalaya	3,276,323
Manipur	3,008,546
Nagaland	2,189,297
Arunachal Pradesh	1,528,296
Mizoram	1,205,974
Sikkim	671,720

Total MoRTH Expenditure

Expenditure (2014-2018) in millions

State	Expenditure
Assam	665.4
Arunachal P..	248.5
Meghalaya	141.6
Tripura	129.2
Nagaland	89.1
Manipur	49.7
Mizoram	26.6
Sikkim	24.7

Length in km/1000 sq km

Length of NH in km/ 1000 sq km

State	Length
Nagaland	93.40
Tripura	81.40
Manipur	78.40
Mizoram	67.50
Sikkim	65.20
Meghalaya	51.50
Assam	49.80
Arunachal Pradesh	30.30

Length in km/100,000 people)

Length of NH in km/ 100,000 p..

State	Length
Arunachal Pradesh	183.5
Mizoram	130.4
Nagaland	78.1
Sikkim	76.2
Manipur	64.3
Meghalaya	39.0
Tripura	23.3
Assam	12.5

The data was taken from http://morth.nic.in/ on 31/05/19.
MoRTH is Ministry of Road Transport and Highways.

Correlating Approved and Utilized Funds

Status: Complete, Ongoing

The data was taken from https://nlcpr.mdoner.gov.in/ on 31/05/19
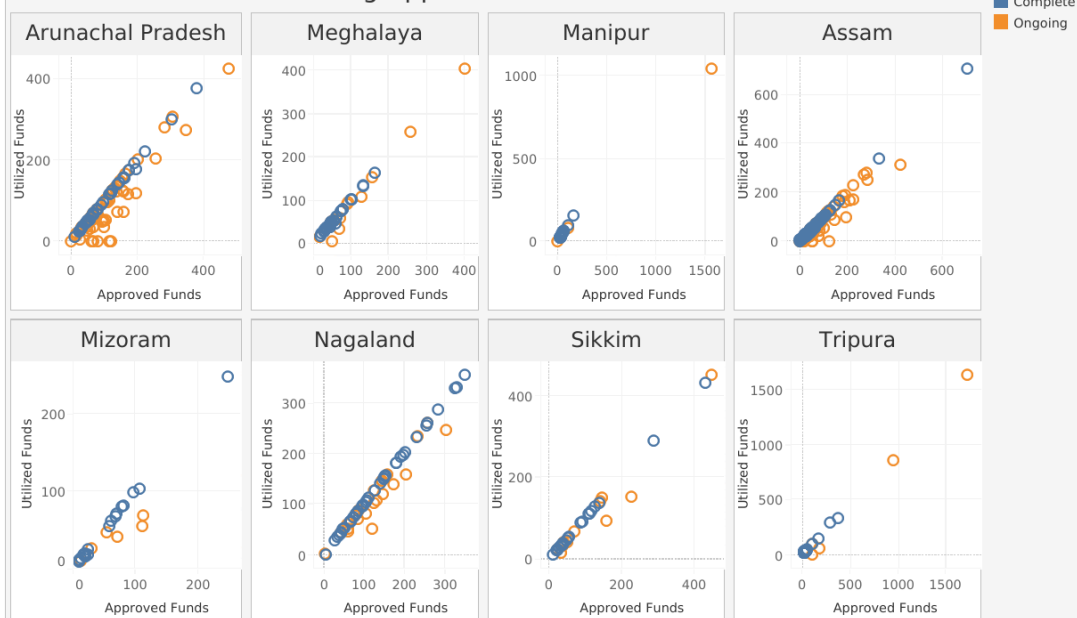
C.

India's Infrastructural Interventions: Out of the Woods and into the Waters

All physical infrastructure is embedded in the natural environment and hence alters the latter in myriad, messy, often unforeseen, but always extractive and violent ways. This section looks at a few major infrastructure projects, however well-intentioned, to illustrate how they often end up not only ruining the ecologies and the local cultures dependent on it but also creating a politics of violence and internecine conflict for natural resources between competing rivals. Ranjan Panda describes how the dams and barrages on the Mahanadi river, together with polluting industries dotted along its course, have shrunk and polluted the river. He argues that the damage to the river's ecology has not only imperilled the health and livelihoods of over 40 million people living off it, but has also led to a rat race between the neighbouring states of Odisha and Chhattisgarh for extracting its diminished waters. He argues that no amount of arbitration through tribunals would resolve the problem unless the two quarrelling states decide to shut down water-guzzling industries, especially the thermal power plants, and switch to greener sources of power. Manju Menon exposes the opportunistic cynicism that underlies the venal politics of big dams in the Northeast. Of the 165 dam projects proposed two decades ago, a majority of them in Arunachal Pradesh, only two have been approved so far. Even so, despite popular resistance and grave objections from experts with respect to negative ecological impact of big dams, both upstream and downstream, governments cutting across the political divide have used the hype over big dams to extract political and financial mileage. She states that "until more enlightened policies for managing the water resources of the Northeast are arrived at, the environment and development of Assam and Arunachal Pradesh are in jeopardy." Kanchi Kohli probes the contentious Forest Rights Act of 2006, widely hailed as a bold and egalitarian piece of legislation that upheld the right of forest communities to forest land and its resources, to show how different political actors have used the law to suit their respective agendas. She cites two examples to buttress her argument. In 2019, the ministry of environment decided to divert of a patch of pristine forest called Hasdeo Arand, in the state of Chhattisgarh, to a coal mining project in the face of staunch resistance from the local communities.

Mahanadi: Looking beyond coal

RANJAN PANDA

Coal fired power plants.
Photo by Ranjan K Panda

When we approached the Tilia village on the banks of a huge 743 square kilometres reservoir of Hirakud Dam in Odisha's Jharsuguda district on a terribly hot day of May 2017, boiling at somewhere above 45 degrees Centigrade, most of the women and children in the village were seen queuing up at a water tanker to fetch drinking water for their families. These villagers, living inside one of India's industrial pockets, dare the summer, winter and rains – 365 days a year – to fetch water from tankers. Development has arrived to the area through roads and chimneys (aluminium smelters, coal fired power plants, etc.), but safe drinking and irrigation waters are still a far cry. People depend on these water tankers provided by nearby industries and mining companies. When the tankers do not arrive, which villagers say is for almost more than half the year, they have to depend on nearby ponds, wells, bore wells, all of which are getting drier by the year. Access to safe drinking water, which is supposed to be their 'right' and should have been delivered to their homes, is provided as a matter of 'mercy' by the miners, power plant companies and other industrial houses who have taken away their land, water and forests in the name of development.

CONFLICT AROUND COLONISATION OF WATER

The Hirakud Dam, built in the 1950s, is the first multi-purpose mega dam project of Independent India, and was famously described as a 'modern temple' by Jawahar Lal Nehru, the first prime minister of India. At that time, it was known

Scan for Listening Article

as the longest earthen dam in the world, with the largest reservoir in Asia. The dam was built as a National Project, a position it held for a few years until it was handed over to the state of Odisha. The dam is located at latitude 21.31 degrees north and longitude 83.52 degrees east across the Mahanadi, about 15 km upstream of Sambalpur town. With a submergence area of 743 square kilometres, the reservoir submerged 1,23,303 acres of cultivable land and displaced 22,144 families officially. Unofficial sources, however,claim the official displaced family statistics is a gross underestimate, At least 3,540 of the officially recognised displaced families are yet to be compensated even 50 years after their displacement (Panda 2007). But other figures put it at 9,913 families[1]. The dam became functional in 1957. Speaking to the displaced people of the Hirakud Dam, Pandit Jawaharlal Nehru had famously said: "If you are to suffer, you should suffer in the interest of the country."

Tilia villagers gave away their land for this dam but they are still struggling to get their share of water. Rather, they have been struggling to retain the remaining land and water bodies as the Odisha Power Generation Corporation Limited (OPGC) wants to acquire their farmlands and water bodies for constructing flyash ponds. The villagers are fighting a losing battle against the OPGC for their survival with dignity. The same is true of hundreds of villages in and around Hirakud, in the coalfield areas of both Odisha and Chhattisgarh, as both the states aspire to be coal-fired power hubs.

The Hirakud Dam has been at the root of a water conflict between both these major riparian states of the Mahanadi river. It has colonised water to attract numerous industries and power plants. Odisha, the lower riparian state of the river, is luring industries by offering them Hirakud water. However, with Chhattisgarh constructing several dams and barrages upstream of Hirakud to attract investors, Odisha is miffed about the drastic reduction of water flow into the Hirakud Dam, which is likely to not only hamper its development plans and but also communities. Odisha has filed a

Hirakud Dam.
Photo by Ranjan K Panda

1 https://timesofindia.indiatimes.com/
   city/bhubaneswar/Hirakud-displaced-
   families-await-compensation/
   articleshow/7810754.cms

complaint in a Tribunal[2] set up under the Interstate River Water Disputes Act (ISRWD Act) of 195. The matter is being heard currently. The Tribunal had a three-year term to give its report. However, it has now been extended to another 2 years.

For the villagers of Tilia, the Hirakud water has been like an oasis for the past seven decades and this fight will not change their fate. Forget about water in Hirakud, they have no right whatsoever over the river water.

Odisha's quarrel with Chhattisgarh, which officially and politically started in July 2016, hinges on six barrages that Chhattisgarh has been building upstream without consulting them. The Odisha government has alleged that the constructions are illegal and that the central government is hand in glove with the upper riparian state. In its prayer to the tribunal, it seeks an immediate halt to all such constructions as well as a thorough assessment of their impact on the Mahanadi flow, which, according to Odisha, has already reduced appreciably over the decades. "The annual flow of water in the Mahanadi in Odisha is 20 million cubic feet and if water is intercepted for storage by the upstream state, the flow will fall sharply," the state's engineer-in-chief had said then[3], at the time when the conflict started, and he was asked to investigate into Chhattisgarh's illegalities. While 53.1 per cent of Mahanadi's total catchment area falls in Chhattisgarh, it is almost 90 per cent for for the Hirakud Dam reservoir. This explains why the Hirakud Dam is completely dependent on the release of water from Chhattisgarh. The catchment area of the dam inside Odisha is only about 9.4 per cent.

The original Hirakud Dam project report envisaged that irrigation and power production would require 12.28 million acre feet (MAF) of water that includes reservoir losses (see table 1). Of this, 4.10 MAF was supposed to be derived from storage and the balance from the normal flow of the river. The minimum run off of the Mahanadi at that point was 20.61 MAF as per the following table.

Sl.No.	Details	Contemplated in DPR 1947
1	Irrigation including lift	3,628 (2.94 MAF)
2	Power	10,785 (8.74 MAF)
3	Evaporation	740 (0.60 MAF)
4	Domestic	-
5	Industries	-
Total		12.28 MAF

Table 1: Quantification of Commitments of Hirakud Dam (Contemplated in 1947)

The project architects had made an allocation of 12.28 MAF for the Hirakud Dam leaving 8.33 MAF for use by upstream states. The dam was originally conceived as a flood-control reservoir to mitigate floods downstream. Apart from flood control, Odisha's requirement of water for irrigation and power, both domestic and industrial,

2 http://www.newindianexpress.com/states/odisha/2018/mar/13/centre-forms-tribunal-to-resolve-mahanadi-issue-1786184.html

3 https://timesofindia.indiatimes.com/city/bhubaneswar/Cgarh-drawing-water-from-Mahanadi-without-state-nod/articleshow/53018795.cms

stands at 18,175 million cubic metre (MCM) (see table 2).

Sl. No	Details	Planned Utilisation (MCM)
1	Irrigation including lift	5,722
2	Power	10,222
3	Domestic	134
4	Industries	1,415
Total		18,175*

Table 2: Planned Utilisation of Water from Hirakud Dam

*This is excluding the environmental flow requirements, which are assessed to be about 9,621 MCM.

The non-monsoon commitment from the Hirakud Dam stands at 6,308 MCM, which is set to increase to 8,179 MCM due to commitments already made by Odisha, as shown in table 3.

Sl. No.	Details	Present Scenario	Commitments
1	Irrigation including lift	1,390	2,804
2	Power	4,077	4,077
3	Evaporation	395	395
4	Domestic	14	78
5	Industries	432	825
Total		6,308*	8,179*

Table 3: Commitment of Hirakud Dam during Non-Monsoon (unit: MCM)

*This excludes requirement for downstream environmental flow4.

Odisha claims water availability in the Hirakud reservoir has been diminishing constantly since 1990-91. Going by inflow versus demand at Hirakud (non-monsoon actual), the water availability has gone down alarmingly from a little less than 8,000 MCM to a little more than 5,000 MCM[5].

Odisha apprehends that when all the contentious barrages in Chhattisgarh start operating in tandem, the Mahanadi will be reduced to an elongated pool, with a storage

4 Surprisingly the Odisha government did not quantify the environmental flow during non-monsoon period as can be seen from this data presented during the CM level meeting. And the quantity of environmental flow calculated in the previous table is more than the committed water during non-monsoon period.

5 This again depicts that there is no water available for maintaining the environmental flow downstream. This creates doubts about Odisha's own plans of utilisation of water during non-monsoon periods.

potential of just 829 MCM of water during the non-monsoon period. These barrages may actually reduce the non-monsoon flow in a normal year to the tune of 1,074 MCM and can also arrest base flow during weak monsoon years.

The Odisha government's apprehensions appear right and justified as the author found out during field visits to these dam sites and discussions with people in Chhattisgarh (Panda 2018). Most of these barrages have been built under the guise of irrigation but a huge quantity of water has already been allocated to industries. These are, in fact, major projects as can be gauged from the gates, height and catchment area interception of the barrages. Chhattisgarh has denied these charges and has asserted its right over the river. It is now for the tribunal to decide who is right and who is not.

TRIBUNALS DO NOT SOLVE THE REAL PROBLEMS

A tribunal, however, does not necessarily solve such conflicts. Tribunals set up under the Inter-State River Water Disputes Act have not always been effective in settling inter-state river water disputes. Researchers believe that while they did playan effective role initially, they have increasingly lost favour with the central government (Vaidyanathan and Jairaj 2009). So far, nine conflicts, including the Mahanadi dispute, have been dealt by tribunals. A look at the Cauvery dispute would tell youhow precious little hope a tribunal order can offer to Odisha.

The Cauvery[6], called the 'rice bowl of the south', is among the most utilised rivers in the world; barely 5 per cent of its water flows into the Bay of Bengal (Wood 2007). The conflict over the river dates back to more than a century but the tribunal took up the matter only in 1990. The tribunal[7], which was initially reluctant to give an interim order, then heard petitions and counter petitions on the interim order for almost 16 years before coming out with a final order in 2007 that spelt out a water-sharing formula between the involved states – Karnataka and Tamil Nadu. However, the conflict continued as petitions were filed in the country's apex court. The disputehas seen several rounds of violent protests, and remains unresolved.

Many experts believe that large dams cause conflicts as they not only obstruct the river water, thereby impeding the flow, but also by colonising the water for the benefit of a few at the cost of a large population. Large dams become the foci of conflicts essentially because (a) they tend to alter geography and hydrological regimes, sometimes drastically; and (b) they involve issues of control, power and political relations, social justice and equity (Iyer 2007). The Mahanadi conflict,which has already witnessed a lot of political and legal drama, is arguably still at an early stage. It must take a cue from similar conflicts over sharing of river waters and thus resolve a host of issues affecting the basin andlocal communities. For, the Mahanadi conflict is much more thanjust the construction of dams and barrages upstream.

A research done by the author (Panda 2018) found that while the inter-state dispute

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6 The Cauvery is one of the major rivers of the peninsular India. It rises at an elevation of 1,341 m at Talakaveri on the Brahmagiri range near Cherangala village of Kodagu district of Karnataka and drains into the Bay of Bengal at Poompuhar in Tamil Nadu.

7 The tribunal had over 440 days of hearing and had to read about 36 volumes of documents that ran to several thousand pages, many technical notes and other submissions. (Main source of information: Wood 2007)

between Odisha and Chhattisgarh centred on reduced flow of water at the Hirakud reservoir because of the dams and barrages constructed upstream, the impact of coal mines and thermal power plants (TPPs) and other industries did not come up for discussion. This is because both the states have committed themselves to mining and industrialisation in the name of 'development' and have been promoting the Mahanadi as a 'water surplus' river for inviting more investment into mining and industrial sectors. This research highlighted some of the real issues facing people affected by mining and thermal power plants.

COAL CURSE FOR THE MAHANADI AND ITS INDIGENOUS COMMUNITIES

The Mahanadi river basin is rich with coal. Chhattisgarh holds the catchment of four rivers including the Mahanadi. Large scale mining in Chhattisgarh is already degrading the Mahanadi's catchment and affecting the quality of the river water. Odisha and Chhattisgarh are two of the richest mineral-bearing states of India. Chhattisgarh has 16 per cent of the total coal deposits of India:about 44,483 million tonnesof coal has been estimated in 12 of the state's coalfields. The state ranks second in the country in coal production and contributes over 18 per cent to the total national production[8]. Chhattisgarh, which is currently one of the few states that have surplus power, has signed MoUs for about 1,40,000 megawatt (MW) of coal- fired power plants including captive power plants (CPPs)[9] Most of these have come up, or will come up, in the Mahanadi basin.

We took up the case of only one coal-rich district of Chhattisgarh – Raigarh, a critically polluted area that is a prominent site for many power plants. Raigarh district has a population of about 1.5 million people, 1.25 millionof whom live in rural areas. Most of the people depend on agriculture for their primary livelihood. Mining and industries disrupted their lives in more ways than one. Less than 3 per cent of rural households in Raigarh have access to piped water[10].

With 75.799 billion tonnes of coal reserve, Odisha accounts for almost 24.72 per cent of coal reserves in India. The Ib Valley coalfields, which covers almost the entire Mahanadi catchment, holds 24.830 billion tonnes of coal[11]. Various estimates show that Odisha is planning to generate about 58,000 MW of coal-fired power, and Jharsuguda, a sample district analysed for a study (Panda 2018), is going to bear a major burden of it. Besides, the Mahanadi is going to bear the maximum brunt of the coal-fired power plants.Jharsuguda, a critically polluted district in the basin, has a population of about 0.6 million people. More than 60 per cent of them live in rural areas and are still dependent on agriculture, forest and other local resources. Only about 4 per cent of the rural households have access to piped water[12].

In both these districts the local people have lost their lands, water and forests to these mining companies and power plants. While the indutries got richer, the people

8 http://www.chhattisgarhmines.gov.in/Coal.htm

9 http://industries.cg.gov.in/SIPB/pdf/List_of_MoUs.pdf

10 Analysis of Census 2011 data.

11 http://www.mcl.gov.in/Others/ecoalfields.php

12 Analysis of Census 2011 data.

Left, A barrage by Chhattisgarh on Mahanadi; right, Tilia village women carrying drinking water.
Photo by Ranjam K Panda

were forced to live in dangerously polluted environment. The coal mines and TPPs have not only polluted the landscape and water resources, but have also gobbled up several feeder rivers and streams thereby reducing the flow to Mahanadi. These issues do not figure in the political fight between the two states over sharing of river water. Climate change, an increasingly critical aspect, too does not figure as prominently as it should. Even though Odisha has been talking about climate change impacts on the basin, it has yet to undertake a comprehensive analysis of its impact on the people, their environment, and their livelihoods.

CLIMATE CHANGE DRIES UP MAHANADI

Climate change is a major factor contributing to the growing distress of the Mahanadi. A study of 2010, done using various scientific models, present a decreasing trend in the monsoon flows of the Mahanadi at the Hirakud Dam (Ghosh et al 2010). An earlier study on the Mahanadi also observed a decrease in the monsoon stream flow for the period 1926-80. One of the possible reasons for such a decreasing trend is the significant increase in temperature due to global warming. An analysis of instrumental climate data has revealed that the mean surface temperature over India has increased at a rate of about 0.4 degree Celsius per century, which is statistically significant (Ghosh et al 2010, and Rao 1995). A recent study suggests that the water yields of the major surplus basins, such as the Mahanadi, Godavari and West Flow River–I, have decreased in recent periods. The water yields show a decrease of more than 10 per cent for the Mahanadi (Ghosh et al 2016).This is mainly because of significant decrease in rainfall.

Ecological concerns and concerns emerging from climate change were hardly anissue for most of the river conflicts in the country when they started. However, they have to be taken into consideration in the Mahanadi dispute. In fact, environmental concerns, wherever they have been a matter of discussion or dispute, have been mostly talked about in terms of reduction of flows. No doubt, the reduction of flows because of upstream dams or barrages or even because of heavy upstream water use (apart from affecting the availability of water) can have serious environmental/ ecological impacts downstream(Iyer 2007), but climate change and other factors downstream too have serious ecological

impacts. In basins like the Mahanadi where destruction of forests has eroded the top soil, the erosion of river banks, reduction in soil fertility, and reduced rate of groundwater recharge are matters of serious ecological concern.

COOPERATION, NOT CONFLICT, IS THE WAY

For the Mahanadi, the ambitious and aggressive plan to mine coal and build coal-fired power plants by both the governments is creating a dangerous cocktail of pollution, greenhouse gas emissions, and loss of local natural resource, thereby adversely affecting health, livelihood and dignity of the local and indigenous communities. The Odisha and Chhattisgarh governments should move beyond the conflict and cooperate to address all these issues if they really want to solve the Mahanadi dispute and conserve the river basins. Forest conservation, ensuring rights of local indigenous communities over the local natural resources, moving towards a green energy path, revival of water bodies and feeder streams/ tributaries, and climate change action plans are some of the key joint actions both the states can undertake. The current laws of the land have no such mechanisms under which states can work together on a basin. The IRWD Act only comes into picture when a conflict arises. Another law, the River Boards of Act (RBA) of 1956, which was meant to foster joint action by states to develop river basins, has been a dead letter, as termed by the government appointed Sarkaria Commission on centre-state relations. In 2018, the current central government drafted a bill to replace the RBA of 1956 in order to take control of the management of interstate river basins, reduce conflicts, and foster cooperation for sustainable management of the basins. However, this Act is unlikely to see the light[13] of day as it tries to give more control to the centre over the states while, as per the Constitution, water is primarily a state subject.

Under the circumstances, the states need to be proactive and, in a spirit of cooperation, move beyond conventions to save the dying rivers and its communities. For this to happen, both states need an urgent plan to phase out coal-fired power plants. Even as the hearing in tribunal continues, the chief ministers of both the states should break the ice and discuss real challenges such as climate change, drought, crop failure, and phasing out coal and ushering in green energy sources. Till then, there is little hope for Tilia villagers as well as the 40 million people and other species dependent on the Mahanadi.

13 https://www.thethirdpole.net/en/2018/11/12/top-down-mindset-bedevils-draft-river-management-bill/

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Infrastructure development in Northeast India: Hydropower, Natural Resources, legal and institutional frameworks and compliance

MANJU MENON

A sacred site downstream of Lower Demwe project. Photo by Manju Menon

In the last months of 2018, two large projects to tap flowing waters and convert them into hydropower, received a go-ahead from the National Green Tribunal (NGT) after long legal battles. These are among the 165 dam projects that were proposed for Northeast India in 2000. Hailed as "clean and cheap", the dam projects, mainly situated in the state of Arunachal Pradesh, would purportedly help sustain India's energy and environmental security in the era of climate change by adding more non-carbon power to the electricity grids.

Both these projects have been unpopular with the public of the Northeast as well as a wide range of independent environmental researchers. Their ministerial approvals based on expert appraisals took years. In fact, the projects also met with much political criticism including from the Bharatiya Janata Party (the party that is now in power at the Centre) during the period from 2010 to 2014. The collective opposition was so effective that these projects did not materialise for 15 years, except for the half built Lower Subansiri Dam. This project has been called the tomb of India's hydropower programme.[1]

Years have passed, but the central and Arunachal governments continue to be attached to these and several other hydropower projects in the region. Their attachment to these projects belies the shifts that have taken place in the energy

Scan for Listening Article

1 https://scroll.in/article/718809/arunachals-unfinished-lower-subansiri-dam-could-be-tomb-for-indias-giant-hydropower-projects

sector over a decade and a half. The revival of hydropower in Northeast India under the new regime at the Centre since 2014 shows the intransigence of politics that threatens both development in the Northeastern region and its socio-ecological dynamics.

HYDROPOWER BASED DEVELOPMENT

Lower Subansiri and Dibang dams are iconic projects of India's hallowed water bureaucracy. The projects are massive structures of 116m and 288m height proposed to be built on free flowing Himalayan rivers, the Subansiri and the Dibang by NHPC Ltd. (earlier National Hydroelectric Power Corporation), a public sector dam builder. These rivers gush down from the Arunachal Himalaya to join and form the Brahmaputra. They wash Assam's plains every year, causing massive floods but also leave behind rich soil sediments. For years, economists and planners have tried to regulate these rivers and turn them into a valuable resource. But controlling these rivers has been far from possible.

In the early 2000s, India's energy requirements were expanding at the back of a rising economic growth rate. To the BJP government in power then, hydropower offered a seemingly simple solution to provide non-carbon fuel for this growth. One could call the Northeast hydropower programme, the BJP's energy transition version 1.0. Dams designed in the 1970s were revived as part of this programme in the attempt to green India's economy by increasing the share of hydropower in it.

At the time when these new dam proposals for Northeast India were announced, India's dam building efforts had already caused large scale displacement, tremendous ecological impacts on vast landscapes and a near shut down of the sector due to lack of domestic and foreign investments. Yet, the Northeast dams were argued as necessary to alter Northeast India's pervasive underdevelopment.

One benefit that was expected from large dams in this region was flood control. The Dibang Multipurpose Dam is designed as a conventional storage dam with a flood cushion component to protect downstream areas from flooding. More importantly, the projects were geared to be profit-making ventures by maximising their power generation capacity. Lower Subansiri is a "Run of the River" or RoR project. A regular RoR is a benign project that generates power from undammed flowing water. But the Northeast RoRs are aimed to be peaking power stations.These projects involve creating a 'head' by stocking water behind a large dam for 24 hours and every evening when the demand for electricity peaks, the waters are released to pass over turbines to generate power.

The amendments to the Electricity Act of 2003 opened up a new front for private investment. Once electricity production was thrown open to private actors, dams in Northeast India also presented a means of attracting financial capital into this corner of India. The 1,750 MW Lower Demwe project proposed on the river Lohit, a tributary of the Brahmaputra that flows through the Mishmi hills in the eastern part of Arunachal Pradesh, was among the hundreds of new ones that hoped to profit by investing in this sector which had zero fuel costs, extremely low operation costs and high returns through its lifetime. Besides, the public sector dam building organisations, other prominent project developers include Reliance and Jindals besides many smaller players looking to expand their construction portfolio[2]. The state government of Aruanchal Pradesh holds

2 https://economictimes.indiatimes.com/industry/energy/power/hydelgate-why-arunachal-pradeshs-hydel-boom-is-going-bust/articleshow/19790466.cms

26 per cent share in the Athena Demwe Power Limited, an SPV with Athena Energy Ventures Infraprojects Private Limited. As the state where most of the proposed dams and their associated infrastructure would be built, Aruanchal Pradesh was hoping to see capital flow in at an unprecedented scale.

ENVIRONMENTAL IMPACTS

Rich biodiversity at a dam site.
Photo by Manju Menon

Globally, hydropower dams are being redefined as renewable energy projects. But in tropical regions rich in biodiversity and where communities have socio-cultural and economic uses of rivers, such projects can have serious consequences. Scholars have suggested that dams in the tropics are an anatopism or 'out of place'.[3] As expected, the projects proposed in Northeast India, a region that is part of the Indo-Myanmar biodiversity hotspot, one of the 25 recognised global biodiversity hotspots and where indigenous communities are the traditional stewards of the region's forests, ran into consent troubles.

Large projects seeking environmental approvals have to undertake mandatory public hearings. The hearings for the Dibang project were cancelled or disrupted a dozen times between 2007 and 2013 because of a near total community opposition before the government could claim that they were "successfully"done. The Lower Subansiri and Lower Demwe public hearings were stretched by protracted negotiations and demands for jobs and compensations. They also faced opposition due to displacement, forest loss and takeover of community lands by the project.

Forest loss due to three hydel projects
L Subansiri: 4,040 ha
Dibang: 4,577ha
Lower Demwe: 1,416 ha

The projects' environmental impact assessment reports limited the impact zone of the projects to a 10 km radius, an arbitrary standard. This helped to contain the studies, present the projects as less damaging and negotiate the project with fewer affected people. This left the people of Assam out of the consent procedures for most projects in Arunachal Pradesh, even though the dams would affect

3 https://link.springer.com/
chapter/10.1007%2F978-94-007-2798-4_2

them in the most profound ways. Nearly 20 million people live in the Brahmaputra valley. They are, as Richter and others note, the people in the "shadow zone" of these projects, uncounted for and unspoken to.[4] The people of Assam could engage with these dams only through the antagonistic routes of protests and litigation because they were ignored by the project authorities. In the view of the Assamese protestors, these project studies legitimised water grabbing by an upstream entity.

The Northeast dams also struggled to obtain the nod of environmental experts. The national level Expert Appraisal Committee (EAC) for hydropower projects and the Forest Advisory Committee (FAC) are in charge of recommending environmental and forest approval to large projects. An approval from the standing committee of the National Board for Wildlife (NBWL) is needed in case of projects that affect Protected Areas. The Dibang project was rejected twice by the FAC. It took the intervention of the Cabinet Committee on investments (CCI) and the Ministry of Power and a reconstituted FAC in 2015 to revise this decision. The project was legally permitted to use over 4,500 ha of forest land holding 350,000 trees.

The non-official expert members of the NBWL including noted bird expert and former director of the Bombay Natural History Society (BNHS), Dr Asad Rahmani, practically staged a protest at the meetings to discuss the approval for the Lower Demwe project. While the senior most government officials of the Arunachal government claimed that the delay was frustrating the people of the state, the experts argued that the project would affect Protected Areas such as the Kamlang Wildlife Sanctuary and the Dibru Saikhowa National Park in addition to several riverine islands or chapories, grasslands and forests. The project would use 1,415 ha of forest land. Finally, the then environment minister, Jayanti Natarajan, who headed the NBWL, approved the project in December 2011.

These committees received scores of letters from independent experts, environmentalists and protestors pointing to the underestimation of impacts in the EIA reports done with the aim of obtaining approvals. Ideally these complaints should have put a cap on these projects, but all the projects received approvals based on questionable arguments and were subsequently challenged in courts.

WATER REGULATION

Among all the impacts that the projects would cause, the extreme regulation of river flows downstream of the dams has been the most contentious and has stoked statewide protests in Assam. The release of dammed water by projects every evening to generate power would permanently alter the very nature of these rivers. The flow regime imposed by the projects, which activists called the daily starving and flooding of the river, would destroy the seasonality of rivers in this region and all the livelihoods attached to them such as fishing, floodplain farming, driftwood collection and grazing during the lean season.[5]

Debates on downstream impacts of dams, mainly provoked by Assam's concerns, have thrown up the question of how much water does a river need? So far, there is no

4 https://core.ac.uk/display/27853584

5 http://www.sanctuaryasia.com/magazines/conservation/5289-are-big-dams-leaving-india-high-and-dry-by-neeraj-vagholikar.html

consensus on what should be the ecological standards imposed on large hydraulic structures so that rivers, our main source of freshwater, are not turned into dead channels. Is flowing water a waste or a valuable environmental feature? What should be the tradeoff between maintaining water stocks for power generation and ecological flows for human and non-human needs? Should these decisions be based on certain governance principles or must it be left to economists and engineers? The answers to these questions have not been ascertained before investing in the Northeast dams.

There are also no scientifically backed regulations addressing the role of dams in water disasters. Last year, the Kerala floods brought to public view the contribution of dams in such situations. In the Northeast, monsoon floods have been routinely exacerbated by dam discharges in the neighbourhood. During the 2018 monsoon, both the Doyang Dam in Nagaland and the Ranganadi project in Arunachal Pradesh, expelled their dam waters increasing the scale and intensity of the floods. Yet their attribution to the destruction caused to over 2,000 villages in Assam is left unaddressed.[6] These projects are much smaller in comparison with the new ones proposed to come up.

In this region, the problems of river regulation are queered further because most of the rivers on which dams are proposed flow through territories beyond Indian borders. India has no sources for real time hydrological information to manage these rivers rationally. Secondly, the Indian government has proposed multiple projects of each of the river basins. The plans are based on impromptu policies, made on the go, of the minimum distance between projects and minimum flows from dams.

Due to public pressure, expert appraisals of dams now require cumulative impact studies and carrying capacity studies in addition to the EIA reports for individual projects. However, the Lower Subansiri, Dibang and Lower Demwe projects are left out of these studies on the claim that they are the first to be built in their respective river basins. All three projects received approvals as single projects.

LITIGATION

The three projects have gone through long years of litigation. The environmental clearance (EC) of Lower Subansiri project was challenged in 2003 and the case went on for six years in the Supreme Court before the EC conditions were finally settled in favour of the Arunachal government. But this did not resolve the downstream concerns on the ground. Protestors in Assam have stonewalled the project construction since 2011. In 2013, an NGO called Assam Public Works filed a case in the National Green Tribunal (NGT), a specialised green court, over these unresolved issues. The judgement of the NGT in this case states that a "neutral" three-member team will mediate a way forward for the project. The petitioners of the case opposed the ministry's selection of these members as they were retired employees of government institutions well entrenched in India's large dam bureaucracy. The NGT upheld their selection to the committee in November 2018. The petitioner of the case has challenged the NGT's decision in the Supreme Court.

After its journey in the approval tunnel for eight years, the legal challenges to the approvals for the Dibang project went on for three years in the NGT. Finally, in November 2018, the project's approvals were upheld because "more stringent" conditions had been imposed on the dam including reducing the dam height by 10m to reduce the loss of

6 https://www.newsclick.in/why-assam-really-needs-worry-about-flood

forests by 445 ha. The Lower Demwe project's approvals were challenged in the NGT for eight years starting 2010. In this case, the final judgments and Union environment minister Dr. Harsh Vardhan's decision as NBWL chief have tied the project's operations to the recommendations of a wildlife study. But the study itself will take two more years to complete.

Regulatory and legal challenges to the projects have forced the production of several new studies by government agencies. The studies influence and in some cases contradict the water, forest, land and other calculations done by project EIA reports. Like the EIAs, the new studies generously model different scenarios of water regulation giving the illusion that these have no real consequences for the people of the region. Irrespective of their methodologies or approaches, these studies are tailored to encourage private investment in dam projects in the region. The acceptance of these studies and simulation models in the final decision-making on the dam projects has technicalised the subject of water management in the Northeast.

The opposition to the projects within and outside courts has restricted the future operations of the dams to balance development with environmental concerns. For example, the NHPC has agreed to keep one turbine of Lower Subansiri running through the day to maintain water in the river and the NGT recommended a monitoring committee to oversee the implementation of Dibang project's environmental measures. The legal sanction to these projects poses an unprecedented challenge to regulatory institutions to monitor their operations in one of the most ecologically and seismically sensitive regions of the world. The period of construction and then the lifelong regulation of downstream flows once the projects are operational would require intense monitoring of multiple dam proponents on a daily basis. With the Arunachal Pradesh government having a considerable stake in the profits from running these dams, the regulatory system will have to reign in the state government and dam builders.

Map showing dam sites in Arunachal Pradesh. Photo by Goverment of Arunachal Pradesh
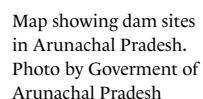
Box: Biodiversity features of the region

The region is part of the Indo-Myanmar biodiversity hotspot, one of the 25 recognised global biodiversity hotspots. It contains more than one-third of India's total biodiversity and over 65 wildlife sanctuaries and national parks are spread out over the eight states, with several more proposed.

The region contains high levels of endemism (species found only here), species diversity and endangered or threatened species:

It contains at least 7,500 species of flowering plants including 700 species of orchids, and many medicinal plants. The plant species richness in all states is over 1,500 with Arunachal Pradesh having nearly 5,000 species. Out of 1,500 endangered floral species, 800 are from this region

The Indian Council of Agricultural Research recognises the region as a centre of rice germplasm, also important gene pool for citrus and banana and of nearly 800 species consumed as food plants, about 300 are from the Northeast. Moreover, out of 60 species of cane and 150 species of bamboo found in India, 26 and 63 species respectively are found in this region.

Faunal diversity is just as rich. Over 3,500 species of insects, 236 fish species, over 500 bird species and 160 mammal species have so far been found in the region. Four out of the six big cats of the world, the tiger, the leopard, the clouded leopard and the snow leopard are found in Arunachal Pradesh. Nine out of India's 15 primate species are found here including the endemic golden langur, two endangered macaques and the highly endangered slow loris. The endangered red panda and all the bear species found in India are also present in this region.

Of the 28,000 wild elephants found in India, one-third is found here. The grasslands and forests are also important for the one-horned rhino and the water buffalo. The region shows very rich amphibian diversity with more new species being added to the list.

The Brahmaputra river has a population of the critically endangered Gangetic river dolphin and the gharial.

The region's biodiversity is still being discovered. Scientists are reporting range extensions, rediscoveries and new species through their surveys.

(Compiled from Chatterjee et al, Biodiversity Significance of Northeast India, WWF-India, June 2006)

More importantly, the additional safeguard conditions that bind projects create a conundrum for project investments. In order to comply with the revised parameters, projects will have to operate under less favourable cost-benefit calculations. Their financial arrangements with the state government, with lending banks and the power purchasers to whom they have promised merchant sales may have to be renegotiated. Who will underwrite the financial losses due to these aspects, in addition to the cost overruns due to project delays? The cost of the Lower Subansiri project, for example, has more than

doubled to over Rs.15,000 crore since 2003[7]. News reports state that the Athena Power Company is already battling insolvency and has urged the Arunachal government to bail it out. Would these costs be palmed off to consumers or tax payers as is usually the case?

WATER POLITICS

The spate of legal clearances to these projects notwithstanding, the political problem caused by the dam proposals looks more menacing today. Water sharing has been a historical problem in South Asia. Unusually, the protests against these proposed dams in Northeast India have politicisied the issue of interstate water sharing before the dams are built, unlike in other parts of India where water conflicts have blown up after projects have come up. How will the sharing of water between Assam and upstream dam building states like Aruanchal Pradesh be arrived at? Will it be in favour of project developers and the Aruanchal government, which seeks to generate 'hydrodollars', as stated by the former chief minister Pema Khanduor, or will it accommodate a fairer approach to water management in the region?

In 2010, this question was taken up by political parties in opposition to the Congress government in Assam as well as in Parliament. The political backlash to dams in Arunachal Pradesh forced the setting up of an Assam expert group and a house committee of the legislative assembly to assess the downstream impacts of these projects. In September 2010, the then Union environment minister Jairam Ramesh made a trip to the Brahmaputra valley to meet protestors. He came back convinced of Assam's problems with the dams. But it seemed too late to change the course of events. By that time, his party's members in the state were complicit by omission or commission in the over hundred deals and monetary arrangements struck with first time dam builders.

Today it is the turn of the BJP governments in Assam, Arunachal Pradesh and at the Centre to take a political decision on these dams. While these projects were being litigated, the energy sector has undergone huge changes and solar and wind power are far more competitive than traditional energy projects. Rather than eschewing mega dams, the central government has recently drafted policies to make large hydro projects more lucrative for private investment. In March the Indian cabinet declared that all large hydro (over 25 megawatt) will be considered renewable energy. This allows the hydropower sector to benefit from more competitive pricing and longer debt repayment. The policy changes also relieve projects of the 'burden' of financing the flood moderation and infrastructure building for roads and bridges.

The Central government's policies on energy and the environment do not leave hope for reflexive decision making on hydropower projects in the Northeast or other parts of the Himalayas. There is hardly any developmental justification today to push these hydropower projects that are unpopular and outdated. Until more enlightened policies for managing the water resources of the Northeast are arrived at, the environment and development of Assam and Arunachal Pradesh are in jeopardy.

7 https://www.telegraphindia.com/states/north-east/green-tribunal-orders-study-on-dams/cid/1530338#.VWRFz9Kqqko

Historical injustice and "Bogus" claims: Large infrastructure, conservation, and forest rights in India

KANCHI KOHLI

Parsa East Ketan Besan (PEKB) mine as visible from Hariharpur village. Photo by Kanchi Kohli

As the country geared up for the 17th Lok Sabha elections, the first quarter of 2019 saw two decisions that signify the deeply fraught forest governance in India. The first was the Supreme Court's direction[1] to state governments on evicting families whose legal rights to occupy forest land were "rejected".

The apex court's decision came in a case challenging the constitutional validity of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006 (FRA). The orders of February 13, 2019, which were revisited two weeks later on February 26, took the view that anyone whose forest rights claims have been rejected could be regarded as an encroacher and therefore liable to be evicted.

In this case, the petitioners were leading wildlife NGOs who argued that several "bogus" claims are being filed in the garb of securing forest rights. They argued that corrective measures including evictions would only protect the legally deserving inhabitants.[2] In response, forest rights groups campaigned

1 Wildlife First and Ors (WP (C) 109/2008).

2 Kishore Rithe (2019), The SC's February 13 order on FRA was consistent with its earlier stand, Hindustan Times, February 28 2019 (https://www.hindustantimes.com/analysis/the-sc-s-february-13-order-on-fra-was-consistent-with-its-earlier-stand/story-JNYBxveKlRiTb3FZnVNeuL.html).

strongly against what they called an attempt to sabotage the FRA process. Social media conversations and other public messages labelled this a conspiracy of groups who believe in "fortress conservation." This approach visualizes the future of forests without any human presence.

Exactly during this period, the Ministry of Environment, Forests and Climate Change (MoEFCC) approved the diversion of 841.538 hectares of the Hasdeo Arand forests in Central India in favour of Parsa, a coal mine in Sarguja district of Chhattisgarh. For the last four years, the tribal village assemblies of the area have asserted their constitutional right to refuse all mining proposals that are likely to damage one of India's last surviving pristine forests. These forests are critical not only for the lives and livelihoods of Gond tribal communities[3], but also the local wildlife and water resources. In response to their opposition, they received a notice rejecting their legally recognized community forest right under the FRA on the grounds that the exercise of their rights is coming "in the way of mining."[4] The villagers have made several formal submissions about the compromised legal process that allegedly includes forged signatures and manufactured consent, which are discussed further in the essay.

If the Supreme Court's orders had not been restrained, these villagers too would have been in line for eviction. Now their records will form part of the docket submitted by the state government before the Supreme Court. How the court proceeds on each claim will perhaps be clearer on July 24 when the case is listed again for hearing.

FOREST RIGHTS AND FOREST DIVERSIONS

A law for forest rights

The FRA was enacted to redress historical injustices faced by tribal and other traditional forest dwelling communities at the hands of a colonial forest bureaucracy. Some of the egregious wrongs committed against them include alienation from and restricted access to their traditional homes, forced evictions, and lack of decision-making over managing these forests. Besides, they were routinely subjected to harassments such as fabricated arrests on account of trespass, and 'connivance' with poachers and timber mafia.

When the law was first envisaged, its primary focus was Scheduled Tribes as recognised in the Fifth and Sixth Schedules of India's Constitution.[5] The draft law was subsequently revised to include both tribal and other traditional forest-dwelling communities, who have

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3 Gonds or Gondi is one of the oldest and largest tribal groups in India, belonging to a forest region in central India that was historically known as Gondwana. They are recognised as a Scheduled Tribe in the Fifth Schedule of the Constitution of India.

4 Kohli, K. 2018. An unresolved legal question about forest rights, Human Rights Law Journal, Vol.II, May 2018.

5 Areas primarily inhabited by constitutionally recognised Scheduled Tribes have been granted special governance and protection status in India. This is through the Fifth and Sixth Schedule as prescribed under Article 244 of the Indian Constitution. While the fifth schedule covers 10 states in India, special administrative status is recognized in the states of Assam, Meghalaya, Tripura and Mizoram, as the Sixth Schedule Areas.

lived in these forests and lived off them for generations..[6]Mainstream political parties rooted for the FRA as they reckoned providing land rights would help them garner more votes in the ST constituencies.

Once enacted, the law did three key things. First, it laid out a detailed process through which rights subsisting as on December 13, 2005 could be vetted and recognised by the Gram Sabhas (village assemblies)[7] and subsequently entered into government records. Secondly, it distinguished between the grant of individual rights up to four hectares and community forest rights for which there isn't any defined limit. These individual rights can only be inherited and not transferred by sale. Thirdly, it clarified how forests should be governed once rights are conferred allowing for conservation and management roles for rights holders. The law distinguishes between tribal communities and other traditional forest dwellers, who are required to show proof of residence for three generations or 75 years.

Conservation groups had expressed concerns that the grant of rights will not only endanger wildlife but also break up already vulnerable forest areas that need to be protected. This is especially true of flagship species like tigers that, it is argued, require undisturbed areas for their survival. The inclusion of conservation duties for rights holders in the law did satisfy organizations and researchers supporting community-based conservation. However, the law failed to assuage the concerns of those who see creation of inviolate areas under laws such as Wild Life Protection Act, 1972 as the most effective way forward for conservation. This model proposes the relocation of human communities for the protection of wildlife.

Use of forests for extractive and infrastructure projects

As forests fall under concurrent jurisdiction of both central and state governments, the implementation of the FRA rests on the Ministry of Tribal Affairs (MoTA) and respective state governments. However, this law does not specify the process that should be followed in case either community or individual forest need to be used for other uses such as mines, dams, highways, industries, power plants or renewable energy projects. Once rights are recognized, the FRA recognises the Gram Sabha (village assembly) as supreme and vests these decisions with a Forests Rights Committee (FRC)[8].

The right to regulate land-use change lies with the Ministry of Environment, Forests and Climate Change (MoEFCC). State governments need to seek prior permissions, as laid down under the Forest Conservation Act (FCA), 1980, before allocating forest land for non-forest use and felling of trees. Permissions are mandatory and subject to several conditions including carrying out compensatory afforestation for the loss of forest land.

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6 Kundan Kumar and John M. Kerr (2012). Democratic Assertions: The Making of India's Recognition of Forest Rights Act, Development and Change 43(3): 751–771.

7 Gram Sabha" means a village assembly which shall consist of all adult members of a village and in case of states having no Panchayats, Padas, Tolas and other traditional village institutions and elected village committees, with full and unrestricted participation of women.

8 The Gram Sabha selects a Forest Rights Committee (FRC), which is empowered to verify and authorize the claims presented before them. It is to comprise of 10-15 members, one-third members of which need to be scheduled tribes. One-third is to be women.

The environment ministry clarified the link between the FRA and the FCA circular, issued in 2009, which was sent to all state governments. The requirement of consent from Gram Sabhas and the completion of recognition process is mandatory before any forest diversion can take effect. No forest land can be transferred for other uses unless the recognition of rights is complete and the state government submits consent of the affected Gram Sabha(s). This requirement is now clearly laid out in Forest Conservation Rules, 2017.[9]

This clarification also opened the possibility of invoking the FRA compliance in cases where final approvals for forest diversions were pending. In the case of the Thoubal Multipurpose (Mapithel) project in Manipur, villagers invoked FRA compliance for a dam project first proposed in the 1980s. The construction of the project had been carried out in the absence of a final approval through which 595 hectares the forest land could be used for the project. In 2014, when the state government eventually approved the forest diversion in favour of the Irrigation and Flood Control Department of Manipur government, the FRA was in place, but its provisions not invoked.

The dam's construction at the tri-junction of Ukhrul, Senapati and Thoubal districts of Manipur was challenged before the National Green Tribunal (NGT). At first, the NGT concluded that the FRA compliance was a "dead issue", as 80 per cent of the project had already been completed. When this was questioned in a review petition, the state government argued that since the government had taken all rehabilitation measures and paid compensations paid to the affected people back in 1993, the post facto compliance of the FRA was not in order.

In December 2017, the NGT overturned its earlier decision related to FRA compliance. Both the project proponent and the state governments were directed to bring the project in line with the legal requirements, including recognition of rights and consultation of the Gram Sabha.[10] As of March 2019, this process was yet to be operationalized,[11] even though the Mapithel Dam Affected Villages Organization (MDAVO) had repeatedly drawn attention to the pendency.[12]

HASDEO ARAND'S FORESTS AND COAL BLOCKS

Hasdeo Arand is celebrated as the largest un-fragmented forests in central India outside the official protected area system. This unbroken forest stretch is an important corridor for the movement of flagship species like elephants and tigers. Spread across Korba, Sarguja and Surajpur districts of Chhattisgarh, they are also one of the most pristine sal (Shorea robusta) and teak forests in the country. Home to many other diverse species, as recorded by the forest department, the area is remarkably rich in biodiversity.

9 Letters of Ministry of Environment Forests and Climate Change dated 30.7.2009 and 1.8.2009 and Forest Conservation Rules, 2017 (Section 6 (3)).

10 Themrei Tuithung & Ors v/s State of Manipur & Ors (Review Application No. 46/2016 & M.A. No. 46/2016/EZ in Appeal No. 4 of 2014 EZ National Green Tribunal).

11 Dutt, Bahar, Failing the Forest, The Hindu, 4 March 2019.

12 The People's Chronicle, Undated. Govt defying NGT directive on Mapithel Dam: MDAVO, accessed from http://www.thepeopleschronicle.in/daily/english/1089 on May 23 2019.

Hasdeo Arand is also known for its coalfields that cover an area of 187,800 hectares comprising 18 coal concessions. Of these, about 150,200 hectares is covered with high quality forests. Studies have recorded that approximately 117,600 hectares have a canopy cover of over 40 per cent while an additional 11,600 hectares have a canopy cover of over 70 per cent.[13] In a joint policy-mapping by India's coal and environment ministries in 2010, the entire area was officially recorded as a no-go area for mining. In 2007, the environment ministry approved a proposal to declare 45,000 hectares of Hasdeo Arand as the Lemru Elephant Reserve—an official recognition that conservation of species needs to be prioritized, and all measures taken to reduce threats. These conservation proposals were, however, put on the backburner as plans to mine coal took primacy.[14]

The forests are home to Gond tribals, who farm and depend on the forests for their livelihoods. Their rights are protected not just under FRA but also under the Panchayat Extension to Scheduled Areas (PESA), as the administrative districts are constitutionally protected Fifth Scheduled Areas.The Gram Sabhas enjoy a special governance status in Hasdeo's forest, including the legal right to be consulted prior to the implementation of development projects such as mining.[15] The forests also form the catchment area of the Bango Dam, built on the Hasdeo river back in the 1960s, which irrigates over 300,000 hectares of farmland. The river is one of the main tributaries of the Mahanadi, one of India's major rivers.

At present there are only two operational coal mines in the area: Chotia, which is on the periphery, and the Parsa East Ketan Besan (PEKB), which lies well within these forests. Parsa, which is also strongly contested by the Hasdeo Arand Bachao Sangharsh Samiti (Save Hasdeo Struggle Committee), is one of three coal mines that threaten to break up the forest contiguity and impact local livelihoods. PEKB's operations have already exacerbated human-elephant conflicts with several reported incidents of elephant movements around tribal settlements, agricultural fields and the railway track transporting coal from the PEKB mine.[16]

THE BIG DEBATES

The orders of the Supreme Court and the coal mining case lend themselves to a deeper review of how the forest rights regime interacts with the demand for land for infrastruc-

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13 Greenpeace India. 2012. How Coal Mining is Trashing Tigerland, accessed from https://www.greenpeace.org/india/en/issues/environment/984/how-coal-mining-is-trashing-tigerland/ on 23 May 2019.

14 Priyanshu Gupta and Arnab Roy Chowdhury (2017), Harnessing Gram Sabhas to Challenge State Profligacy in Chhattisgarh, Economic and Political Weekly, Vol. LII, No. 49, December 2, 2017.

15 Section 4 (e) (i) of the PESA Act says every Gram Sabha shall "approve of the plans, programmes and projects for social and economic development before such plans, programmes and projects are taken up for implementation by the Panchayat at the village level".

16 Chitrangada Choudhury (2019), If we give the Hasdeo forest, where will we go?: Jainandan Porte on mining protests in Chhattisgarh, The Caravan, February 25, 2019. (https://caravanmagazine.in/communities/coal-mining-hasdeo-forests-protests)

ture projects. It also allows us to understand how the unresolved concerns of wildlife conservation groups were reiterated in the interpretation of the apex court's orders.

There are three big debates that bring together infrastructure, conservation and forest rights.

Community ownership and forest diversion

A central challenge for forest rights is whether forest rights re-distribute ownership of forest land or are limited to use rights. This has been one of primary conflicts related to forest governance in India. Forests are in the concurrent list of India's constitution, which means both central and state governments have jurisdiction over the use of these areas. Before 2006, barring Sixth Schedule Areas in North East India that enjoyed special constitutional privileges,[17] state governments were vested with a substantial administrative control over forests. In addition, some areas had a system of community rights like nistar (community use rights), where recognising ownership was a relatively easier task.

The FRA changed this dynamic. In respect of individual rights, the land ownership is transferred to a claimant and the formal title, or patta, officially entered in government records. In instances of community forest rights (CFR), the land remains under the 'jurisdiction' of the state forest department. The CFR can be granted for extracting forest produce without any restrictions, or it could be granted to conserve and manage large tracts of land, which has been a traditional practice.

The forest rights question is at the center of the environment ministry's approval for the Parsa coal mine in Sarguja district of the central Indian state of Chhattisgarh. In order to divert 841.538 hectares of forests for the Parsa coal mine, the individual rights of four villages— Salhi, Hariharpur, Fatehpur and Ghatbarra—have to be either acquired or surrendered by claimants.

The Chhattisgarh government's letter, based on which the forest diversion is approved, claims that all the Gram Sabhas have consented to surrendering over 614.219 hectares in lieu of ameliorative measures. The residents of Hariharpur village, who are members of the Hasdeo Arand Bachao Sangharsh Samiti, deny this, as there is no record of any Gram Sabha where such consent was recorded.[18] They have continued to object to the land acqusition and forest diversion procedures, even as both central and state governments have carried out the paperwork as a routine matter. [19] .

For the community forest rights, where consent was hard to come by, the state administration revoked the community forest right title. Through an order dated January 8 2016, the district level committee (DLC) under the FRA had informed the CFR holders of Ghatbarra village that their rights stand cancelled as they disrupted mining activity. The district collector, the divisional forest officer (DFO), and the district level representative of the tribal development department all signed the order. The village had received

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17 See Note 5.

18 Letter to district collector, Sarguja dated 21.8.2018 by residents of Hariharpur villages pointing to repeated rejection of forest diversion proposal for the Parsa coal block and submission of papers by user agency to the environment ministry.

19 Nilenna, M.S. 2020. The long battle of Hasdeo Arand residents against the Parsa coal project in Chhattisgarh, The Caravan, 24 June

this CFR title to access 811 hectare of forests.[20] This area overlaps the coal concessions of both the PEKB and the Parsa mines.

This decision came under intense scrutiny within the tribal affairs ministry, which recorded that the DLC took this step even though the legal framework of FRA does not envisage revocation as an option. The legal validity of the decision is yet to be confirmed in the executive records and through a case pending before the Bilaspur high court.[21] Meanwhile, the environment ministry approved the application for the diversion of forests for the Parsa coal concession. [22]

Recognition of rights or settlement of claims

The question of forest rights is stuck somewhere in between the political recognition of existing habitation and use of land and the bureaucratic exercise of filing and settling claims. For the drafters of the law, the existence of rights was never a debate; it was about setting right the historical wrong of alienation. There was an urgent need to take a fresh look at the offical records where all previously subsisting rights were reconciled. That done, rights holders would be able to politically assert their choices on how individual and community forest areas should be governed and managed.

The administrative implementation of the law has been mostly about the filing and settling of claims, just as it is done to access government schemes. At different points of time, the highest offices have pushed governments to settle forest rights in "campaign mode" or in an expedient manner.[23] Administrators have been obsessed with milestones, timelines and record sheets rather than ensuring fair and deliberative processes such that recognition is not turned into mere administrative formality.

This contradiction continues to influence the manner in which forest rights are perceived, demanded and understood by both government and non-governmental actors. As part of Parsa coal mine's approval condition, the state government permitted double the amount of degraded forest land for mandatory compensatory afforestation (CA). This land was handed over in Korea district on the assurance of the forest department, despite the fact that villagers of the designated CA site were waiting for the paperwork on their forest rights to be completed. It is not clear whether these rights have been rejected in

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20 The Ghatbarra CFR recognised three specific rights for the villages: Section 3 (1) (b) community rights such as nistar, by whatever name called, including those used in erstwhile princely states, zamindari or such intermediary regimes; Section 3 (1) (c) right of ownership, access to collect, use, and dispose of minor forest produce which has been traditionally collected within or outside village boundaries; and rights to grazing (both settled or transhumant) as per Section 3 (1) (d) of the FRA, 2006.

21 Forest Right Committee Ghatbarra Versus Union of India (WPC No.1346 of 2016).

22 Nandi, Jayashree. 2021. Villagers oppose opening up of Hasdeo Arand forest for coal mining in Chhattisgarh, Hindustan Times, October 30 retrieved from: https://www.hindustantimes.com/india-news/villagers-oppose-opening-up-of-hasdeo-arand-forest-for-coal-mining-in-chhattisgarh-101635572458456.html

23 Mayank Agarwal (2015). Government asks nine states to implement Forest Rights Act immediately, Mint, June 19 2015 (https://www.livemint.com/Politics/Rh9S8NYRnVfhoBfWDAm5yO/Govt-asks-nine-states-to-implement-Forest-Rights-Act-immedia.html).

official records, but the residents of Dhanpur village have been caught unawares.[24]

This may well be yet another instance included in the records submitted to the apex court. Would the court be interested in, or be in a position to corroborate, the documents on a case-by-case basis? Will this process not reverse the decentralization of forest governance that the FRA had sought in the first place? For Dhanpur in Korea and Salhi, Hariharpur, Fatehpur, Ghatbarra, it is not their village assembly but a national court that may eventually determine the rightfulness of their claim.

Wildlife and tribal people

One of the oldest divisions on forest rights are those related to wildlife conservation and tribal livelihoods. The conventional top-down models of conservation envisaged enclosures for wildlife without any human interference, with all rights denied or only partially allowed. This model continues to exist both in law and in wildlife practice, although other frameworks that encourage the leadership, wisdom and partnership of tribal and local communities in conservation have also evolved. Similarly, human rights groups have not always accepted the scientific arguments that some areas may need to be isolated for a threatened species to survive or revive. And those that do nevertheless stress on a due and democratic process of decision making but only after rights of communities are recognized in full. They reject forced relocations in the name of creating conservation enclosures.

The question of whether forests should be for tribal communities or wildlife was also one of the key drivers in the case challenging the validity of the FRA in the Supreme Court. In their press release, the petitioners Wildlife First, Nature Conservation Society and Tiger Research and Conservation have argued that parceling forest areas into individual rights would lead to habitat fragmentation, which has been "scientifically established as the most serious threat to long-term conservation of forests and biodiversity", which includes wildlife.[25]

Groups such as Campaign for Survival and Dignity (CSD), instrumental in the enactment of the FRA, have, however, called the petitioners' claims as misleading and argued for the positive role of the forest rights act in encouraging community-based conservation.[26] Over three hundred conservationists signed a petition against the evictions, asking for the recall of the SC order as it was both anti conservation and against forest rights.[27]

In the forests of Hasdeo Arand, both tribal communities and wildlife remain vul-

24 Ishan Kukreti,Uprooted for the sake of compensatory afforestation, Down to Earth, April 30 2019 (https://www.downtoearth.org.in/news/forests/uprooted-for-the-sake-of-compensatory-afforestation-64268).

25 Press Release: The Recent Supreme Court Order on Forest Rights Act (FRA) Does Not Affect Genuine Claimants, accessed from http://www.conservationindia.org/articles/fra-sc on May 13, 2019.

26 Campaign for Survival and Dignity. Whose Bogus Claims? Anti- Forest Rights Petitioners Again Make Misleading Arguments, accessed from https://forestrightsact.com/2019/02/21/whose-bogus-claims-anti-fra-petitioners-again-make-misleading-arguments/ on May 14 2019.

27 Conservationists Speak Out Against Evictions, Say This Is Not Pro-Conservation, https://forestrightsact.com/2019/02/27/conservationists-speak-out-against-evictions-say-this-is-not-pro-conservation/, February 27, 2019.

nerable. A government that has decided to pave the way for coal mining would want both tribals and wildlife out of the way. The official documents submitted for seeking diversion of forests for the mine hold no surprise. A site inspection by the forest department records the "occasional" presence of elephants even though Hasdeo Arand was once about to be declared an elephant reserve. Villagers routinely report the movement of elephants, and increased instances of human-elephant conflict due to forest disturbance. They remain organized against the opening of the Parsa coal mine, questioning the documents that record their willingness to give up their rights. The decision on executing forest diversion following the environment ministry's approval now rests with the Chhattisgarh state government.

NEGOTIATING OUTCOMES WITH FRA

The three debates may be seen as manifestations of a poor implementation of the FRA, but there is much more at stake. The FRA is a new legal tool that is being used by a range of actors in various socio-political contexts. In each of these, it seems to have strengthened different people's hands. In some cases, the forest bureaucracy has utilized it more effectively to achieve its goals. In other places, campaign and community groups have used it to strengthen their case against extractive and infrastructure projects. Rights holders have also tried to use the FRA, for instance in the Mapithel Dam case, for re-opening pending issues of consent and compensations.
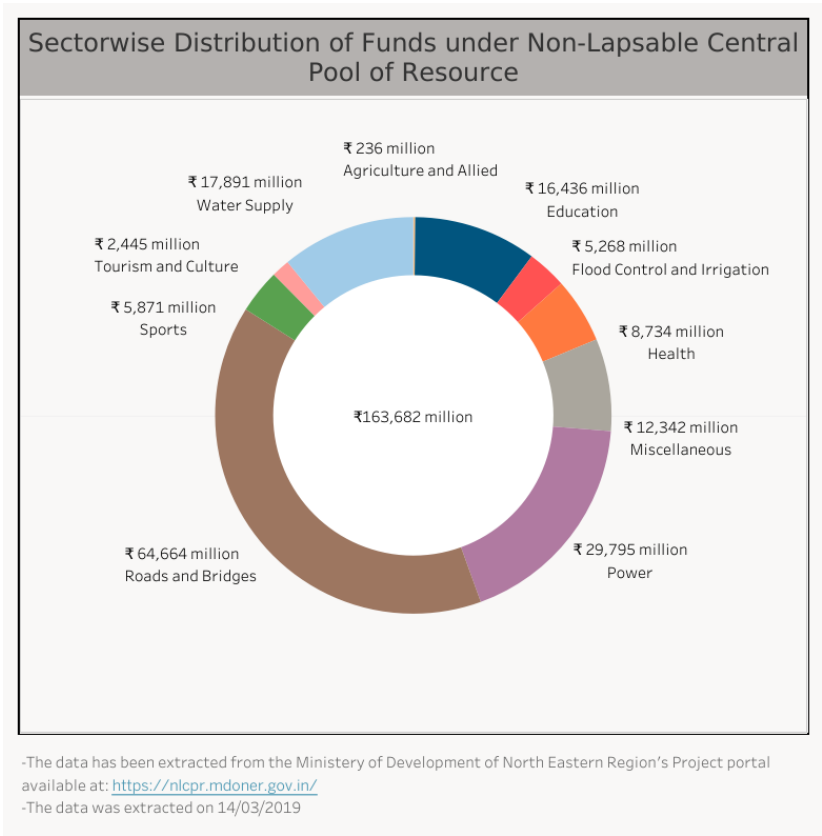
It is clear that the effects of FRA implementation on the ground are varied. It provides an opportunity for both rights holders and governments to negotiate conservation strategies such that only socially relevant and economically gainful projects see the light of day. But the Supreme Court's decision has little space for the local. It may end up judging the proper implementation of a law against standard set of parameters without considering its multifaceted and site-specific contexts. The FRA had taken several strides into institutionalizing democratic decision-making centred on the Gram Sabha. This might be completely lost if the space for approving and rejecting forest rights claims shifts to the closed doors of a national court
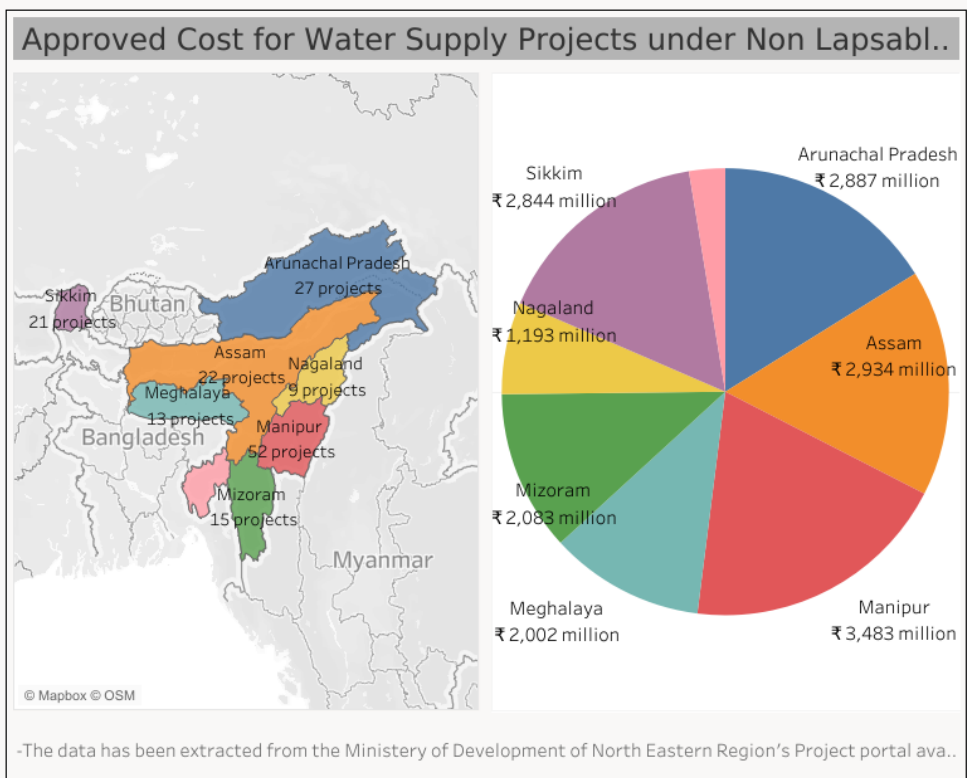
Infographic status of water supply projects under Non-Lapsable Central Pool of Resource in Northeast India

ASHISH KHANDALIKAR

Non Lapsable Central Pool of Resource (NLCPR) Scheme was started in 1998 to fill up the gap in infrastructure sector of the North Eastern Region through sanctioning the projects prioritized by the State Governments. So far, one thousand six hundred forty-three (1,643) projects at an approved cost of Rs. 163,668.2 million have been taken up in eight States of North Eastern Region. It was later transferred to DoNER (Development of North-Eastern Region) in 2001.

The following visualisation shows the distribution of funds across the ten sectors from 1998 till date. Hovering over any sector will reveal the number of total projects in that sector, completed projects and ongoing projects.

Sectorwise Distribution of Funds under Non-Lapsable Central Pool of Resource

- ₹ 236 million — Agriculture and Allied
- ₹ 17,891 million — Water Supply
- ₹ 16,436 million — Education
- ₹ 2,445 million — Tourism and Culture
- ₹ 5,268 million — Flood Control and Irrigation
- ₹ 5,871 million — Sports
- ₹ 8,734 million — Health
- ₹ 12,342 million — Miscellaneous
- ₹163,682 million
- ₹ 64,664 million — Roads and Bridges
- ₹ 29,795 million — Power

-The data has been extracted from the Ministry of Development of North Eastern Region's Project portal available at: https://nlcpr.mdoner.gov.in/
-The data was extracted on 14/03/2019

Approved Cost for Water Supply Projects under Non Lapsabl..

Map labels:
- Sikkim — 21 projects
- Arunachal Pradesh — 27 projects
- Assam — 22 projects
- Nagaland — 9 projects
- Meghalaya — 13 projects
- Manipur — 52 projects
- Mizoram — 15 projects
- Bhutan
- Bangladesh
- Myanmar

© Mapbox © OSM

Pie chart labels:
- Sikkim ₹2,844 million
- Arunachal Pradesh ₹2,887 million
- Nagaland ₹1,193 million
- Assam ₹2,934 million
- Mizoram ₹2,083 million
- Manipur ₹3,483 million
- Meghalaya ₹2,002 million

-The data has been extracted from the Ministry of Development of North Eastern Region's Project portal ava..

Scan for accessing more charts

D.

India's Infrastructural Margins: Questioning the Business-as-Usual

This section investigates the promise and rhetoric of infrastructure, which is often tied to the aspirations of its recipients, often the young, for a better future. Infrastructures, promised or built, may reflect the desires of a people or they may fashion new desires and fantasies. Either way, they end up transforming the economic, social, political, and ecological landscapes and the complex relations among them, often in unpredictable ways and not always in accord with the original blueprint. Kaustubh Deka investigates the recent infrastructure boom in India's Northeast, a region long beset by what scholar Sanjib Baruah has described as "durable disorder", from the point of view of its materially deprived and politically disgruntled youth. He argues that if the recent flurry of infrastructure expansion is merely a stratagem for the state to tighten its political grip over the region, while ignoring the real concerns, needs, and desires of its people, "it has every prospect of turning the youth in the northeast into a precariat." Dolly Kikon likewise argues that roads, highways, and railways are not merely conveyor belts that circulate goods and people—they are great disrupters of social relations, which more often than not reproduces existing class and power relations. She argues that the recent infrastructure uptick in the Northeast, when viewed through the lens of gender, reveals a dark underbelly where women, rather than feeling empowered with better skills and education, are forced into leaving the region and ending up joining the burgeoning underclass of low-paid workers and maids in the metropolises. Infrastructure in its present form, she suggests, is nothing but a form of phantasmagoria, a cunning ploy by the sorcerers of capital to deceive people into confusing the promise of infrastructure for the real things, like dignity, stability, peace, and contentment that may actually make their lives better. In her poignant poem Questions on Her, Manipuri poet Chaoba Phuritsabam calls out the machinations of state power and corporate greed, which have used infrastructure as a ruse to abuse Loktak lake and its once-sovereign women.

Youth and Infrastructure Development in Northeast India

KAUSTUBH DEKA

SECTION ONE

1.1 NORTHEAST INDIA: AN INFRASTRUCTURAL ENTITY

"Northeast India is littered with concrete. From winding flyovers to towering churches on village hillsides to surveillance towers housing paramilitary forces, concrete is integral to the region's urban and rural landscapes and everything in between. What can all this concrete tell us? What stories does it open up? What can questions about politics, power, development and culture can concrete raise?"
—'Concrete and Culture in Northeast India' Duncan Macduiara[1],
(Above Photo by the author at Kohima, Nagaland, July 2018).

Containing a little less than four per cent of the country's total population and approximately eight per cent of the total land area, the eight north easternmost states in India, collectively referred to as India's Northeast, assume significance

Scan for Listening Article

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1 http://raiot.in/concrete-and-culture-in-northeast-india/, accessed on 01.11.18.

due to their geo-political location (at the tri-junction of South, East and South East Asia), ecological resources (a rich bio diversity zone with abundance of water, mineral, forest resources) and cultural diversities (hosting eclectic ethnic minority identities resulting in competing territorial nationalisms). In recent years, the region, as a geographical and historical entity, has attracted much attention as a productive site of research 'in its own right', as more dynamic geographies called for attention to 'emergent spatial configuration between the national and the global.' (Karlsson 2018, Willem van Schendel 2002). From the 'policy making' perspectives, though, these significances have mostly been construed in terms of a complex geography of difference – the region being projected as one trapped and languishing in an infrastructural void. A void that marks the general perception of the region as remote, isolated and less developed. In the policy making rubrics, the region is moulded in the language of physicality and infrastructure – essentially as a geographical entity – a bridgehead between South-Asia and South-East Asia, precariously connected to 'mainland India' by the 21 km wide road corridor at Siliguri, the gateway for the North Eastern Railway. The 'Chicken's Neck' corridor, "a congested space, the techno-formal domains of security and modern logistics that visualises the region". (Middleton, 2018). This emphasis on the 'locational disadvantage' faced by the region results in the pre-dominance of infrastructural imaginations in the policy discourse on the region. The Northeast 'Vision 2020' document, considered a key policy guideline by the government for the development of the Northeast region, puts infrastructure development as the key strategy for achieving its vision. The Northeast region being identified in the official discourse as a 'development-deficit' region, immense 'faith' is put in the capacity of infrastructure: "The people in the region envision having state-of-the-art infrastructure not only to enhance the quality of life but also to dictate the pace of economic activity, and the nature and quality of economic growth. The infrastructure deficit is a major deficit in the region, and acceleration in economic growth and the region's emergence as a powerhouse depend on how fast this deficit is overcome."[2] Additionally, the Act East Policy proposes the development of the infrastructure of the region by building roads and highways, expansion of air connectivity, extension of railway networks, opening of trade routes, as well as creation of infrastructural conditions for border trade. These have all but put the Northeast region in an infrastructural expansionist fast track. Most of the Ministry of Urban Development flagship schemes have been focusing on the region. Nine cities from across the Northeast region have been declared as 'Smart Cities' – Agartala, Guwahati, Imphal, Kohima, Namchi, Gangtok, Pasighat, Itanagar and Aizawl. A fund of Rs 14,124 crore for 464 projects has been sanctioned in the first phase as part of the Smart City Mission in the Northeastern region.[3] In essence, policy thrust like this means a lot of bridges, highways, rail roads and airports. What does this high level of infrastructural expansion do to the region, which is mired in contradictions of conflict and transition? The critical task is to assess the foundational doctrine on which the rationale of such 'developmental interventions' are premised.

2 http://mdoner.gov.in/contentimages/files/Vision_2020.pdf, accessed on 20/10/18.

3 http://egov.eletsonline.com/2018/03/smart-cities-set-to-elevate-life-in-northeast-india/, accessed on 02/11/18.
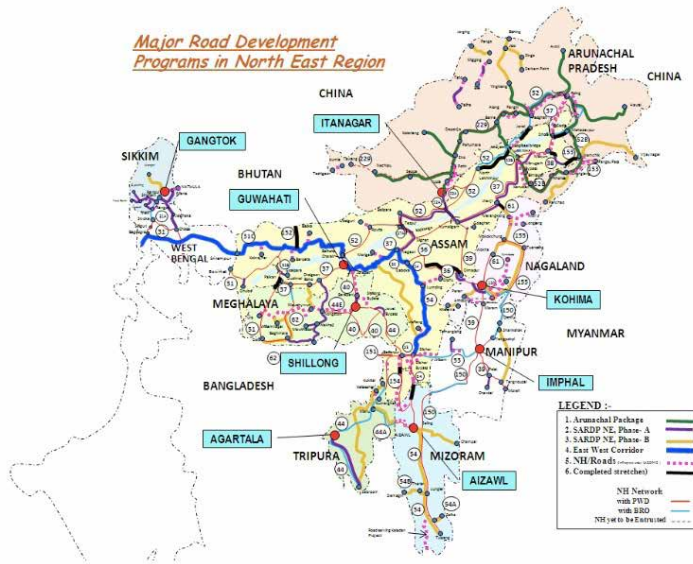
Map Source, http://mdoner.gov.in/infrastructure/sardp-ne, accessed on 05/11/18

1.2 THE CONTENTIOUS CONCRETE: AN EXCEPTIONAL REGION

Northeast India is in many ways "an umbrella connotation, which tends to wipe off its immense diversity of history, culture and politics." (Misra, 2006: 8). Yet, the term persists and assumes increasing significance as a normative as well as instrumental frame for both policy making as well as social movements. The background to India's Northeast, as a region and a borderland, as "the residual fallout of colonial politics and administration" (Phanjoubam 2009: 158), as "a freak child of partition" (Van Schendel, 2018:273), continues to shape the public discourse in the region in many ways. It is this significant 'transformation' (or the lack of it) of the category defined as Northeast into a 'region' under the post-colonial settings from that of a 'frontier' in colonial times, which is of utmost significance from the point of view of understanding the politics and poetics of infrastructural interventions in the region. 'National security' from above and 'ethno-nationalism' from below shape up the discourse of change in the region, while the revenue generating capacity of the states in the region remains relatively weak with consistently high ratio of central grants-in-aid to their total revenue receipts. Further, in an interview to this author, development specialist Raile Rocky Zilpao also pointed out the 'inorganic' nature of infrastructure development in the region, which is state led as against industry led in most other parts of the country. Therefore, it is not immediately apparent what the effects of infrastructure will be on the development of society at large. In this understanding, infrastructure is both a practice as well as a discourse manifesting tangible material forms as well as intangible forms in terms of networks and institutions. In the Northeast, besides the presence of 'international' and 'state' boundaries, there is also the presence of "multiple less tangible but nevertheless real boundaries that crisscross the region – fiscal, legal, liquor, and emotional borders among them. Such borders, which do not usually appear on maps, are also underpinned by a similar "border-logic" of dividing a relating territories and peoples (Tunyi and Wouter, 2016:1). How do the phenomena of infrastructure

development engage with these complexities of the region? A good place to begin will be to critically engage with the complex life world of the youth of the region – multilayered, fraught with contestations but reflective of the complex realities of the region under transition. But first one needs to take a stock of the existing conditions of employment and opportunities for the youth.

SECTION TWO

INFRASTRUCTURE AND THE YOUTH IN THE NORTHEAST: CONNECTIONS-DISCONNECTIONS

"Last month there was heavy rain and ferry services were stopped for two consecutive days. I couldn't cross over the river and nearly lost my job at the town. But there are more serious cases from my place, where patients have lost life not being able to reach better medical facilities on the other side of the river. We are now hoping that the bridge will be constructed soon and crossing the river will become easier"
-- Mrinal Doley, 26, from Dhemaji, who works in a shopping complex at Dibrugarh town at a distance of four to five hours journey including an hour to three of river crossing depending on the season of the year, recounts. The completion of Bogibeel bridge will cut it down to a road journey of an hour.
(Above Photo by the author, Bogibeel, Assam, September, 2018)

2.1 YOUTH AND OPPORTUNITIES IN THE NORTHEAST REGION (NER): THE STATE OF AFFAIRS

As per one report, the Northeast region has its share of 4 per cent of the youth population[4] of the country in the age group of 15-35 years and also a relatively higher proportion of youth unemployment in the same age group compared to all India level.[5] While unemployment in the region remains a steady phenomenon, at the same time, growing outmigration of the youth from the Northeast to different parts of the country has captured attention. About 137.6 million youth from the region were reportedly workers in 2011-12, accounting for 29.1 per cent of the total workforce in India (NSSO 2014).[6] The growth rate of the youth employment was around 1.3 per cent per annum during the period from 1993-94 to 2004-05 but thereafter declined in absolute terms between 2004-05 and 2011-12, at the rate of 1.39 per cent per annum. As per a more recent report by the Organisation of Economic Cooperation and Development (OECD) over 30 per cent of youth aged 15-29 in India are not in employment, education or training, a figure almost three times that of China.[7] As per the Youth Development Index Report 2017, 'Self Employment' (SE) remains the most preferred segment of youth employment in India (53.5 per cent) across the states. The 'Primary Sector' remains the most engaging sector (64.9 per cent), as far as sectoral distribution of youth employment across states is concerned.[8] Both these trends hold true for all the Northeastern states too. However, in almost all the Northeastern states, the figures on these counts are much higher than the national average. As per sources, the number of job seekers in the age group of 15-29 is about 21.03 lakh in Northeastern states.[9] Census 2011 reveals that states like Mizoram and Meghalaya show decline in total workers indicating possibilities that more are joining the labour force than jobs are created and the literacy rate has not translated into employability and productivity. In a survey conducted by the National Sample Statistics (NSS) data 68th Round, 2011-12 titled 'Formal Skill Acquisition of Population in the Age Group 15-29 Years across the States of India (in per cent)', the Northeast states collectively account for a mere 0.4 per cent of the total youth population against the all India figure of 3.9 per cent. States like Maharashtra (21.7 per cent), Kerala (12.2 per cent) and

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4 Notwithstanding all the internal differences in conceptualising, in this study we go by the definition of the 'youth' adopted by the National Youth Policy, 2014. As per this policy 'Youth' are defined as those aged 15 to 29 and as perthe last census this age-group constituted 27.5 per cent of India's population. The NYP defines 'youth' along the following parameters: as a more fluid category than a fixed age-group, as a person between the age where he/she leaves compulsory education, and the age at which he/she finds his/ her first employment.

5 https://vvgnli.gov.in/sites/default/files/124-2017-P%20Amitav%20Khuntia.pdf, accessed on 25/10/18.

6 'Youth of India', 2017, Ministry of Statistics and Programme Implementation,Government of India, http://mospi.nic.in/sites/default/files/publication_reports/Youth_in_India-2017.pdf,accessed on 30/10/18.

7 https://www.livemint.com/Money/JYalqNRTOtaQCIU4EuXGRO/More-than-30-of-Indias-youth-not-in-employment-shows-OECD.html, accessed on 25/10/18.

8 http://rgniyd.gov.in/sites/default/files/pdfs/publications/youth_development_index.pdf, accessed on 20/10/18.

9 Press Information Bureau, Ministry of Skill Development and Entrepreneurship, 12 March 2015.

Tamil Nadu (11.3 per cent) are the better performing ones. Besides, the newly formulated Youth Work Index (YWI), the composite index that reflects upon the quantity and quality of employment among youth, puts the score of most of the Northeastern states in the lower category, with the states like Nagaland, Manipur and Tripura being some of the worst performers. The YWI at the national level stands at the score of 0.572, putting India in the Medium category globally ranking in at 133 out of 179 countries. Higher levels of industrialisation and education, and availability of training infrastructure and training capacities both in the public and private sectors in other states are given as explanation of their better performance. As industrialisation and skill development are seen as the main factors for creating employment opportunities, there has been emphasis on skill development initiatives amongst the youth in the region. As per available data, a total of 93 training centres and 69 skill partners are working in the Northeast region. Assam has 48 training centres with 39 skill partners, Manipur one training centre with one skill partner, Mizoram six training centres with one skill partner, Meghalaya 10 training centres with eight skill partners, Nagaland eight training centres with five skill partners, Tripura 16 training centres with 12 skill partners, and Sikkim four training centres with three skill partners.[10] However, the youth migration from the region to other parts of the country remains a growing phenomenon. This fact points out the complexities of 'job creation' that often has the aspects of both anxiety (needs) and aspirations (prospects).

2.2 COMPLICATING THE 'YOUTH BULGE'

Aiming at youth development is often considered as one of the most cost-effective strategy for achieving growth and development in a country characterised by demographic dividend, as the youth are seen as the 'change agents' aimed at bringing 'good governance at the grassroots' (Gireesan, 2013). With this definition India is considered poised for a 'youth bulge', which reflects the peak of India's 'demographic dividend', as fertility declines and India's population begins to age. According to the population projection 2001-2026 released by the National Commission on Population, the average median projected age of the population of India in 2026 will be 31.39. The same average for the states in Northeast India (excluding Assam) is 33.59 and for Assam it is 30.80.[11] However, the concept of demographic dividend and 'youth bulges' needs to be complicated further. Youth bulges are argued to potentially increase both opportunities and motives for political violence as they provide greater opportunities for violence through the abundant supply of youths with low opportunity costs, as they are more likely to experience institutional crowding, in particular unemployment. (Urdal, 2006:1-2). In other words, although demographic dividend or "the decreasing dependency ratios represent a potential for economic growth, the realisation of this potential largely depends on the social, economic, and political environment" (Williamson 2001:108). Youths are severely impacted by any developmental projects as much as they are likely to influence the formation of such projects. This is where, to understand the equation between 'youth' and 'development', the 'social background' to the formation of the 'youth' as a category of change needs to

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10 https://vvgnli.gov.in/sites/default/files/124-2017-P%20Amitav%20Khuntia.pdf, accessed on 22/10/18.

11 http://gujhealth.gov.in/pdf/projection_report.pdf, accessed on 15/10/18.

be investigated. As Fabio Lanza sums up: "There is something politically and historically incongruent in portraying categories (such as 'students'), places (such as 'university'), or even communities as always already established." (Lanza 2012:32).

2.3 'YOUTH' AS AGENTS OF 'CHANGE': THE DUAL LIFE OF PROTEST AND PARTICIPATION

The social category 'youth' becomes significant in the Northeast region through the phenomenon of youth assertion and mobilisation as it reflects the larger contradictions brewing in the society, capturing emerging trends through which the socio-political plot gets scripted. It is through the body of the youth that state societal interaction takes place in the volatile Northeast region. Historically, the outline of the political discourse in the Northeast region has often crystallised around the trends of student-youth activisms of various kinds. With their varied history and social location, the youth as a socio-political category has played the role of effective and at times pioneering agents of change in the region, both as channels of protest as well participation. The student and youth organisations have provided crucial platforms for the articulation and performance of different identities in the region at various levels. These have ranged from the 'inception' of identities within movements to 'deliverance' of it in the form of accords as well as their further 'circulation' through continuing activism that have been central to the discourse of political change in the state. Their role fits very well with what Jennifer Earl succinctly puts as the functioning of a 'social movement organisation' (SMO), "to collect and strategically distribute resources, institutionalise movements, provide strategic leadership, organise protest events, reach out to the media and secure media coverage, and build collective identity" (Earl,2014: 48). Thus, the implications of 'infrastructure development' in India's Northeast must be placed in the context of the unfolding 'aspirations' as well as 'lived realities' of the region's youth. In this context, there is a need to understand the developments in the Northeast region by unravelling the dual narratives of anxiety and aspiration, marked by the coexistence of protest and participation in the social life of the region, a play between a neglect narrative with a long history and "an emerging narrative that is both oppositional and participative" (Dutta, 2012). At times, 'migrant', other times 'indigene'; at times'rebel', other times 'participant' – the fluctuating nuances in the complex discourse of the youth as a category of change is reflective of the larger trends in the region. The critical role of 'infrastructure' within this discourse needs to be highlighted and perhaps the trends and nature of the 'infrastructure discourse' itself be re-evaluated on this basis. As we mentioned earlier about the 'unique' background to the formation of the region, here it needs to be re-emphasised that 'territoriality', the spatial strategy to affect, influence, or control resources and people by controlling area, has been a dominant theme in the post-colonial politics of Northeast India. (Baruah, 2013). As Willem Van Schendel pretty much sums it up: "Ideas about autonomy, self-determination, historical iniquity, belonging, political strategy and armed resistance against state militarisation circular in the entire region-by means of cross-border networks of kinfolk, trade partners, refugees, co-religionists and political elites."(Van Schendel, 2018: 285.)

Within this discourse the ethnic politics and the state policies exists in a symbiotic relation and embedded to this discourse the flow of infrastructural intervention goes on creating ruptures/ consolidations.

2.4 OF ASPIRATIONS/ EXASPERATIONS: 'THERE'S NOTHING TO DO AT HOME'

Despite the massive proliferation of infrastructural interventions in the region, the number of out-migrating youth has been increasing. In a survey conducted by this author[12], 'infrastructural development' emerged as a top priority issues for youth of the region. The same survey showed that an overwhelming majority of the youth (74.5 per cent) in the Northeast would like to get settled outside the region/ state for better career and job prospects. A survey released by the North East Support Centre and Helpline in early 2011 puts the number of migrants outside the Northeast at 414,850. The same report cites a 12-fold increase in migration out of the Northeast from 2005 to 2011. Karlsson and Kikon calls it 'wayfinding' by the indigenous migrants, "a journey without a map or pathway to follow, with no clear destination or end point" (Karlsson and Kikon, 2017:4), Duncan Mcduie Ra points out the emergence of 'adjacent identities' due to the increasing migration from the region, intensifying encounters between communities from the region and so-called 'mainstream' India (Mcduie Ra, 2016). The often discussed structural factors behind this migration are high levels of insecurity and violence, a non-functional local state, lack of educational facilities, a stagnant economy, dependence on subsistence farming, and unsustainable extraction of natural resources (Karlsson and Kikon, ibid). Whereas, Sanjoy Hazarika sees this transformation of the Northeast from a "migrant-receiving region" to a "migrant-producing area" as a sign of the Northeast people coming of age (Hazarika, 2018). The ongoing efforts therefore need to be urgently measured alongside unfolding phenomena like youth outmigration as well as alienation that critically reflect on the nature and outcome of the ongoing discourse infrastructural expansions in the region. The significance here cannot be missed

Above at a road junction near Kidima, Nagaland where sellers (mostly women) carry their load from far off villages in search of passer by customers, December 2017. Below the author at Junbeelmela (a traditional annual barter trade fair) at Morigaon, Assam on January, 2018.)
Photo by Kaustubh Deka

12 A survey was conducted across seven university campuses in the NER targeting the student organisations as well as 'common' students to know their views on elections and the electoral processes. The survey report can be accessed at, https://www.thehinducentre.com/multimedia/archive/02670/Policy_Report_No_1_2670863a.pdf.

that in the same areas where the juggernaut of big infrastructure has moved, alienation of the youth has also been sparked. In many places there are reports of a (renewed) spurt in the number of youths joining militancy.[13] Apart from youth absorptions into these infrastructural projects, the path of protest and gun too needs to be looked as 'responses' to infrastructure. As Karlsson and Kikon noted earlier: "Despite the visions for development and progress that are promoted in order to reconstruct the underdeveloped and militarised societies of India's northeast, the increasing number of indigenous migrants draws our attention towards connections between the labour market, conflict and poverty. (: Ibid.)

> "The local governance system/ traditional institutions, though recognised by the state, are neither part of the infrastructure planning and implementation process, nor involved in identifying the locations where the infrastructure would be most beneficial. Hitherto, the framework of infrastructure development has been conceived from the statist perspective, thus widening the gap between state and society,".
> (Zilpao, 486-87: 2018).

SECTION THREE

3.1 INFRASTRUCTURE AS DESIGN OF GOVERNANCE: CONTENTIONS AND CONNOTATIONS

Sanjay Barbora talks about India's northeast being at the grip of "an urban transformation that has followed a counter-intuitive path, influenced by the socially disruptive capacities of capital, calamities and counter-insurgency."[14]
Left, Photo taken by the author of Dibrugarh town, which is undergoing rapid urbanisation in the wake of some major infrastructural transformation with new river bridges and hub of communications coming up.

The Sahitya Akademi winning novel 'Mouna Outh Mukhar Hriday' (silent lips, murmuring heart) by the writer from Arunachal Pradesh, Yeshe Dorjee Thongchi, revolves around the story of a couple in love, belonging to two different tribes, who comes into contact first time when 'drafted' by the government road construction work. Despite the lack of a common language, romance blossoms between the two, a development not taken very kindly by their respective tribes. This theme of part resistance, part reciprocity to the 'imposed' and 'sudden' strokes of 'modernity' underwrites most of the narratives of infrastructural developments in the region. The consequences are seemingly contradictory but mutually reinforcing. Infrastructure in this understanding not only imposes spatial limitations but also creates and consolidates boundaries and borders. In other words, social identities become induced performances, conditioned by the flow and tenor of the infrastructural designs.

To give few examples, the All Assam Chutia Students' Union (AACSU) threatened to commit mass suicide by jumping from the under construction Bogibeel bridge unless the upcoming bridge were named after 'Sati Sadhani, a cultural/ mythological/ historical icon from the community. The youth group put this demand in the context of the government's 'earlier betrayal' of not granting Scheduled Tribe (ST) status to their community.[15] At other place, the Khasi Students' Union (KSU) and the Hynniewtrep Youths' Council (HYC) in Meghalaya have put on hold the extension of railway linkage to the state, being proposed as part Mission 2020, a North East Frontier Railways initiative to connect the capital cities of the Northeast. For these youth groups, railway expansion can mean a threat to their 'indigenous' identity by opening up the floodgates of unchecked influx of the 'outsiders' into the state.[16] Some other commentaries, however, hinted at the possible involvement of the powerful 'truck lobby' in 'using' the student groups to stall the coming of the railways.[17] In various states of the region, proposed infrastructural interventions have brought together youth groups into platforms of struggle bound by the emergence of complex 'ethno-ecological' identities (student-youth in Assam and Manipur against the construction of mega river dams, in Meghalaya against uranium mining and

14 https://iias.asia/the-newsletter/article/remaking-dibrugarh-contemporary-assam, accessed on 01/11/18

15 https://www.sentinelassam.com/news/all-assam-chutia-students-union-aacsu-threatens-to-commit-mass-suicide/, accessed on 01/11/18

16 https://www.firstpost.com/india/shillongs-anti-railway-groups-threaten-to-intensify-protest-demand-meeting-with-chief-minister-mukul-sangma-3731911.html, accessed on 01/11/18

17 http://www.theshillongtimes.com/2017/06/14/why-oppose-railways/, accessed on 25/10/18

so on) (Deka, 2013). The complex co-existence of the agendas of development, cultural assertions as well as methods of political bargaining in these examples illustrates why youth activisms and policy designs should not be viewed merely as mutually antagonistic or collaborative enterprises but as being increasingly interlocked within a 'contentious politics'[18]. It is an understanding that, one, challenges the boundary between institutionalised and non-institutionalised politics (Mcadam, Tarrow and Tilly, 2001), two, needs to be understood in the context of 'a society coming to terms with historical social change'(Baruah, 2005) and, three, emphasises the relationship between movements and the responses of the political system (Saikia, 2011).

Thus, as Northeast India is 'transitioning' under the phase of large scale infrastructural transformation under the grip of a changed political economy, the "neo-liberal context of jobless growth, increasingly unregulated and precarious forms of employment" (Menon and Sundar, 2018: 2) gets added to the lens of 'security' through which the region continues to be largely construed. As we have seen, the result is a contentious engagement of the region's youth in the infrastructural interventions of the region, both through means of confrontation as well as participation. If the phase of heightened infrastructural expansion in the region is considered primarily as a strategy of strengthening the regime and practices of governance by the state, ignoring aspects of internal equality, environmental consequences and social fabric in the region (Nafis, 2018), it has every prospect of turning the youth in the northeast into a precariat, "a dangerous class - characterised by deep anger, anomie, anxiety, and alienation"(Standing,2011: 113), "youths living a life without the promise of stability" (Ulrik and Jørgensen. 2016). The infrastructure discourse engulfing the region must take note of it. Let the foundation be a pragmatic, emphatic and nuanced assessment of the anxieties and aspirations that make up the lives of the youth in the region.

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18 By 'contentious Politics' Mcadam, Tarrow and Tilly meant:" episodic, public, collective interaction among makers of claims and their objects when (a) at least one government is a claimant, an object of claims, or a party to the claims and (b) the claims would, if realized, affect the interests of at least one of the claimants" (2011:04).

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Gendering infrastructure in Northeast India

DOLLY KIKON

A PERSPECTIVE ON INFRASTRUCTURE

In this essay, I offer how ongoing developments and aspirations on the ground transform gender relations. Across Northeast India, when people demand for "infrastructure" they generally refer to roads, bridges, schools and clinics. There are aspirations for houses and materials such as water supply and electricity as well. Such processes allow us to move from conceptualising infrastructure from abstract ideas to providing tangible and concrete evidences on the ground. These materials, as anthropologists have shown, are powerful tools of thinking about the transformation in our lives. As people begin to attach their aspirations, dreams, and failures to roads, bridges, power supplies, machines, planes and buses, we also witness how they deeply share the social, economic and political lives of people. These connections and relations that are formed as a consequence of these connections and networks are often fragile and constantly evolving (Appel, Anand, Gupta 2015).[1]

Today, infrastructure visions and plans occupy the central place in policy documents and government mission statements for Northeast India.[2] In this context, a gendered perspective on infrastructure is important. It will help us to understand the promises and delivery of material structures and networks on the ground as they transform the composition of households, family, and the society across the region.

My focus on gendering infrastructure in Northeast India in this essay aims to foreground the lived reality of communities in the region. This will, I hope, connect the concept of infrastructure with what can at times remain abstract and at the realm of an idea to the everyday experiences of people. By adopting a gender lens, I present how social relations and politics are informed by forms of infrastructure, and how social lives of societies are constitutive of the infrastructure boom in the region. The everyday lives of people, who live beside a superhighway or next to a mining town where high tech drilling machines break the earth to extract coal, force us to think about infrastructures as deeply bound up in producing political, social, and economic transformation. These living conditions go beyond the material and physical functionality of the material objects such as roads, malls, and the increased circulation of goods and people

Scan for Listening Article

1 Refer to this special issue of infrastructure https://culanth.org/fieldsights/714-introduction-the-infrastructure-toolbox (last accessed 9 December, 2018).

2 http://mdoner.gov.in/

to and from the region. From questions about market, mobility, governance and the role of the state, adopting a gender perspective might help us to attend to formations of new relations and politics.

In addition, a gender framework allows us to see how infrastructure projects and visions take shape and are shaped by communities simultaneously. Economic and political plans to open up the region as a hub of global circulation and development, and, at closer observation, visions for technological innovations and urbanisation across small towns and villages have led to social and economic changes. Gendering infrastructure, then, is a way to recognise the importance of social relationships and how power and authority are constantly negotiated as construction of roads, expansion of markets and circulation of goods and people's aspirations grow expeditiously across Northeast India. In the following section, I focus on the ongoing transformation in the post Look East Policy and Act East Policy period. Construction projects and ideas about connectivity, like in many regions of the world, are synonymous with progress and growth in Northeast India as well. I show how ongoing conversations and projects about development and infrastructure impact gender relations across societies.

POST LOOK EAST POLICY AND ACT EAST POLICY

In 2005, political scientist Sanjib Baruah edited a special issue titled "Gateway to the East: A Symposium on Northeast India and the Look East Policy" for Seminar. He noted that the Look East Policy, an initiative from the early days of the Post-Cold War was finally showing results. Citing the 2004 ASEAN-India car rally that was flagged off in Guwahati, Baruah gave us comprehensive views and challenges to this grand policy. Yet, he concluded with a cautious note. He argued, "…it may be a while before the political, intellectual and material resources necessary to make the Northeast India's actual gateway to Southeast Asia can be mobilised" (2005). But this has not stopped the excitement of the Look East Policy to grow into the Act East Policy under Narendra Modi, the current Prime Minister of India. Since Modi came to power in 2014, the Act East Policy has been pushed as an initiative to open up the region. These policies are focused on establishing new ties and renewing old ones with its neighboring states.

Both the Look East Policy and Act East Policy were focused on economic ties with ASEAN countries with an emphasis on infrastructure, manufacturing and trade.[3] In this aspect, thinking about gendering infrastructure also means relating to the story of mobility, resource flows, and spatial linkages. My encounter with the Look East Policy in the region took place more than a decade ago accidently. Focusing on the theme of "people to people contact"[4] that is propagated in the Look East and the Act East policy reflections, in 2005, I wrote a piece called Operation Hornbill Festival, an invented Naga traditional festival that was launched in 2000 by the government of Nagaland. I was not very concerned about "Look/ looking East". Instead, I was just simply focused to "Look Around" and what I saw was contradictory at many levels. I wrote, "Showcase events like the hornbill festival, with catchy slogans coined in sanitised offices of the tourism department, hide a murky story of the hegemonic control of the military establishment in civil and political affairs in the Northeast. If anything, they add to the distortion of everyday

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3 http://pib.nic.in/newsite/PrintRelease.aspx?relid=133837

4 http://pib.nic.in/newsite/PrintRelease.aspx?relid=133837

realities that are vital in reconstituting the social and political voice of the people. This is where the Look East Policy confronts a world outside economic rhetoric."[5] In addition, both the Act East Policy and the Look East Policy erase the history of militarisation on societies in Northeast India and the overwhelming public and administrative spaces co-opted by military and security structures.

What happens when one chooses a gender framework to understand the transformation of the region as highways and airports, bridges and water pipes are laid down? Among others, questions about land, ownership, justice and gender equality begins to matter. These matters go beyond the aspirations of the people and force us to focus on the household and, for example, turn our gaze on the womenfolk who sell vegetables beside the shiny highways in the region. When we begin to define infrastructure and development initiatives through a gender framework, we succeed in connecting theory to everyday experiences in order to start new conversations and interventions. This is where we begin to witness how and why it is important to connect with the ground experiences and realities.

Across Northeast India, women have always been visible figures in the market spaces as vendors, workers, traders, and owners of mobile food kiosks. They have always remained visible in the public places as workers – in construction sites, road repairs and agricultural fields. They are also the driving force to keep the household running from cooking for the family, feeding the cattle, mending clothes, taking care of the sick, to fetching water and tilling the land. In tribal societies across Northeast India, the predominant distinction of gender identity is set by the traditional councils and the ancestral inheritance rights. Women are neither allowed to hold decision making powers nor are they allowed to inherit ancestral property.[6] Northeast India is increasingly getting connected through roads and bridges; some villages are getting bridges, and the market is expanding in big cities across the region. But who is getting the benefits and what kinds of gender relations are emerging?

The increasing trend of female migrants leaving the region draws our attention to issues about work and employability. Women are leaving the region as migrants to work in the service industry, factories and as maids. Many of them are vulnerable and experience physical and sexual abuse (Haksar 2016). The promise and implantation of infrastructure and connectivity is also connected to the ongoing trend of migration from the region, which is generating new social relations, gender dynamics, and power networks. Experiences of migrants are a deeply gendered one as I noted earlier. For instance, rural women from Assam who migrate and work in factories and households find it extremely hard to return to their villages and hometowns. They are stigmatised as women with suspect morals and harassed. Many women migrants have no savings because they send their remittances to their respective families in the village. Yet the money is often spent in educating the male members of the family or to construct houses for the brothers. In other instances, married women who leave villages as migrants and send remittances home are often abandoned by their husbands once they return home.[7]

With females migrating from the region, there are cases where men become

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5 http://www.india-seminar.com/2005/550/550%20dolly%20kikon.htm

6 https://scroll.in/article/830065/what-kind-of-nagaland-are-we-moving-towards-a-naga-feminist-reflects-on-the-row-over-womens-quota

7 Conversation from a panel discussion on migration in Northeast India held at the Tata Institute of Social Sciences (Guwahati Campus), December 2016.

caregivers. These new roles and expectations at times disrupts the boundaries of what constitutes feminine and masculine works and transform the division of work within the family, but at other times reproduce existing dominant gendered stereotypes.

In addition, the absence and presence of infrastructure is a relevant theme to connect with gendering infrastructure. They make us think how infrastructure ideas (bridges, roads, pipelines) become concrete projects on the ground. Once they are completed, we begin to understand how, for example, the absence or the presence of a bridge in a village becomes an important part of talking about changes that take place within communities.[8] But absence of infrastructure need not deter communities from talking about it. For instance, the absence of proper market infrastructure in Nagaland has not deterred women traders from selling vegetables and fresh produce. Irrespective of the absence of sheds and garbage collection, or basic amenities like toilets and drinking water, women traders and vendors in Dimapur (Nagaland), Guwahati (Assam), Shillong (Meghalaya) or Imphal (Manipur) squat on the ground in poorly maintained urban bazaars or along the city streets. In Nagaland, women traders who fall ill frequently from inhaling the dust and the unhygienic condition of the market place came together and formed the state unit of Self Employed Women's Association (SEWA).[9] Livelihood and poverty alleviation strategies for the women vendors in Nagaland and its neighbouring states, where basic infrastructures are lacking like roads and bridges, require the support of the government and laws. Women vendors selling their produce along the footpaths or beside bus stands due to the absence of designated markets for tribal women traders demand for market infrastructure from the government.[10] This is where the connections between gender, infrastructure and making the government accountable to its citizens become an important political and citizen project. In this context, the absence or the presence of infrastructure on the ground needs to be done by bringing back the state in conversations about development and providing security to its citizens.

CONNECTING INFRASTRUCTURE AND GENDERED EXPERIENCES

Irrespective of the strategic economic visions that policy makers and politicians have shared about the Look East[11] Policy and East Act[12] Policy, people's experiences have been intertwined with the ground reality. With a deep history of violence and existing

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8 Anthropologist Akhil Gupta writes about the ways in which we can also think about suspension; incomplete and suspended infrastructure projects. Such projects, Gupta notes, draws our attention to the temporality of infrastructure. Refer to https://culanth.org/fieldsights/722-suspension

9 http://morungexpress.com/street-vendors-contribute-to-naga-economy-without-infrastructural-support/

10 https://www.telegraphindia.com/states/north-east/street-vendors-demand-protection/cid/1404008 . Also refer to http://e-pao.net/epSubPageExtractor.asp?src=features.Spotlight_On_Women.The_street_women_vendors_in_Imphal_Part_2_By_Grace_Kamei

11 http://www.atimes.com/india-switching-look-east-act-east-policy/

12 https://www.gatewayhouse.in/indias-act-east-policy-far-beyond/

dysfunctional ceasefire agreements with various armed groups across Northeast India,[13] government bodies like the North Eastern Council (NEC) remain focused on implementing major infrastructure projects like roads, railways, airways, power and telecom connectivity. According to the NEC, these projects are part of the socio-economic plans to develop the region.[14] Yet, the lived reality of the people on the ground like the lives of female traders or migrants is often complex as vulnerable citizens.

Development models and infrastructure projects being implemented on the ground are often detached from the lived experiences of the people. Economic empowerment programmes on the ground are often linked to larger issues of land ownership, distribution, and privatisation, and it is insufficient to limit it to workshops. Linking gender relations and infrastructure projects in Northeast India forces us to ask different questions such as the new composition of households (female headed houses), employment opportunities, decisions making powers and the institutional support systems for women who are increasingly losing their land to extractive resource companies involved in coal mining, timber and limestone (Kikon 2015).

In addition, communities also take up infrastructure projects, which can be quite different from the heavy capital and technology driven spectacular scales like building bridges and roads. Old trucks, scribbled documents, patched up footpaths, and recycled metals and woods that rural villages across the region repair and use can be conceptualised as community infrastructure or infrastructure from below. Community infrastructure in this aspect might be understood as matters that create conditions for the formation of new trading connections under extremely tenuous conditions (Kikon&McDuie-Ra 2016). In this context, tropes of infrastructure cannot be reduced to brand new development initiatives and progress alone, but projects/ things/ matters and relationships that people establish with their surroundings. This connects us to the meaning of infrastructure as matters that enable the movement of things, which also shapes the relation between them (Larkin 2013). In the same manner, understanding infrastructure through evidences on the ground might help us to look at new connections between gender and infrastructure.

REFLECTION: SEEING AND ACTING INFRASTRUCTURE

The development visions and projects, and the lack of it, highlight how policies and other ambitious infrastructure and economic plans have become routine in Northeast India. Both the Look East Policy and the Act East Policy focus on senses of sight and practice. Seeing and action are central to the Look East Policy and Act East Policy in Northeast India.

We have seen models – some are operational like roads and bridges, others as miniatures in expositions at the planning stage, and the rest under construction. Yet, many of these projects in Northeast – elaborate industries, schools, and hospitals – are not meant for the poor. These projects might benefit the rich and the tribal elites including the contractors and Indian business houses. But this does not dissuade the larger public from aspiring for them. In 2017, I met a female student from Manipur who was excited about

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13 https://www.outlookindia.com/website/story/talking-with-the-ulfa/268116. Also see https://economictimes.indiatimes.com/topic/NSCN-IM

14 http://necouncil.gov.in/about-us/nec-vision-2020-0

the construction of the national highway that would pass through her village land. She said: "It is 15 kilometres away from my village, but people are worried. They are going to lose all the paddy fields to the highway and they don't know what to do after that. I told them that the highway is not for us. We cannot eat the road. But there is also excitement to see the big road and the development that will come."

The account of this young student who was witnessing the transformation of her village land and her reflection about what is lost and gained with the arrival of a national highway that is going to pass though her village land is an important story to reflect about the infrastructure developments in Northeast India.

Walter Benjamin's struggles to document the physical transformation of the city of Paris in the post-industrial revolution era in Europe must have been a similar one. All the capital cities in Europe, Benjamin noted, were transformed into glittering showcases of progress, new industry and technology. But among all the cities that appeared as paradises, it was Paris that dazzled the brightest. Yet, it was from this brilliant and glittering city of Paris that Benjamin thought about darker realities. What was it that the city of light (Paris) had erased? For Benjamin, the dazzle erased the night's darkness. As Paris transitioned from gas lanterns to electricity and finally neon lights, it turned into a city of splendour. A city of mirror where the crowd themselves became spectacles. It reflected the images of the people as consumers rather than producers, keeping the class relations and production virtually invisible. Benjamin described this spectacle of Paris as phantasmagoria – a magic lantern show of optical illusions, rapidly changing size and blending into one another. The fairs and international expositions between the latter part of 19th and earlier 20th century were, according to him, the origin of the expositions. These trade fairs conditioned crowds with the principle of advertisements such as, "Look, but don't touch", and taught them to derive pleasure from the spectacle alone (Morss 1989).

CONCLUSION

The ongoing infrastructure projects in Northeast India like the grand highways cutting across the student's village in Manipur are also development spectacles where people are conditioned to derive pleasure about "development and progress" simply by looking at them. Other ongoing development programmes ranging from the extractive activities like plantations and logging, to agricultural programmes such as cash crop initiatives and skill training courses, are similar to shops filled with novelties. We can connect with the phantasmagoria aspect of capital and commerce in the ongoing infrastructure and development projects across the region. In particular, the ethnic festivals and celebrations of cultures that aim at connecting the region with mainland India remind us of the exciting aspect where the poor are encouraged to attend and learn about the wonderful displays of development (roads and bridges) or their own culture like weaving, food, and handicraft (in the festivals and expositions). Encouraged by authorities to visit the display and wonders that their own class had produced, many visitors to these ethnic festivals and fairs are unable to afford what is being produced (clothes and food items are for tourists). They can only marvel at the goods and look at the gadgets like the latest technology of water pump or machines. In all these development, the gendered aspect is deeply inscribed as women in the festivals and expositions organised across Northeast India are presented in their ethnic fineries where femininity is reiterated, while males dressed as warriors are inscribed with heightened masculine traits.

Gendering infrastructure in Northeast India, in this aspect, is connected with

phantasmagoria – the dialectics of seeing and acting. This deeply resonates with the ongoing transformation in Northeast India. These policies have fundamentally affected the gender relations across communities and also the structure of governance, desire and aspirations. Most importantly, the interests of industry partners and the corporations are visible. Behind the infrastructure projects and plans, the ethnic expositions and merchandise fairs, lies the power of the industry, corporation and technology. These powerful players might pretend to promote a future world of peace, class harmony, and abundance by constructing airports, roads, and bridges. Yet, if we adopt a gender framework, the contradictions and challenges begin to emerge. We begin to see these economic transformations as citizens with rights and not as consumers of these developments.

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Questions on her

A POEM BY MANIPURI POET
CHAOBA PHURITSABAM

Fish evacuated Loktak
Smoked bullets fill her empty lubak[1]
She recalls the face of her crying child
Waiting for her to come home
With handful of rice and hope

The day falls mercilessly
Leaving her alone amidst the darkness
She couldn't even get a morsel to feed
Those hungry stomachs

In the middle of the Loktak
Who cheats her for so long
Embracing her only namesake pride
Lost and left
Only with her flesh
To be bidden and sold

Finally she closed her eyes
Murmuring and moaning in silence
'Is it me or the Loktak?
Tell me
Who is the real prostitute to you?'

*Questions on her, poem by Chaoba Phuritsabam in Tattoed with Taboos: An Anthology of Poetry
by Three Women from Northeast India.*

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1 Bamboo basket

E.

Incredible India's Infrastructure: Circuit-breakers of Ecology and Sustainability

Before it was laid low by the Covid pandemic, tourism was one of the biggest industries in the world. In 2019, it accounted for over 5 per cent of global GDP, besides being one of the 10 largest employers. However, the vast infrastructure that supports this industry, mainly transport and hotels, also has a vast social and ecological footprint. This section looks at the dark side of tourism as well as some attempts to smoothen its rough edges. Seema Bhatt describes the pernicious impact of over-tourism on the fragile social and ecological landscape of Corbett Wildlife Reserve. As she puts it, "it is being loved to death." The swelling horde of tourists are not only over-stripping the park's natural resources like water but also disrupting the social fabric as poor villagers living in the shadow of the park are wheedled into selling their land to make way for luxury resorts. Resentment, strife, and crime are not far behind. Seema believes involving the local communities and giving them a say and share in the economy of park tourism could be a win-win solution to the problem of over-tourism. In her insightful and scathing essay, Chinmayi Sarma describes how the double whammy of neoliberal markets and climate change has reduced indigenous women in Assam to low-paid maids, cultural commodities, and caregivers. While eco-tourism moulds them into glamourised performers for the amusement of the so-called eco-tourists, climate change disasters uproots them from their indigenous moorings and hurls them into the tumult of big cities as vulnerable labour.

Addressing overtourism in the Corbett landscape

SEEMA BHATT

The Pawalgarh Conservation Reserve. Photo by Seema Bhatt

INTRODUCTION

From time immemorial tourism has been promoted as a benevolent, non-consumptive activity that provides enjoyment and entertainment to the traveller. It has also brought to many communities and countries substantial revenue, helped conserve endangered species, and rejuvenated and revived cultural heritage. However, this is only one side of the coin. What many have now seen coming for several decades is that tourism can cause great harm when it goes beyond the carrying capacity of a place.

In the summer of 2017, the media and the travel industry finally acknowledged the negative impacts of tourism and thus came into existence the term 'overtourism'. Very simply, overtourism takes place when there are far too many visitors at a particular destination. However, the term 'too many' itself is site-specific and would be defined by local residents, travel entrepreneurs and tourists themselves. For protected areas, it is determined by the health of the ecosystem and its resident species.

The signs of overtourism are many. When local communities are forced to sell their land to hoteliers, tourist vehicles jam forest roads, and tourists cannot view wildlife because of the crowds, thereby disturbing wildlife. Degraded fragile ecosystems also signify overtourism.

The Corbett Tiger Reserve is showing all signs of overtourism. This case study is presented in this context. There is a need to look at more innovative ap-

Scan for Listening Article

proaches to tourism, particularly in the larger Corbett landscape. The case study looks at the ecological significance of this landscape and highlights a local initiative called Eco Harryman's. It describes how this initiative and the declaration of the Pawalgarh Conservation Reserve have both played a catalytic role in promoting an alternative framework of tourism in the landscape. Taking the lead in this direction is the Pawalgarh Prakriti Prahari (PPP)[1], a local youth group supporting innovation in infrastructure through community-based tourism.

THE LARGER CORBETT LANDSCAPE

The landscape that encompasses the river Yamuna in India, river Bhagmati in Nepal, and the Shivalik hills boasts of some of India's well-known tiger reserves and protected areas. Corbett National Park that ranges across Nainital, Pauri and Almora districts of Uttarakhand is perhaps one of the most celebrated parks in this landscape. The landscape is an amazing blend of high hills, the mighty river Ramganga, riverside belts, and grasslands. It is a unique blend of Bhabar that is characterised by boulders and sal trees (Shorea robusta) and other mixed vegetation, and the Terai characterised by clay-rich swamps that support a mosaic of tall grasslands, wetlands and mixed deciduous forests. Corbett is one of India's best-preserved parks with164 tigers and over 600 elephants. More than 600 species of trees, shrubs, herbs, bamboos, grasses, climbers and ferns have been identified in the park. With approximately 550-recorded species of birds, this landscape is one of the Important Bird Areas (IBAs).

Before 1820, most of these forests were the private properties of local rulers. Once the ownership was passed into British hands that year, these forests were ruthlessly felled for timber. Sal (Shorea robusta) for which these forests are known was the favoured timber. Teak, the more precious of the timbers, was planted on the periphery and was later used for making railway sleepers.

It was in 1858 that the first comprehensive plan to protect these forests was made by Major Ramsey, and after over 36 years of careful vigilance, the condition of these forests improved. In 1879, they were declared

The Corbett Landscape.
Photo by Seema Bhatt

as reserved forests. From 1907, many a dedicated British forest officers attempted to get protected area status for the forests. In 1934, the governor of the United Provinces (later Uttar Pradesh and now Uttarakhand), Malcolm Hailey, supported the idea of making this area a game sanctuary. Subsequently, Smythies attempted to get it declared a national park through legislative means.

It was during this time that Colonel Jim Corbett roamed these forests in his quest for man-eaters. His knowledge about the area was commendable. Smythies, in consultation with Jim Corbett, demarcated the boundaries of the proposed national park with adequate room for expansion. In 1936, the United Provinces National Parks Act was enacted and, as a result, the Hailey National Park became India's first national and the world's third national park In 1952, the park's name was changed to Ramganga National Park after the famed river that forms the lifeline for the park and its inhabitants. However, in 1957, subsequent to the death of Jim Corbett, it was renamed Corbett National Park after the man who played a significant role in demarcating its boundaries and whose name remains synonymous with this area.

The year 1973 was a landmark for India in the context of wildlife conservation as the country launched its pioneering overarching conservation project in the name of 'Project Tiger'. The Corbett National Park became the venue of this momentous launch and became the first tiger reserve in the country. Today, the Corbett National Park, along with the Tiger Reserve, covers an area of 1288.31 square kilometres (sq km), and is a part of the greater Corbett landscape. It has long been referred to as the 'land of roar, trumpet and song'– the roar of tigers, the trumpet of elephants and the melodious song of birds.

PAWALGARH CONSERVATION RESERVE

Less than half an hour from the Corbett Tiger Reserve lies the Pawalgarh Conservation Reserve, a part of the larger tiger landscape. Jim Corbett made Pawalgarh famous for having hunted the largest ever tiger – titled 'The Bachelor of Powalgarh' – in these forests. Corbett recounted his tale of tracking and killing this tiger, which took him over a decade, in his famous book, The Man-Eaters of Kumaon.

The amendments made to the Wildlife (Protection) Act, 1972, in 2002 provided for the formation of two new categories of protected areas. One category was that of conservation reserves, which the state government might declare after consultation with relevant local communities. Areas adjacent to existing protected areas or those connecting one protected area to another were a priority. Pursuant to this, the Pawalgarh Conservation Reserve was established in 2012.

The landscape is crisscrossed by three rivers, the Kosi, Buar and Dabka, and has large tracts of undisturbed forests. This 58.25 sq km reserve is a birding paradise with 365 species of birds. Unlike Corbett Tiger Reserve, the trails here can be traversed by foot. The reserve also has 32 species of mammals and more than 125 species of butterflies.

ECO HARRYMAN'S RESORT: AN INNOVATION IN INFRASTRUCTURE

In close proximity to the Pawalgarh Conservation Reserve is a unique homestay called Eco Harryman's (Eco Harryman's is actually an acronym based on all the people who were part of the formation of the first coordinating committee). It is owned and man-

aged by the dynamic Manralji, who belongs to a family several members whom were part of the Indian Army. He too wanted to join the Army, but his family wanted him to look at other options. He got a Diploma in Electronics Engineering from Delhi and was exploring employment opportunities when a series of events brought him back to Uttarakhand, the most significant being the ongoing struggle for independent statehood. He wanted to be part of the movement and also in some ways promote the natural beauty of the state. He then decided to start a tourism initiative from his family house in Pawalgarh. In the year 2000, when the state forest department started looking at ecotourism in earnestness, Manralji's place was the obvious choice for the launch of the movement.

Eco Harryman's has three rooms on the ground floor and three on the first floor with varying number of beds. The rooms themselves are comfortable and clean. There is a common set of toilets and bathrooms at the back. Across from this is another building that has on the first floor an outdoor venue for meetings. The vast collection books and the wildlife-related art-work on the walls indicates that one is in the company of a true naturalist. One walks across a beautiful fruit orchard to get to the dining hall that can also double up as a dormitory. The walls throughout the resort are adorned with nature-related paintings by local artists, making the place vibrant and attractive. This is an ideal venue for school/college camps. Manralji's wife supervises the cooking of delicious organic local cuisine.

Eco Harryman's offers a range of activities to travellers that include nature walks, camping on the campus, adventure activities, and some traditional games. There are many who come on a regular basis to just relax in the wonderful surroundings, eat healthy food, and enjoy the tranquillity. There are naturalists who make the resort their base to explore the conservation reserve. At any given time, there are always a few youngsters who come here to volunteer and help in a range of activities at the resort. The resort also hosts many conservation-related meetings and events. With an annual turnover of INR 0.3-0,5 million, the resort is sustainable and able to support other relevant activities.

Eco Harryman's Homestay.
Photo by Seema Bhatt

Eco Harryman's Homestay.
Photo by Seema Bhatt

BIRDING FESTIVALS IN UTTARAKHAND: A UNIQUE ENDEAVOUR

Recognising the amazing bird diversity in Uttarakhand and the need to conserve it, the Uttarakhand forest department in 2011 started bird watching camps across the state. Between 2011 and 2016, the ecotourism wing of the forest department supported 25-30 such camps. These camps culminated in birding festivals, the first of which was held in Asan in 2014. This commendable initiative to promote birding in the state and subsequently create awareness was the brainchild of the then chief conservator of forests in charge of ecotourism, Rajiv Bhartari. These festivals have elicited an overwhelming response and, in collaboration with other groups that include Titli Trust, Kalpavriksh and Himal Prakriti, birding festivals have become a regular feature in the state. These festivals are not only opportunities for forest staff, local community members, tour guides and others to learn the basics of birding, but also to become conservation ambassadors.

The second birding festival was held in Pawalgarh in 2015. A workshop on community-based tourism convened during the festival highlighted the need for more trained nature guides, particularly with the delineation of the Pawalgarh Conservation Reserve. Titli Trust[2] urged the forest department to support a nature guide training programme that would help link rural youth to conservation. It was this need that led to the establishment of the Pawalgarh Prakriti Prahari (PPP). PPP was registered as a not-for-profit nature conservation society in December 2015.

The main objective of the society is to support nature conservation, environment protection, and sustainable living by promoting alternate livelihoods such as ecotourism through village homestays, nature tours with experienced guides, and promoting local produce and cuisine in the landscape of the Pawalgarh Conservation Reserve. PPP also supports the sale of nature interpretation products such as books, brochures, handicrafts and paintings. The society focuses its efforts mainly in the Pawalgarh Conservation Reserve landscape and its members hail from the surrounding villages, which including Pawalgarh, Mankanthpur, Kyari, Kotabagh, Syat, Ramnagar, Gabua, Chhoi and Amtoli.

Once established, the Titli Trust organised an intensive training of nature guides for over 70 men-days. This included training on basic skills of bird watching followed by bi-monthly practice sessions, first aid, and soft skills such as communication and storytelling. There were also other training sessions conducted by organisations such as the Wildlife Trust of India and the Uttarakhand forest department. The participants included advanced nature guides as well as trekking leaders. A four-day test was conducted at the end of 2016. A total of 65 youth took the test out of which 30 were selected as requested by the forest department. It was at this point that the forest department seemed to go back on its word, and did not take on the trained nature guides as agreed upon earlier. There was no clarity on why this happened. This greatly disappointed the trained youth as they had high expectations from the training programme. Recenly, almost two years after the initial agreement, there was a move to register guides as part of the nature guide programme. Unfortunately, many of the youth trained as nature guides have taken to other occupations.

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2 Titli Trust (www. titlitrust.org) is a not-for-profit nature conservation organisation based in Dehradun, India. It is primarily focused on conservation and livelihoods in the Himalayas.

TOWARDS MORE COMMUNITY-BASED TOURISM

In the wake of the delay in taking trained youth as nature guides, the PPP, with the help of the Titli Trust and Manralji, is attempting to move towards a model of community-based tourism in the Pawalgarh region. It hopes to:

- provide livelihoods to local youth in the Pawalgarh Conservation Reserve landscape by offering a range of "products" for tourists.
- ensure that the tourism at Pawalgarh Conservation Reserve is eco-friendly, sustainable and equitable with benefits flowing to local community.
- support nature conservation activities in Pawalgarh Conservation Reserve, as determined by and in consultation with the Pawalgarh Conservation Reserve management.

With the above background, PPP has initiated homestays, at both the community and individual levels. Following a unique mode, PPP will sign an agreement with individual homestay owners who will then comply with the terms and conditions laid down by PPP and in turn avail themselves of the benefits of this agreement. As part of the agreement, PPP will be responsible for marketing of homestays, customer engagement, planning of schedules and itineraries, managing bookings and financial transactions, registration of homestays, and ongoing training and capacity building. PPP retains the right to conduct annual performance assessments of the homestays based on pre-determined standards. These standards may be revised from time to time based on customer feedback.

Homestay owners will be responsible for all onsite customer management that includes boarding and lodging, nature guidance, upkeep of homestay property, payment of bills for all utilities used, and sharing onsite customer feedback. Homestay owners will inform PPP in case of direct engagement in any marketing activity and also with large groups/schools/institutions. Homestay owners should be geared to provide visitors guides for bird watching, nature and heritage walks, and introduction to other activities such as traditional games.

'OVERTOURISM' IN THE CORBETT LANDSCAPE RESPONSIBLE TOURISM: NEED FOR INNOVATION

The Corbett Tiger Reserve (CTR) is one of the most popular protected areas in the country. The reserve records over 200,000 visitors annually. The CTR authorities state that over 150 vehicles carrying about 600 people are permitted in on a daily basis during the season. There is accommodation for over 3,000 visitors around the reserve[3]. The Wildlife Institute of India carried out a study on tourism-related impacts in the village of Dhikuli situated just outside the eastern edge of the Corbett National Park. The study found that tourism is causing social disruption in the villages surrounding the park by creating islands of prosperity that exacerbate financial disparity, resentment and conflict. Besides, the high demand for water in the mushrooming luxury resorts is making water scarce in

3 www.indiaenvironmentportal.org.in/files/corbett_tourism_report.pdf

villages.[4]

The Corbett landscape is in a crisis in terms of tourism. Given the popularity of the Corbett Tiger Reserve, and the alarming growth of luxury resorts in the buffer zone, the landscape is in danger of being smothered by mass tourism. It is being loved to death. Often, in the 'five-star resort' culture of tourism, tourists care precious little about wildlife, but are there only to have a good time. There are others who care only about seeing the tiger and will go to any extent to see it. Finally, there are the true nature lovers and conservationists who want to enjoy the peace and tranquillity of the wilderness and soak in nature. Ironically, while they are the greatest allies of the reserve, they now hesitate to visit it.

Tourism in the Corbett landscape and many others needs to diversify and go beyond just the parks. In this context, the declaration of the Pawalgarh Conservation Reserve and the PPP initiative are indeed timely. There is a need to spread tourism activities beyond the Corbett Tiger Reserve and it is critical that tourism be promoted in other parts of the larger landscape. The Pawalgarh Conservation Reserve is ideally suited for this. Furthermore, the PPP model supports the participation of local youth in tourism thereby giving them a larger scope as stakeholders in conservation. At present, the Corbett authorities are under tremendous pressure to best manage the reserve, particularly the sheer number and kind of tourism being promoted. PPP is the ally that can provide services in providing nature guides as also alternate accommodation. The PPP code of conduct also ensures that tourism in the Pawalgarh Conservation Reserve is sustainable and responsible.

This article is adapted from a more detailed case study titled, "Community-based Tourism in Pawalgarh" specially written for Vikalp Sangam and 'People in Conservation' newsletter.

http://www.vikalpsangam.org/article/community-based-tourism-in-pawalgarh/#.XRH6JGQzY1g

ACKNOWLEDGEMENTS

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4 http://www.sanctuaryasia.com/magazines/cover-story/10094-tourists-from-the-dark-side.html

Indigenous Women in Assam: Bearing burdens of nature, culture and market.

CHINMAYI SARMA

Kaziranga National Park, Assam.
Photo by Jiten Yumnam

In the global south, a new form of colonialism has evolved with the neo-liberal market as perpetrator. It has induced multiple structural inequalities also subsuming under it, the body.

As per the Forest Rights Act of 1876, community commons were declared as wastelands and miles of deciduous forest were cleared off in Central and Western Assam for expansion of railways. The alluvium rich land of Assam Valley began the gold rush for commercial plantation of tea and teak, thereby introducing the saga of labouring bodies. Indentured labour from the Chota Nagpur plateau was poured into these plantations pushing the indigenous people higher into the hills from duars[1]. The plantation culture created a gulf between communities of the valley and hills rupturing their age-old cohesion over trade, frontier governance and social interaction. Thus, the indigenous communities of Brahmaputra of today are a shadow of their past. In the first wave of colonialism, their cohesion was replaced by isolation and in the second wave of colonialism in the neo-liberal era, autonomy among clans and kinship groups was further ruptured by introduction of money.

Scan for Listening Article

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1 Duars/ Dooars are the alluvial floodplains in Northeast India that lie south of the Brahmaputra Valley, bordering with the foothills of Himalaya.

THE INDIGENOUS COMMUNITIES AND THE OTHERS

The market forces rendered a new dimension of profitability to the relation shared by indigenous women with nature and culture. Assimilation of neo-liberal traits led autonomy among clan and kinship groups to crumble owing to introduction of money. For instance, the endemic turmeric root, which was used to cure local ailments, became a tradable product. Younger generations are oblivious of the folk songs sung during community plantation of turmeric. They are also unaware of traditional weeding and harvesting practices, as turmeric plantation has begun to be outsourced by multinational companies. Similarly, other customs, services and products of the forest villages such as tribal festival, artifacts, structures and food have been commodified to entertain brown-sahibs working as white-collar professionals in multi-national companies, seeking nature's sojourn.

Outside interference in erstwhile autonomous societies began with colonial ethnographers exoticising the indigenous people as remnants of a savage world, far from world wars and modernisation. Often the British anthropologist was closely followed by Marwari moneylenders from mainland India who made inroads into tribal heartland replacing barter in the self-sustaining ethnic economy with bonded labour. The illiterate forest tribes were traded off in the market by these shrewd moneylenders who were addressed with envy as 'asami'. In this process, the tribal woman became a property disposed sometimes as labour and other times as flesh. The asami disapproved of indigenous customs thereby imposing mainstream values in forest society and the indigenous woman became an agency to propagate his cause. For instance, the Rabhas of Assam had the custom of deka-chaang, which was a social arrangement for young girls and boys to interact and explore potential marriage partners. However, the moneylender along with economic transformation brought in social transition. He launched a mission of moral salvation by introducing the mainstream notion of shame in forest villages, thereby alienating indigenous people from their ancestral culture.

As neo-liberalism strengthened, forest villages resembled market spaces. This endeavour was aided by the government and projected as transforming the linkage between indigenous and market societies by bringing in employment and development through ecotourism resorts. These resorts amidst forests legitimised the presence of a different set of outsiders, namely the backpack travellers, who became customers procuring ecosystem services and ethnic culture, in the name of ecotourism. Thus began the saga of neo-liberal deceit and ordeal of dehumanising indigenous bodies.

BACKPACK TRAVELLERS AND WOMEN AS LABOURING BODIES

The outsider is a representative of the consumerist society who ventures into forest villages seeking pleasure from ethnic cuisines, spaces, bodies and festivity. The gains, which they seek from the forest is entertainment often translated as tranquility. Resorts and home-stays thus become avenues for the service industry transforming the natural zone of Chandubi lake into a tourist hub, advertised with the punchline, 'backward is beautiful'. As backpack travellers, both national and international, mostly urbane and university educated, entered the forest hinterland of Chayani Borduar Forest Reserve languishing in home-stays and occasionally taking forest trails, the indigenous women's drudgery and servitude as labouring bodies galvanised. It required her to dispense traditionally ascribed cultural roles, in addition to the emerging role of entertaining guests, providing

ethnic cuisine and liquor. The inflow of money into the household increased her domesticity by restricting her participation in the public sphere and even prevented education in context of adolescent girls. Home-stays eulogise traditional norms thereby trapping her within four walls. These spaces are often owned by male members of the society but their roles are limited to tending of guests, providing guided tours and collecting fees. Thus, the labour of the indigenous woman remains hidden as her work is seen as a mere extension of domestic responsibility.

The consumers of ethnic culture constantly seek natural or authentic ways of acting and behaving, which has imposed newer standards of gender norms. The indigenous woman becomes an actor in her own household where her behaviour unfolds as theatre and the outsider its audience. She remains in constant surveillance and becomes an alien in her personal space because her emotions and mood require being in consonance with that of the guest's. Especially on weekends, she is expected to make cultural performances of dance and drama to rejuvenate these nature enthusiasts. Today the sense of festivity is replaced by gross routinisation as the indigenous woman becomes an incoherent puppet in the ecotourism[2] loot.

Gendered bodies are contested sites. In the postmodern sense of the word, the indigenous woman is required to dress and accessorise in such a way that her body resembles a cultural museum. A race has ensued searching for beads and family heirlooms to mesmerise potential customers. Also, resurgence of bamboo artifacts and handicraft are parts of this re-ethnicisation process. Her cohesion with nature is replaced by bargain to suit the neo-liberal taste of backpack travellers while she herself becomes a cog in the wheel of nature based industry, too weak to protest and voiceless to resist domestic drudgery.

She is required to spend longer hours tussling forces of nature in the forest, field and pond systematically segregating the limited resources for her family and guests. Her closeness with the ecosystem and culture are mythically glorified in folktales, which she herself resonates in the form of short stories or songs to sooth the ears of travellers. She is indoctrinated in the gendered division of labour and accepts her diminishing being as a contribution to the welfare of society and family. She fails to acknowledge that unpaid hidden labour is a surplus accumulation of benefits, which she will never reap; instead more is expected of her to satisfy the sensual urges of travellers. Thus begins a saga of abuse at home where her overworked body is toyed around in the name of full customer satisfaction.

So, the home-stays have converted the indigenous woman into private machines producing labour of love while being excluded from the political process of decision-making,

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2 The Chandubi Lake region is a fragile ecosystem in the Chayani Borduar forest reserve along which the Rabha community resides in forest villages. This region has been declared as an ecotourism hub by the government. However, there is disjuncture in name, nomenclature and practice as the region is in low Human Development Index (HDI) and gross domestic product (GDP).
The Chandubi Lake is of seismic origin that emerged in the earthquake of 1897 and is the nodal point around which this ecotourism zone is declared. But the rest focus rests onforest villages surrounding the lake, where tourists leave their footprints after brief ride in the lake on country made boats andshort forest trails. Indeed, travellers enter a vulnerable ecology and observe the wilderness but their action and enthusiasm are more ethnically inclined thereby transforming ecotourism in the Brahmaputra Valley to ethno-ecotourism.
Tribal belts in India coincide with the natural zones, thereby enmeshing ecology with ethnicity. Unfortunately,these are also the regions with low income, poor HDI and Gender Development Index (GDI).

entitlements and wage. She is perceived as subordinate to her male counterpart despite being the real breadwinner of her family. She continues to be the second sex despite trading her being and body to ethnic consumers bearing baggage of nature, culture and market in the forest based ecotourism industry.

INDIGENOUS STRUCTURES, BEINGS AND THE NEW OTHER

Ecotourism is hailed as a successful strategy by the government to include the forest villages into the mental map of economy. Advertisement of this cause is done by re-introducing primitive means or transport and bamboo platform houses in the forest tracts with an aim to enhance ethnic experience highlighting its biodegradable character. Traditional houses called chaang ghor (platform cottages made of bamboo) have reentered the community space and become an integral part of the ethnic retreat. The traditional drip irrigation system made out of bamboo and non-motorised wooden boat are artifacts from the past introduced by the government to pull nature enthusiasts. But such efforts have been incompatible with welfare policies for inclusive development and have not met basic needs of the rural poor. The forest communities are trapped in the shadows of their past as development continues to elude them in the guise of ecotourism.

Ecotourism has not only influenced the body but also structures of a society wherein modern equipment must coexist with manually operated primitive ones. Re-ethnicisation is challenged by factors like erosion of indigenous knowledge wherein women do not have the agency to question, or rather reproduce, objects and acts without doubt. The Chandubi forest is known for the malarial epidemic and the parasites were kept at bay by burning different variant of leaves with straw to cleanse the atmosphere. This practice of burning 'thupa' has lost its utilitarian value and instead has become a showcased custom performed during tourist seasons.

Introduction of a class of contractors by the government to broker between the local people and travellers has further transformed culture into a procurable item. He[3] is an insider of the Rabha society but adept in mainland language, needs and networks. The contractor resembles a feudal lord, controlling the network of home-stays, tour guides and organises cultural shows in the forest villages. He has become custodian of primitive ways and modern marketing strategists to keep the inflow of tourists alive. He is the bridge between the people, customers and government. This contractor of culture has turned Sal groves into museums and festivals into business ventures. Female headed households are most vulnerable being forced into voluntary labour by these indigenous entrepreneurs. Young girls are hired as dancers and older women as cooks donating free labour for the sake of the forest society while the contractor continues to mint money from such entertainment. Thus, the transformation of forest space into commercial hub of culture is laden with stench of male supremacy and oppression from within.

Re-introduction of primitive modes of operation appears exotic to the city eye but has bogged down the indigenous woman. Fuel and technology, which is supposed to reduce her drudgery has been banished in favour of backwardness leaving her at the mercy

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3 Use of the word 'he' is deliberate because in a society stratified along the lines of gender, male possess greater power, authority and command. The contractor often belongs to the family of the village headman thereby garnering internal allegiance and outsider's respect.

of muscles. This has compromised her health and decimated her into a human machine. Today, she is required to share her home with strangers in the name of heritage conservation while preservation of self remains marred in doubt. The lines between personal, political and price is getting blurred for the indigenous women as she becomes a mere pawn in the ecotourism industry.

CATASTROPHES, VULNERABILITIES AND MINDSET

Rising ecological catastrophes are indications that climate change is a reality hunting down the last man standing, turning notions of a dystopian society into reality. In the Brahmaputra Valley, it manifests in form of tidal waves and devastating earthquakes affecting communities on margins. These ecological catastrophes have become more frequent and rendered geographies in a permanent state of chaos. Indigenous communities with unique ethnic, racial and linguistic ties have become helpless victims of such catastrophes, unfurling a saga of displacement from ancestral roots, loss of indigenous culture, migration of males to urban centres and feminisation of poverty.

Disasters are followed by domino effect on the economy, polity and society, which has disproportionately victimised women because of her pre-ordained gender role preventing her mobility, decision and choice. An enquiry into subjectivities of disasters lay bare women as living flesh (Bhattacharjee 2018) breaking duality of private and public. The dwindling sex ratio in India is not merely an economic figure but a reflection of deep-seated bias against females, which is illustrated by the example below.

During floods, baring a few highlands, rivers, ponds and paddy field become one resembling a huge sea of turbulent muddy water.

In the Sumoimari Mishing Gaon of Majuli, a father with two children had boarded a banana raft to reach the embankment but suddenly the raft was caught in a whirlpool, colloquially called the deadly 'kur'. Within minutes the raft dismantled but the father held on to his children, a son and a daughter. As turbulence rose, drowning seemed inevitable. At that moment, a mythical voice of his ancestors echoed, "…free your hand, leave your daughter behind! Swim to safety with your son, he carries forth your lineage!"

The father recollects that he did as was directed!

The proliferation of market relations based on exploitation of natural resources has increased the number of disasters worldwide directly affecting women in their day today life. Catastrophes are becoming anthropomorphic and nature is the aggressor yet women at the grassroots are unable to disassociate from all of it given that they share a symbiotic relationship with the ecosystem. Disproportionate burden of nature is borne by women, which also reflects in the number of recorded deaths. The rate of casualties as per statistics post Indian Ocean tsunami reveals that women died in greater number during the disaster than men – 73 per cent female fatalities in Cuddalore of Tamil Nadu and 77 per cent to 80 per cent in various parts of Indonesia (MacDonald 2005, Aglionby 2005). The opportunity of survival of women in disasters is skewed because culturally they are expected to care for the household, children and elderly. Caregiving roles place them at greater risk to adapt, cope and survive (ibid).

Besides, the indigenous woman is perceived as an embodiment of culture, as her body becomes a stage to reproduce it on daily basis, decimating her chances of survival. Mekhela Chador, worn by the Assamese women, or Phaneks, by Manipur women, on a daily basis act like chains during floods preventing them from swimming, climbing or even running in flood prone zones. Sordid tales are told of mothers with children in

tow being drowned by tidal waves imprisoned in the straitjacket of traditional dresses. Historically, traditional dresses have put women at great disadvantage by reducing mobility but today their susceptibility has enhanced because of increase in magnitude and frequency of hydro-climatological disasters owing to climate change. Repeated and unpredictable exposure, especially to floods clubbed with pre-existing traditional structures, has weakened the indigenous women.

Natural calamities in the Northeast of India are not a contention of the fraught times but a permanent risk within which identities and frames are created. Customs and traditions of the indigenous people are shaped keeping in mind the seasonal shifts. Living on the Brahmaputra Valley means coexisting with floods and river bank erosion; thus life and labour in the valley are precarious. Anthropological excerpts from Kathoni Bari Ghaat of Morigaon bring to light the clash of forces of nature with space and communities, manifesting multiple layers of gender based vulnerabilities. An empirical excerpt below seeks to explain this.

Das Baideo has been languishing in the government relief camp for six months now. She points at the heart of the Brahmaputra sighting and stating "Our ancestral land lie 3 nautical miles inside the river. This year, 'gorakohoniaya' i.e., river bank erosion has permanently displaced us. Now we have nowhere to go."

The family had marginal farm holdings since decades but chronic annual flooding had pushed them to penury. This led Das Baideo and her husband to offer free labour to the local moneylender but the flood and erosion of 2017 in middle reaches of the Brahmaputra served its final blow. It turned the family from marginal farmer to landless destitute. The erosion, which dispossessed the family, forced her husband to move to Guwahati, an urban centre as a security guard of a private company. He managed to remit a few hundred rupees but it was grossly inadequate. Without ancestral asset and inadequate earning, Das Baideo remained stranded in the relief camp with her children.

As time drew near to evacuate the camp, she was required to search for a new dwelling and a new piece of land to cultivate on. This was in addition to her old roles of securing fodder, fish and firewood on daily basis for her family. Her existence was compounded by an emerging responsibility of protecting her adolescent daughter from slanderous men who cohabited in the precarious terrain.

Thus, surviving catastrophe is accompanied by its own drudgery, which endangers livelihood and security for the asset-less indigenous woman. It doubly burdens her social intercourse decimating her being. The woman of the developing world faces greater susceptibility to catastrophes because of historic and geographic variability which continually (re)produces essentialised identities, further disempowering her to become an equal member of the economy, polity or society.

CONCLUSION

So long as society was insulated from external forces, the system of traditional burden on women continued without a hitch. However, it aggravated with the coming of neo-liberalism and climate change. Subjective experience of loss and indignity of the indigenous woman reveal the trap of market and culture, which have imprisoned her either in home-stays as embodiments of culture or as residue post-disasters performing caregiving roles. In both cases she is coerced by social norms thereby failing to overcome the drudgery of unpaid domestic labour. Behind the bond of cohesion with nature lies deep-seated exploitation by patriarchal forces from both within and outside society.

Some instances suggest that slowly she is attempting to overcome primeval bond with nature and culture by exercising ownership over resources. Politicising the ethnic spaces by public policy innovation such as guaranteeing 33 per cent reservation in panchayats, the lowest unit of institutional democracy, are proactive measures doing justice to indigenous women. Yet the ills of patriarchy continue to haunt wherein husbands of the incumbent women representatives govern on their behalf. The institution of sarpanch-pati (husband of the village headwoman) is a reminder that proxy based democracy exists and the voice of the marginalised indigenous woman remains unheard. Thus, inclusive development will remain a utopia unless the indigenous woman becomes an equal member in society.

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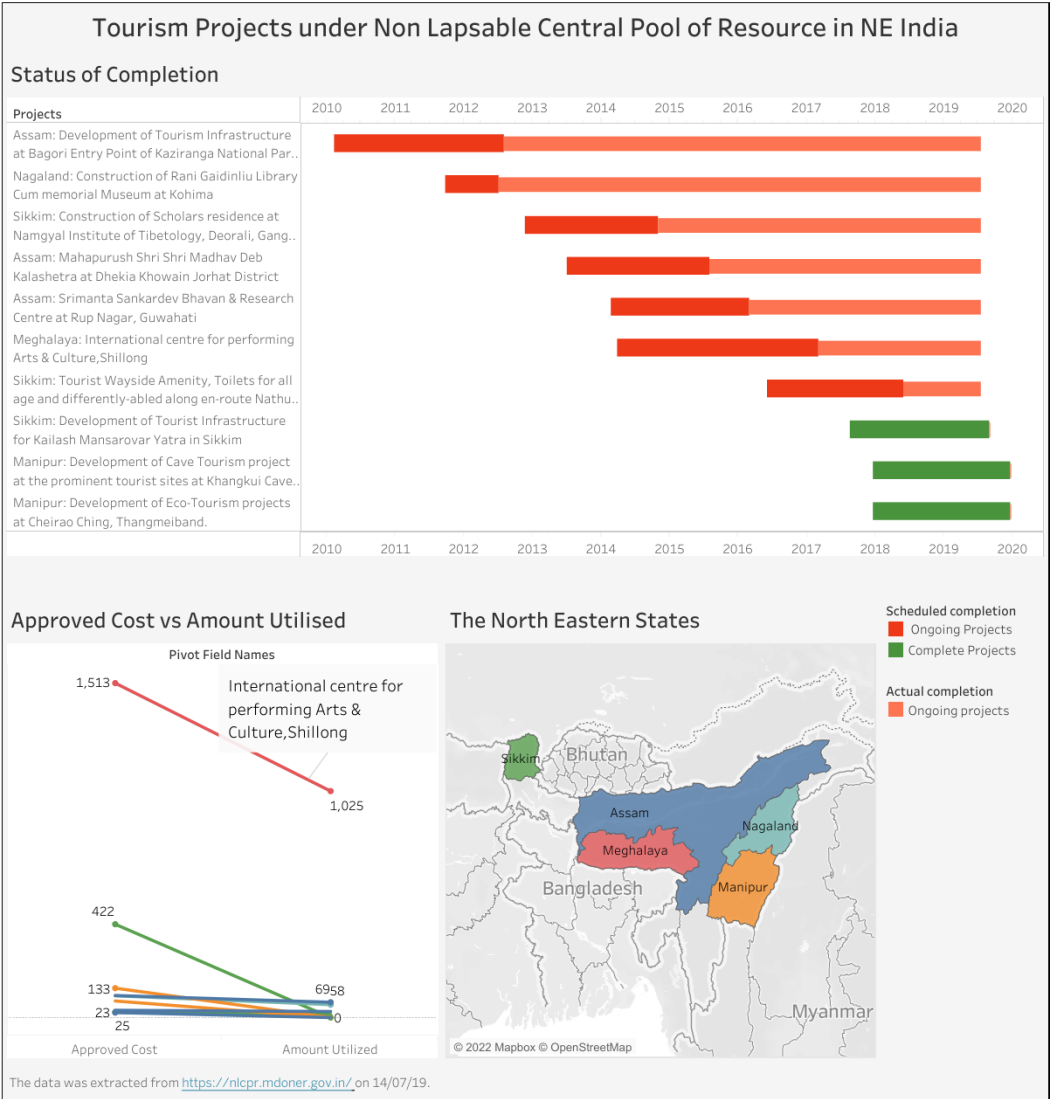
Infographic on tourism data of Northeast India

ASHISH KHANDALIKAR

Northeast India boasts some of the most mesmerising places one can ever visit in a lifetime. Cherrapunji, the wettest place in the world, Shillong, famously called as the Scotland of the East, Kaziranga, the UNESCO Heritage site for one horned rhinos are all located in the Northeast of India. However, only ten projects have actually been undertaken so far under the NLCPR to promote and facilitate tourism. The below infographic shows the status of completion, the financial costs incurred and the geographical location of the tourism projects happening.

The first project was approved in 2012 for the development of infrastructure at the entry point of Kaziranga National Park and most recent one was approved in 2017 in Manipur.

Red bars of the first chart shown indicate ongoing while the green ones indicate projects for which the completion date is yet to come. The thicker bars indicate the scheduled date for completion of the projects while the thinner ones indicate the eventual date of actual completion. It is saddening to see that none of the projects have yet been completed.

In the slope chart one can see the projects according to their Approved Cost. The right side indicates the amounts that have so far been utilised. If one hovers over the slope chart the state in which a project is happening gets highlighted. Hovering over the states on the right side map, shows all projects ongoing in this particular state in the slope chart.

Tourism Projects under Non Lapsable Central Pool of Resource in NE India

Status of Completion

Projects	Timeline (2010–2020)
Assam: Development of Tourism Infrastructure at Bagori Entry Point of Kaziranga National Par...	
Nagaland: Construction of Rani Gaidinliu Library Cum memorial Museum at Kohima	
Sikkim: Construction of Scholars residence at Namgyal Institute of Tibetology, Deorali, Gang..	
Assam: Mahapurush Shri Shri Madhav Deb Kalashetra at Dhekia Khowain Jorhat District	
Assam: Srimanta Sankardev Bhavan & Research Centre at Rup Nagar, Guwahati	
Meghalaya: International centre for performing Arts & Culture,Shillong	
Sikkim: Tourist Wayside Amenity, Toilets for all age and differently-abled along en-route Nathu...	
Sikkim: Development of Tourist Infrastructure for Kailash Mansarovar Yatra in Sikkim	
Manipur: Development of Cave Tourism project at the prominent tourist sites at Khangkui Cave..	
Manipur: Development of Eco-Tourism projects at Cheirao Ching, Thangmeiband.	

Approved Cost vs Amount Utilised

Pivot Field Names

International centre for performing Arts & Culture,Shillong

1,513
1,025
422
133
6958
23
25
0

Approved Cost — Amount Utilized

The North Eastern States

Sikkim • Bhutan
Assam
Meghalaya • Nagaland
Bangladesh • Manipur
Myanmar

© 2022 Mapbox © OpenStreetMap

Scheduled completion
- Ongoing Projects
- Complete Projects

Actual completion
- Ongoing projects

The data was extracted from https://nlcpr.mdoner.gov.in/ on 14/07/19.

F.

India's Indigenous Infrastructures: Traditional Knowledge, Networks, Systems

Modern infrastructure, which also embodies modern knowledge systems, poses an existential challenge to indigenous knowledge infrastructure. Can the twain meet in a spirit of creative and constructive dialogue? This section discusses some of the challenges and possibilities. Shrishtee Bajpai, et al, describe how indigenous forest communities in the Gadchiroli district of Maharashtra have pushed back attempts by forces of private capital, mostly mining companies, and of the state to usurp their habitat. Invoking the rights granted to them under the Forest Rights Act, the communities have successfully wrested control over their forests and put in place a homegrown governance model, which not only privileges organic and democratic infrastructure over a top-down one but also, remarkably, questions the patriarchy inherent in their own traditions. In contrast to the Korchi model, Avantika Haflongbar argues that the famed but languishing weaving tradition of the indigenous Dimasa community in Assam could be revived through an appropriate alliance with the state and markets. Through eleven short tales, she describes the origins, brilliance, and, finally, as young Dimasas leave the village for jobs in the cities, the decline of Dimasa's artistry at the loom, which, she believes, can be revived yet through better infrastructure, market access, supply chains. Nena Seitz discovers the enchantments, meanings, and uses of a scared grove as she interviews a young Khasi tour guide from Mawphlang village in the state of Meghalaya.

Mining conflict and transformative alternatives in Korchi

SHRISTEE BAJPAI, NEEMA PATHAK
AND MUKESH SHENDE

Mining in Surajagadh, Gadchiroli.
Photo by Shrishtee Bajpai

The history of takeover of forests in Maharashtra's Gadchiroli district and the rest of India began in 1854 when, under British patronage, many outsiders, including money lenders and traders, were allowed to encroach upon these areas. This led to large-scale exploitation of the Adivasis (Vidyarthi 1976). After the zamindari or feudal system was abolished in independent India, the forests in Gadchiroli, like the rest of India, came to be vested with the Indian state and suitable areas were handed over to the forest department in 1951. Despite a long history of resistance movements, and legal and policy efforts towards decentralisation of governance, the control over forests has continued to remain with the forest department.

The forests of Gadchiroli are dense and rich in timber, bamboo and other forest produce. They are important to local people economically, ecologically, spiritually and socially. These forest resources contribute significantly to the economy of the state as well. For instance, 85 per cent of Maharashtra's bamboo comes from Gadchiroli.[1] The other commercially important forest resources include tendu leaves[2] (Diospyros melanoxylon), mahua flower, lac and silk.

1 http://www.mahaforest.nic.in/fieldoffice/internal.php?lang_eng_mar=Mar&oid=34&MID=1

2 One of the commercially important NTFPs.These leaves are used for making bidis (Indian cigarettes). Fruits are an important source of nutrition

The forest department has extensively exploited forests of Gadchiroli through granting leases to industries or through large scale extractions by the state-controlled Forest Development Corporation of Maharashtra (FDCM)[3]. As per the data from the forest department of Gadchiroli district, currently 51,823.1 hectares (ha) of forests have been leased to FDCM, most of which fall within the traditional boundaries of surrounding gram sabhas[4] (official term used for a village; literally meaning a village assembly). Since the mid-1990s, the mineral-rich forests of Gadchiroli have been gradually leased out for mining. By 2017, there were 25 sanctioned and proposed mines in the district. Collectively, these proposed and sanctioned mining projects will destroy approximately 6,453.11 ha of dense forest directly, while an additional 16,187.4 ha and more would be impacted by mining-related allied activities in Gadchiroli. These mining leases are being given to small and large corporations, sometimes in clear violation of the country's legal provisions related to forest diversion, particularly the clause of Free Prior Informed Consent (FPIC) provided under the Scheduled Areas and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 – commonly known as the Forest Rights Act (FRA), 2006.[5] [6]

MINING IN KORCHI TALUKA

Korchi, an administrative subdivision or taluka[7] of Gadchiroli district, is located 92 km north from the district headquarters. It inhabits 133 villages or gram sabhas, which were traditionally divided into three ilakas (feudal territories)[8] namely, Kumkot ilaka including 60 gram sabhas; Padyal Job ilaka including 30 gram sabhas and Kodgul ilaka including 40 gram sabhas.[9] In Korchi, around twelve mining projects are proposed in Zendepar, Agari Maseli, Nadali, Sohale and Bharitola villages, covering a forest area of about 1,032.66 ha.

3 http://www.fdcm.nic.in/

4 http://www.mahaforest.nic.in/fieldoffice/internal.php?lang_eng_mar=Mar&oid=34&MID=1

5 Forest Rights Act, 2006, is a key piece of forest legislation passed in India on 18 December 2006. It provides for recording of Adivasi rights (indigenous peoples) over their traditional forests. These include, individual forest rights (IFRs) over land being cultivated by the forest dwelling communities without legal documents; community rights (CRs) of use and access to forest land and resources; but most importantly it provides for the gram sabhas to claim rights to use, manage, and conserve their traditional forests (here on CFRs) and protect them from internal and external threats.

6 http://www.countercurrents.org/2017/06/17/mining-in-gadchiroli-building-a-castle-of-injustices/

7 An administrative district for taxation purposes, typically comprising a number of villages.

8 An administrative unit under the control of one traditional feudal lord or a Zamindar.

9 https://www.censusindia.co.in/subdistrict/korchi-taluka-gadchiroli-maharashtra-4055

In 2003, the Nistar[10] forest area (area over which individual and collective usufruct rights of the local villagers are officially recorded) of Zendepar gram sabha was diverted and reserved for iron-ore mining by the Gadchiroli district collector without the gram sabha's consent. People in the area found out about the proposals accidentally in 2007. On December 12, 2008, the Ministry of Mines released a letter approving the mining lease for iron-ore over 65 ha in another village in Korchi, Sohale, for a period of 20 years. However, this was processed without seeking consent letters from the surface landowners, permission from the forest department, necessary clearance of land owned by Adivasis, and site clearance from the Ministry of Environment and Forests (MoEF). Sarpanch Sangathana,[11] an informal collective of sarpanchs[12] in Korchi, initiated a taluka level boycott of state assembly elections due in 2009 demanding withdrawal of mining proposals. This strategy proved successful as the government assured the villagers that the leases would not be granted for mining. Meanwhile, around the same time, 87 gram sabhas in Korchi taluka filed and received their individual forest rights (IFRs)[13] and community forest rights (CFRs)[14] claims under the FRA. However, Zendepar and Nandali villages received their CFR titles without the forest area that was proposed under mining.

Despite the government's assurance, in the same year a public hearing was organised in Gadchiroli. Villagers objected that the hearing site was far from their homes and demanded that it should be held in Korchi instead to ensure effective public participation. Their request was denied. Nonetheless, people thronged to the hearing in Gadchiroli and raised their concerns over the impacts of mining. Apart from political, ecological, and economic objections, communities also cited strong spiritual reasons to reject mining.

In the words of Samaru Kallo from Zendepar village:

> "We will never let our forests be mined, not just our village forests, but we stand with all the Adivasis who are resisting destruction of their forests. All our gods live in the forests. We Adivasisdo not have temples. These stones, trees, twigs, forests, they are our gods. The spirits of our ancestors live in these forests. If they forcefully relocate us, we will go, and we will even take our family gods, but what about the community godsand the spirits, where will they go? They cannot leave these forests?"

Villagers' opposition was registered and the public hearing dismissed. However, in 2016, some villages received a notice about another public hearing. Following that, a meeting

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10 Nistarpatrak, gaonamuna (village sample) and P1 record of the Zendepar village.

11 The collective emerged out of the need to better implement government development schemes and policies meant for the local villages in addition to raising other local issues of concern.

12 A sarpanch is a decision-maker, elected by the village-level constitutional body of local self-government called the gram sabha (village government) in India (gram panchayat).

13 IFRs are rights over land being cultivated by the forest dwelling communities without legal documents.

14 CFRs are rights to use and access to forest land and resources; but most importantly it provides for the gram sabhas to claim rights to use, manage, and conserve their traditional forests.

was held by Mahila Parisar Sangh, the taluka level women's federation on gender empowerment through the FRA, in Temli village in Korchi. In this meeting, mining and its impact on environment and livelihoods of people, particularly on women, was extensively discussed:

> "The forests are most essential to us. For Adivasis, development is to have access to basic health and education. People get food, fruits, leaves and flowers from the forest. Our development will happen here. If this forest is given to a mining company, then we will lose our independence. We will be like slaves. Mining won't lead to development.
> –collective stand by the Mahila Parisar Sangh in Korchi.

Zendepar forest area proposed under mining.
Photo by Shrishtee Bajpai

Despite strong opposition, a public hearing was again held in Gadchiroli on August 6, 2017. Gram sabhas from across Korchi taluka mobilised resources to reach Gadchiroli and once again vehemently opposed the proposal. A Right to Information (RTI)[15] application was filed by Zendepar village in 2017, seeking information about all mining leases proposed and granted within Zendepar forest area, their current forest status, copy of gram sabha resolutions under the FRA if villagers have given consent or not, topography sheets and maps of the village and mining area, and a copy of proposals by the company. Out of all the requests, the information was made available only on the area sanctioned for mining, which included 278 ha of Zendepar's traditional forest area.

Though the mining has not been initiated yet, the strategies to mount pressure on the local people to agree to mining continue in many ways: Through publication

15 Right to Information Act (RTI) was passed by Parliament in 2005. Under the provisions of the Act, any citizen of India may request information from a "public authority" (a body of Government or "instrumentality of State"), which is required to reply expeditiously or within thirty days. The Act also requires every public authority to computerise their records for wide dissemination and to proactively certain categories of information so that the citizens need minimum recourse to request for information formally.

of propaganda papers by the proponent companies listing out 'benefits of development' if mining was to go ahead, organising events with the youth including through educational institutions, co-opting members of the grams sabhas that are opposing mining, and targeting leaders, among many other ways.

TOWARDS TRANSFORMATIVE ALTERNATIVES

The processes of clearing mining proposals and denial of information to local villagers are in complete disregard of local traditions, cultures, needs and worldviews, besides being in violation of their rights under the FRA. Local communities, however, are not giving up. They are not only collectivising but also beginning to re-imagine their social organisation and localise the control on forest resources. Through this, they are also questioning the mainstream development models and centralised decision-making of the state.

MAHILA PARISAR SANGH: WOMEN, MINING AND ROLE OF WOMEN' COLLECTIVE

Women have played a critical role in the resistance as well as alternative transformation processes that are emerging in Korchi. In this predominantly patriarchal society, women had little say in traditional institutions and forest governance. Women also faced a number of social challenges, including domestic violence abetted by alcoholism, lack of resources or property and decision-making rights. To empower women financially, legally and socially, a local NGO, Amhi Amchya Arogyasathi (AAA),[16] started creating women's self-help groups (SHGs). These SHGs led to emergence of local women leaders who facilitated a collective of SHGs called Mahila Parisar Sangh. It has since become a support group for women facing injustice, oppression and violence within the family or the community. One critical push for the resistance to mining came from the discussion on mining and its impact in one of the meetings of the women

Above, Mahila Parisar Sanghs mining meeting, Zendepar village. Below, Banner stating the protest againt mining, Zendepar village Photo by Shrishtee Bajpai

collective mentioned above. Alongside, women are playing an important role in collectivising and democratising decision-making processes in Korchi.

MOVING TOWARDS DIRECT DEMOCRACY

It was in 2009 that the villagers of Korchi reckoned the need for collectivisation and political decentralisation. In the wake oft he mining conflict, communities realised that they need to collectivise to make the state institutions, particularly local and administrative,, accountable. The Sarpanch Sangathana was one such collective. However, it remained in the hands of a few powerful sarpanchs influenced and supported by national political parties and their agendas, and with no women representation.

On the other hand, many local leaders and activists began to initiate processes within their villages to understand what it meant to have received CFR rights. This collective deliberative process initiated discussions on the role, powers, rights and responsibilities of a gram sabha. They also began discussing strategies towards empowering gram sabhas instead of panchayats as a first unit of decision making, thereby gaining control over natural resources. Along with the help of local NGOs like AAA and other activists, the concept of gram sabha and its legal powers were researched extensively, published and distributed as fliers across the villages, and eventually put up as posters at various public places.

By the end of 2016, as the concept of gram sabhas was catching on, the traditional Ilakas began to see themselves as supra gram sabha bodies. Encouraged by the above processes, the Ilaka sabhas[17] (territorial assemblies) began to include within their programmes and ceremonies political discourses and conversations on gram sabha empowerment, direct democracy, how laws like FRA could help empower gram sabhas, mining and its impacts, concepts like growth and development, colonisation and imperialism, among others. Efforts were made towards revisiting the meaning of the word 'adivasi' (indigenous), Adivasi cultures and histories, retelling the stories of tribal revolutionary heroes (usually invisible in mainstream historical narratives) and understanding co-option of animistic Adivasi cultures by dominant religions. The process also worked towards understanding how legally empowered gram sabhas could work towards self-determination and self-governance, including asserting equitable control over forests and local economy.

As gram sabhas began to gain empowerment and recognition, it was important for them to get more teeth in order to support those who were just beginning to reorganise themselves and develop mutual learning and support. The traditional Ilaka sabhas had their limitations in addressng these issues, as they were not seen as truly inclusive of all sections of society like non-tribals (like Other Backward Classes and Scheduled Castes) or women in their decision-making processes. To tackle the inefficiencies of the traditional institutions, curb market exploitation, ensure equity in benefit sharing and enable knowledge, learning, and exchanges, a federation of 90 gram sabhas – Maha Gramsabha – was formed in 2017.

17 These were meetings at the level of an ilaka represented by the poojaris (community priests) of all villages in an ilaka.

Left, A woman gathering mahua in the forest, salhe village. Right, tendu-patta auctioning meeting in Korchi.
Photo by Shrishtee Bajpai

A FEDERATION OF GRAM SABHAS

Maha Gramsabha (MGS) is now a political, economic, social and cultural space that aims to obtain the recognition of local people's normative regulations for governance. All designated representatives are obliged to report back to their gram sabhas. Newer policy prescriptions or information are duly discussed and informed decisions taken, but only to be taken back to the constituent gram sabhas for ratification. Before acceptance, proposals for future actions are discussed and details of expenses incurred shared. Four representatives from each member gram sabha constitute the general body (GB) of the MGS, while an executive committee of 15 members (one female and one male from seven clusters[18] including one person with disability) representing marginalised groups like women, other social groups like SCs and OBCs and disabled persons is selected to handle the day-to-day functioning. It is specified that the executive committee would change every three years and its president be elected from the Scheduled Tribes.

In one of the first meetings of the MGS, the Mahila Parisar Sangh members insisted that along with challenging the hegemonic and top-down bureaucracies, it is also important to challenge the established traditional structures that legitimise oppression of women and restrict women's role in decision-making. Their efforts ensured that the executive committee has women representatives. Along with this, MGS has mandated two women representatives along with two men from each gram sabha that passes a resolution to join the MGS and adhere to its rules and regulations. The fact that the decision-making bodies are now the gram sabhas and not the panchayats (far away from the village), there is a greater opportunity for women's participation. Through the efforts of the Mahila Parisar Sangh, some gram sabhas have also made special efforts to ensure that the meetings are held at times when women are able to attend. The sangh also ensured that Korchi taluka is one of the few areas in the country with a focus on the rights of

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18 Cluster is a group of villages divided by the MahaGramsabha based on their territorial boundaries. Each cluster may have 7-10 villages. 87 gram sabha members of MGS have divided themselves into 7 clusters, namely, 1) BodeseraPadyal Job 2) RaopatGangaramGhat 3) Peko Pen Saoli 4) Jabragat 5) KuwarpatKokha 6) ShamshergatKokha 7) DantasheroJambadi. These clusters are also used as units for collection and sale of NTFP like tendu patta and bamboo.

women under the FRA and Panchayat Extension to Scheduled Areas (PESA) Act, 1996.[19] Going a step beyond, many gram sabhas have also decided to offer women will get daily wage labour as well as the profits from the sale of non-timber forest products directly in their own accounts, instead of their husbands'. In fact, one village, Sahle, has decided that the entire profit earned by the family from forest produce will go only to the account of the women of the family – a powerful and unique decision.

LOCALISING CONTROL OVER FOREST ECONOMY

In 2017, the 87 gram sabhas in Korchi with the support of MGS carried out a total business of Rs.107,987,970 (1,526,871 USD) from the sale of tendu leaves. As the villagers recall, when the forest department harvested tendu, gram sabhas did not benefit from the trade as there was no transparency on how much tendu was actually being harvested. Villagers claim that the harvest was always much more than the initial estimates but any harvest above the estimates was not officially recorded.

Comparative income of families and gram sabhas from sale of tendu leaves in Korchi taluka:

Years	Payment/ standard bag of tendu leaves (in Rs.)	Share retained by forest department for its use (in Rs.)	Share retained by gram sabha for village development (in Rs.)	Collections families received (in Rs.)	Total collective income (in Rs.)
2013	4,577.37	6,225,452	0	35,277,561	41,503,013
2014	5,071.09	7,356,601	0	38,622,156	45,978,757
2015	4,796.17	6,957,653	0	36,527,679	43,485,332
2016	8,272.37	15,001,170	0	60,004,680	75,005,850
2017	11,910.39	0	14,038,436	95,029,414	107,987,970
2018	4,600	0	5,422,066	36,286,134	41,708,200
2019	5,700	0	7,091,066	50,650,475	57,741,541

In addition to the tendu leaves, the income is also earned from the sale of other forest fruits such as jamun (Syzizium cumini), mahua (Madhuca indica), charoli (Buchnania lanzan), among others. The three gram sabhas in Korchi this study focused

19 The provisions of the Panchayats (Extension to Scheduled Areas) Act, 1996 or PESA is a law enacted by the Government of India for ensuring self-governance through traditional gram sabhas for people living in the Scheduled Areas of India. In 2014, the Government of Maharashtra also decided to draft the Rules under PESA, which gave power to the smallest unit of decision making the village assembly and granted rights over the minor forest produce among others.

on – Zendepar, Salhe, and Bharitola – earned around Rs.5,96,653 (8,405.64 USD) on an average from sales of tendu, mahua and tarota in 2016 and around Rs. 10,21,516 (14,391.1 USD) in 2017.[20] Along with this, the average annual income from farming in the three villages is around Rs.9,39,600 (13,237.07 USD).

The direct income from the non-timber forest produce including bamboo, tendu and others is clearly more than the incomes that the mining companies have been promising in word to people, particularly the youth. An analysis carried out by those engaged in the local processes in Korchi suggests that 78 unskilled labour jobs, as promised by the mining companies, will fetch no more than Rs. 350/ day.[21] Additionally, men and women will have different wages, the latter less, as always. On the other hand, the income from the forest produce is equal for men and women, and provides equal opportunities to earn for all members of gram sabha.

ECOLOGICAL CONSIDERATIONS

Conversations with people in the community in Zendepar, Salhe, and Bharitola revealed that gram sabha empowerment and laws like FRA and PESA have helped in reversing the process of alienation of communities from the forests.[22] A few gram sabhas in Korchi have started making rules and regulations for the management and protection of forests. The three villages have also put in place a system of regular patrolling of their forests to monitor forest fires and felling of trees. Zendepar, Salhe, Bharitola and Nandli gram sabhas have planted over 70,000 saplings of bamboo, amla ('Indian gooseberry), custard apple, mango, and guava, among others on 100 ha of their forest land. The FRA requires all gram sabhas to formulate management plans and strategies for the forests over which their rights have been recognised. In addition, some gram sabhas like Bharitola have been funded by the government to compile their 'community biodiversity registers' to safeguard and record local biodiversity and associated traditional knowledge.

CONCLUSION

The processes of assertion of rights, self-governance, and forest conservation and management are unfolding in Korchi under varied threats. Communities not only have to resist the hegemonic and oppressive state policies (including heavy militarisation of

20 Village-level socio income data from 2016-2017

Village name	Number of families	Income from farming	Income from other sources	Income from tendu, mahua and tarota 2016	Income from tendu in 2016	Income from tendu, mahua and tarota 2017	Income from tendu in 2017	Total income in 2016	Total income in 2017
Zendepar	46	8,21,000	8,34,600	3,48,200	2,23,800	7,42,200	6,28,400	24,17,300	28,11,300
Bharitola	56	10,70,800	8,34,600	12,31,760	6,50,700	17,71,718	10,18,600	31,37,160	36,77,118
Salhe	53	9,27,000	2,05,700	2,10,000	1,41,000	5,50,630	4,26,830	13,42,700	16,82,630

21 https://capindia.in/minimum-wages-maharashtra-2019/

22 Based on the conversations that the authors had with the community members during the study period- 2017- 2019. The detailed report will be available by end of October, 2019.

the region and macro-economic policy), which are deeply skewed in favour of corporatisation and privatisation, but also redress internal hegemonies and patriarchy. Yet they have emerged as a creative political force, providing alternative models of local governance and suggesting that there are alternative ways of meeting human needs and aspirations, without destroying the earth and without leaving half of humanity behind.

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Weaving in indigenous Dimasa community of Assam

AVANTIKA HAFLONGBAR

INDIGENOUS WEAVING KNOWLEDGE AND CULTURE OF THE DIMASAS

The Dimasas are one of the earliest aboriginal tribes of India. Dimasas consider themselves to be the descendants of the Brahmaputra river. The word 'Dimasa' is taken from three words of Dimasa dialect 'di' 'ma' and 'sa', which means 'water', 'big/great' and 'son' respectively. So the literal meaning is, "the son or descendant of a big river". Dimasa ethnic group is one of the Scheduled Tribes of India and belong to the Indo-Mongoloid group of people. Dimasas now mostly inhabit the Dima Hasao district in the state of Assam in India. Dima Hasao is one of the two hill districts of Assam enjoying the status of Autonomous District under the provision of the Sixth Schedule to the Constitution of India.

Weaving is an age old practice in Dimasa society. The entire process of weaving was woman-centred in the Dimasa community, but in recent times few men have also started to weave. Expert women weavers are called 'Daokrigdi' and expert male weavers are called 'Daokrigdao'. Most girls in a Dimasa family start at a young age to learn weaving from their mothers or grandmothers by observation. They can weave both complicated patterns for occasional use as well as simple and plain clothes for everyday use. According to tradition, it was essential for a girl to learn weaving before marriage. Incompetence in weaving was regarded as disqualification for prospective marriage proposals. But in modern times this is not the case anymore. It is not merely a custom to observe but a means of independence for females of the community. Weaving is a lifelong association for many. A Dimasa woman will continue weaving until her body is too old to perform such activities. An old Dimasa lady, even when not working at the loom, would be rearing eri silkworms (S. cinthya ricini). Most of her activities would be revolving around weaving. But in recent times, the majority of women who take up other jobs do not weave once they start working, except for a few who still weave because of their strong sentiment for this traditional art.

Dimasas of Samparidisa village in
Dima Hasao district of Assam.
Photo by ROOHI

Dimasas of Samparidisa village in
Dima Hasao district of Assam.
Photo by ROOHI

Photo by Sarpola Kemprai

Hand-woven cotton cloth plays an important role in all the stages of life in a Dimasa community, starting from the birth of a newborn till death. During the ritual known as 'Nana Dihonba', a ceremony for carrying a newly born child outside the house for the first time, while taking the baby out, the 'hojaijik' (first midwife) carries the baby in a folded 'rihmsao' in case of a baby boy and 'rikhaosa' in case of a baby girl. It is customary to clothe a male or female dead body in complete traditional attire worn during their wedding and at their funeral. A deceased male is covered with rihmsao and a female in 'rihjamphaingufu". Rihmsao is a traditional shawl. It is usually woven in white or yellow colour. It has a particular design on its border. Rihjamphaingufu is a plain white chest wrapper with a particular design.

'Rihmsao' - Traditional Dimasa shawl - ©ROOHI

Photo by Sarpola Kemprai

The monolithic hut (stone house) of Maibang erected by Raja Harish Chadra Hasnusa in the 16th century. Photo credit - Mrs Snigdha Hasnu, District Museum, Haflong,Dima Hasao. 2013-2014.

FOLKLORES RELATED TO THE ORIGIN OF WEAVING

It is difficult to trace the origin of traditional loom 'daophang' in the Dimasa community due to lack of written documents and records. The traditional folklores, folk songs, and inscriptions on historical relics have to be the main source of information. But according to the legends and stories from the elderly people, it is believed that the usage of daophang existed at the beginning of the universe, which was completely uninhabited. There was neither sound nor air. It was only filled with water and immense silence. In this midst, two godly beings appeared – a male and a female. The male God was called Bangla Raja (Father of Dimasa Gods and King of Earthquake) and the female Goddess was called Arikhidima (Mother of Dimasa Gods/ Goddess with wings of a fairy). Arikhidima and Bangla Raja later fathered seven sons. But Arikhidima was not happy with her sons because they were very simple and content in their ways despite having divine powers. None of them had the desire to neither explore more nor create newer things to make the world an exciting place. Disappointed with her sons, Arikhidima left for the most suitable place to lay her eggs. At last she found a big, evergreen banyan tree in between the confluence of two rivers, Dilaobra and Sangibra. This place was described as Utopia, with tall big leaves and branches of the banyan tree, which could not be broken in any storm. The land beneath the tree could hold as many as 1,000 animals; equal number of birds could live over the leaves of the tree. Arikhidima laid seven eggs and flew away. After seven days, all the eggs hatched themselves. From the first egg Lord Sibrai was born. Doo Raja, Wah Raja, Gonyung Raja, Brayung Raja and Hamyadao were born out of the next five eggs respectively. The seventh egg, which got rotten, is believed to have made way for all the evil spirits, sufferings and diseases into this world. Hence, the six Gods, from Sibrai to Hamyadao, are considered to be the ancestors of the Dimasas and also worshipped as their Gods. After living a long time by themselves these six God brothers went out looking for their Mother. Their first few attempts to search for her were in vain but one fine day while returning to their birthplace they found their Mother weaving under the evergreen banyan tree. Among all beliefs, this legend is regarded as the most acceptable theory about the origin of the Dimasas and weaving.

FOLK SONGS RELATED TO WEAVING

Weaving and spinning are the core essence of a Dimasa community. The significance of weaving is often echoed in a number of Murithai songs (songs which are sung orally and by playing the traditional pipe like instrument called Muri).

1. "Agasi sari ha longphaiba,
angjamgthangjaoya,
Miya horhalongphaiba,
angjangthangjaoya,
Rikahosahoraigilidaophanggalamla" (2 times)

Meaning: "You came to pick me the night before yesterday but I could not go,
you came to pick me yesterday too but I could not go,
Rikhaosa in the loom, horai gili is yet to complete"

Rikhaosa is a chest wrapper and horai gill is a design to be woven in a rikhaosa.
The song indicates the dedication upon weaving of a cloth.

2 "Ninirihborihgadain, anirihborihgadain,
Ninirihbohoraimin, anirihbohoraimin,
phaidiberao,
phaidiberaokhunanghakhliha (2 times)
Ma madaisainribabasain se,
phaidibailainang,
Pa madaisainribabasain se,
phaidibailainang"

Meaning: "Your cloth is new, mine too.
Your's cloth is horaimin, mine too horaimin
Come friends, come friends to the village headman's porch.
Mother God has given us this day, let's dance together.
Father God has given us this day, let's dance together."

'Horaimin' is a kind of design woven on the rikhaosa and 'khunang' means the village headman.

Name of the pattern- Horaimin meaning gwai khaosha, an offering tray for betel leaves and areca nut. This cloth belongs to my mother in law and is thirty years old. This pattern is no longer being woven in modern times.
Photo © ROOHI

Scan for Listening Song

The song indicates the joys of wearing new woven clothes and dancing together at the God given day at the village headman's house.

Weaver Minali Kemprai in her traditional wooden throw shuttle loom. Photo by ROOHI

WEAVING DEVICES, TECHNIQUES AND PATTERNS

Every Dimasa household has a daophang in their frontward or the backyard with a roofed area or else they have a separate room especially for keeping the daophang called 'daophangkho' (a room for the loom).

Types of daophang:

Nowadays, only three types of daophang are being used by the Dimasa weavers in the villages as well as in the town area.

Yaoni/ bondo ni daophang (traditional wooden loom/ throw shuttle).	Khol ni daophang (throw and fly shuttle loom).	Wah ni daophang/ danti/ kanti (traditional bamboo loom).
This type of daophang is used by the majority of the Dimasa weavers. It is made of wood by an expert carpenter. It can be moved from one place to another.	This is also made of wood but a little bigger than the bondo ni daophang. It is moveable as well.	

SILK AND COTTON PROCESS

Eri rearing is an age old tradition of the Dimasa women. Process of rearing eri worms is usually carried out in March-April and September-October, the most suitable seasons for its rearing. The women folk rear 'yungma' (silkworm, eripolu) to produce 'khunthon' (eri/ endi silk) and the cloth produced from this thread is called 'rihendi'. Eri silkworm feeds on castor leaves and kesseru leaves, which are found mostly in Dima Hasao district. Castor leaves are known as 'Radaolai'. It takes one month to complete a cycle of

Left, Khunthon meaning eri/endi silk. Right, Hamsmaidi Naiding Kemprai, 78-year-old lady from Dibarai village, Haflong. © ROOHI

re-rearing, from egg larva to cocoon. At a certain time, the eri moth leaves the cocoon on its own. Eri silk spinning does not involve the killing of the silkworm. Hence, eri silk is known as Ahimsa silk or non-violence silk. Before spinning, the eri cocoons are boiled in 'khari', an alkali mixed with water, for around an hour. The khari used for boiling the eri cocoon is made from the charcoal of the castor stem. It is different from the other khari made from banana-stem ash. After boiling, the cocoons become thin. These are later dried in the sun and kept aside for spinning. The method of reeling is known as 'thakriluba' and the ball of endi/ eri thread is called 'khunthon'. For spinning the khunthon, a special tool known as 'thakri' (spindle) is required. The main fabric traditionally made by eri yarn is a shawl called 'rihthap'.

The Dimasa people conserved the khunphang/ cotton plant for weaving. In earlier days, it used to be cultivated in 'jhum' (slash-and-burn) method of farming land along with other crops. Previously, Dimasa women used to do cotton ginning in their homes, then spin it on spinning wheels. But in the recent past, cotton cultivation amongst the Dimasa community is on the decline. The yarn produced from cotton is called 'khundi'and the process of spinning the cotton is known as 'khundi luba'

'GONTHAI' © ROOHI

Dimasas use plants as natural dye to colour their cotton yarns. They carry on the process of dyeing twice a year. They prepare red dye from the root of a wild raw indigo plant known as 'jengklong' and the method of dyeing black colour is prepared from the leaves of wild herbs known as 'gisim balai'. The dyeing process is generally done in winter. Before the yarn is dyed, it has to be kept out in the open at night for about a week. When the yarn becomes completely moist with dew, it is ready for dyeing. But this practice is on

the verge of extinction and naturally dyed cotton yarns have been replaced by readymade multi-coloured acrylic yarns.

All the Dimasa designs, known as 'rikhu', before being woven in the fabric, are carried out in the traditional device known as 'gonthai'. We generally use 'wahdu ni gonthai' (gonthai made of thread). This kind of gonthai is made by cutting two hard bamboo sticks, vertically tying it with endi/ eri thread in 37 lines where, different colours of thread are allowed to hang horizontally. The horizontal colours of thread represent different rikhu.

MOTIFS, PATTERN AND DESIGN

The rikhu or designs of the Dimasas look like 3D art, always colourful. Usage of the same colour in the rikhu is not followed. It includes geometrical designs, designs of plants, animals and nature. Each of the Rikhu has its own unique name and identity. One main characteristic of the rikhu is that the male rikhu/ design is completely different from the female rikhu/ design, and females are not allowed to wear anything with the male rikhu/ designs. There are recorded 159 designs/ rikhus with their distinctive names in the Dimasa textiles symbolising layers of soil, small water carrying jar, small oyster, small brinjal flower, tortoise, small crab and so on.

Name of pattern: Bathormai (Parrot's beak with one-line motif) © ROOHI

Name of pattern: Sampherma yasong meaning trunk of sampher tree. © ROOHI

Name of pattern: Nagurlai represents the design of fish scale. © ROOHI

Name of pattern: Gadha ni turisamin bathai meaning old fruit pattern from a bamboo shuttle. © ROOHI

Name of Rikhu: Upper Part is Misha Kroshi meaning one headed small animal, Middle part is Ruina Rengin meaning geometric design with two lines up and down motifs and Lower part is Dilam balai taijai representing eight fruits flowing in a river. © ROOHI

Name of pattern: Baitha meaning paddle/boat oar. © ROOHI

Rihgu: It is a wrapper, lower garment worn from the waist till the ankle. This is usually plain but can be woven in motifs. It can be of any colour. It may be smaller of bigger according to the age and size of the wearer. Normally, the size of the rihgu is 'muh bri' (four times the distance between the elbow and tip of the fingers of the hand).

Pink color Rihgu. Pattern 7. Name of Rikhu: Phraphrang jengreng meaning Banyan tree with crab and one-line motif. © ROOHI

Rih jhamphain: It is a chest wrapper, outer garment worn from chest to knees along with rihgu.

Dimasa girls in traditional Rajampahain Beren with Rihgu and Rikhaosa. © ROOHI

Rikhaosa: It is a shawl or a dupatta that is worn above the chest wrapper. It can also be used by men on occasions like marriage and dance.

Rihgu rikhaosa (**rigu set**): It is modern wear introduced in the recent past resembling a mekhala chador, a two-piece set adorned and popularised by the Assamese women. It is a semi traditional Dimasa wear consisting of two pieces.

Red Rigu Rikhaosa in Bathormai motif meaning parrot's beak with one-line motif. © ROOHI

URGENT NEED FOR INFRASTRUCTURE

Emergence of women entrepreneurs in the economy will help in building the economic independence of the weavers, improve the status of women, promote economic development and solve the problem of unemployment. But before that we need to work on the upgradation in skill and technological know-how. Since handloom is an age-old traditional activity in all the villages of our district, each and every targeted beneficiary requires training for skill upgradation, improved looms, design support for product development and proper work shed due to their poor economic condition. At the moment, very few looms supplied by the government actually reach the weavers. Most of the times, the beneficiaries of the loom provided by the government agencies cannot even weave, which results in total administrative failure.

The loom and yarn, when given to the rightful person, will only help keep the art alive. Majority of the weavers are from the villages and very marginalised. Many villages in our district are not connected with roads and have no electricity yet in this age and

time. In order to preserve the enduring tradition of Dimasa handloom against the backdrop of globalisation, government bodies and non-government bodies should rigorously equip the weavers with the required loom, yarn and updated skills. Facilitating awareness, training on product development and design development are not visible in the handloom community of the Dimasas. The need for a textile park providing all essential facilities from pre-loom, on-loom to post-loom is also to be considered. Infrastructural support on the part of the government is required. The handloom industry of Assam should help Dimasa textile to be brought under the Geographical Indication (GI)[1] tag.

Moreover, the younger generation have forsaken the art of weaving and have little interest as well. Since many of the children are sent away to towns and cities for higher and better education, the interest or the desire to work on the loom is dwindling. Weaving community in Dimasa society is undergoing a major change. With the passage of time, the practice of making natural dyes is also declining. Of late, a handful of elderly women are practising the art of natural dyes in the district. Weavers prefer to buy coloured yarn from the market, which offers a variety of shades, whereas, natural dye has limited shades. Cotton yarns are now being replaced by acrylic, zero ply and polyester yarns. In the thick of this transitional phase, with marketing and branding skills along with the support of handloom and textile departments of the government, social entrepreneurs from Dima Hasao can revive the age-old traditional knowledge of weaving by using social media and e-marketing platforms. Challenging times are ahead for the weavers of the Dimasa community and technological and infrastructural intervention is the urgent need of the hour that will keep up local practices, giving a much needed boost to the centuries-old traditional art form.

SOURCES

This study was done by visiting Phrapso and Dibarai villages of Haflong town in Dima Hasao district. The methods of weaving were observed and discussed with Maimu Bathari, Kerola Naiding, Elbita Naiding, Baby Phonglo, Maiphal Kemprai, Janata Haflongbar and Minali Kemprai. All of them are expert weavers in the Dimasa community. Information was given by the elderly people of Samparidisa, Gunjung and Phrapso villages of Dima Hasao.

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1 Geographical Indication (GI) is a sign used on products that have a specific geographical origin and possess quality or reputation that are due to that region.

Local knowledge networks: A portraying interview of a sacred grove. An interview with John, a guide at Sacred forest in Shillong

NENA SEITZ

A shield, welcoming at Mawphlang Sacred Forest. Photo By Nena Seitz

Formed in 1972 and located in the northern east of the Indian subcontinent, Meghalaya shares its northern border with Assam and southern border with Bangladesh. With a population of over three million, the state is made of a mild climate with clouds constantly floating through green layers of the hills. And nestled in the state's East Khasi Hills lies the Mawphlang sacred grove. Guiding through the forest, Johnstarfield Myrthong offers a portrait of his perception of the grove, local belief systems and the social structure of the Khasi community.

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JOHN

"I am here for seven years and we are the Khasi people." Dressed in a red sports jacket and trainers, Johnstarfield Myrthong, who introduces himself as just John, is 24 years old and grew up in the Mawphlang village near the sacred grove. He identifies himself as Khasi, and as Christian – ways of life many people in the region are being interlaced with by birth. John has been working as a tour guide for the last seven years tour guide by profession for the last seven years and he offers tours through Mawphlang's Sacred Grove, day by day.

TRIBES

"In Meghalaya we have very few tribal people. Three tribal groups are existing: Khasi, Garo and Jaintia." Meghalaya's main tribes are named after the three hillsides, which determine the state's landscape. "But the language we speak and the food we eat, and our culture, especially the traditional dance of the Khasi people, differ between the groups."

LANGUAGE

Although John is speaking in English, his mother tongue is Khasi. Khasi does not have its own written script, but its oral sound is thus even richer of vivid sounds and emphasises. "The Khasi language is difficult to learn. For writing, we use the Roman scripture, which we learn in school." Being sent to Calcutta as a Christian missionary, Thomas Jones (1810 – 1849) worked among the Khasi and by living in the region, he started recording the Khasi language in Roman script, which is why the same script is used till today.[1]

MONOLITHS

Monoliths are lining the way, here and there – not organically grown, but brought "from outside inside the forest", by the people. Outside, monoliths are arranged next to each other, like a sculpture, "for our memory". "We put the long stone along with the flat stone; the long stone represents the male and the flat stone represents the female." Inside the forest, arranged in a line, next to the path, made of flattened earth and leaves, the monoliths mark a meeting point. "When a sacrifice is performed, we have to assemble behind that stone, at the meeting place, and wait for the chief."

1 Magdalyne, Syiemlieh. 2013, Early Khasi Response to Christian Missions: Challenges, Acceptance and Assertion, IOSR Journal Of Humanities And Social Science, Volume 14, no. 2 (Jul.-Aug. 2013): 36-43, http://www.academia.edu/download/32109782/G01423643_(1).pdf.

LABASA

 "Some people only have one religion. But the people here, we believe in the initial god." "In Khasi we call it the labasa. That's the name of the holy spirit in the forest." Existing beyond material limitations and rational perceptions, "the deity only appears in the body of a leopard in the time of a sacrifice." If the deity embodies itself in a leopards' shape, "the god is happy and the sacrifice was successful". On the other hand, the expression of the initial god in form of a snake means "bad news for the people". 'Sain' means snake, 'la' can be translated into leopard and 'basa' means deity. "It won't appear for everyone. I mean, you can do a sacrifice, but nothing will happen. It will only appear for us, the Khasi."

PLAYGROUND

"You've seen it when we stand outside." Outside the grove, standing next to the paved road, where a tea stall is stationed, car parking is arranged and huts for tourists staying overnight are under construction. "What do you think why this dense forest never expanded to that side?" John points towards the green field, located between the paved road and the densely grown forest. "So, if you'll come here again in the next 10 or 20 or 30 years, you will see that the forest will be still the same." As being withheld by a not yet materialised barrier, the plants, the trees, the bushes, the flowers and their roots which constitute the forest over and under the ground, come into being and form a cupola, intensifying the obvious flatness of the grassy area right next to it. "We call that flat side the playground of the god. But inside is the place where the god, labasa, lives. So, the labasa used to play outside. Even if we try to plant the trees on the playground of the deity, they won't grow."

PRESERVATION

 "The total area of the forest is 76.8 hectare and we don't allow anyone to pick anything up from the forest." While the flat side, outside the grove, forms the deity's playground, the grove's inner side forms the space where the deity lives. Each and everything growing inside can be used, but needs to be kept within, too. Being "more than 800 years old", the Mawphlang forest belongs to the people living in the village nearby and is preserved and protected by them. "We have another forest, from where we can collect firewood to cook food at home. But if we use wood from this forest, we make a fire directly in front of the forest and we never take the wood home." At the routes' end, outside the forest, some greyish-black and almost round fireplaces appear like memorials at one of the forests thresholds, seeking shadow below the trees' branches, which the visitor has to cross during the walk back from the grove to the tea stall.

OFFERINGS

"It's a little bit similar with the practices in Hinduism. In the sacrifices I have seen, the people used the coconut and check from the inside if the coconut has any disease." Before a house is build or an important event takes place, an offering is made to the deity. "It's nothing you can learn in school." Some people, a few and "only men" have the knowledge of the way an offering has to be performed and "only men" are allowed to do so. "Like in the Hindu religion. They also have a special person who knows how to do the puja. In Khasi, we have the nongkiniam who will know how to do the sacrifice." The nongkiniam, the priest. "Even I am Khasi, but I don't know how to do the sacrifice." Physical sacrifices are expressed for community purposes only. "Before building a bridge or before a festival starts or before doing something for the village in general, they (the priests) do a sacrifice. There are also people who want to do sacrifices for personal reasons, but then they don't do it in the forest, they do it outside the forest."

SACRED GROVE

"We have the sacred forest, which starts from there" – a door-like arch, constituted by leaves in different types of green form an entrance to the grove, guarded by a reddish plant hooded with pitcher-like leaves and bearing a bright red flower. "The red lily cobra plant has a very poisonous fruit. You cannot use it for anything." "In the forest, we have many species of plants and orchids and different kinds of insects." Constantly accompanied by the chirping of crickets, immense trunks of trees form the forests' inner structure. Some of them are wrapped in lines of roots creeping and crawling their ways downward to the earth from the tree's branches. Also called the Tree of Heaven, the Mahrukha tree is "more than 600 years old." Out of Mahrukhas's fruit juice, "we make medicine for gastric." The bark of the Rhododendron tree can be used as a "medicine especially for heart diseases".

ROUTES

"In the forest we have two routes. Do you want to walk the short or the long path?" Having chosen the longer route, a carved path leads us into the forests' inner side. Without recognising it, the paving stones turn themselves into a brownish-earthy ground, interspersed with roots, flattened and dried by countless pairs of feet, which have trampled it down by time.

Inside the forest, monoliths are
lining the way and marking a
meeting point
Photo By Nena Seitz

TOURISM

"A person from Hyderabad came here eight years ago, walked the David Scott trail and shot some pictures with his camera. He uploaded them and put my number on the same travel website. That is how the people became aware of this place and the forest. And you know how tourism works. This was the first step and now more and more tourists are coming." More and more tourists, that means 30 to 40 people a day, in high season. Now, at end of August, it's monsoon season. A cloudy sky and a grey atmosphere at 10 o'clock in the morning. Two to three tours a day for around 15 tour guides. "This time there are very less people visiting here, but in high season there are more, and we then need around 25 guides." All of the guides are male and mostly in their mid-twenties. "The youngest guide is 18 and the oldest is 50 years old". All the tour guides are from John's village, which lies next to the Mawphlang forest. "Khasi people from other villages – Shillong or Cherrapunji – are not allowed to guide other people inside the forest."

DAUGHTERS [2]

Women may not lead any tours through Mawphlang's sacred grove, but they are still part of the community. Visibly, a woman is steaming momos and boiling water for tea in a hut next to the paved road. Invisible, many other Khasi women are living in and between the houses of the village. The Khasi is a matrilineal society, being structured by a clan system with mothers being the heads of each clan. The son who marries a girl from another family establishes a sub-clan with the wife being the head of it. As a bachelor, John has to give his earnings to his mother. "This demands our tradition." The Khasi's tradition also demands the men who are married to give their earnings to their wives and to take the last name from the mother's side. Part of this structure is also the inheritance of the family's property: "Our parents won't give anything to us boys, instead they will give everything to the girls." If there are three girls in the family, around 10 per cent of the property will be transferred from the mother to the first daughter and 10 per cent to the second. "The remaining 80 per cent they will give to the last one." Inheriting the property, the youngest daughter is thus responsible for taking care of the parents, too.

2 Esther Syiem, Khasi Matrilineal Society: The Paradox Within (2010), https://zubaanbooks.com/shop/khasi-matrilineal-society-the-peripheral-centre/.
Sapphira Beth, The Khasi Community Is Matrilineal, But Not Matriarchal (March 16, 2018), https://feminisminindia.com/2018/03/16/khasi-community-matrilineal-society/

VILLAGE

 "All the men are allowed to participate in the durba shnong." Two of John's brothers stay in Shillong and his father "is a little older", John attends the 'durba shnong' (village council) nowadays, "to represent my family". Durba shnong is made up of male representatives of the local families. "Every male person of the family is welcome to attend the assemblies, but usually only one representative will attend the same." Before implementing a scheme for a footpath or a building or even before a festival can take place, the government has to consult the village, which is represented by a mayor who the Khasi called 'rangbaj shnong'. He is the elected head of the Mawphlang village and the person who people from outside have to communicate with. However, "the chief then has to call the people for a durba shnong to discuss with them. "In 2015 the government planned to build a highway from here to Cherrapunji, but we, the local people, didn't allow that. Only if a majority votes for it, a festival can take place, or a street can be built." The government "respects our decision" – the decision to preserve this forest, this sacred grove, this network of knowledge and facilitator of exchange.

FURTHER READING

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Poffenberger, Mark (2014): Khasi responses to forest pressures: A community REDD+ project from Northeast India. In: Katila, Pia et al. (eds.): Forests under pressure: Local responses to global issues. IUFRO World Series Volume 32. Vienna, p. 229-240. (https://www.researchgate.net/profile/Wil_De_Jong/publication/265017551_Forest_under_pressures_-_Local_responses_to_global_issues/links/5403d1020cf2bba34c1c27b7.pdf#page=230

G.

India's Living Roots,
Bees, Elephants:
Sketching along
nature-human hybridity

Infrastructure and nature are inextricably entangled. The former, more often than not, is borne of nature, as when natural elements like metals, minerals, sand, and asphalt are used as raw materials to build roads, railroads, bridges, and electric and communication cables. But they are also intertwined in that each alters the other's nature and structure—chemicals scrambling the DNA, or plastics becoming a ubiquitous contaminant in the food chain, or highways disrupting the natural traffic of wildlife. This section tries to unravel some the entanglements of nature and infrastructure. Sebastian Walter and Axel Brockmann describe how the colonisation of farmlands by urban infrastructure has forced different species of bees to rebuild their lives in various urban niches. They report that between 1987 and 2014 nine out ten bee colonies in Bengaluru were wiped out due to felling of trees, air pollution, and intentional gassing by ignorant and fearful residents. As bees pollinate a wide range of wild and cultivated plants, the authors describe that killing them off might not just disrupt the natural rhythms of ecosystems but lead to a drop in crop yields, which will affect food sufficiency. They believe such fears may not come true provided citizens are enlightened about the many ways they can coexist peacefully with the endangered bees. Ashok Narayan makes a similar point about how loss of habitat, fragmented wildlife corridors, and violent skirmishes with people over crops, all a culmination of indiscriminate development, have forced the revered Asian elephant in Assam to a life of continual want and insecurity. He cites the example of the Rabha community, who have chosen to live off the forest's bounty rather than eat into it as cultivators. Even though elephants live in their backyards, there has not been a single incident of the pachyderms raiding their village or killing a person. This, the author argues, is one of many ways human and elephants can make peace with each other. For many, finding ways to coexist with other species in the Anthropocene, the name given by scientists to the post industrial revolution period in which humans themselves have become a great geological force, the greatest challenge facing humanity. In her essay, Sonal Jain argues, invoking many thinkers such as Jason Moore, who believe a more accurate term for our times should be Capitalocene, that so long as we see ourselves as conquerers of nature and not subject to it, the quest for remaking the planet is doomed from the start. To illustrate her point, she points to the living root bridges and trees in the Indian state of Meghalaya as "the perfect examples of living in tune with nature rather than controlling it."

Pollinators in the urban age

SEBASTIAN WALTER AND
AXEL BROCKMANN
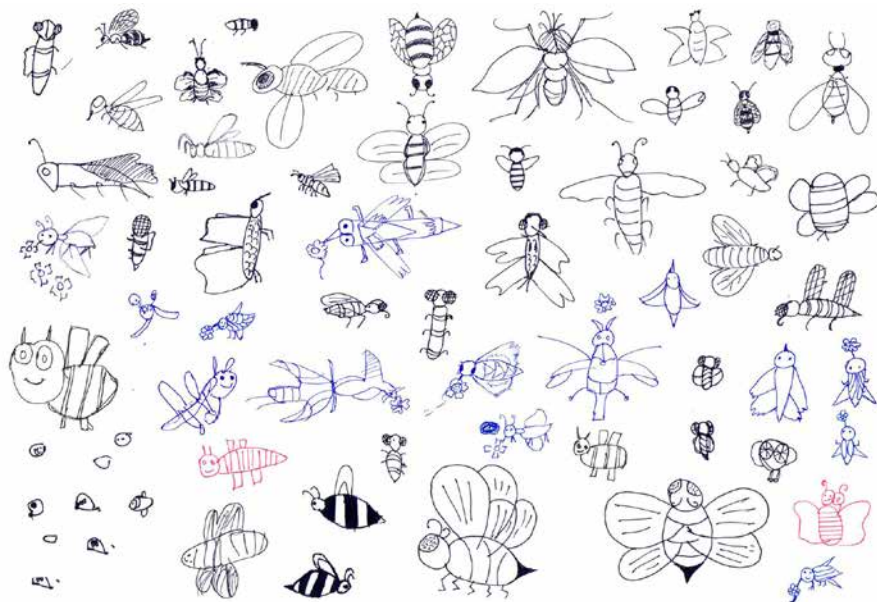
Bee drawings by children, teenagers, and adults during the NCBS Moth Day, National Centre for Biological Sciences, Bengaluru (arrangement by Sebastian Walter).

THERE ARE MANY: THE DIVERSITY OF HONEY BEES OF INDIA

"I don't have much experience with bees." "We have seen honey bees, but don't know anything about them. ...We are afraid of giant honey bees, they are dangerous...small honey bees will not do anything." "...there might be many other bees, ...smaller ones, bigger ones, I'm not pretty sure."

These are common answers given by people in Bengaluru when asked about bees. Most are not very familiar with bees and only have little knowledge about them, but they know that there are different kinds of bees and also different kinds of honey bees.

India is among the countries with the highest diversity of honey bee species. The scientific 'first name' of a honey bee is Apis. Conservative estimates suggest that there are nine to 11 Apis species worldwide, all of them native to Asia. In India, we find five native honey bees. Three of them are widely distributed: The giant honey bee or rock bee Apis dorsata, with big nests in large trees, at cliffs, and at buildings; the red dwarf honey bee Apis florea, which makes small nests in bushes and smaller trees; and the Eastern honey bee Apis cerana, a cavity-nesting bee (e.g., in hollow trees, termite hills or lamp posts), which is traditionally used in beekeeping. In certain regions of India, two more species of wild honey bees are found: Apis laboriosa, the Himalayan giant honey bee, adapted

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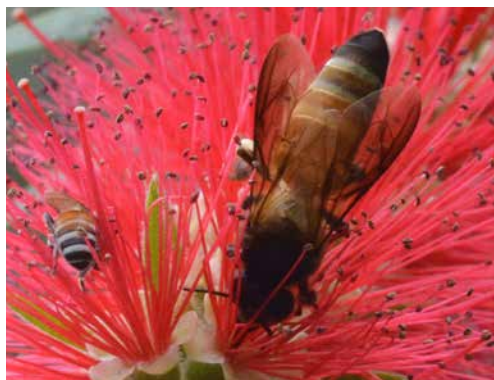
to higher altitudes, and Apis andreniformis, the dark dwarf honey bee, restricted to the forests in Northeastern India. Apis ceranaas well as Apis dorsata are represented in India with two different forms or subspecies, of which one occurs only here[1].

Apis mellifera, the Western honey bee, native to Europe, Africa and south-western and central Asia[2], was first introduced to India during the late 19th century[3] and is today of special importance for beekeepers[4]. It is also the bee that has been most intensively studied by scientists all over the world. Most of our current knowledge about honey bees and bees in general derives from studies on Apis mellifera[5].

Like the honey bees, stingless bees (scientifically
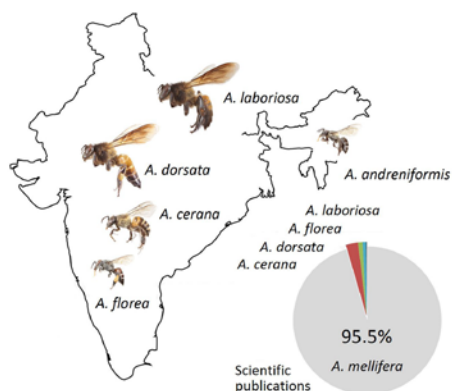
Above, Dwarf honey bee Apis florea and giant honey bee Apis dorsata on flowers of a bottlebrush tree (photo by Sebastian Walter).Below, The honey bees of India and percentages of scientific publications on the different honey bee species (photos of bees by Alberto Lucas López, graphics by Axel Brockmann).

1 Crane, E. 1999: The world history of beekeeping and honey hunting. Duckworth, London.
Radloff, S.E., Hepburn, H.R. & Engel, M.S. 2011: The Asian Species of Apis. In Hepburn, H.R. & Radloff, S.E. (eds.): Honeybees of Asia. Springer, Berlin: 1–22.
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2 Smith, D.R. 2020: Biogeography of Honey Bees. In: Starr, C. (ed.): Encyclopedia of Social Insects. Springer Nature Switzerland.

3 Rao, G.M., Rao, K.S. & Chaudhary, O.P. 1993: Introduction of Apis mellifera in India. Khadi Gramodyod 34: 815–819.

4 Tej, M.K., Aruna, R., Mishra, G. & Srinivasan, M.R. 2017: Beekeeping in India. In: Omkar (ed.): Industrial Entomology. Springer Nature, Singapore: 35–66.

5 Frisch, K.v. 1965: The dance language and orientation of bees. Belknap Press of Harvard University Press, Cambridge MA.
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Tautz, J. 2008: The Buzz about Bees: Biology of a Superorganism. Springer, Berlin.

Meliponini) live in colonies and produce highly valued honey. Altogether there are more than 700 different bee species in India, most of them solitary, but all important pollinators[6].

FRUITFUL RELATIONSHIPS: THE ECOLOGICAL AND ECONOMIC IMPORTANCE OF WILD HONEY BEES

"Honeybees are only useful for honey, apart from that for nothing."

Many people in Bengaluru assume that the only benefit of honey bees is that they produce honey for human consumption. They are often not aware that bees pollinate many wild and cultivated plants; and thus are of high significance for the stability of terrestrial ecosystems – the survival of many plants, birds and other animals – as well as for human crop production and food security[7].

Unfortunately, there are not many comparative studies in India investigating the importance of different honeybee species or other bees for pollination. Apis dorsata has the biggest colonies, the largest foraging range and thus likely the biggest foraging force. However, a recent survey on pollinators visiting plants in Bangkok showed that the smaller dwarf honeybeevisited almost four times, stingless bees even twelve times the number of flowers that were visited by Apis dorsata[8]. Yet, pollination interactions are more complex. A study on pollination success in Karnataka showed that under normal rainy conditions the fruit set is mainly dependent on stingless bees, whereas in drought years, with lower abundance of stingless bees, Apis dorsata foragers took over so that fruit set was similar in both years[9]. For the pollination of unevenly and irregularly flowering trees of tropical forests, the migrating honey bees, especially Apis dorsata,are

6   Michener, C.D. 2007: The Bees of the World. 2nd ed. JohnHopkinsUniversity Press, Baltimore.
    Ascher, J.S. & Pickering, J. 2020: Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). http://www.discoverlife.org/mp/20q?guide=Apoidea_species (16.10.2020)

7   Oldroyd, B.P. & Wongsiri, S. 2006: Asian honey bees: Biology, Conservation, and Human Interactions. HarvardUniversity Press, CambridgeMA.
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8   Stewart, A.B. & Waitayachart, P. 2020: Year-round temporal stability of a tropical, urban plant-pollinator network. PLoS ONE 15(4): e0230490.

9   Mukherjee, R., Deb R. & Devy S.M. 2019: Diversity matters: Effects of density compensation in pollination service during rainfall shift. Ecology and Evolution 9(17): 9701–9711.

probably indispensable[10].

Above, In 2002, this banyan tree hosted about 100 Apis dorsata colonies. In 2017, when this photo was taken, only two colonies remained. Below, One of two Apis dorsata colonies in the banyan tree.
Photo by Sebastian Walter

THE ABANDONED BANYAN TREE: DECLINE OF HONEY BEES IN RURAL AREAS

Huge losses in abundance and diversity of bees and other pollinating insects are observed in different regions of the world[11]. In this context, India received not much attention, even though the loss of wild pollinators might have grave consequences for one of the most populous and naturally diverse countries. Although there is not much reliable data on their abundances, there are already clear indications that wild bees are endangered in India, too – specifically the giant honey bees[12].

Giant honey bees often nest in aggregations. The so-called 'bee trees' can host more than 50 colonies. A huge banyan, located amidst fields on the grounds of the University of Agricultural Sciences in Bengaluru, used to be such a bee tree. In 2002, about one hundred

10 Oldroyd, B.P. & Wongsiri, S. 2006: Asian honey bees: Biology, Conservation, and Human Interactions. HarvardUniversity Press, CambridgeMA.
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11 Potts, S.G., Biesmeijer, J.C., Kremen, C., Neumann, P., Schweiger, O. & Kunin, W.E. 2010: Global pollinator declines: trends, impacts and drivers. Trends in Ecology and Evolution 25(6): 345–353.
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12 Oldroyd, B.P. & Wongsiri, S. 2006: Asian honey bees: Biology, Conservation, and Human Interactions. Harvard University Press, Cambridge MA.
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Apisdorsata colonies lived in this tree[13]. "They looked like big fruits. At sunset, first birds in the tree started flying – the colourful bee eaters. Then many thousands of bees from all the colonies started to fly and the tree released a humming sound that could be heard from far away. Really a magical spectacle of nature." Fifteen years later, only two colonies remained. Eucalyptus and other trees nearby, which provided a lot of nectar, were cut and the honey bees are gone.

Investigations in rural southern Karnataka showed a continuous decline of honey bee as well as stingless bee populations[14]. In particular, the giant honey bees experience an immense pressure due to human activities. Honey hunters often destroy the whole nest. Probably even more important is the loss of food resources and natural nesting sites, caused by deforestation, the cutting (down) of large trees on farmland, and the fast progressing urbanisation and landscape fragmentation[15].

BENGALURU – A CITY OF REFUGE FOR BEES?

Interestingly, the above-mentioned survey in southern Karnataka found most colonies of Apis dorsata and stingless bees not on farmland or in more natural habitats but in residential areas[16]. Cities are not necessarily bad for bees[17]. Actually, several studies demonstrate that cities with gardens and green space provide a rich diversity of food plants and nesting sites. In view of the decline of insects in rural areas, it has been proposed that

13 Woyke, J., Wilde, J., Reddy, C.C., & Nagaraja, N. 2005: Periodic mass flights of the giant honey bee Apis dorsata in successive days at two nesting sites in different environmental conditions. Journal of Apicultural Research, 44(4): 180–189.
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14 Basavarajappa, S. 2010: Studies on the impact of anthropogenic interference on wild honeybees in Mysore District, Karnataka, India. African Journal of Agricultural Research 5(4): 298–305.
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15 Oldroyd, B.P. & Wongsiri, S. 2006: Asian honey bees: Biology, Conservation, and Human Interactions. Harvard University Press, Cambridge MA.
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16 Basavarajappa, S. 2010: Studies on the impact of anthropogenic interference on wild honeybees in Mysore District, Karnataka, India. African Journal of Agricultural Research 5(4): 298–305.

17 Wenzel, A., Grassa, I., Belavadi, V.V. & Tscharntke T. 2020: How urbanization is driving pollinator diversity and pollination – A systematic review. Biological Conservation 241: 108321.

cities might function as refuges for pollinating insects, especially bees[18].

Zameeroddin and Vasuki Belavadi from the University of Agricultural Sciences in Bengaluru were looking for possible differences in bee diversity and numbers between urban and rural areas of northern Bengaluru[19]. They found virtually no difference: 46 versus 49 species in similar abundances. The results indicate that regarding bees the situation inside the city is neither better nor much worse than in the agrarian landscape around Bengaluru, where the bees are confronted with a low diversity of plants, i.e. lack of flowers.

Other studies – mainly from Europe and North America – comparing highly urbanised areas to adjacent farmland found similar results, whereas more natural habitats usually show a clearly higher diversity[20]. For the United Kingdom, a clear correlation between the process of industrialising agriculture and the extinction of bees has been shown[21]. Therefore, moderate urbanisation, with many diverse green spaces, can have a positive effect on pollinator diversity and abundance. High-level urbanisation, with a very dense structure of buildings and roads, usually has a negative impact on pollinators. [22]

IT'S BECOMING UNLIVEABLE: TRANSFORMATION OF A BIG CITY TO A MEGA CITY

Bengaluru is a fast-growing city. The official census in 2001 counted 5.1 million people, the latest one in 2011 counted 8.4 million. For 2020, the population was estimated to be about 14 million or nearly three times the population the city had 19 years ago [23].

"Obviously Bengaluru is growing very rapidly. Many people come to Bengaluru in search of jobs." "Also my village changes, it's already becoming a part of the city."

18 Hall,D.M., Camilo, G.R., Tonietto, R.K., Ollerton, J., Ahrné, K., Arduser, M., Ascher, J. S., Baldock, K.C.R., Fowler, R., Frankie, G., Goulson, D., Gunnarsson, B., Hanley, M.E., Jackson, J.I., Langellotto, G., Lowenstein, D., Minor, E.S., Philpott, S.M., Potts, S.G., Sirohi, M.H., Spevak, E.M., Stone, G.N. & Threlfall, C.G. 2016: The city as a refuge for insect pollinators. Conservation Biology 31(1): 24–29.

19 Zameeroddin & Belavadi V.V. 2018: Does Urbanization Affect Diversity of Bees? In: Walter, S.M.: Bee Lab Bangalore: Humans and Bees in an IndianMegacity. 2nd ed. Goethe Institut & NCBS, Bengaluru: 76–77. https://drive.google.com/open?id=1uaZ6KKf2FDlN7cHvUgMzCRlCHycuRw1I (16.10.2020)

20 Wenzel, A., Grassa, I., Belavadi, V.V. & Tscharntke T. 2020: How urbanization is driving pollinator diversity and pollination – A systematic review. Biological Conservation 241: 108321.

21 Ollerton, J., Erenler, H., Edwards, M. & Crockett, R. 2014: Extinctions of aculeate pollinators in Britain and the role of large-scale agricultural changes. Science 346(6215): 1360–1362.
Woodcock, B.A., Isaac, N.J.B., Bullock, J.M., Roy, D.B., Garthwaite, D.G., Crowe, A. & Pywell, R.F. 2016: Impacts of neonicotinoid use on long-term population changes in wild bees in England. Nature Communications 7: 12459.

22 Wenzel, A., Grassa, I., Belavadi, V.V. & Tscharntke T. 2020: How urbanization is driving pollinator diversity and pollination – A systematic review. Biological Conservation 241: 108321.

23 Indiaonlinepages 2019: Population of Bangalore. http://www.indiaonlinepages.com/population/bangalore-population.html (16.10.2020)

Left, On the way from the northern parts to the city centre of Bengaluru. Right, Nest of wild giant honey bees and remains of old combs at an office building in Indira Nagar in the centre of Bengaluru.   Photo by Sebastian Walter

During the past decades, the former 'Garden City' Bengaluru has been transformed into the megacity Bengaluru. To get space for roads and buildings, many trees were cut down – the 'green' city became 'grey'.

"Bangalore…is a concrete jungle. …And it's becoming unliveable."

Bengaluru is among the cities with highest air pollution globally. In 2012, Bengaluru's annual mean pollution level was about six times the maximum level recommended by the World Health Organisation. For humans, air pollution is a major health risk, causing for example heart and respiratory diseases[24]. A recent study revealed that the same is true for giant honey bees in Bengaluru[25].

NATURAL BALCONY DWELLERS: WHERE THE CONFLICT BEGINS

In Bengaluru, high-rise buildings have mushroomed due to the huge demand for commercial and residential spaces. Giant honey bees seem to be pre-adapted to this kind of cities. As Apis dorsata colonies like to nest high up in trees or at overhangs of rocks and cliffs, they are also attracted to human-made constructions like water towers and buildings with overhangs or balconies. Unconsciously, humans build artificial nest sites of giant honey bees.

"You can see this in many other places also, honeybees nesting on the buildings… Because Bengaluru becomes more developed, more and more buildings coming up, trees are cut down. So, they occupy the buildings now."

24 WHO 2018: Ambient (outdoor) air quality database, by country and city. https://www.who.int/airpollution/data/cities/en/ (26.10.2020)

25 Thimmegowda, G.G., Mullen, S., Sottilare, K., Sharma, A., Mohanta, S.S., Brockmann, A., Dhandapany, P.S. & Olsson, S.B. 2020: A field-based quantitative analysis of sublethal effects of air pollution on pollinators. PNAS 117(34): 20653–20661.

That a loss of trees also meant a loss of natural nesting sites was probably a minor problem for the giant honey bees. This easy adaptation to a human-made environment can be regarded as a natural advantage for the bees. The bees can find new niches in the urbanised area by constructing nests at roofs and balconies, in front of offices and apartments. Unfortunately, this leads, inevitably, to human-honey bee conflict.

FEARED SHIFT WORKERS

While humans go to sleep, Apis dorsata workers continue to forage. Different from all other honey bee species, giant honey bees are able to fly and forage at low light intensities[26]. Therefore, they are not only active during the day, but also at night after sunset if the moon is shining or if there is ambient light from artificial sources. The bees get attracted to the light sources and enter human apartments through the open windows and fly around the lamps.

Above, Office on the 6th floor of the University of Agricultural Sciences with Apis dorsata nest in front of the opened windows. Below, Nest of Apis dorsata with flying bees, and view over the campus of the University of Agricultural Sciences in north Bengaluru. Photo by Sebastian Walter

> "They...come into the rooms
> when the light is on."

Yet, not only at night, also during the day Apis dorsata behaves in frightening ways.

> "During early morning sometime
> there is a rearing, that means they
> all swarm around. Something
> happens for five, ten minutes.
> That time it's a little scary. And in
> the evening, they are doing again
> the same."

This phenomenon called 'mass flights' appears often several times a day, most prominent at sunset. Scientists still discuss why Apis dorsata shows this behaviour. Possible explanations are, for example,

'Bee curtain' of the Apis d orsata nest. A layer of worker bees clinging together covers the comb and protects brood and stored food against rain, wind, and predators.
Photo by Sebastian Walter

26 Somanathan, H., Warrant, E.J., Borges, R.M., Wallén, R. & Kelber, A.2009: Resolution and sensitivity of the eyes of the Asian honeybees Apis florea, Apis cerana and Apis dorsata. Journal of Experimental Biology 212(15): 2448–2453.
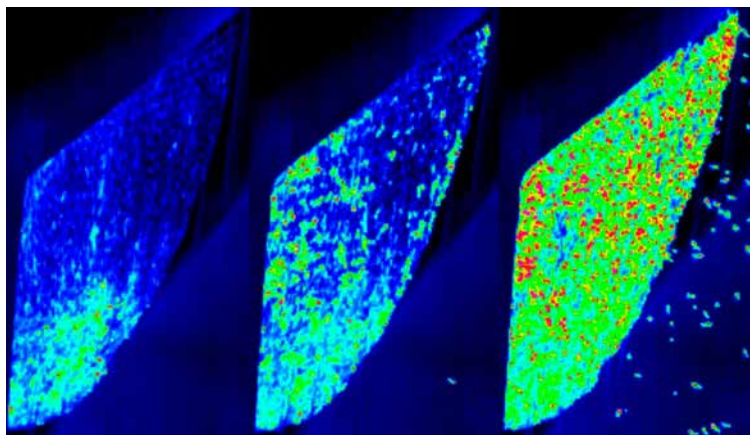
Scientific observation of a mass flight event. Body temperatures of bees are measured with a thermal camera during foraging activity (left), pre mass flight heating up (centre), and mass flight (right). Photos by Benjamin Rutschmann

reorganisation of the bee curtain, temperature regulation, flight exercises for young bees or 'toilet' flights[27].

BEWARE OF HONEY BEES!

"Especially in Bengaluru 100 per cent will be afraid of bees."

Apis dorsata bees are big as wasps or hornets. Most people are afraid of them. The bees behave in strange ways, react very sensitive to disturbances and are considered to be rather aggressive, because when agitated they start a mass attack[28].

"Definitely it is a problem when the bees are disturbed. ...I think it has happened two or three times in our university. During student strikes, when there are drums and everything. ...So many people were injured [by bees] on that day."

Although usually at least 150 to 1,000 honey-bee stings are necessary to kill somebody who is not allergic to the bee venom[29] mass attacks can be very dangerous. Big honey bee colonies have tens of thousands of workers and if one Apis dorsata colony starts a mass attack, the neighbouring colonies will join in.

27 Woyke, J., Wilde, J., Reddy, C.C., & Nagaraja, N. 2005: Periodic mass flights of the giant honey bee Apis dorsata in successive days at two nesting sites in different environmental conditions. Journal of Apicultural Research, 44(4): 180–189.

28 Oldroyd, B.P. & Wongsiri, S. 2006: Asian honey bees: Biology, Conservation, and Human Interactions. HarvardUniversity Press, CambridgeMA.
Koeniger, N. & Koeniger, G. 2015: Apis dorsata – champions of defence. Bees for Development Journal 115: 6–10.

29 Vetter, R.S., Visscher, P.K. & Camazine, S. 1999: Mass envenomations by honey bees and wasps. Western Journal of Medicine 170: 223–227.

"I have been attacked by bees once, when I was on a picnic. Then everybody says that you have to sleep down, so that the bees don't attack your face, and you have to curl up. I think in panic you just run, and you don't know what to do."

GREEN SPACES BECOME NO-GO AREAS FOR BEES

Urban green spaces are important refuges for wild bees, but they are also important for the recreation and health of urban citizens[30]. Bengaluru's largest green space is Lalbagh, the botanical garden.

Warning board at the entrance to Bengaluru's botanical garden. Photo by Sebastian Walter

"Once upon a time Bangalore was called a garden city. So this is the last kind of what remains. ... This whole space is air-conditioned with so many trees."

Warning boards at the entrance gates give instructions on how people should behave to prevent bee attacks. The boards, along with first-aid stations and a rescue tent, were installed after two incidents of mass attacks by giant honey bees during the annual flower shows in Lalbagh. In 2016, two young adults had to be treated in the hospital; in 2015, a seven-year-old girl playing close to a tree with Apis dorsata colonies even died[31]. Probably the bees were agitated by the unusual masses of people 'flooding' the park on these days.

30 WHO 2016: Urban green spaces and health. WHO Europe, Copenhagen.

31 Deccan Herald 2015: Girl dies in bee attack during flower show at Lalbagh. www.deccanherald.com/content/495995/girl-dies-bee-attack-during.html (16.10.2020)
Bangalore Mirror 2016: Bee attack in Lalbagh. https://bangaloremirror.indiatimes.com/bangalore/others/Bee-attack-in-Lalbagh-2-suffer-severe-stings/articleshow/53714582.cms (16.10.2020)

"It was something like a shock to us."

Probably as another reaction to the bee attacks, in 2017, nearly all Apis dorsata nests were removed from the trees in Lalbagh, which had been home to a large number of colonies[32].

"It was a constant thing for many people to come here and look at all the honeycombs. It looked very beautiful.... And now we see that the honey bees are removed, for human safety."

HOW TO GET RID OF THEM: PESTICIDES AGAINST BEE COLONIES

"I don't like bees, they're a pest!" "In the forest it's beautiful, in the city it's a nuisance."

People see the bees as enemies or at least as a nuisance, like those insects that enter your homes, for example, cockroaches. Thus, giant honey bees are treated like a pest insect in Bengaluru and other parts of India. It is allowed to call a pest management company to remove a honey bee colony nesting under the roof of your house or on your balcony.

"The housekeeping service...persuaded me to try to get rid of that. ...people were complaining that bees try to enter their home." "The first thing if people see bees is they panic. ...So they call pest control companies. They come, spray pesticide. In the morning a bed of dead bees will be there."

Investigations in rural and urban areas of Bengaluru in 2013 and 2014 showed that especially in urban areas a large number of bee colonies were destroyed with insecticides. "These brutal killings are responsible for the death of thousands of Apis dorsata colonies every year"[33].

And the problem will persist. Removing a colony is only a short-term solution. Apis dorsata colonies are picky in which places they use as nesting sites, so the balcony chosen by one colony will be chosen by other colonies in the future.

THE DECLINE OF APIS DORSATA IN BENGALURU

A survey of Apis dorsata colonies in parts of Bengaluru showed that between 1987 and

32 Walter, S.M. 2018: Bee Lab Bangalore. 2nd ed. Goethe Institut & NCBS, Bengaluru. https://drive.google.com/ open?id=1uaZ6KKf2FDlN7cHvUgMzCRlCHycuRw1I (16.10.2020)

33 Nagaraja, N. 2016: Effect of Insecticide Poisoning on Mortality of Giant Honeybee, Apis dorsata Colonies. PESQUISA- International Journal of Research 2(1): 96–100.

Drawing with schematic representation of different forms of migration, created by Sebastian Walter and NCBS students during a seminar at the National Centre for Biological Sciences.
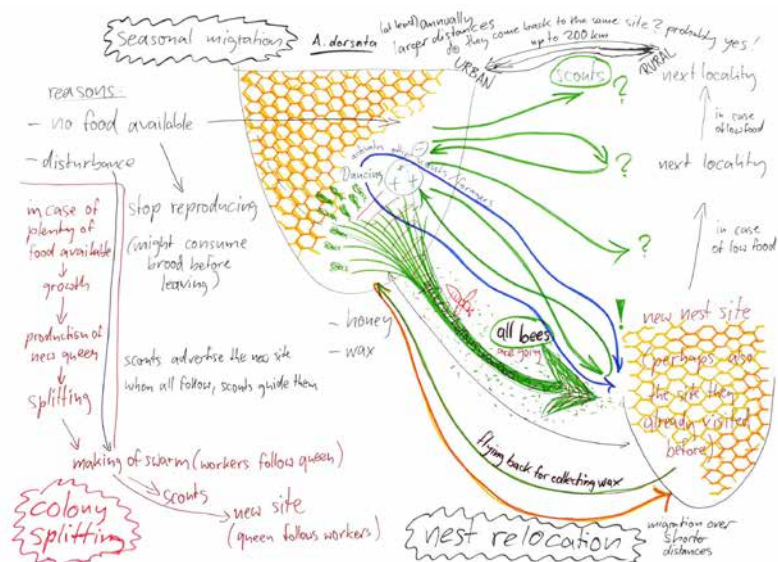
2014 the number of colonies was reduced by 90 per cent[34]. The observed strong decline of Apis dorsata populations has probably many reasons. First, the felling of trees in the context of city development reduced important food sources of the bees; secondly, the increasing air pollution; and thirdly, the intentional killing of colonies nesting at buildings by means of chemicals.

SEASONAL WORKERS: MIGRATION CONNECTS URBAN AND RURAL REGIONS

Once a year Bengaluru's Apis dorsata colonies leave their nests voluntarily.

> "Most of the time during the year they are present here. During one particular time they just fly away, and then come back and build another nest in the same place."

Like humans, who move to places like Bengaluru because they find better living conditions there, giant honey bees also migrate. The colonies perform seasonal migrations over large distances (up to at least 200 km) like bird or butterfly migrations. These have evolved as adaptations to recurrent annual unfavourable weather conditions like temperature declines during winter or sustained rains during monsoon, which affect food availability and survival rate.

In Bengaluru, monsoon lasts from July to September. Not many plants flower during these months, and the colonies depart. Later, with changing conditions, they return to

34 Venkatesh, G. 2014: Study on population status in relation to urban development in few selected nesting site of rock bee colonies, Apis dorsata F. International Journal of Scientific and Research Publications 4(10): 22–23.

Colonies of Apis dorsata on balconies.   Photos by Axel Brockmann and Vatsala Thirumalai

the original location[35].

As a consequence of this behaviour – wandering constantly between different places – extinction of colonies in the city directly causes a loss of honeybees that are available for pollination outside the city, on farmland and in forests.

THEY DO HAVE A RIGHT TO SURVIVE: COEXISTENCE IS POSSIBLE

> "Now one person got attacked in many, many years. A young kid died…but it does not mean that beehives should be removed, but [there should be] more awareness [about] how you could live with them."

In all parts of Bengaluru remains of removed Apis dorsata nests can be observed. You will, however, also find intact colonies and people who think that treatment with pesticides is the wrong way to deal with giant honey bees in the city. In interviews with people who work or live with colonies of the giant honey bee in front of their office or apartment, we also found awareness of their importance and respect for them as living beings.

> "I think bees are an important part of our ecosystem. They are fighting for their survival, like everyone of us they do have a right to survive."

35 Woyke, J., Wilde, J., & Wilde, M. 2012: Swarming and migration of Apis dorsata and Apis laboriosa honey bees in India, Nepal and Bhutan. Journal of Apicultural Science 56 (1): 81–91.
Koeniger, N. & Koeniger, G. 1980: Observations and experiments on migration and dance communication of Apis dorsata in Sri Lanka. Journal of Apicultural Research 19: 21–34.
Neumann, P., Koeniger, N., Koeniger, G., Tingek, S., Kryger, P. & Moritz, R.F.A. 2000: Home-site fidelity in migratory honeybees. Nature 406:474–475.
Paar, J., Oldroyd, B. P. & Kastberger, G. 2000: Giant honeybees return to their nest sites. Nature 406: 475.

These people developed different strategies to live more or less constantly with bees' nests in their surroundings. The easiest way is to not open the windows. However, even with open windows giant honey bees seem to be no problem as long as there is no artificial light in the room, people do not smoke or burn incense sticks and there is no extraordinary disturbance.

> "The bees are not a problem for us. ...We never open the windows.""Now the windows are open, without a disturbance they will not harm any people."

With simple protective measures a more or less normal life is possible:

> "Initially it was a problem...Then we put a net on the balcony, so that they don't come in. And slowly I've the feeling that they got used to the light. And they don't bother us anymore."

If they have time to adapt, giant honey bees can get used to initially strongly disturbing situations[36].

In cases where Apis dorsata colonies must be removed, smoking the colony and only removing the comb – which will make the bees to move away – is much bee-friendlier than to kill them all with pesticides. Even the transfer of a colony together with its nest is possible. However, due to the phenomenon that Apis dorsata colonies have preferred nesting sites, residents that had removed colonies from their balconies should take measures to prevent new colonies from building nests on their balconies.

TIME TO TAKE ACTION

> "I think the conflict between the bees and the human beings is a sign of a critical junction in our city's life. When people are really fighting the bees, it means they're also fighting nature. This is also symbolic about the situation how we are treating nature around us, and we want to occupy spaces. That does not allow for this kind of diversity of plants or insects and animals to survive. We're pushing them to the edge of the city, we don't want to have any connection with it."

Within the next decade, India is expected to become the world's most populous country[37] and to experience the world's second largest growth of urban areas. This growth

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36 Koeniger, N. & Koeniger, G. 2015: Apis dorsata – champions of defence. Bees for Development Journal 115: 6–10.

37 United Nations 2019: World Population Prospects 2019. https://population. un.org/wpp/Download/Standard/Population/ (16.10.2020)

will mainly take place on former farmland[38]. Environmental degradation already causes major economic, social, and health problems[39]. India's hunger situation is still serious[40]. A further decline of vitally important wild pollinators like the giant honey bees must be prevented. Certainly, it is time to act.

The Indian government focuses its attention on promoting and studying beekeeping with Apis cerana and the introduced Apis mellifera. A few years ago, the "Sweet Revolution" was launched to expand beekeeping and honey production in rural areas to increase the income of farmers. Indians do not consume or use much honey in their daily life and most of the honey produced in India is exported to the West, which is highly profitable. There is not much public or political interest in the other Indian honey bee species. This needs to be changed, because many plants depend on these wild honey bee species for pollination. Studying their biology and ecology as well as continuous monitoring studies on their populations are necessary for their conservation[41]. In the process of urban transformation we must consider plants and animals and should actively design pollinator habitats[42].

There is a public responsibility and initiative needed to maintain these animals. It is important to create more public awareness of the value of wild pollinators like Apis dorsata, and of their difficult situation. People must know nature to protect it. Apparently, insufficient knowledge and fear are the main reasons for destroying colonies of the giant honeybee, one of India's prime pollinators. We should provide people with better knowledge about wild honey bees and teach them how to interact with them in non-harmful ways.

We are part of a complicated, fragile network of interacting organisms. The history of biological evolution teaches us that protecting diversity is to our own advantage[43].

In the urban age, cities must be a place to be for bees, even if they are not always 'sweet'.

38 The Nature Conservancy 2018: Nature in the Urban Century. https://www.nature.org/content/dam/tnc/nature/en/documents/TNC_NatureintheUrbanCentury_FullReport.pdf (16.10.2020)

39 Thakur, B.K., Rout, H.S. & Chakraborty, T. 2014: Environmental Degradation, Sustainable Development and Human Well-being: Evidence from India. Manthan: Journal of Commerce and Management 1(1): 101–120.

40 Global Hunger Index 2020: Complete Report 2020.https://www.globalhungerindex.org (16.10.2020)

41 The Indian Pollinator Initiative 2020: Online Seminars Series 1st Edition: Perspectives for research on Pollination. (Organizers: A. Brockmann., H. Somanathan, V.V. Belavadi, J. Joseph & P. Basu). https://www.youtube.com/channel/UChMVz2YjjYhAxPP80x3Ribg (16.10.2020)

42 Hernandez, J.L., Frankie, G.W. & Thorp, R.W. 2009: Ecology of urban bees: A review of current knowledge and directions for future study. Cities and the Environment 2(1): article 3. http://escholarship.bc.edu/cate/vol2/iss1/3

43 Mayr, E. 1997: This is Biology. Harvard University Press, CambridgeMA.

A worker of the giant honey bee.   Photo by Sebastian Walter

ACKNOWLEDGEMENTS

Uneasy Neighbours

NARAYAN SHARMA, VIPPIN KP
AND SEEMA LOKHANDWALA
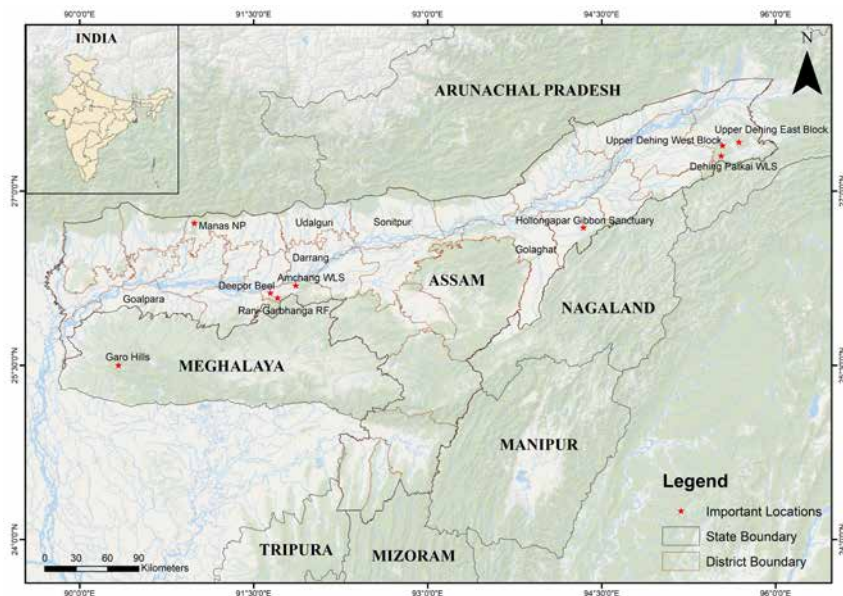
Important locations
mentioned in the Article.
By Dr Narayan Sharma

The Northeast of India is one of the strongholds of Asian elephants Elephas maximus. However, rapid habitat loss, fragmentation of habitats, loss of connectivity and escalating human-elephant conflicts have jeopardised the survival of elephants in the region. This contribution examines the historical and contemporary factors contributing to the precarious status of elephants and their habitats, highlighting the consequences of human-wildlife conflicts on humans and elephants, it examines measures to address the conflict and promotes coexistence.

The article is supplemented by illustrations by Vippin Sketchplore and a set of soundscapes curated by Seema Lokhandwala, illustrating a diversity of sounds that the elephants make when confronted with different life situations. It will help the reader to visualize and connect to the varied sounds, imageries, and emotions in the life of elephants in their spaces.

On 21 July 2014, Kalia Boro and his team of Haathi Bandhu were patrolling the railway track near Deepor Beel, a wetland located southwest of Assam's capital Guwahati. A herd of elephants had descended from the adjoining Rani Reserve Forest (RF) and were crossing the road and the railway track to reach the wetlands. Kalia Boro immediately informed the station master of the nearby railway station to limit the speed of an incoming Guwahati-bound goods train. But all in vain! The train spared the elephants this time but hit Kalia Boro, who died on the spot.

The Elephant Protection Committee, popularly called Haathi Bandu, was constituted to prevent the increasing deaths of elephants on this railway track, and Kalia Boro of nearby Mikirpara-Chakardo village was a natural choice to lead the team, primarily
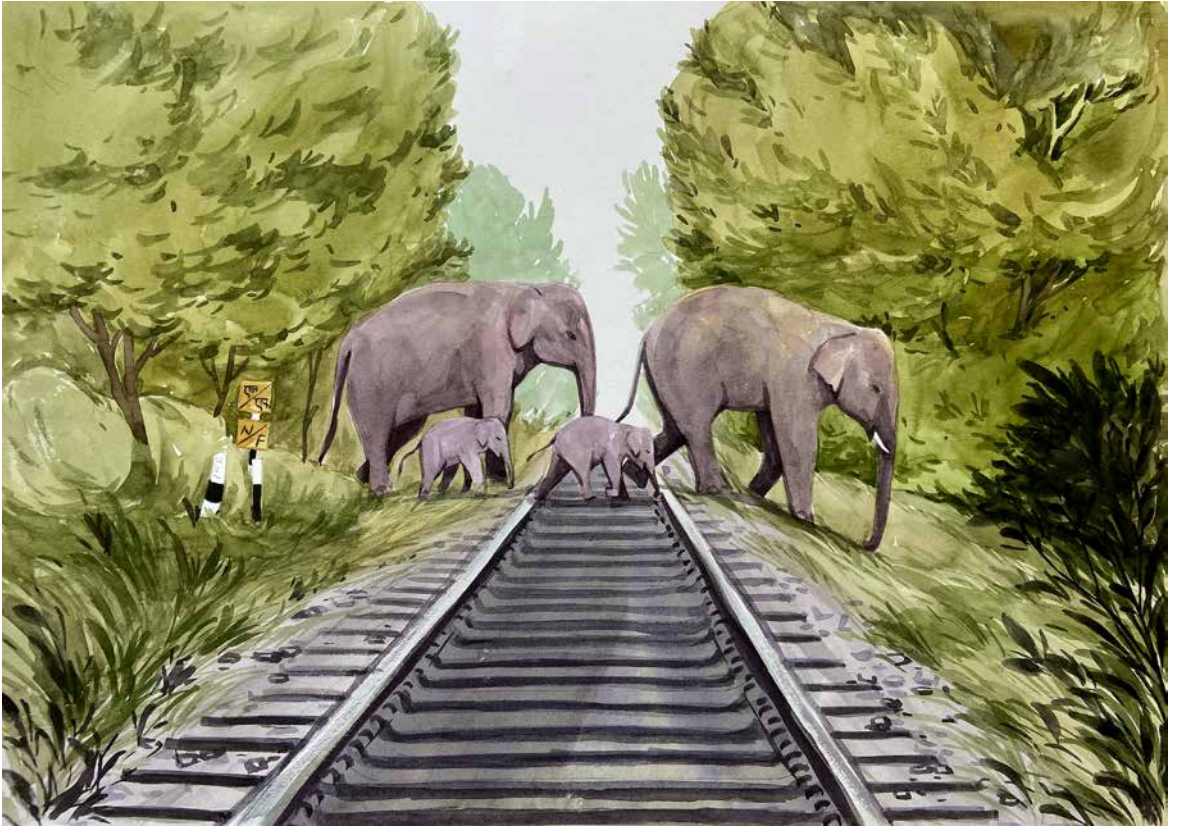
Scan for Listening Sound

A herd of elephants 'rumbling' to form a larger herd for the safety of the young ones before crossing the railway track. Even the largest living land mammal believes in "safety in numbers"!

because of his immense understanding of elephants in the landscape and their behaviour. This track, constructed despite strong objections from environmentalists by the Northeast Frontier Railways in 2001 to connect Guwahati with areas south of river Brahmaputra, has claimed the lives of 15 elephants and a human so far. The track lies between the famous Deepor Beel and Rani-Garbhanga Reserve Forest, which is a sanctuary for 200-odd elephants. 'Deepor Beel' literally translates to "a wetland inhabited by Dipa" (a Sanskrit word for elephants). The elephants frequently emerge from the forest and visit the wetland to drink and feed on the aquatic plants. Several of them have been mowed down by speeding trains.

Elephants are an integral part of the culture, beliefs, and history of Assam since time immemorial[1]. During medieval times, elephants were mostly used in wars, and keeping them was considered a status symbol. During the colonial period, elephants were considered an important source of revenue generation. Domesticated elephants were also used for transportation and to clear-off jungles, hauling logs for railway construction work and used as mounts for hunting. The British government used to get significant revenue from elephant mahals[2]. Hundreds of elephants were captured from elephants mahals and sold to different parts of the country. The selective removal of tuskers from the forests of Northeast India over the last 1,000 years has, unfortunately, skewed the ratio of tuskers and makhanas (male Asian elephants without tusks). Due to this selective removal, it has now been estimated that over 60 per cent of male elephants in the Northeast of India are currently tuskless[3]. Moreover, encouraged by the colonial wasteland policy to promote tea plantation in the valley, thousands of acres of forestlands and grasslands – prime elephant habitats –were cleared to make room for tea gardens. The current human-elephant conflict in Assam can thus be understood as a manifestation of the historical and current deforestation and fragmentation of elephant habitats that the state has faced over the past centuries.

CURRENT STATUS OF ELEPHANTS AND THEIR HABITATS IN ASSAM

Approximately 10,000-odd elephants now remain in Northeast India are distributed in four major populations[4], over an area of about 37,000 square kilometres. All these popu-

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1   Elephants have been mentioned in the ancient texts of Kalidasa and Kautilya, in the Mahabharata and in the writings of Hiuen Tsang, a Chinese pilgrim-scholar and traveller.

2   John M'Cosh, in his book Topography of Assam, says that about 700 to 1,000 elephants were exported every year at an average value of Rs.300 each.

3   https://www.downtoearth.org.in/coverage/towards-a-tuskless-future-44573

4   The elephant population on the north bank of river Brahmaputra is distributed across northwestern West Bengal, the Himalayan foothills, Bhabar-Terai belt, most of the northern districts of Assam up to eastern Arunachal Pradesh. In the 1950s, this elephant distribution showed connectivity to the neighbouring country of Myanmar through eastern Arunachal Pradesh, which is, however, now defunct. The population on the south bank of the Brahmaputra is distributed as three populations: The eastern, distributed in Arunachal Pradesh, eastern Assam, Nagaland; central, in certain parts of Assam and Meghalaya; and the western population, found in western Assam and Meghalaya.

ACOUSTIC COMMUNICATION IN ELEPHANTS

Asian and African elephants are highly social yet spatially dispersed species. Because of the spatial dispersion, short and long-distance acoustic communication is vital for mating and for group cohesion and coordination. The male elephants leave their natal family units when they attain sexual maturity, whereas their female counterparts stay with their families throughout life.

Long distance acoustic communication is mostly by 'rumbles' which are inaudible to humans as they are below 20 Hz (Hertz) in frequency. These calls are able to travel long distances up to 10 kms (kilometres) in forests and open areas, which supports elephants in-group movement even while crossing lianear infrastructure or during crop raiding. High frequency calls such as 'trumpets', 'roars' and 'chirps' are known to be produced in the social context of play and aggression and due to anthropogenic disturbances. Vocal creativity in elephants is depicted by mimicking sound of vehicles such as trucks and their elephant zoo-mates. Hence, elephants' versatile vocal repertoire helps them recognize their own kind and facilitate long-term group bonding.

Scan for Listening Sound

A group of elephants are 'rumbling' and 'roaring' due to an unknown phenomenon happening in the distance.

lations are, however, highly fragmented and their habitats, throughout these ranges, face severe threats from encroachment and various developmental activities.

Elephant habitats in Northeast India have declined, fragmented, and degraded due to human settlements, land-use change, chronic resource extraction, and several developmental activities, including the expansion of linear infrastructure, such as roads and railways. Nikhil Lele and P K Joshi (2009) analysed deforestation rates in Northeast India during 1972-1999 and found that approximately 30 per cent of the total forest cover was lost under pressure of rapid land-use changes[5]. Close to 50 per cent of all reserve forests – prime elephant habitats – have been cleared for tea plantations and other land use along the Arunachal Pradesh and Bhutan border[6]. The chronic extraction of forest resources from these forests has degraded the quality of elephant habitats and significantly reduced forage availability. Once the habitat is degraded and the canopy cover lost, it encourages invasive species to invade and proliferate. Coupled with an extensive road network, which acts as conduits, most elephant habitats have witnessed a rapid spread of invasive species, including plants such as touch-me-not, mile-a-minute while Ipomoea carnea and water hyacinth, have choked water bodies. The invasion of these species in elephant habitats has drastically reduced forage and water availability for elephants, and this could be one of the important factors that have led to elephants foraying into agriculture fields and human settlements in search of food.

STATUS OF ELEPHANT CORRIDORS

Shaped by the historical as well as contemporary factors, the once contiguous elephant habitats of Assam have now been cut up into fragments of different sizes and shapes, located in a sea of tea gardens, agricultural fields and human settlements. Populations of elephants are now confined to these fragmented islands and their fate is determined by the quality of the remaining habitats and the nature of the areas surrounding the forests, which determines how well-connected these patches are. Right of Passage: Elephant Corridors of India, a report produced by the Wildlife Trust of India, has identified 101 elephant corridors[7] throughout India, of which 23 corridors are from Northeast India. However, only a mere 12.9 per cent of elephant corridors are totally under forest cover while the rest are in mosaics of different land use, such as human settlements, agriculture or tea gardens. An ever expanding network of linear infrastructure has, unfortunately, obstructed the corridors, leading to an increasing mortality of elephants due to accidents. The report further highlights the fact that active railway lines pass through 14 per cent of elephant corridors of Northeast India. It has been estimated that 265 elephants

5   Lele, N. and Joshi, P.K., 2009. Analysing deforestation rates, spatial forest cover changes and identifying critical areas of forest cover changes in North-East India during 1972–1999. Environmental monitoring and assessment, 156(1), pp.159-170.

6   https://earthjournalism.net/stories/hundreds-of-casualties-on-both-sides-in-world-capital-of-human-elephant-conflict

7   Habitats that are connected through narrow linear strips of forest or other favourable habitats aid in the dispersal of individual elephants and thus help in the mixing of genetically viable populations. Corridors, perceived to ameliorate the effects of habitat fragmentation, are linear habitats that connect two or more large block of habitats and enhance or maintain the viability of wildlife population by facilitating their movement.

Scan for Listening Sound

A young adult elephant 'trumpeting' and 'roaring' while trying to cross a linear infrastructure built in an elephant corridor.

have been killed in railway accidents throughout India, between 1987 and 2017.

In Assam, many corridors have been encroached to build resorts or other infrastructures. For instance, the Numaligarh Refinery Limited has erected a 2.2-km boundary wall close to an elephant corridor in the Golaghat district of Assam, severely obstructing their movement. A couple of corridors that connect the East and West Blocks of Upper Dehing forests in Digboi, where 295 elephants frequently cross, are now compromised by the building of Oil India Limited's despatch terminal and the widening of India's proposed NH-38 bypass through National Highways Authority of India. The elephant habitat of the Northeast Indian region, in general, is contiguous with Bhutan, Bangladesh and Myanmar, and, to some extent, with Nepal. The fencing along the India–Bangladesh border has become a huge barrier to the trans-boundary movement of wild elephants at many locations in Assam, Meghalaya, Mizoram and Tripura[8]. It is important to note that the continued survival of elephants in the region depends on the genetic mixing of the different fragmented populations and any barrier that prevents their movement decreases their opportunities to mate, thereby leading to inbred populations that could be susceptible to low genetic and reproductive fitness. Due to various developmental activities, rapid construction of roads, railways and other linear infrastructures, many such elephant corridors are now defunct. Such encroachment of corridors by people has also led to increasing human-elephant conflict across Northeast India.

CONSEQUENCES OF HUMAN-ELEPHANT CONFLICT

Diminishing and fragmented habitats have led to a greater interface between humans and elephants, giving rise to human-elephant conflict, a situation detrimental for both species. The conflict mostly arises because of crop and property damages, and both human and elephant mortalities. In Assam alone, 875 people have lost their lives due to human-elephant conflicts over the last 10 years. The highest number of 115 deaths was reported from Udalguri district, followed by 102 in Sonitpur, 74 in Goalpara and 51 in Darang. At the same time, 825 elephants have also died, especially in Sonitpur, Udalguri and Goalpara, which have thus become the conflict hotspots of Assam. That habitat loss is possibly the primary cause of increasing human-wildlife conflict is evidenced by the observation that between 1994 and 2001, Sonitpur district of central Assam has lost 232.10 sq km forests due to encroachment while Udalguri district has also witnessed massive deforestation, due to the expansion of its small tea gardens[9]. A study by Chartier et al. (2011) in Sonitpur proposed that a critical habitat threshold for human-elephant conflict may exist at a level of 30-40 per cent forest cover. Below this level, it is possible for such conflict to expand across the landscape[10].

In the Goalpara district of Assam, another hotspot of human-elephant conflict, natu-

8 Choudhury, A., 2007. Impact of border fence along India-Bangladesh border on elephant movement. Gajah, 26, pp.27-30.

9 Srivastava, S., Singh, T.P., Singh, H., Kushwaha, S.P.S. and Roy, P.S., 2002. Assessment of large-scale deforestation in Sonitpur district of Assam. Current science, pp.1479-1484.

10 Chartier, L., Zimmermann, A. and Ladle, R.J., 2011. Habitat loss and human-elephant conflict in Assam, India: does a critical threshold exist?. Oryx, 45(4), pp.528-533.

Scan for Listening Sound

At the fringes of a village, a herd of elephants are 'roaring' back to one another while playing with each other.

ral forests are being increasingly replaced by rubber plantations, banana and oil palm cultivation, tea gardens, and dipterocarp forests. The local communities have observed that earlier, elephants used to come from the nearby Garo Hills of Meghalaya only during the cultivation of paddy. However, they now inhabit these areas throughout the year, thereby escalating their negative interactions with people. Between September 2020 and September 2021, for example, 11 people have lost their lives due to elephant attacks. On the other hand, five elephants have died, all of them from electrocution. Frustrated by the repeated incidences of crop raids as well as the failure of the state forest department to provide timely compensation for their crop and property loss, the local people have resorted to illegal means of killing wild elephants through electrocution and poisoning. Between May 2001 and November 2001, 14 elephants have died due to poisoning in the Sonitpur district of Assam alone. Between 2009 and September 2020, 113 elephants have been reported to have died due to electrocution in Assam, the highest in the country, and this is rapidly becoming a leading cause of elephant mortality[11].

Such recurrent conflict has had detrimental effects on both elephants and humans. It has been found that due to constant chasing by people, elephants, particularly the males, who are mainly involved in crop-raiding and property damage, in some cases, have elevated concentrations of stress-related glucocorticoid metabolites in their dung.[12] There are also marked changes in elephant behaviour as well, with local testimonies and recent human death incidents in the Udalguri district of Assam suggesting that elephants, especially solitary makhanas, have become far more aggressive than before in recent times.

People, mostly the marginalised farmers, disproportionately bear the brunt of human-elephant conflict. The continuous presence and depredation of crops by elephants force people to switch to other monocultures, such as tea and rubber, and, in some areas, to lemon and chilli farming. People of Rasi Line, a colony of tea garden labourers near the Hollongapar Gibbon Sanctuary, have recently abandoned paddy cultivation due to frequent elephant raids during the crop season. Other villagers within the vicinity of the sanctuary have converted their small farmlands and orchards to small tea gardens, due to the continuous depredation by elephants and non-human primates. Local communities have also been encouraged to cultivate crops, such as lemons and chilli, around the Manas National Park. Although there is a huge visible cost of human-elephant conflict, as outlined above, the hidden costs associated with such conflict also cannot be ignored.

Maan Barua, an expert in human-wildlife relationships, and his team have categorised these hidden costs in terms of opportunity costs, transaction costs, and impacts on mental health[13]. Opportunity costs are those incurred due to restrictions of human movement and increased guarding of crop fields, which lead to poor physical and psychological well-being. This results in a severe loss in opportunities for individuals or the community to achieve its full potential and hinders their overall well-being. People incur transaction costs mostly because of the delay in proper compensation and their associated costs that can lead to increased debt, especially for marginalised communities. In fact,

11 https://www.sentinelassam.com/guwahati-city/assam-recorded-113-elephants-electrocuted-in-11-years-forest-dept-helpless-517068

12 https://www.sciencedirect.com/science/article/pii/S0016648017308584

13 Barua, M., Bhagwat, S.A. and Jadhav, S., 2013. The hidden dimensions of human-wildlife conflict: Health impacts, opportunity and transaction costs. Biological Conservation, 157, pp.309-316.

most of the time, people do not receive any compensation at all, or even if they do get it, it is only after making several trips to the forest department, with the amount received often being less than the amount they had spent making these trips. A constant fear of elephants and loss of livelihoods could also lead to increased mental health issues. These factors have never hitherto been considered while assessing the costs of human-elephant conflict. Barua's team has also found that the fatality of men could especially lead to increased family debts and aggravated pre-existing poverty.

Both genders within human society are differentially affected by human-elephant conflict. There are costs shared by both males and females equally, while other costs have distinct gender components. Sayan Banerjee, a doctoral student at the National Institute of Advanced Studies in Bangalore, who has been studying elephants in Udalguri district, opines that space usage and division of labour in society often overlap with the elephants' preferred spaces. Human spaces are, however, always gendered. Rural women, for example, need to take care of the household by accessing spaces, such as forests or riverbanks to collect firewood, fodder or water. They thus have higher chances of encountering elephants in the wild. On the other hand, men experience more combative situations with elephants in the agricultural field at night while guarding crops, as it is their duty to provide food security to the household.

The cost of chasing elephants, when they come out of the forest, is mostly borne by the forest department. The department thus needs to stay vigilant at all times, especially during the harvesting season, when the fields are rich with crops. This causes a loss of many hours of manpower, which could have otherwise been used in the patrolling of the forest areas to prevent other wildlife crimes.

PREVENTIVE AND MITIGATIVE MEASURES

Various methods have been tested in the field to prevent and mitigate human-elephant conflict. Preventive measures, such as early warning systems, including barriers like trenches or electric fencing as well as deterrents – drum beating, chilli fencing or spotlights – are used to prevent elephants from raiding crops and to safeguard human settlements. The effectiveness of these preventative measures has been rigorously tested by a team of Assam Haathi Project in the Goalpara and Sonitpur districts[14]. They found that amongst all the interventions employed by the local communities, spotlights, chilli fences and electric fences have been highly effective in preventing crop damage by elephants. They, however, found that noise-based methods, such as shouting, bursting crackers, and beating drums, appeared to compromise the effective measures. Some of the mitigative measures, such as compensation schemes, seem to have absolutely failed, due to the prolonged delays in disbursing compensation amounts. Villagers adjacent to the Hollongapar Gibbon Sanctuary and Amchang Wildlife Sanctuary claimed that they had not received anything for the last several years despite filing compensation claims on time and in the correct way.

To offset such economic losses, many non-governmental organisations (NGOs) and different line departments of Assam have implemented several livelihood-based

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14 Davies, T.E., Wilson, S., Hazarika, N., Chakrabarty, J., Das, D., Hodgson, D.J. and Zimmermann, A., 2011. Effectiveness of intervention methods against crop-raiding elephants. Conservation Letters, 4(5), pp.346-354.

programmes. Nandita Hazarika, who led the Assam Hathi Project[15], said that although it would seem natural to initiate livelihood programmes to mitigate the damage caused by elephants, most of them have failed as the programmes need continuous financial support and long-term engagement with the communities. Her team, for instance, tried several interventions, such as encouraging plantations of cash crops, including ginger, chilli or citrus fruits, production of handicrafts, food processing, poultry and cattle farming, and piggeries. However, none of these seems to have worked effectively, except perhaps the piggeries to a certain extent.

Wildlife management is actually human management. Elephants being intelligent animals adapt quickly to the temporary mitigative measures. So in the long run, none of the mitigative measures become sustainable as no work has been carried out to improve the root causes of such conflicts such as improving habitat quality by habitat restoration.

WWF-India has been working with the tea estates of Apeejay Tea to find a sustainable solution to human-wildlife conflict in Sonitpur district, which is one of the districts most affected by the conflict[16]. It is but natural that the tea estates of the state have become a natural ally in the conservation of elephants in this landscape, not only because of the landscape transformation caused by these tea gardens but also because the majority of human-wildlife conflict events occur in tea estates. Some unique interventions have recently been employed to mitigate human-wildlife conflict. A unique experiment is being carried out by an NGO, Haathibondhu, in which paddy is being cultivated in an area of 200 bighas in Ronghang-Hatikhuli village, located in Nagaon district, exclusively for the consumption of elephants.

FUTURE OF ELEPHANTS IN NORTHEAST INDIA

The future of elephants in Northeast India seems to be bleak unless immediate measures are taken to secure and increase suitable habitats and corridors for them and urgently address human-elephant conflict. Elephants need large contiguous forests to move and fulfil their dietary and reproductive needs. Ensuring this is a herculean task and perhaps success in such an endeavour can alone determine the future of elephants in Northeast India. There are around 32 notified elephant reserves in India including five in Assam[17] and 101 corridors, but none of these, unfortunately, enjoy formal legal protection, unlike our tiger reserves and other Protected Areas. There has recently been a huge outcry at the opening of coal mining inside the Dehing Patkai Elephant Reserve and this is a

15 https://biaza.org.uk/projects/detail/assam-haathi-project

16 The Sonitpur model, as they called this partnership, includes "the use of kumki or captive elephants to drive wild elephants from fields and tea estates, training anti-depredation teams to facilitate elephant drives and empowering the local community – (these) have shown a marked decrease in human deaths and reduction in crop and property damage over the last decade."

17 Assam has five elephant reserves (ER) situated on both the northern and southern banks of the Brahmaputra. The Chirang-Ripu ER and Sonitpur ER, on the northern bank, aid in the transboundary movement of elephants between the state of Arunachal Pradesh and the neighbouring country of Bhutan. The Dihing Patkai ER, Kaziranga-Karbi Anglong ER and Dhansiri-Lungding ER, on the southern bank, in contrast, ensure connectivity between eastern and southern Arunachal Pradesh, Nagaland and Meghalaya.

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An elephant 'rumbling' to keep the young ones safe from drowning in the floodwaters.

case in point. While restoring elephant corridors, the consent of people living in these corridors must be taken and the entire process should involve voluntary relocation. For example, the Wildlife Trust of India purchased over six acres of land to relocate a village called Ram Terang, which was initially located within the Kalapahar-Doigurung Elephant Corridor. The relocation took place after 19 households voluntary agreed to this shift. In other corridors, which are not purchasable, the human-elephant coexistence model could be put in place, but with proper mitigation measures that ensure minimal negative interactions between humans and elephants.

Most human-elephant conflicts in India occur in the regions outside Protected Areas. Managing elephant populations in densely human-dominated areas then becomes key to the persistence of elephants in most of their current habitats. Although the Wildlife Trust of India has identified many elephant corridors, the exercise has mostly relied on subjective evaluation. Identification of corridors, based on the actual tracking of elephant movement is essential for understanding the dynamics of their ranging and movement patterns across a fragmented landscape although alternative methods have been tested[18].

It is now becoming an imperative that an extensive restoration programme be initiated to restore the degraded elephant habitats and corridors in Assam and the adjoining regions of the Northeast India. Losing precious crops, coupled with bureaucratic hurdles in receiving compensation amounts, has forced several people to resort to retaliatory killings of elephants. Timely disbursement of compensation amount would thus go a long way in addressing human–wildlife conflict. The problem has also become exacerbated due to climate change-induced repeated monsoon failure over the last decade. Recently, 18 elephants died due to a lightning strike in the Nagaon district of Assam. Experts believe that the frequency and intensity of lightning, such as in this case, have increased due to climate change.

There are several guidelines[19] for mitigating conflict with elephants and other potentially dangerous wildlife, when they venture into densely populated areas but due to a lack of awareness, such measures are hardly followed. More extensive cooperation and coordination amongst the police, forest department and the revenue department

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18 The telemetry method, which involves fitting radiotelemetry devices on elephants, may be desirable but is quite expensive. Resistance-based methods, which again rely on subjective evaluation by experts is useful to understand the movement of elephants but is often fraught with several shortcomings and barriers that are usually overlooked while mapping their movements. An alternative method of tracking elephant movement was recently carried out by Divya Vasudev and her team, covering a large landscape, ranging from the Nambor Wildlife Sanctuary of Assam to the Garo Hills of Meghalaya. They merged the modelling approach with the data obtained in the field through questionnaire surveys to identify the factors responsible for the movement of elephants across this massive landscape. Their results suggest that forests facilitate connectivity, but the surrounding matrix also plays an extremely important contributory role in elephant dispersal. They also found that elephants preferred locations with high vegetation cover, close to forests and with low human population densities. Such fine-scale work covering a large landscape helps us to understand the movement of elephants and its drivers, and perhaps design mitigative or preventive measures that would not only lessen conflict with humans but also ensure their conservation.

19 http://moef.gov.in/wp-content/uploads/2020/08/Best-Practice-Man-Animal-Conflict.pdf
http://www.indiaenvironmentportal.org.in/files/guidelines-human-leopard-conflict-management.pdf
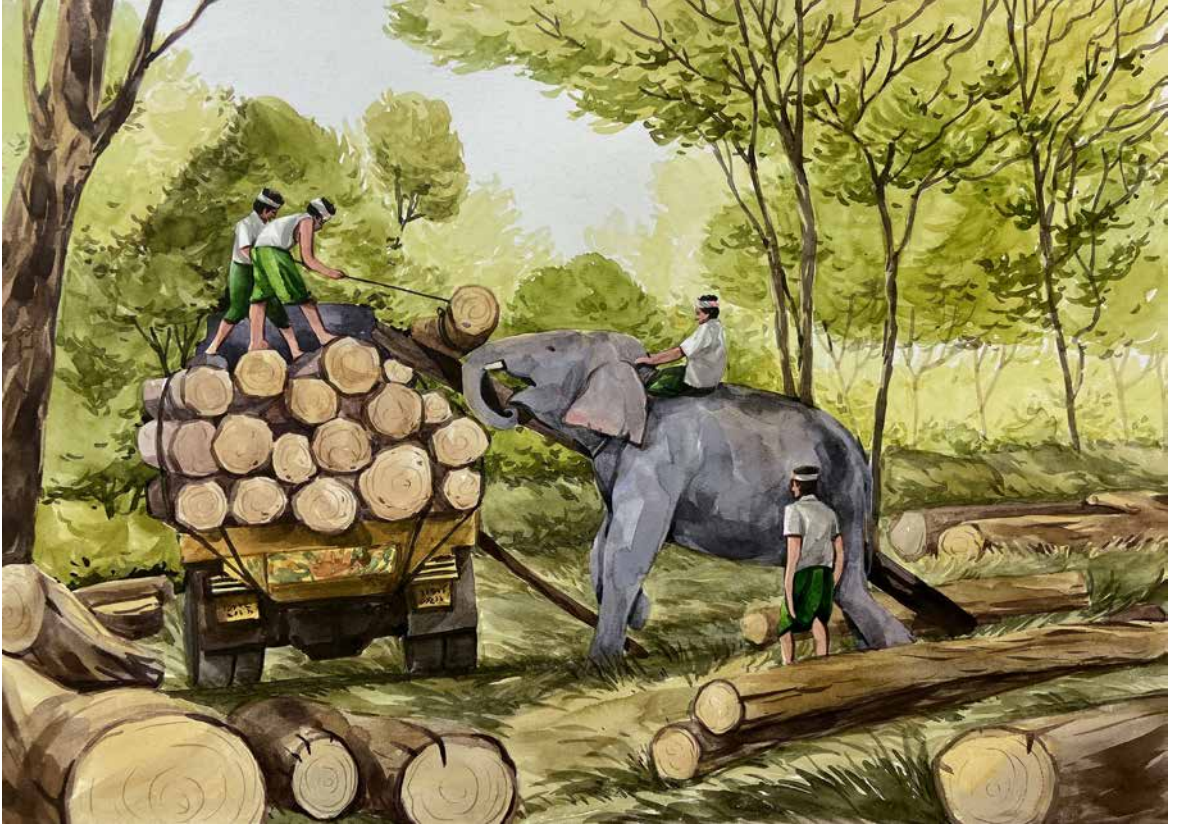
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A mahout is commanding an elephant to move forward and elephant is exhibiting aggression and discomfort towards his mahout by 'chirping' , 'rumbling' and 'trumpeting'.

are crucial in controlling unruly crowds and in capturing or chasing away elephants from conflict zones. In fact, the presence of a large crowd stresses out elephants and more damage is then caused.

Some of the recent policies by the Government of India, notably the expansion of oil palm plantations in Northeast India, pose grave threats to the survival of elephants in this landscape, for two reasons. First, where rates of crop depredation are high, people might prefer a shift to extreme monocultures. That is because plantation of unpalatable monoculture cash crops are safe bets as elephants do not depredate such crops. Secondly, some of the forest areas and those along corridors might be cleared for oil palm cultivation. Furthermore, the proposed dilution of the Forest (Conservation) Act, 1980 could pave way for the conversion of many forested areas into non-forest areas. Many agrarian communities are increasingly sharing their landscape with elephants and there is growing evidence that agricultural landscapes may soon become the prime, rather than marginal, habitats for Asian elephants[20]. In such cases, human-elephant conflict will become inevitable and our conservation focus should then veer towards preventing and mitigating such conflict while ameliorating the status of present elephant habitats.

FROM CONFLICT TO COEXISTENCE?

Unless they are physically removed from human-dominated areas or their degraded habitats are restored, elephants will be sharing space with humans, far more intensively in future. In such a scenario, is it possible for people to at all coexist with elephants? There are extreme cases of intolerance, where elephants, which are otherwise revered as gods, are poisoned or electrocuted, dubbed[21] as they were by the name 'Laden', after the infamous terrorist. When the same elephants, however, die, people throng to pay their respects. This is a unique conundrum that is becoming common across the Indian subcontinent. Instead of considering the prevailing human-elephant relationships as either being mere conflict or coexistence, we should perhaps treat them as being in a continuum, where the attitudes, perspectives and the actions of people range from extreme intolerance to empathetic stewardship. It is perhaps in acknowledging this continuum that the solutions to understanding and managing negative human-elephant interactions lie.

Satargaon is a village with around 69 households, nestling inside the Rani Reserve Forest. It is primarily inhabited by members of the Rabha community, who frequently encounter elephants in their backyard. Due to this continuous presence of elephants, the villagers cannot cultivate any paddy. Most of them derive resources from the nearby forest to meet their daily needs. It is fascinating that there has not yet been a single instance of elephant depredation or of any elephant-related casualty in the village. People say that the elephants come, and they let the animals roam freely, walk along the village roads and soon vanish inside the forest. It is perhaps in remarkably tolerant villages like Satargaon, where we must search for the ways forward that will ensure that a day will come when we can peacefully live with elephants. And such a day must come soon,

20 de la Torre, J.A., Wong, E.P., Lechner, A.M., Zulaikha, N., Zawawi, A., Abdul-Patah, P., Saaban, S., Goossens, B. and Campos-Arceiz, A., 2020. There will be conflict–agricultural landscapes are prime, rather than marginal, habitats for Asian elephants. Animal Conservation.

21 https://www.hindustantimes.com/india-news/elephant-named-laden-may-have-killed-37-people-in-assam-since-2016/story-NPXqCIdcMUlEjoDP9zuWgK.html

before we lose our elephants forever.

Scan for Listening Sound

A disturbed elephant responds by 'chirping' and 'trumpeting' loudly at the tourist vehicle!

Living (planet) versus dead (capital)

SONAL JAIN

The Wahmawlong living root bridge. Photo by Sonal Jain, 2020

After five centuries of global capitalist expansion, we are in the midst of the largest mass extinction of species in the last 65 million years; we are confronted by the climate crisis and the mass acidification of the oceans. The Anthropocene discourse posits humans as a geographical force, measured by significant changes humanity has had on the biosphere. Many, however, counter this arguing that it is not human impact but global capital that is responsible for the climate crisis. Caught in our collective addiction to consumption, growth, progress and infrastructure development based on a flawed economic model, we need a radical change in our way of being. In stark contrast to the techno-utopia of our post-industrial societies, we have amidst us in the present day and age many communities, people and cultures who see themselves as being subject to nature, rather than in control of it; their worldviews and knowledge systems are completely opposite to the Western civilisation, global capitalism and the modern education system. The living root bridges and trees in the Indian state of Meghalaya, firmly enmeshed within the culture and identity of the people who create them, are perfect examples of living in tune with nature rather than controlling it.

ANTHROPOCENE VERSUS CAPITALOCENE

After five centuries of global capitalist expansion, we are in the midst of the largest mass extinction of species in the last 65 million years (the sixth mass extinction); we are confronted by the climate crisis and the mass acidification of

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the oceans. The small numbers of remaining rain forests worldwide are being cut down at the rate of an acre per second, 90 per cent of fish in the sea have been eaten, and 50 per cent animals have disappeared due to logging and agriculture.

The Anthropocene discourse posits humans as a geographical force, measured by significant changes humanity has had on the biosphere. Man has a domination of the earth. "1,000 years ago free-living animals made up 99 per cent of the biomass and human beings made up only 1 per cent. Today (fraction of time) human being and the animals we own as property make up 98 per cent of the bio mass and wild free-living animals make up only 2 per cent. We have basically stolen the world, the earth from free-living animals". (Will Tuttle, environmental and ethics author, in the film, Cowspiracy: The Sustainability Secret)

However many like Jason W. Moore counter the Anthropocene position and argue that it is not human impact but global capital that is responsible for the climate crisis. It is the Capitalocene, understood as a system of power, profit and re/production in the web of life that is responsible for the changes on the earth's biosphere. Moore in his essay, The Capitalocene, Part I: On the nature and origins of our ecological crisis, says, "I situate the Anthropocene discourse within Green Thought's uneasy relationship to the Human/Nature binary, and its reluctance to consider human organisations – like capitalism – as part of nature."

HUMAN VERSUS NATURE

Human/Nature binary is largely a result of the Cartesian dualism and similar thoughts. Rene Descartes, the first of the modern rationalists, laid the groundwork for debates developed during the European Enlightenment. He argued for a separation between the mind and bodyleading to a split between mind-nature and humans-animals. Mind became pure thought-incorporeal while body was reduced to pure matter. The ensuing Nature/Society divide was instrumental in the rise of capitalism as removed from its spirit matter and nature was reduced to its utilitarian function at the disposal of humanity. "This coupled with a new knowledge regime, a series of 'scientific revolutions'… made it possible to launch and sustain a process that threatens as all today: Putting the whole of nature to work for capital." (Jason W. Moore, The Rise of Cheap Nature)

Henceforth, "Some people became Humans, who were members of something called Civilisation, or Society, or both – as in Adam Smith's 'civilised society'" (Jason W. Moore, The Rise of Cheap Nature). With Nature becoming "mere matter" and a resource it was/is explored, surveyed, mapped and calculated. It became an easy target for exploitation and extractive energy, enabling colonialism and imperialism. Carbon industries, forestry, mining, agri-business, construction, mega-farming and mega-fishing are all ongoing and everyday processesfor the accumulation of capital even today.

CIVILISATION VERSUS CIVILISATIONS

In stark contrast to the techno-utopia of our post-industrial societies, we have amidst us in the present day and age many communities, people and cultures who see themselves as being subject to nature, rather than in control of it: People who live entirely from the land, growing and foraging for their needs. These are people and communities deemed savages, primitives, natives by the supposed civilised Western colonisers, and who were/

The Wahmawlong living root bridge. Photo by Sonal Jain, 2020

are in need of education and refinement. The loot, plunder and absolute devastation of world's indigenous cultures, which continues to this day is largely unaccounted for. None of the data present can account for loss of languages, cultures and knowledge systems.

The Western civilisation, global capitalism and the modern education system are in radical conflict with the indigenous worldviews and knowledge systems. Themind-body dualism, which gives human life its implicit worth, based on a qualitative distinction between the relationship to the animal life rather than the mind-spirit is what Western reason erected its empire on. Prior to the rise

of Judeo-Christian values 2000 years ago, there existed multiple belief systems with many gods and earth spirits, such as paganism, animism, and (the various forms of) Hinduism among other eastern religions.They generally considered the sacred to be found throughout nature, and humanity as thoroughly enmeshed within it, as is the case with most indigenous worldviews. "The Anthropocene argument relies on the construction of humanity as a collective actor", (Zalasiewicz et al. 2011; On the Poverty of Our Nomenclature). This assigns responsibility of global climate change to humanity as a whole versus capital and empire, and it denies the existence of multiplicity and the plurality of human "civilisations".

In the dense subtropical humid broadleaf forests on the steep valleys leading from the Shillong Plateau to the Bangladesh floodplain live indigenous Khasi and Jaintia people. Meghalaya in India is one of the wettest places in the world. Incessant rainfall and high levels of humidity is an integral part of life, and people live in an effortless synergy with it. Out of the living roots of the Ficus elastica (India rubber) trees are woven these organisms/structures that look more like they are from an Avatar or a Lord of the Rings film rather than something that is part of our contemporary reality.

The tender and supple aerial roots of the trees are given direction and support and intertwined with each other. With this technique they build dreamscapes like surreal bridges that help in getting across monsoon-swollen rivers and deep ravines that characterise the area, platforms on tree overlooking luscious verdant valleys, laddersto climb up steep rocks and massive boulders and swingsthat sway silently in the dense forests.

The process of making the bridges begins with a planting of the trees on either sides of a stream. Once the tree is mature its aerial roots are inserted into hollowed out areca nut or bamboo trunks giving themthe necessary direction and protection. They are supported by bamboo bridges as they slowly grow in strength. Later, stones are inserted into the gaps and then still handrails and steps made from the same roots are added. The bridges are made and maintained by individuals, families or by communities. The length of the bridges can vary from 2m to 52.7m. (Ludwig, F., Middleton, W., Gallenmüller, F. et al. Living bridges using aerial roots of Ficus elastic – an interdisciplinary perspective. Sci Rep9,12226 (2019). https://doi.org/10.1038/s41598-019-48652-w).

Sitting on the intricate weave of the handrails of thick roots of 300-year-old Wahmawlong living root bridge and listening to MorningStar Khongthaw, a 24-year-old man working on the regeneration of these structures, talk about the ways of the forest over a background of singing birds and buzzing insects is as enchanting now as was my first encounter with these magical forests and these structures many years ago. MorningStar tells me that these bridges are a part of an intricate network of ancient forest paths that lead all the way down into Bangladesh. Due to the physical proximity, the villagers here share ancient ties with the plains people of Bangladesh. National boundaries notwithstanding, weekly village markets still exist with cross border trade happening. They are more familiar with Bangladesh than with the state capital, Shillong.

The root we sit on provides nice little niches to perch oneself on. There is a waterfall on one side and a deep ravine on the other. The continuous shrill whistle of the cicadas resounds in the entire valley. MorningStar tells me how a man named Sngap made this bridge. The reason was that his wife's village was on the other side of the mountainside and with the bridge he could go more easily to his wife. MorningStar points out small shallow cuts on the barks of the ficus trees, forming a pattern. These cuts are made to collect the sap from the tree bark that is used to make latex. On the trees are also manmade homes for the honeybees, from which wild honey is collected. Villagers forage bay leaves, broom grass, ginger and chillies from the forest. The area for the foraging of the broom

grass is divided among the families with the only markers being trees and rocks. Asked about any cases of dispute or theft happening in this division, MorningStar replies that the people here are very honest and there has never been any kind of difficulty.

GEOENGINEERING VERSUS LIVING ARCHITECTURE

Geoengineerning hailed as a saviour for the ecological messes humanity is creating works in a myopic way, providing a solution to a problem only to create a new one. In contrast to this, the living root bridges are a perfect example of a holistic and locally adapted ecological approach to problem solving. Given that the average annual rainfall in some areas of Meghalaya is as high as 12,000 mm (470 in), making it the wettest place on earth, the living root bridges are a marvel in innovation. Very quickly into the monsoons, it is practically impossible to even walk on the slippery surfaces of the stone, steps and paths going up and down these steep mountains. In these conditions, the living root bridges prove very efficient, as they don't gather moss and are easy to walk on. The humidity in the dense forests eats into most materials. The roots of these bridges are alive and grow only stronger with time. There is a qualitative observation and understanding of the climate, geography and the biological life and characteristics of the same, which has no substitute in quantitative data methods. Communities over generations have acquired intimate place-based knowledge through an everyday interaction with the land.

The many interdependencies and interconnectedness of society to the forest/nature are a given. The knowledge of making the bridges is handed down by one generation to the next with a living continuity. Many existing bridges are made by ancestors going back even five generations. It is an evolutionary design process to meet the "needs of locally adapted, place-based communities within the limits of their local environment"(Daniel Christian Wahl).

The ingenious and non-intrusive/non-destructive manner in which the roots are adapted demonstrate how, "Many traditional cultures prove that it is possible to sustain locally adapted, place-based communities for centuries and even millennia through prudent and ecologically and socially responsible resource management and sustainable ways to meet human needs within the limits and opportunities set by the natural conditions of their particular region" (Daniel Christian Wahl, A Sense of Place). It is part of an inventive life giving and life-affirming matrix that humans and the natural world work collaboratively on.

The forest here is conceived as a sacred living being and not just a natural resource. Its offerings are used judiciously without depleting and destroying the forests. The Law Kyntang are the sacred groves inhabited by protective deity/spirits called U Ryngkew U Basa. They are revered by the people. These are today rich bio-diversity hotspots as cutting anything, killing any animal or even taking even a fallen leave from it premise is taboo, based on a belief that the protective deity will turn maleficent if one does. There are rituals and ceremonies that are performed in spot with megaliths called Mawbynna in order to maintain personal and local equilibrium.

In the last few years, the once completely obscure living root bridges have received worldwide attention. One of these bridges, the Riwai Root Bridge near Mawlynnong village, is in danger of collapse under pressure of the sheer number of tourists treading upon it. There is also an interest of the state government with projects aimed at preservation and regeneration. According to MorningStar, this too has been counter-productive as such projects are insensitive to the social-community aspect of the bridges. A concrete
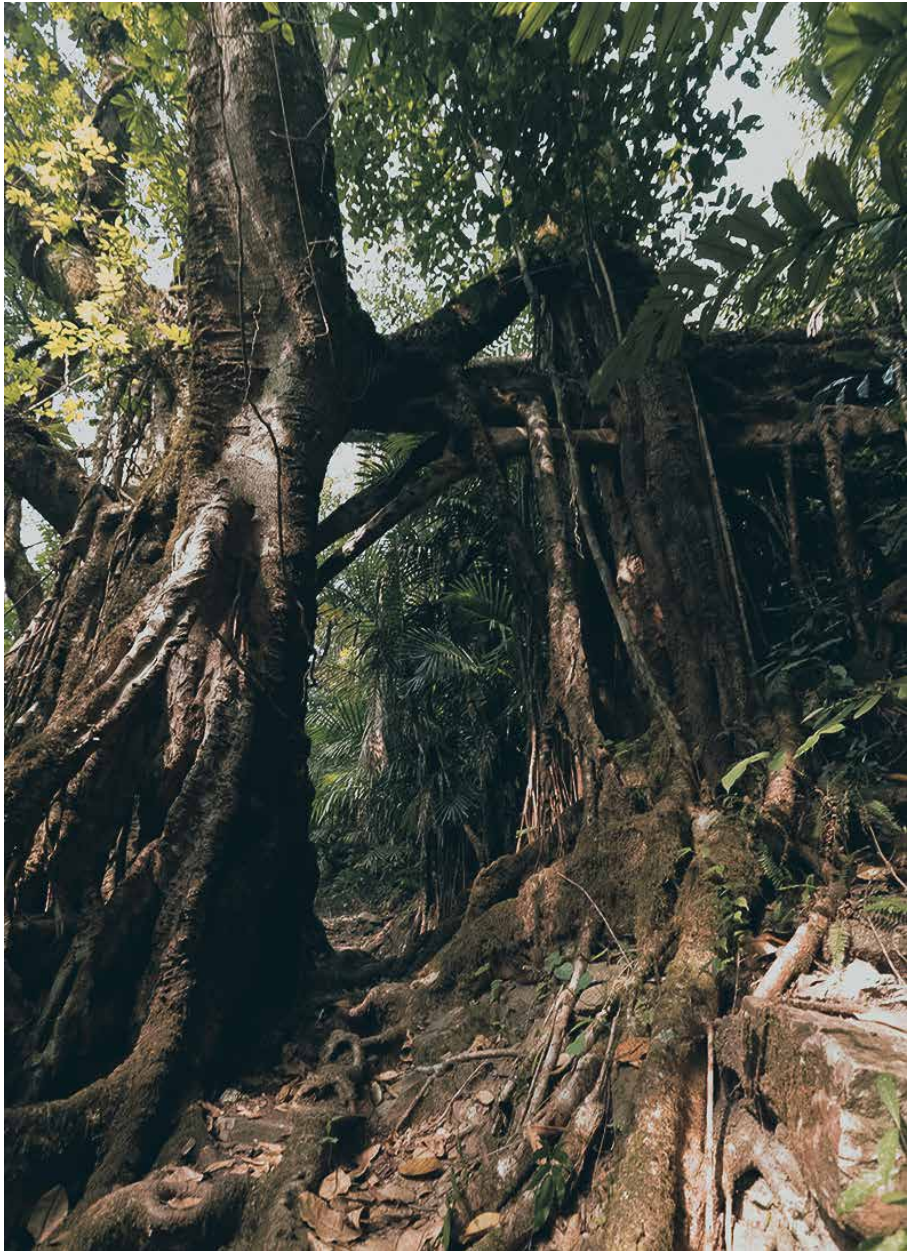
The Wahmawlong living root bridge. Photo by Sonal Jain, 2020

bridge, concrete footpaths with metal railing and other such structures have been built in close proximity of the root bridges. Riwai Root Bridge and the Umshiang Double Decker Bridge have both borne the brunt of the recent surge in unsustainable tourism and a 'false modernity'. A healthy local eco-system has been reduced to a mere tourist spectacle and selfie point.

EMPIRICISM VERSUS MYTH

Empiricism, Merleau Ponty complains, robs sense experience of all mystery

by reducing it to physicochemical processes and causal relationships of stimulus and response. The task of a phenomenology of perception is accordingly to rediscover that "vital communication with the world" (Merleau Ponty). While if one lives in synergetic co-existence with other living/spiritual beings who are sacred, one is in regular communication with them. Like, in a local myth the 'puri' are beautiful feminine creatures who live in streams and rivers. Some men get enchanted by them and go and live with them and their purioffspring temporarily in the watery realms. These stories are not something limited to yesteryear and distant villages. They, among numerous others local myths, persist even in cities like Shillong despite mass conversion to Christianity and the pervasive forces of capitalism and globalisation. A contemporary poet from Shillong, Jobeth Ann Warjri interprets the "abnormal" behaviour of a young boy in her neighbourhood in this poem:

<div align="center">

ÏohPuri

They say he stole into the sacred groves,
They say he sprouted golden wings
To soar the clear skies,
Webbed feet to swim in the blue pool.
But, by noontime,
Thunder clouds
From beyond the rainbow descended.
They say, "He is bewitched."

</div>

The indigenous knowledge, coded into stories, songs, dances, rituals and place, integrates the people with the natural world, one that is living, intelligent and sacred. They become one integral, inter-connected eco-system where one cannot be dissociated from the other. Living root bridges and trees are firmly enmeshed within the culture and identity of the people who create them. They are part of the oral and the material knowledge system that has evolved over hundreds of years: One that draws from a wealth of knowledge collected, stored and passed down orally and materially over generations. Oral cultures "memorise the vast amounts of practical information they needed to survive" (Lynne Kelly, The Memory Code). Kelly further postulates how oral societies are able to store vast quantities of knowledge to memory without it degrading over time through associating memory with a location or place, known as loci in Latin. The living root bridges too, like ceremonial sites and landscape, are memory spaces. In ancient times, MorningStar's ancestors, the War Khasis, won a war against the Jaintia people and their chief picked a sampling of the ficus tree from the river there in order to commemorate this victory. He planted it in their village Rangthylliang. There are now 22 living root bridges here. These trees are thus sacred to the people here and they believe that deities, protectors of the village live in the big ficus trees and the people give them an offering during the festivals. There is a taboo on burning or cutting the tree.

For the Warjri clan too the ficus tree has a special significance. Jobeth: "Diengjri is the 'Rubber tree' in Khasi. According to clan lore, the Warjris' ancestress was an old woman who sat under a rubber tree and, by doing so, received protection from a plague that ravaged the village of Nongjri." In a poem titled Origin, she writes:
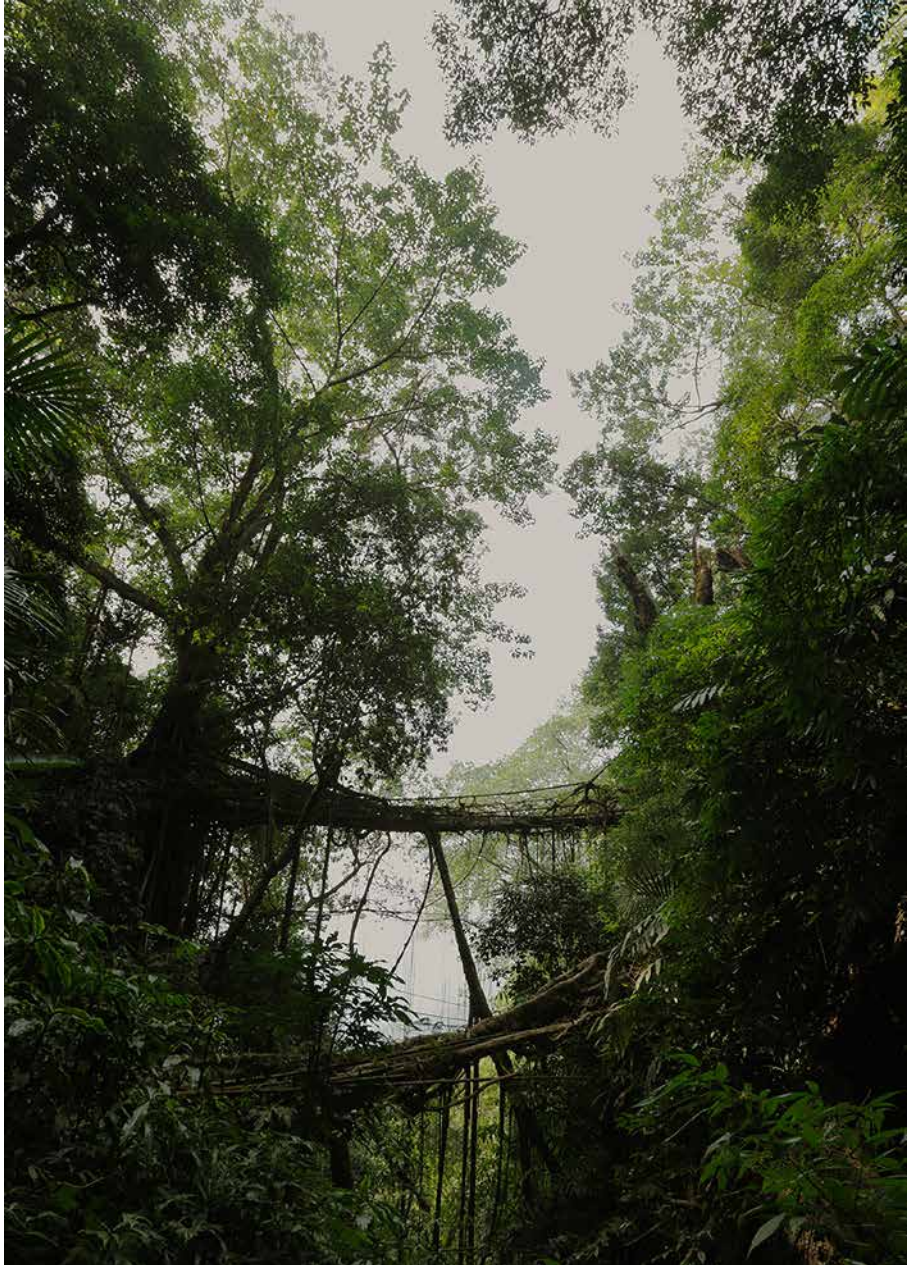
The Wahmawlong living root bridge. Photo by Sonal Jain, 2020

...I have left you, Diengjri of my origin,
only to find your offerings of legend
pealing with laughter
from my body.

The origin myth of the Khasi people too refers to a tree. God in a bid to create a link between the kingdom of Man on the earth and the kingdom of God in the

Heavens planted on the sacred mountain Lum Sohpetbneng – the Mount of Heaven's Navel, a divine tree to serve as a golden ladder.

In The End of the Cognitive Empire: The Coming of Age of Epistemologies of the South, Boaventura de Sousa Santos calls for a needfor a radical change in what counts as knowledge and a rejectionof the assumptions common to epistemologies of the North (Western rationalist): "That authorship is individual, not collective; that knowledge must be linguistically expressed; and that knowledge is a 'purely cognitive' matter. Instead, we must accept the importance of oral traditions and non-linguistic practices and the fact that all knowledge is produced by embodied subjects." This puts all indigenous practices back into the frame of knowledge where they belong.

MECHANISTIC VERSUS VITAL MATERIALISM

What really changed with Descartes' ontologically dualism, when he made a distinction between thinking substance, res cogitans, and extended substance, res extensa, the latter being a single but infinitely modifiable substance in extension, is that the vitality or implicit life force from matter was taken away. Matter becomes "inert stuff emptied of all immanent vitality… Because, moreover, matter is without value or internal qualities or significance, it is not forbidden for this subject to control the material domain that is, for Descartes, synonymous with nature (including animals, whose lack of a soul or self awareness renders them mere automata)" (Diana Coole, The Inertia of Matter).

The critical shift here was that nature went from being an organic whole: A cosmos with a living female earth at its centre, to dead and passive.Humans hence are flexibly taken in and out of the category of matter/nature. Indigenous Australians were legally considered animals by the Australian government and were categorised under the "Flora and Fauna Act" up until 1967.

Intrinsically empty of metaphysical purposes and devoid of animistic of human spirit and, "This is what sets it free for modernity's secular or technoindustrial projects…"(Diana Coole); this is precisely what gives technocentrics', including imperialists', absolute faith in technology and industry and the firm belief that humans have control over nature; this is also what in the last few decades has led to the environmental/green movement in the embracing the new technologies, geoengineering and new forms of power premised on the Great Frontier. However this movement too, apart from being flawed in its very conception of the nature/society divide, has been co-opted by big corporations for profit motives andall in the guise of 'sustainability'. It is in the name of sustainable fishing that 28 billion animals have been pulled out of the oceans just in the 2015. For every pound of fish caught there is 5 pounds of untargeted species trapped known as "by-kill". Scientists predict that we may see fishless oceans by the year 2048.

TECHNO-UTOPIAS VERSUS VIROID DYSTOPIAS

In its essence, capitalism is a system that promotes unlimited growth on a finite planet and this at the cost of even basic human health and well being. In her book The Politics of "Life Itself", Rosi Braidotti calls capitalism an "all consuming entropic energy", and reduces its participants into an endless self-propelling loop of production and consumption. Rosi goes on to say, "Capitalism has no built-in teleological purpose, historical logic, or structure but rather is a self-imploding system that will not stop at anything in order

to fulfil its aim: Profit. This inherently self-destructive system feeds on and thus destroys the very conditions of its survival: It is omnivorous, and what it ultimately eats is the future itself."

In the midst of the Covid-19 pandemic with a proposed vaccine that can potentially change the DNA structure of the human genome, one cannot but reflect on the biogenetic capitalism that is presenting itself to us not in the distant visions of a techno-utopian future but in the very present. The body is the direct site of potential profit and the subject of what Michel Foucault calls biopower (now more than ever). It is a systemic reduction by of the "subject" to what Agamben calls "bare life" which is that in you that the despotic force of power can kill: Body in its hands as disposable matter.

Multiple visions of cyborgs, humanoids,artificial intelligence and perfect humansabound: A future with immortality and near complete control over nature, life and death with biotechnology and eugenics. Here humans will exercise choice of what they want to be. Ansell Pearson, in his book Viroid Life counters this line of thought with the proposition that the true enemy of our times is the assumption that technological progress will bring about human perfection, even the transcendence of the human. He vehemently challenges such post human thinking. I resonate Pearson's fear that in constructing a posthuman paradigm that makes the logic of capitalist biotechnology synonymous to thatof human history, alternate stories of human pasts and human futures are being disabled and discredited, something imperialism andcolonialism havealready done so effectively in the past.

"ACCUMULATING EXTINCTION" VERSUS "LIFE ITSELF"

The Anthropocene discourse tends to disavow differentiated responsibility for those geological changes and does not acknowledge the many different and diverse human civilisation, systems and knowledge. Many of which did not or do subscribe to capitalism. The urgency of our times is voiced very succinctly by Justin McBrien in Accumulating Extinction, Planetary Catastrophism in the Necrocene where he says, "The logic of accumulation is not capable of outrunning extinction because accumulation and extinction are the same process. They cannot be decoupled. But the human being can be decoupled from Capital. Capital is extinction. We are not."

Caught in our collective addiction to consumption, growth, progress and infrastructure development based on a flawed economic model, we need a radical change in our way of being. We need to reintegrate ourselves with the living planet taking our cues from living root bridges, which boldly challenge the status quo. The need of the hour is what Rosi Braidotti calls "a post anthropocentric shift", with actions and a system change that affirm Rosi's conception of "Life Itself."

H.

India's Infrastructural Promise: Agricultural Economy and Fishing Communities

The recent year-long farmers' protest against agricultural reforms brought the ills of India's rural economy into sharp focus. Ever since India liberalised its economy in 1991, successive governments have tried to push through agrarian reforms aimed at liberalising and privatising a part of the economy that sustains, directly or indirectly, over 60 per cent of India's population. This churn, along with exacerbating factors such as climate change and volatile markets, has pushed the farmers into a state of chronic precariousness and unpredictability. This section examines what ails India's hinterland and what kind of infrastructures might be needed to make it vibrant and sustainable in the long run. Jyoti Awasthi argues that wooing private investors is not the answer to the chronic ills of India's farming economy. The answer, she avers, lies in a well-designed and state-sponsored rural infrastructure—roads, hospitals, banks, schools, communications, among others, all tailored to the local needs, skills, resources, and ecology of a rural region. The other two essays echo and bolster Awasthi's argument. Salam Rajesh describes how a hydel project in early 1980s not only disrupted the ecology of Manipur's Loktak lake, a famous Ramsar site, but also turned the lives of the local fishing community into an unmitigated nightmare. Following popular agitation against the dam, the Manipur government set up the Loktak Development Authority in 2006 with the purpose of protecting and conserving the lake. Rajesh argues this top-down, technocratic approach, which pushed tourism in a big way, has, if anything, done more harm to the lake, not to speak bringing more ruin to the fisherfolk. He argues that unless the government makes the fishing community an active stakeholder in preserving and managing the lake, the people have no choice but to resist and fight for what's rightfully theirs. Nandini Thokcham comes to the same conclusion but through the eyes of the fisherwomen. Based on interviews with women involved in campaigns for the rights of the fishing community, she paints a vivid picture of the fisherwomen's deep involvement in the fishing economy as well as understanding of the lake's ecology—they regard it as their spiritual mother (Ema in Manipuri) as well as someone who knows the lake intimately. Thokcham is convinced that these women will not back off until they have liberated their Loktak Ema from the clutches of a callous state.

Rural economy no sidekick to India

JYOTI AWASTHI

I sit in a remote village in one of the routinely flooded panchayats on the banks of Kosi river in Saharsa district of Bihar, and wonder what type of magic mantra would really transform this sleepy hamlet into a self-sustained economy where people are not forced to migrate to far off lands to earn and support their families back in this village. Is it just the roads that are missing? Or education? Maybe skill or could be jobs? What is that one missing link between our villages and their development, or are there plenty of them?

India in the year 2020 is still struggling to find answer to the same old question that arose way back in 1947 when the country attained Independence – "What development model should we choose to put India on the rails of economic growth?" While Gandhi insisted that Gram Swaraj (or village self-rule) was the only way we could strengthen our nation and its economy from within, Nehru saw modern science and technology as the panacea for uplifting Indians from abject poverty that was staring at our face at that point in time. Seven decades later, when the country is grappling with an unprecedented blow of novel coronavirus disease (COVID-19) pandemic, the confusion between choosing self-reliant rural India or growth propelling urban India surfaces more clearly. Images of millions of migrants walking back to their villages at the time of crisis puts a big question mark on the development trajectory that India has taken. Big cities could not promise them protection from this crisis of survival and these migrants looked towards their own homeland for seeking refuge.

INDIA'S DEVELOPMENT PATHWAY – A RETROSPECTIVE VIEW

Looking back at the unfolding of consecutive Five-Year Plans ever since the commissioning of a planning institution by India's first prime minister Pandit Jawahar Lal Nehru in 1950-51, one can see how the lawmakers designed the trajectory of development of an India that was struggling to feed its people, explore and exploit its natural resources like land, water, minerals and energy, and make the country self-reliant. Infrastructure development was always at the centre of our growth story, be it irrigation, transportation, communication and industry. Agriculture was 'modernised' with heavy inputs of research, developing new high yielding varieties, thrust on growing wheat, paddy and oilseeds, use of technology for agriculture and food processing for making India self-reliant in food. Similarly, large dams were built, irrigation channels were laid to provide water to dry lands too. While all this was happening in the rural hinterland, a new industrial India was also taking shape with cities and townships being

Scan for Listening Article

developed around industry and mining centres. Import duties were raised on capital goods and more emphasis was laid on manufacturing our own goods in order to create a circular economy that stays within the country. The defence sector was getting strengthened, especially when the country faced wars on its north frontiers. 'Jai Jawan, Jai Kisan' (hail the soldier, hail the farmer) was the slogan central to development and self-reliance until Rajiv Gandhi, the sixth prime minister of India from 1984 to 1989, led the Sixth Plan and brought industrialisation, information technology and rapid transportation to the core of development.

With the policy thrust more on seeing cities as propellers of growth, infrastructure development became more urban and gradually rural India turned into a source from where cities could attract human resource. Thus, a country that was largely agrarian with approximately 85 per cent people engaged in agriculture at the time of Independence, India started transforming itself into an industrial economy where rural youth became job seekers in labour market.

OPEN MARKET, STRUCTURAL REFORMS AND URBAN INFRASTRUCTURE BECOMES THE KEY TO ATTAIN HIGH GDP LEAVING RURAL INDIA TO FEND FOR ITSELF

Post Gulf War, India faced a major financial crisis that occurred in the late 1980s so much so that the country was in deep debt and was forced to pledge its gold reserve to International Monetary Fund (IMF). As a result, in 1991, IMF and the World Bank compelled India to adopt the Structural Adjustment Programme (SAP) that had begun in the mid-1980s and unfolded itself later in its myriad forms. India became a member of WTO and entered the global market seeking investments to 'uplift' its sinking economy. The famous liberalisation-privatisation-globalisation (LPG), phenomenon was set in under the iconic leadership of the then prime minister P.V. Narasimha Rao and his finance minister Manmohan Singh, and the country started readying itself for receiving foreign direct investments (FDIs).

In 1993, 74th Constitutional Amendment[1] Act was brought in the Nagarpalika Act 1993, which mandated major urban reforms, giving power to municipal bodies for local self-governance, handing over the responsibility of local area development to the local governments and also pushing municipalities to raise their own funds and perform in the best interests of people.

The greatest vehicle to bring this urban overhaul was the Jawaharlal Nehru National Urban Renewal Mission (JNNURM). Launched in the year 2005 in select 65 cities, JNNURM had two submissions – Urban Infrastructure and Governance (UIG) and Basic Services for Urban Poor (BSUP). The motive was very clear: Cities must improve their infrastructure and living conditions of poor in cities should be improved by providing them basic services. Therefore, the major reforms brought in to expedite the processes under JNNURM were – Financial Management Reforms, E-Governance Reforms and Pro-Poor Reforms.

The landscape of India's urban centres was thrown open to 100 per cent FDI in infrastructure development. The Urban Land Ceiling Act was repealed, public private part-

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1 https://economictimes.indiatimes.com/news/politics-and-nation/aims-of-74th-constitution-amendment-act-remains-unfulfilled-niti-aayog-official/articleshow/64947634.cms (Accessed on 7 December 2020)

nership (PPP) mode of working was initiated and urban India was declared as 'engine of growth' for the country. Amidst this hullabaloo, rural India was left to fend for itself.

Interestingly, in the same year, in fact much before 74th Constitutional Amendment Act, another amendment – 73rd Amendment of the Constitution – was brought in by the government to push the famous big reform for devolution of power for rural governance by bringing in the role of panchayati raj institutions (PRIs). With this, the then ruling party, Congress, could realise the dream of Gandhiji's Gram Swaraj. Gandhi always advocated for seeing villages as mini republics where people were the decision makers and implementers of holistic development. Could the villages really become so is a debatable question, though. What is clearly visible is that rural India became a land bank for an ever-expanding urban India. All the roads to development towards villages were only to bring migrants as cheap labourers and infrastructure merely serving for industrial and information technology (IT) development.

In the absence of any real financial powers or specific budgets, PRIs became mere vehicles of implementing projects decided at the top, rather than planning for their specific village development in a bottom up approach that could touch lives of rural community, build assets and infrastructure relevant to village centric development. Moreover, caste equations and cultural hegemonies have also played a huge role in disallowing Gram Sabhas to perform their mandated functions. Over a period, these last tiers of local governance have become a sheer formality losing their significance in the integrated development of rural India.

COULD A 'STRUCTURALLY REFORMED SMART INDIA' BECOME THE SOLUTION FOR DEVELOPMENT?

When India opened its markets for foreign direct investments, the hopes were sky high. Metro and other capital cities were being modernised with better transport network,

industrial corridors were getting built, special economic zones (SEZs) were being created to welcome multinational companies set up their manufacturing units, and IT parks were introduced. To feed these high speed vehicles to development, the education sector also started opening up to privatisation of professional education with more and more colleges coming up to create a pool of human resource for the new found management and service sector. Employment rate zoomed up and surpassed its targets. GDP was sky-rocketing and urban infrastructure, especially construction industry, was reaching new heights. However, beyond a point, this growth could not take the country anywhere. A look at the graph showing youth employment rate[2] narrates the story well.

YOUTH UNEMPLOYMENT RATE IN INDIA 1999-2019

This graph on adjacent page released by the World Bank and UN's International Labour Organisation (ILO) sums up where we are after four decades of having opened up our economy to the western model of private markets, industries and fast speed development.

After a landslide victory in the general elections in 2014, the newly elected Modi government tried to repackage urban renewal mission into a new avatar – Smart City Mission[3]. It was supposed to be their attempt at modernising urban India that aimed at building urban infrastructure with modern technology providing smart solutions to urban population. The focus however remained technology, mechanisation and corporatising solutions. Integrating urban poor community's basic needs of social security, employment, education and health in this development model is still a missing link.

Today, India appears to be at a standstill. From P.V. Narasimha Rao-Manmohan Singh era to Modi-Shah regime, the economy has stagnated and is at the risk of going further down with barely touching GDP at 5.5 per cent in 2019-20. Youth lack modern employability and whole country is seriously looking for solutions. This is a classic case of getting stuck in a quagmire. Fast economy requires huge investments, world class infrastructure, automation, modern technologies, skilled professionals and committed buyers. Unfortunately, this modernisation could not provide employment to our youth who were in millions but without matching skills and potentials. Not surprising, large and erstwhile large-scale employers like mining industry, construction work and manufacturing were now being run on sophisticated machines that gradually removed manual labour and the jobs went from workers to trained professionals.

Agriculture and allied sectors that were the large source of employment bore the brunt of this race to achieve modernisation. Agricultural lands, especially adjoining major cities, were acquired by the governments in the name of national interest and huge land banks were created so that new era industries could be set up. Farm owners turned landless, rendering farm labourers jobless. While the former still had some cash to invest in the world that they were not aware of, the latter had nothing in their hands. As the country was moving on a fast track, large part of farming community was paying the price of this speed.

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2 https://www.statista.com/statistics/812106/youth-unemployment-rate-in-india/ (Accessed on 10 February 2020)

3 http://smartcities.gov.in/upload/uploadfiles/files/What%20is%20Smart%20City. pdf (Accessed on 7 December 2020)

Since then, several analyses have time and again concluded that the agriculture sector that was the largest employer completely crashed and therefore India finds itself stagnant and now sinking in terms of economic growth, overall development indicators and employment.

The Modi government has been working on multiple strategies for "Doubling farmers' income by 2022" and one of the big ticket reforms claimed by the government is the Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020. However, instead of becoming a matter to celebrate, this bill is facing severe opposition from farmers and policy lobbies across the nation. The biggest critique of the new Act is that while it brings down the marketing committees set up in the previous Act, APMC Act, 2003[4], and gives farmers the freedom to sell their produce across the nation, the new Act does not provide any regulation over minimum support price (MSP). Hindustan Times, a national newspaper has quoted[5] Kavitha Kuruganti, an activist representing Alliance for Sustainable and Holistic Agriculture (ASHA), highlighting the most contentious issue in the new Act: "The government is abdicating all oversight responsibility since it is not prescribing a system of registration of all traders of farmers' produce, nor does it want to build a price intelligence system even as it weakens the mandi (market) system. How and when will it intervene then?"

With corporates coming in as big players in food sector, the risk of farmers getting unfair share due to power imbalance is quite evident and government opting out of the system puts farmers further at the mercy of private companies.

The stir is going on, farmers are not letting this go and the nation waits to see how this stalemate gets over and in whose favour.

RESPONSIBLE AND RESPONSIVE ALTERNATE PATHWAY TO REVIVE RURAL ECONOMY

Niti Aayog in its Discussion Paper[6] in 2017, "Changing Structure of Rural Economy of India – Implications for Employment and Growth", authored by Ramesh Chand, S.K. Srivastava and Jaspal Singh mulls over the plight of agriculture as a sector in India and how the loss of jobs in this sector is a big factor in the stagnant economic situation of India. The paper highlights that contribution of the rural areas in the economy of India for the period 1970-71 to 2011-12 is seen from its share in national output and employment (Table 2.1). The rural areas engaged 84.1 per cent of the total workforce and produced 62.4 per cent of the total net domestic product (NDP) in 1970-71. Subsequently, rural share in the national income declined sharply till 1999-2000. Rural share in total employment also witnessed a decline but its pace did not match with the changes in its share in national output or income. The declining contribution of rural areas in national

4 http://agricoop.nic.in/sites/default/files/apmc.pdf (Accessed on 7 December 2020)

5 https://www.hindustantimes.com/india-news/critics-cite-crucial-loopholes-in-farm-bills/story-cXkw5I5xHpSpjwEDJxhCxK.html#:~:text=Critics%20say%20the%20Farmers%20(Empowerment,t%20adequately%20protect%20the%20farmer. (Accessed on 7 December 2020)

6 https://niti.gov.in/writereaddata/files/document_publication/Rural_Economy_DP_final.pdf (Accessed on 7 December 2020)

output without a commensurate reduction in its share in employment implies that a major portion of the overall economic growth in the country came from the capital-intensive sectors in urban areas without generating significant employment during the period under consideration.

RURAL INDIA AND MGNREGA

In 2005, the Manmohan Singh government passed a landmark Act, National Rural Employment Guarantee Act 2005 (NREGA), which later became Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). The sole purpose of the this Act and then the programme was to generate employment in rural India for both men and women so that poor in rural India could get employment in their native place, lead a better life and were not forced to migrate in search of work, simultaneously building infrastructural and productive assets in villages that could respond to people's needs. This was indeed a path breaking programme that was aimed at transforming rural India if it were to be implemented in letter and spirit.

Assets built through MGNREGA funds range from soil and water conservation related work, farm ponds, reviving old water bodies to building new ones for ground water recharge, irrigation, drainage, plantation, land development, rural housing and related work, livestock related infrastructure development.

However, time and again, review reports on implementation of MGNREGA have highlighted the fact that the programme is facing a variety of obstacles ranging from political whims and fancies, and bureaucratic bottlenecks causing restricted fund flow, social and caste hegemony in villages and corruption at various levels of fund transfer. The successive governments have always tried to plug the holes but the challenges have been unlimited. With the advent of direct bank transfer (DBT) and geo-tagging, the implementation seems to be improving but the real question is whether the ambit of MGNREGA is enough to cater to the real infrastructure needs of the villages. The Modi government used MGNREGA to mitigate work and wage crisis in rural India during lockdown period in COVID-19. Quoting government data on the utilisation of funds[7] for 2020-21 in MGNREGA, an article in Business Standard reports that almost 63 per cent of the increased allocation of around Rs.1.01 trillion was already spent in the first five months of the financial year.

RURAL INDIA NEEDS INFRASTRUCTURE THAT REJUVENATES LOCAL LIVELIHOOD AND PROMOTES CIRCULAR ECONOMY

Structural reforms, urban makeover, SEZs, FDI in retail, infrastructure put together have failed to give livelihood to rural India. In fact, the whole dream of "ripple effect" and

7 https://www.business-standard.com/article/economy-policy/mgnregs-funds-fast-drying-up-as-demand-surges-amid-covid-19-pandemic-120091100035_1.html (Accessed on 7 December 2020)

"trickle down" approach of modern economy could not reach far and wide villages of India and do any good to the backbone of India – its agriculture.

This laid-back village, I am sitting in, is water rich and therefore best for production of paddy, wheat, makhana (fox nut) and freshwater fish, besides a range of vegetables and lentils. However, there are two major problems. First, the landholdings have become very small over a period and in most of the Kosi river affected belt, it is inundated for large part of the year, making it difficult to produce enough grains. Second, in the absence of any wholesale mandi facilitated by the government, traders buy the produce at much bargained price not reaching anywhere near the MSP declared by the government. In the absence of any exposure to value addition to their raw produce they end up selling it to the regular traders.

What villagers share is echoed well in an analysis[8] presented by the Centre for Budget and Governance Analysis (CBGA): "We can't expect demand to increase as 70 per cent of our population lives in rural areas and has stagnant incomes and wages. There is a need for revival of the rural economy with infrastructure investment and structural reforms. Agricultural marketing reforms should be a priority. For better price discovery, agriculture has to go beyond farming and develop value chains comprising farming, wholesaling, warehousing, logistics, processing and retailing. Agricultural exports should be promoted with various policies. Similarly, rural infrastructure and water management are other priorities. Stimulus and structural reforms can raise farmers' prices and wages and rise in demand for manufacturing and services."

Microenterprises established by and for rural youth is the need of the hour. Farmers of this village in Bihar can set up microenterprises that add value to the farm produce, pushing the product into supply chain. But how is this possible? Is the private sector interested in investing in rural India? Prima facie it seems difficult. First and foremost, the government must invest in rural infrastructure to develop roads, electricity, bridges, education and health.

Rajju Shroff, president of Crop Care Federation of India (CCFI) and MD of United Phosphorus Limited, has urged[9] the government to treble India's share in agri exports. He says: "India ranks second in global agriculture production at $367 billion and we have potential to double farmer's income and increase agri export to $100 billion by 2020."

The Rural Infrastructure Development Fund managed by the Reserve Bank of India's subsidiary National Bank for Agriculture and Rural Development (NABARD) is mandated to bring infrastructure development to rural India. However, due to several bottlenecks in implementation, it is not getting fully utilised by the states. This is putting a negative impact[10] on the utilisation of priority sector lending (PSL) quota available with the banks. PSL includes lending for agriculture, micro and small enterprises, education, and housing sector. One leading to the other is what is creating a slowdown in the rural areas.

8 https://www.cbgaindia.org/opinion/rural-infrastructure/ (Accessed by 7 December 2020)

9 https://economictimes.indiatimes.com/news/economy/agriculture/agriculture-exports-may-grow-to-100-billion-by-2022-experts/articleshow/60197117.cms (Accessed by 7 December 2020)

10 https://economictimes.indiatimes.com/news/economy/policy/nabards-rural-infrastructure-development-fund-needs-a-relook-says-rbi-official/articleshow/40928706.cms (Accessed on 7 December 2020)

Pumping money into investments in rural infrastructure not only creates durable assets in the long run to make the economy efficient, it also creates consumption demand in the short run, by putting money in the hands of construction workers, painters, electricians, masons and so on. As the private sector is reluctant to invest in rural areas due to low profitability, it should come directly from government investments in construction of rural roads and housing in terms of the viability gap in funding and housing subsidies. Public investment in rural infrastructure will in turn attract private investment with the expected increased profitability being a major incentive.

SKILLED RURAL YOUTH MEETING GLOBAL STANDARDS IS THE NEXT INFRASTRUCTURE INPUT

Infrastructure does not limit to only roads, toilet, water and electricity. Professional skill and sustainable livelihood are the next milestones to be achieved by the country. We must make our youth skilled to match the expectation of global quality standards.

A very interesting study published in EPRA International Journal on Economic and Business Review, Impact of Globalisation on Economic Growth in India[11], by PC Jose Paul, analyses the economic growth journey of India right from 1990-91 till 2014-15 and why we are still struggling in the economic sector despite completely changing gears from a socialist model of growth to corporate model borrowed from the west. While India started producing for foreign markets, our products could not meet the quality standards set by those markets. There were serious issues of lack of qualified labour, machinery, technology. Besides, social issues like child labour and caste discrimination also played a crucial role in our products not winning the markets. Quite interestingly, the sectors – agriculture, textiles and leather – that could have been ace contributors to our GDP performed the lowest.

The Ministry of Rural Development is undertaking two initiatives in skill development[12] under the National Rural Livelihood Mission (NRLM). The Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) is a placement linked skill development programme, which allows skilling in a PPP mode and assured placements in regular jobs in an organisation not owned by the skilled person.

The Rural Self Employment Training Institutes (RSETIs), thereby, enable the trainee to take bank credit and start his/ her own micro-enterprise. Some of such trainees may also seek regular salaried jobs.

As per the government data released for 2018-19, both the schemes surpassed their targets of skilling rural youth, but surprisingly it has not shown any impact in the employment/ livelihood status of India's youth. The reasons for this failure are many. Our education system fails to connect youth with employment, where the whole focus is on scoring marks and getting ranks. Skill development programmes too fall short of achieving their promised outcomes, where, again, the number of students undertaking courses matters more than number of youth getting employed. Having realised the shortcomings in both education and skilling programmes, the current government has embarked upon

11 https://eprawisdom.com/jpanel/upload/articles/1131pm19.Dr.%20P.C.%20 Jose%20Paul.pdf (Accessed on 7 December 2020)

12 https://rural.nic.in/press-release/training-and-employment-rural-youth (Accessed on 7 December 2020)

a new education policy and newer approach to Skill India Mission. Debates and analyses on both of these are yet to happen.

CHALLENGES AND IMPEDIMENTS IN SKILLING INDIA

A very thought provoking article[13] in The Pioneer by agricultural economist S Amarendar Reddy clearly emphasises that the buck now stops at strengthening rural infrastructure to produce export class products. He writes, "The goal of crafting a $5 trillion economy by 2025 is only achievable if rural India grows by 12 per cent per annum. In spite of increasing urbanisation in the last decade, the rural economy still contributes about 46 per cent to the national income. Once a predominantly agrarian economy, now rural India is more diversified, with the non-agricultural sector contributing to about two-thirds of household incomes.

"Most of the SMEs (small and medium enterprises), livestock and horticulture sectors have a huge export growth potential, which also provides high productive employment for the rural youth and generates more profits for the private sector. These sectors also provide quality employment and absorb educated youth with higher labour productivity in the post-harvest units, food processing industry and export sectors."

To infuse a new life and spirit in the times when the whole country is grappling with the economic breakdown post COVID-19 infused lockdown, Prime Minister Narendra Modi has launched a Rs.20 lakh crore worth of campaign titled Atmanirbhar Bharat (self-reliant India). This is a nationwide campaign to motivate youth to become entrepreneurs, work on their dreams and explore new avenues of enterprises. The new pitch of development is now 'Vocal for Local', which also influences consumers to buy local and strengthen local enterprises.

One of the fundamental challenges is of poor educational background with even basic literacy levels being a tough ask in the present generation of youth. Any livelihood model requires some amount of computer literacy, technology handling, book-keeping and a clear understanding about quality standards for selling. Reaching global standards comes at a much later stage. Hopefully all this is taken care of in the new National Education Policy 2020[14] that has been approved by the central government.

In states like Gujarat, Rajasthan, Maharashtra, Tamil Nadu and Andhra Pradesh, rural livelihood has seen a direct connect with global market and the youth can see the way towards setting up their own micro enterprises. However, when I look at the rural youth in several other states like Uttar Pradesh, Bihar or Madhya Pradesh, I fail to find any such orientation whatsoever. Finding a sundry job in Punjab, Delhi, Noida or Mumbai is the aim and beyond this, youth largely have no vision in the absence of any guidance and efficient government infrastructure.

Instead of luring multinational corporations for investments, rural micro, small and medium enterprises (MSMEs) must be promoted at a large scale by the government. Availability of microcredit, livelihood counselling centres and Jan Suvidha Kendras (public facility centres) style assistance to youth for setting up their own work, linkage with

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13 https://www.dailypioneer.com/2019/columnists/thrust-on-rural-india-must.html (Accessed on 7 December 2020)

14 https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf (Accessed on 7 December 2020)

market, either direct or through mid-sized traders, exhibitions, buyer-seller meets even in remote areas, should be organised by the government.

If all the recommendations put forth by a number of intellectuals and economists are implemented with passion and commitment, one day this village on the banks of river Kosi in Bihar will have its own 'Makhana Snacks' making unit, fish drying and canning system, wheat and lentil based healthy products, which will employ rural population, put money in the hands of the people and propel a circular economy.

Small is beautiful, they say. Let us think small, think diverse and see how more and more people can be employed in micro industries based out of Indian villages, in their natural resource, promoting local skill and work towards Gandhi's India that was self-sustained, ecologically responsible and left no one behind. I am curious to see how the design and spirit of an Atmanirbhar Bharat enthuses the dampened spirits of villagers, especially youth in Saharsa in Bihar, the first Indian state that went to polls post COVID-19 pandemic.

Alienating community in Loktak, Industrial fishing in Loktak lake

SALAM RAJESH

Loktak Lake, the largest freshwater (sweet) lake in northeast India, also called the only Floating lake in the world

For Oinam Rajen and his wife Roma, life has been a story of struggle to cope with the changing tides of the Loktak lake in Manipur, said to be one of the largest inland freshwater lakes in the eastern parts of India. Fishers by birth and living, Rajen and his family have lived in the harsh environment of the lake in the shadow of a hydel project that changed everything for them and hundreds of fishers dependent on the lake for their livelihoods and sustenance. Life in the lake during the 1970s, and earlier, was certainly quite different from what they are experiencing today.

In early part of 1983, the National Hydroelectric Power Corporation Limited commissioned a hydro project called as Loktak Multipurpose Hydroelectric Power Project, having an installed capacity of 105 megawatt (MW). A barrage named as Ithai Barrage was constructed at the confluence of the Manipur river and the Khuga river near Ithai Khunou village in Bishnupur district of Manipur as an integral component of the hydro project. The barrage impounded the water of Loktak lake and several other adjoining wetlands, turning them into a vast spread of water body. Loktak became an artificial water reservoir to serve the hydro project. Since then, life has been a constant nightmare for Oinam Rajen and the fisher families struggling to eke a living out of the lake's resources.

UNDERSTANDING THE ISSUE

Manipur, having land mass of 22,327 square kilometres (sq km), falls within the Assam Hills Province of the North East India Bio-Geographical Zone I. Its geographical location

is 23º50'N to 25º42'N latitudes and 92º58'E to 94º45'E longitudes. Strategically, an extension of the Eastern Himalayas southwards, Manipur lies at the crossroads of the Burmese, Chinese and Indian faunal and floral ranges. The ecosystem in Manipur consists of two interrelated biomes, wetlands and forests. Loktak lake, located towards the southern portion of the central Manipur valley, constitutes an important asset of the state's natural heritage. In terms of importance in biological diversity, Manipur falls under the Indo-Burma Biodiversity Hotspot, indicating presence of a wide diversity of biological life – some of which are endemic and rare to the world.

With a water spread of 289 sq km[1], Loktak is rich in biological diversity and plays an important role in the ecological and economic security of the region. Loktak and its associated wetlands support wide biodiversity ranging from aquatic and semi-aquatic plants to migratory fishes and wildlife like the endangered Manipur brow-antlered deer. Loktak was accorded the status of a Ramsar site of international importance in 1990. The principle behind the declaration of a wetland as a Ramsar site under the Ramsar Convention of 1990 entails the significant ecological services of the wetland to humanity and the natural environment. The inclusion of a wetland in the Ramsar list embodies the government's commitment to take up steps necessary to ensure that its ecological character is maintained for future generations.

The implementation of the Loktak project, initiated by the Ministry of Irrigation and Power way back in 1971 and duly commissioned in 1983, disturbed the entire lake ecosystem, resulting in extensive loss to biodiversity and displacing massive human population and the wildlife.

During the past five decades, Loktak's natural ecosystem degraded considerably due to the hydro project's impact. Many interventions in the lake during these past decades, including Ithai Barrage, dredging activities to de-silt the lake's bed, weeding, encroachments, and physical modification of the water body, contributed largely to the degradation of the lake ecosystem. Habitat changes caused by changes in hydrological regime of Loktak, its associated wetlands and river systems induced by human interventions are noted as significant reasons for the sharp decline in migratory water bird and fish population in the lake. The Loktak Development Authority and Wetlands International-South Asia[2] agree to this fact, wherein they say, "The populations of migratory and resident waterfowl have declined during the last few decades due to poaching and changes in ecological character of the wetland. The habitat of sangai deer in Keibul Lamjao National Park is also threatened due to habitat degradation." The national park, which lies in the southern portion of the lake, is equally affected by the changes in hydrological regime of the lake.

Professor Hijam Tombi Singh and Dr Rajkumar Shyamananda Singh (1994)[3], who worked in the lake studying its ecology during the early 1990s, noted that the Loktak Project caused the disappearance of over 20 species of aquatic plants of economic and commercial value in the lake area. The project caused the disappearance of several species of indigenous fishes that traditionally migrated upstream from the Chindwin-Irrawaddy river system in western Burma through the Manipur river to spawn in Loktak lake and adjoining wetlands. It caused accumulation of floating biomass, locally called as phumdi, and spread of invasive species of weed and grass. The stagnation of water led to accumulation of silt load brought downhill from the western catchment, and pollution load carried by rivers flowing through urban areas, accelerating process of nutrient enrichment. Ecosystem degradation led to thinning and deterioration of the phumdi biomass, which supports habitat and shelter for the Manipur brow-antlered deer, hog deer, wild boar and other wildlife in Keibul Lamjao National Park.

In these past four decades and more, the Manipur government through its undertaking, the Loktak Development Authority, set up in 1987 to address issues of the lake, had initiated schemes to work for the conservation of the lake. However, things have not worked out as planned. A reason cited by critics is that the workforce of the authority is limited to engineers and there is a lack of experts on wetland ecology and management. The other reason cited is the lack of active local community participation in the overall monitoring and management of the lake. In the absence of effective conservation and management plans, Loktak is largely seen in a process of 'ageing' due to factors like increased human intervention in the lake area, siltation, pollution, physical modifications, reclamation for agriculture, and encroachments.

LOKTAK SUPPORTS LIVELIHOODS

The natural resources of Loktak lake provide the backbone of economy for around one lakh families living within it and around its peripheral areas. For the fishing community in the lake, like Oinam Rajen and his family, their entire life is spent fishing day in and day out. From dawn till dusk, the fishers are out there in the open waters of the lake setting their fishing nets, collecting the day's catch and taking the catch for sale in the local markets. Each day of the year is spent only on fishes and fishing. This is the only occupation for them to earn their living, buy their essentials and send their children to school. The larger part of their lives is spent huddled in their dugout canoe, in rain and in sun, through the day and the night, fishing.

Above, Mother and child on canoe at Loktak. Below, Women travelling in dugout canoe at Loktak.   Photo by Salam Rajesh

The fishery in Loktak lake and its associated wetlands accounts for up to 60 per cent of the total fish produce in Manipur. Migratory fish species coming upstream from the Chindwin-Irrawaddy river system in western Myanmar contribute about 40 per cent of the capture fishery in Loktak and adjoining wetlands, and up along the Manipur and the Nambul rivers. With Ithai Barrage blocking their passageway, there has been sharp decline in the fish yield, considerably impacting the traditional fishery and the fishers' lives. Migratory fishes no longer reach the lake obstructed by the barrage.

Canoe rally to mark World Wetlands day. Photo by Salam Rajesh

To compensate the loss, the state's fishery department introduces fingerlings of the carp species into the lake every year.

Akashini Devi, a resident of Champu Khangpok floating village located inside the lake, says she and her family have lived in the lake for years, engaged only in fishing. She was brought up from her childhood learning the nuances of navigating the waters of the lake, huddled in her dugout canoe and laying nets, and setting out early every morning before daybreaks to locate her nets and fetch in the day's catch. The only occupation she knows is fishing, which feeds her family. Her family does not own any agricultural land and so they depend entirely on capture fishery for their sustenance. Like the hundreds of fisher families as her own, Akashini struggles between coping with the harsh environments of the lake and the threat from the state to evict them from the lake on grounds that they are illegal occupiers.

CONSERVATION OR DESTRUCTION?

The Manipur government passed a law on 5 April 2006 titled as the Manipur Loktak Lake (Protection) Act, 2006, under which the state sought to control and administer the management of Loktak lake with the objectives of its conservation, to halt the process of degradation of its ecosystem and to rejuvenate its health. The Act empowers the state, represented by the Loktak Development Authority as the implementing agency, to act for the protection, preservation and conservation. However, the implementation of the law became controversial when it was made to understand that the government sought eviction of the fisher families from the lake on the grounds that they were polluting it.

In November 2011, the Authority started evicting the fishers settled at Champu Khangpok floating village. Fishing huts that were built with bamboo and thatch on the floating biomass were torn down and burnt one after the other. More than 400 of these fishers' huts were torched, destroying everything the fishers owned – fishing nets, cooking pots, clothing, beds, solar batteries and even cats that the family reared. There was, however, strong resistance from the fishers resulting in a stiff stand-off between the fishers and the authority.

World Wetlands Day 2019
at Champu Khangpok
floating village, Loktak.

Yet later in 2019, the Manipur government came up with a fresh proposal called as 'Loktak Inland Waterways Improvement Project', which sought to popularise tourism by plying motorised boats across the lake for tourists. The fishers opposed this project on the grounds that plying of motorboats widely across the lake could disturb its fragile ecosystem besides dislocating the fishers from their traditional fishery practices. The boats could rip apart the fishing nets laid just below the water surface to catch fish. As a component of the project, there were suggestions to remove the biomass to avail the clear water body. However, much of the biomass is utilised by the fishers for their traditional fishery practice, locally called as 'Athaphum-namba'. The practice involves fishery in open water fish culture ponds that are formed by dragging in cut biomass to form the circular ponds. This fishing practice yields the maximum earning for the fisher families, with fish catch worth around Rs.10,000 from a single pond if luck and hard work favour.

The objection to the state's intervention comes from the reasoning that the projects were designed without prior consultation and knowledge of the fishers, and without explaining how the projects might affect them in the long term. The contention is that these projects had potential to displace the fisher families and dislocate them from their traditional fishery and livelihoods. The other contention is that even as the fishers seek to contribute their might towards conservation of the lake, their voices are not heard and they do not find any reference on their involvement in any of the planning process and management of the lake by the authority.

The Manipur government sought funds worth Rs.378 crore from the Government of India under the Special Plan Assistance to clear most of the biomass crowding the lake's water surface within a time span of three years beginning January 2010. However, this project is seen as a failure as the authority had not managed to accomplish its objective. As of today, the lake is still full of the phumdi biomass and is crowded with invasive weeds. The fishing community did propose to the authority to rope them in as they have local knowledge of cutting up the biomass in pieces and clear these from the lake through the Khordak channel, which is a natural outlet connecting Loktak with the Manipur river. However, the lake managers have so far not responded to this proposal from the local community.

COMMUNITY PARTICIPATION IN LAKE CONSERVATION

There are a few initiatives at the community level in the general effort at conservation of Loktak. One of these initiatives was taken up by non-governmental organisation Manipur Nature Society in association with villagers of Tokpa Kabui, which is located on the eastern face of the Thangjing-Loiching range that forms the western catchment of the lake. The NGO worked in around 500 hectares (ha) of forest land belonging to the village community, with a projected total area of 1,000 ha in later times. The emphasis was on the natural and aided regeneration of forest to check top soil loss and revitalise the micro-watersheds, healthy growth of the vegetation cover and to induce the return of the wildlife in the area. Micro vegetative check dams were constructed along the course of the hill streams, and few water bodies were created to slow down the process of silt load deposition downhill. The water bodies provide space for fishery by the village community. The villagers formed Tokpa Nature Club with around 80 volunteers consisting of boys and girls belonging to the Rongmei tribe to take up much of the community-based management work of their forest land.

Other than the Tokpa Kabui initiative, there are some efforts at conservation of wildlife in the peripheral areas of the lake. The Sangai Protection Forum, based at Keibul Lamjao, has worked for the protection of the sangai (Manipur brow-antlered deer), hog deer, wild boar and other wildlife in Keibul Lamjao National Park from poachers and been involved in rescue of stranded animals during floods. The Nongmaikhong Youth Club, Khoijuman Students' Club, Generation de New Image Manipur (GENIM) and Centre for Conservation of Nature and Cultivation of Science (CCNCS) work towards protection and conservation of migratory water birds. During the winter months from October to February, thousands of migratory water birds visit Loktak from as far as Europe, Siberia and China. In 2019, CCNCS in collaboration with Bishunupur forest division of the state's forest department declared a portion of the lake near Thinunggei village in the district as a bird sanctuary to protect roosting migratory water birds, in addition to protecting the resident avifauna population in the area.

In late 2011, fishers living at Champu Khangpok village formed an association called All Loktak Lake Areas Fishermen's Union, Manipur with the objective of addressing livelihoods issue and concerns on the ecological status of the lake. The other purpose for forming the union was to resist the government's attempts to evict them from the lake. The union organises awareness and motivation campaigns to attract active participation of the local community in realising its objectives. As part of their conservation strategy, the union organises consultations amongst the locals, observation of significant days dedicated to the natural environment, canoe rallies, and lake clean-up. In fact, the union declared a portion of the lake as a fish sanctuary to serve several purposes including control of overfishing, indiscriminate harvesting of fingerlings and promotion of native fishes.

The other objective of declaring the fish sanctuary is to control and administer a portion of the lake within their control to raise awareness and to protect migratory water birds during their roosting season between October to February. The union recently started an initiative to sow seeds of aquatic plants like water chestnut and fox nut, which they consume as food. Populations of aquatic and semi-aquatic plants that are consumed as food and are of economic value have declined due to the degradation of the lake. The fishers hope to increase the plant population to meet their food needs and to revitalise the lake ecosystem.

CONCLUSION

For Oinam Rajen, his wife Roma and the other fishers, their future lies in the healthy regeneration of the lake ecosystem. They live off the lake and its resources. If the lake faced an unnatural death, it would spell the end for them. It is a dire need for the fishers to step in to save the lake, as best as they can in their own way, which is why the union came into existence, and for the past nine years they have been actively involved in many ways to generate awareness and support for conservation of the lake.

The only hitch in the story is that the fishing community does not figure in the government's scheme of things. They are not represented in formulating and designing of projects on Loktak. The government considers the fishing community as encroaching upon the lake and even accuses them for polluting it. In fact, the government has repeatedly tried to evict them from the lake.

Oinam Rajen and his family, and the rest of the fishers, have no other option than to resist and fight back for their rights to life.

Salam Rajesh at Champu Khangpok floating village, Loktak. Photo Oinam Rajen

ENDNOTES

1. This has been revised to around 236.21 sq km only as per a 2016 report of the Loktak Development Authority.
2. LDA-WISA Newsletter 'Loktak', Vol.1, October 1999.
3. Singh, H. Tombi and Singh, R.K.Shyamananda, 1994.Ramsar sites of India: Loktak lake, WWF-India, p.32

Women power to save Loktak Lairembee

NANDINI THOCKCHOM

our needs, our right.
Photo by Nandini
Thockchom

Ask anyone living in and around Loktak Lake what it means to him or her.

"Loktak Ema[1] is our provider" will be the reply and it will have its echoes loud and clear across the vast expanse of the lake.

Loktak Lake is situated in the state of Manipur. Measuring about 235 square kilometres, Loktak is the largest freshwater lake in Northeast India. The lake has within it the only floating national park and the natural floating village in the world. It is also home to thousands of fisherfolks.

Since centuries, through generations, many have depended, and shall continue to depend, on the lake. It not only provides food and shelter to hundreds of families living in the peripheral shores but also shelters many species of fish, aquatic plants, endangered mammals and migratory birds. It provides sources of livelihood for thousands of people directly or indirectly dependent on its aquatic resources. It plays an important role in making the valley fertile and productive. The lake is the foundation of several legends, myths and historical events that provides insights into ancient Manipur.

A visit to Loktak, a listed Ramsar site, is a must on the itinerary of any visitor to Manipur; many from the state itself too long to have a glimpse of the lake from any of its peripheral locations. These visits, seemingly unwarranted, are proving to be a systemic bane rather than a boon for Loktak as well as for the people living in and around it. For the very reason of these visits, each and every

Scan for Listening Article

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1 Ema is 'mother' in Manipuri, and people in general, those who live on the lake as well as those depend on it refer to Loktak as Loktak Ema.

Canoes and Women in a meeting.
Photo by Nandini Thockchom

ruling government has tried to flex its muscles by pushing a series of tourism related projects to give a boost to tourism, supposedly the only viable industry in the conflict torn state – all at the cost of Loktak.

Understanding the lake requires going back to history prior to the construction of Ithai Barrage, where there were patches of water bodies, which during monsoon became one body called Loktak. These smaller bodies of water were separate lakes with separate names. They were named according to certain 'owners' based on first use of clans or sub-clans or by the area or some kind of landmark. Only those who reside there now know by these separate names or else it is one just big lake, Loktak. The current development politics of Loktak can be broadly be asserted as those who know the many parts of Loktak versus those who know only one vast Loktak.

> "We are the user and protector of the lake and should be the 'owner' of the lake. But the government has been taking up projects in the lake without the consent of the Nga-mees."
> (Note on interviews is at the end of the article)

Therein lies the problem of contestation of ownership as the state, according to the Manipur Loktak Lake (Protection) Act, 2006, is the state authority through Loktak Development Authority (LDA) to administer and manage the lake. LDA was constituted in 1986 and reconstituted by the Act to look after the management and conservation of the lake, where understandably the committee is dominated by government officials and with little or no participation of local stakeholders.

The Act defines the traditional dwellers of the lake as 'occupiers', which is in clear contradiction to the Ramsar Convention's Resolution VII (8) that gives room for recognition of stakeholders. The Act is in contravention to the National Wetlands Rules of 2017 as well where crucial "Wise Use" principle is not even mentioned once. The Act itself, moreover, is in clear violation of the statutes given in the United Nations Declaration of the Rights of Indigenous Peoples, which recognises indigenous peoples who have been living in harmony with the lake for centuries as its guardians and beneficiaries. The lake people are now being defined as occupiers and encroachers.

THE CONTEST FOR OWNERSHIP

As a follow up to the enactment of the Act of 2006, Loktak Development Authority (LDA) officials entered into the lake area along with police during mid November 2011. From 15 November to the 25 November, it launched an eviction drive wherein several huts built on the floating biomass phumdi[2] were dismantled and burnt to ashes. Around 777 out of 1,147 phum-huts[3] inhabited by around 10,000 people within the lake were forcibly evicted by during this period.

> "We tried to talk with the officials calmly, but they didn't listen to us. We thought that those in uniform would at least show some decency but no they didn't. They treated us like mosquitoes and flies".

> "We saw the Watermaster and I told them, let us climb the machine. So, we went to climb it and I almost reached the top. They tried tickling my foot but I kicked them, some in the face. They could not stop me. If I was on the machine then they won't dare destroy the khangpoks (phum-huts) or if they dared I would have died but I was ready to sacrifice my life to save Loktak Ema. I came down when people started rushing and lowered the machine."

> "Then when they started chopping the khangpoks with swords, a team led by the secretary of All Loktak Lake Fishermens Union, Manipur tried to commit suicide. They laid themselves down in the phumdis and shouted out to first shovel-dig in their body before destroying the khangpoks."

Despite strong protests by the fishers, the LDA went ahead with the eviction and 14 more phum-huts were destroyed in January 2012 without any prior notice. Between 8 March 2012 and 29 March 2013, it destroyed 56 more phum-huts in contravention to a high court order of 25 January 2012 staying the eviction. On 16 February 2013 a contempt notice was issued against the LDA for violating the court orders. However, it attempted another arbitrary effort at eviction again on 29 March 2013.

Then came the lull – no activities for almost a decade from the government side. It is during this period that the fishing families worked to strengthen themselves under the All Loktak Lake Areas Fishermen's Union, Manipur (ALLAFUM). The main leaders are men but ALLAFUM drew its strength from the women who wore the spirit of resistance. ALLAFUM's solid organisation is reflected in the fact that no one, including the government, dares to bring their motor boats to the centre of the lake. The ALLAFUM members will fiercely oppose any such move as motor boats cut and destroy the fishing nets. The organisation went to court and till date LDA has not been able to abide by the court's order where it has been directed to conduct a joint survey of the fishing families living on floating huts.

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2 Floating islands made of soil, organic debris, and matted vegetation that are in various stages of decomposition

3 Huts on the floating islands

Even though LDA was not able to operate inside the lake as earlier, it was continuing to push projects along the periphery of the lake. A small hillock by the name of Sendra was leased away for a resort while a road from Mayang Imphal to Toubul was metalled dissecting almost one-fourth of the lake. LDA was also planning a ring road around the lake. Often, ALLAFUM members, especially women, resisted such projects.

CURRENT RESISTANCES

In the current scenario, renewed and serious attempts are being made by the government to stake claim over the lake, which is considered to be against the way the lake and its people complement each other. We will look primarily at two issues and reflect on how the fishing women and the villages responded to these proposals from the government.

On 3 January 2018, the state government's forest department notified through local dailies of their intention to convert the Loktak lakefront of Thinungei village into a bird sanctuary. Thinungei is one of the fishing villages on the western lakeshore. Migratory birds[4] from around the globe visit Loktak in winter every year in large numbers but they flock to many locations across the lake and not just Thinungei. So, the government notification to confine the bird sanctuary only to Thinungei came as a surprise.

An RTI query filed by Indigenous Perspectives[5] revealed that there were no scientific background studies, document and data that could be a base for notifying Thinungei as a bird sanctuary[6]. The massive protests in response to the notification seem to have forced the government to lie low, at least for the time being.

Here are some quotes from women of Thinungei that reflects the mood.

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4 https://avibase.bsc-eoc.org/checklist.jsp?region=INnemn01&list=howardmoore

5 Indigenous Perspectives is an NGO based in Imphal that focuses on local and indigenous issues. This author is associated with it since its inception.

6 Indigenous Perspectives filed an RTI on 21 January 2019 and the response from the office of the principal chief conservator of forest/ wildlife and chief wildlife warden came on 7 February 2019.

According to response No. 2 of the RTI, the Government of Manipur has not prepared any detailed project report (DPR) nor any background documents on the proposed sanctuary. It simply says that "....it is the prerogative of the state government in accordance with the powers .... Under section 18 of the Wildlife (Protection) Act, 1972 ... to declare its intention to constitute any area as a sanctuary if it considers that such area is of adequate ecological, faunal, floral, geo-morphological, natural or zoological significance, for the purpose of protecting, propagating or developing wildlife or its environment". However, under the same RTI response No. 5, it says that there is no specific bird estimation done for any specific location including that of Thinungei though the forest department has bird census data from 2011 till 2018. Strangely and in contradiction to saying that there is no location specific data, the same response No. 5 claims that Thinungei is the area with maximum density and species diversity!

In other words, there are no scientific background studies nor any document nor any data that can inform a decision to announce a notification for TBS. It is at best an arbitrary decision of the department and therefore the notification has no standing and has to be annulled until adequate information is gathered.

Above, Mass Peaceful Canoe Procession & Public meeting. Below, Consultation at Thinungei. Photo by Nandini Thockchom

"When we heard about the Thinungei Bird Sanctuary, we panicked. Prohibiting us from entering the lake and only reserving a space for the birds is meant to cut off the source of our livelihood and it is a case of gross violation of human rights. No discussion was held with the villagers before notifying it as a bird sanctuary."

"With the government being adamant on its proposal without any discussion with the villagers and the villagers aspiring to be included in the planning process, the rift grew larger. Subsequently, the officials who came to survey were barred from entering the area by the people, with the women in the forefront. The fishing communities of Thinungei had several rounds of meetings amongst themselves to discuss their strategy."

"We were not afraid of even those in uniform having guns, tear gas or sticks. They said, 'Nongmei amuk kappada, ki dana chen-khradabane' (a single shot and the crowd will disperse). So, we told them 'Noina ngammaga hatlu laklo, eikhoi ngamma-ga noi hatkani' (kill us if you can. But if you can't, we will kill you)".

It was a do or die situation for the villagers. The government offered no alternative source of livelihood except providing a job to one member from each household, which meant security for a generation only. However, submission to such an offer raises the question of how the next generation will survive, while Loktak has been sustaining generations. Other alternatives like duck farming, piggery, poultry and textiles were also cited but that came with high risk in the market with higher investments. The meagre sum of compensation people were offered would dry up within months. On the other side, women and men who all depended on fishing were to be badly affected if the bird sanctuary came up. So they resisted. Women barricaded the road by hanging out their

phaneks[7]. They came out in large numbers and took the lead in the rallies and protests that ensued. At least, 10 persons were seriously injured, all women. Unsurprisingly, only one man was injured in the protest.

Here I would like to highlight the critical question of the model of conservations where western model[8] does exclude people or keeps them on the margin to the extent of categorising them as 'occupiers' or 'encroachers'. We see this play out at Keibul Lamjao National Park[9] where people are completely excluded from the conservation of Sangai. What we see in the Loktak Protection Act of 2006 is a replica of a typical western conservation model where the law seeks to remove any human activities in the core zone of the lake.

The proposed bird sanctuary at Thinungei reflects the same thinking. However, the intricate relationship between people and nature will fall apart if this model of conservation gets implanted. When I enquired further, local people argued that they had always lived with the migratory birds and knew which species of birds occupied which particular parts of the lake and what they fed on. They argued that the whole lake must be a bird sanctuary rather than just their village and that the local fishing villages and those who lived in the middle of the lake in floating huts must be made the guardians of these migratory birds rather than the current model of the government where people would be excluded in the efforts to protect the birds.

I must also quickly mention another project that will have long term consequences and which has been highly contested by local fishing groups. The Loktak Inland Waterways Improvement Project was suddenly in the news when the Press Information Bureau (PIB) of the central government announced on 28 November 2019 that this project had been sanctioned Rs.25.6 crore. The project plans to connect three islands and seven villages in and around the lake by motor boats. This project has met with resistance from all the fishing villages. They have now come together under one umbrella body known as Ngamee Lup (the fishing federation) to oppose it. Ngamee Lup is now an informal body formed by executive members of different fishing unions and associations and this is for the first time an apex body of fishers of the valley of Manipur has come up to identify and protect the rights of fishers as part of the joint resistance against the Loktak waterway project. Fishing associations of Ningthoukhong, Thinungei, Thanga and Champu Khangpok have made separate submission to the grievance committee of the Manipur State Wetlands Authority asking the government to drop the project as it may destroy the lake ecosystem, which, in turn, may destroy the livelihood of the fishing community. They say the dugout canoes or non-motorised boats are lake-friendly while a motor boat is noisy and can spoil the water with the use of oil, destroy fishing nets, dis-

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7 Traditional sarong worn by women

8 The term 'western model' here is used in the sense as used by authors such as Ramachandra Guha who explained in several papers on varieties of environmentalism about western or northern conservation models where people are kept out of an effort to protect a specie. He goes on to say that in the south people have lived with animals. When conservation sans people is 'imported', they tend to create several problems with local communities.

9 Keibul Lamjao National Park (KLNP) is a 1977 declared national park of 40 sq km within Loktak Lake. People who were dependent on this wetlands were deemed encroachers. There has been intermittent conflict of people with park officials since then. Loktak is a fine example how different conservation models have been played out.

Left, Water-Master at a background in a meeting, Right, Life as it is in Loktak.
Photo by Nandini Thockchom

turb birds and numerous seen and unseen aquatic life. A critique of the waterways was prepared by ALLAFUM along with other supporting organisations and was also submitted to the government[10].

STANDING UP FOR LOKTAK

Based on the above information and broad movement of the fishing unions of Loktak, I would like to analyse the role and contributions of women in resisting laws and projects that not only adversely affect Loktak's ecology but also undermine their own livelihoods and existence.

In Loktak, fishing is a way of life; in fact, fishing is life. This is true for many other wetland areas also. Besides, catches from capture fisheries comprise the main source of protein for the inhabitants. Among the Meitei indigenous people, who are primarily settled in the small Manipur valley area, in every meal you will eat fish, whether in fried, dried, smoked, fermented or fresh in the dishes. Fishery in Loktak Lake accounted for up to 60 per cent of the total fish production in the state[11] but this has reduced drastically due to several reasons such as the impact of the barrage and declining water quality.

Loktak is the primary source for fish, the staple diet of Manipur, as dependence on the riverine system is seasonal. More than 100,000 people directly or indirectly depend on this ecosystem for their food and livelihood. Over the decades, however, the Ithai Barrage has altered the hydrology and ecology of the Loktak wetland, while continuing to pose threats to the food security of the indigenous community. Nevertheless, women across the breadth and length of the lake persevere to feed their families and make ends meet through the year. It is poignant here to mention that most of the families are indebted with high interest rates borrowed from local moneylenders and at the onset of the COVID-19 pandemic in 2020, they appealed to the government to give relief as the

10 https://sandrp.in/2020/03/01/critique-of-the-loktak-inland-waterways-improvement-project/

11 Loktak. Newsletter of Loktak Development Authority. Vol. March 2003-Vol.3.

lockdown affected their sales. However, there was no response from the government.

> "Here in the lake, we women don't wait for the men. We do what
> we can. We can do almost what the men do. We look after our
> families, help each other out in spreading the nets and catching
> fishes. A husband doesn't usually fish alone so division of labour is
> equitable."

Livelihood activities along with fishing in Loktak Lake are largely a women's domain. They play multiple roles – from catching to processing to transportation to marketing. During the season when fish are available in abundance, women spend several nights working to preserve them in various forms for use during off-season. Although men do assist in larger scale operations, which do not happen regularly, in general women independently undertake the smaller scale activities such as laying fish nets, drying of fish and then taking them to the market. Fish marketing is generally undertaken by women and is an exclusive domain of women in retail trade sector[12]. It is the fisherwomen who also supply the unique edible aquatic vegetation of the lake to the larger markets as their work is not limited to only catching fish. And Loktak provides immensely.

As women are involved with fish trading for the major part of the day, they are hard pressed for time to accomplish other activities. Women face enormous problem in the transportation of fish in the early hours of the day. The most difficult problem is rowing a boat and catching a public transport to the market in the wee hours and that of frequent strikes by different groups, which result in loss of several days a month. With no cold storage facilities in place, women face hardship in preserving the fish that are not sold. A common means of preserving fish is to smoke it. No man ever smokes fish; it's the women who do this tedious task with possible health hazards of overexposure to smoke.

Women have been visible in every form of protest and dissent in Manipur for the past decades and Loktak is yet another theatre. The state has consistently responded with violence and repression. In certain cases, where persons of influence or projects with high economic returns like tourism were involved, the police would come out in force and resort to teargas firing and baton charge. There is very little formal documentation of this form of extensive state condoned or perpetrated violence against women. The women who were injured during the protests might heal physically but the trauma remained. There is also angst of the uncertainties of their very survival and means of livelihood in the future. When ten women were brutally assaulted by an all-male Manipur police posse at Thanga Chingjin for protesting against the Act on 19 December 2011, it created shock and panic amongst the villagers for many years to come.

But then, when it comes to any forms of resistance, women have led from the front when the forces in uniform arrive to back officials implementing government order. This is because when a man tries to speak or even resist, those in uniform usually beat him up. In worst cases, they do not hesitate to fire upon men. Besides, in Manipur it is quite easy for the police to accuse men who resist any development project of having links

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12 Nupi Keithels or women markets dots all over the valley of Manipur and these are markets where only women are allowed to sell. The central market of all these women markets is the Nupi Keithel situated in Imphal, the capital of Manipur.

with the underground militant groups. So, in most cases women lead from the front but that does not mean that men lag behind. The shared understanding of the need to protect the lake is the key to their active participation in the space as a collective, no questions asked, no seconds lost in dire circumstances, it is personal and so it is political.

> "If the government comes back to Loktak with projects that will destroy the lake we will resist and resist, and we are ready to even go further than what happened in the Kangla nude protest or on June 18."

These are indigenous women who rely on nature and primary resources (here Loktak) for their survival as well as for their spiritual and cultural grounding, and they continually find themselves directly threatened by the proposed projects while trying to survive through the poverty manufactured primarily by Ithai Barrage[13]. In most regions, women are already central stakeholders – in farming, water and resource management, and household consumption decisions – making them uniquely poised to chart a new social, economic, environmental, and political course[14]. It is time for the policymakers to try not to 'nurture' nature but to harmoniously work towards and for a sustainable future. While there is an increasing consciousness of the relationship between women and nature globally, the women of Loktak continuously reaffirm these convictions.

Loktak is regarded as Ema and it is the female spirit and power that has transcended over the centuries providing sufficiently to those dependent on it. It is also the intimate knowledge of the lake by the fishing community, which has enabled them to protect Ema with all their candour. Violating Loktak Ema is an attack on womenhood, and the fishing women of Loktak shall not absolve any perpetrators and shall retain their resilience and fight for the regeneration and sustenance of Loktak Ema.

WOMEN INTERVIEWED FROM END OCTOBER 2020 TILL 14 NOVEMBER 2020.

Champu Khangpok floating village:-
Ema Ekashini (53) was the one who climbed the Watermaster to stop the destruction of the floating huts
Ema Sanajaobi (55) and Ema Chaoba (54) Ema Thasana (48)

Thinungei:-
Ema Memma and Ema Sorokhaibam Joybati Leima (58)

Ningthoukhong:
A group of women were interviewed in a focus group discussion and names have not been given as such as the output were rather general.

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13 To understand the impact of this barrage please refer to http://www.e-pao.net/epSubPageExtractor.asp?src=education.Scientific_Papers.Ecological_social_impacts_of_Ithai_Barrage_Part_1_By_Ramananda_Wangkheirakpam

14 https://www.opendemocracy.net/en/5050/mapping-womens-resistance-to-social-and-ecological-degradation/

I.

India's Health Infrastructure: Prescribing a Fair Global Pandemic Response

The regime of patents has been a huge stumbling block in making essential drugs and vaccines available at affordable prices to billions of poor in the developing world. The unequal access to Covid-19 vaccines has yet again underscored this sordid fact. According to the Our World in Data website, even after two years since the Covid-19 pandemic began, fewer than 10 percent of people had received at least one dose of a vaccine in low-income countries. The figure is about 80 percent in high-income countries. In June of 2020, India and South Africa had jointly proposed patent waiver on vaccines to the WTO in June 2020 but still there is no consensus on it. In this section, Shalini Yog Shah talks to legal advisor KM Gopakumar from India and Thokozile Madonko likewise interviews South African researcher Dr. Marlise Richter from South Africa to unpack the waiver proposal and highlight the intersecting ways that vaccine power regimes further exacerbate existing gender and social inequities in developing countries. Gopakumar argues that the wavier, if adopted, would open up the policy space for WTO members bypass the patent regime. In addition, he says "it would also enable the local producers in Global South to produce the therapeutics, vaccines, diagnostics and other health products required for COVID-19 response without the fear of IP infringement." Richter is worried about "the ever-widening gulf between the poor and the rich and between the Global South and the Global North; the environmental disregard that catalysed this pandemic; and the lack of genuine global solidarity." She believes it is absolutely critical not just to invest more in health but also to create more equitable societies that respect the natural environment. But to bring all this about, she believes we require "a radical rethink of our national/ regional/ global priorities, the values we hold, who should lead us, and how we distribute power and resources."

Interview with K M Gopakumar of India on vaccination infrastructure

SHALINI YOG SHAH

The "scandalous inequity" in COVID 19 vaccines exposes acutely and in distinct ways the structural cleavages in our global health system. With the Global North having siphoned much of the available vaccines, the Global South pays heavily with lives and livelihoods. In the current scenario of COVID-19 medicines and vaccines that is fraught with patents, trade secrets and intellectual property regimes, India and South Africa filed a waiver proposal before the World Trade Organisation to counter shortages. Civil society experts from India and South Africa – KM Gopakumar and Marlise Richter – unpack the waiver proposal and highlight intersecting ways that vaccine power regimes further existing gender and social inequities in developing countries.

CONNECT WITH OUR GUESTS:

> K.M. Gopakumar (Gopa) is the Legal Advisor and Senior Researcher with the Third World Network (TWN). He has more than two decades of experience in the area of global intellectual property regime and its impact on developing countries.

What is the TRIPS Agreement and why are its flexibilities not enough to ensure fair and just access to vaccines worldwide? Why is the COVID-19 Vaccines Global Access (COVAX) facility not enough?

> KM GOPAKUMAR
> The Agreement on (TRIPS) creates a legal obligation and sets minimum standards on members of the WTO to protect and enforce various intellectual property (IP) rights such as patent, trade secrets, copyrights, industrial designs and trademarks. Except for the least developed countries (LDCs), all WTO members are to adhere to the minimum standards prescribed under the TRIPS Agreement.
> One of the TRIPS obligations adversely impacting people's health is the compulsory patent protection on pharmaceutical inventions. As a result, all WTO members, including developing countries like India, are under an obligation to provide patent protection to medicines, vaccines, diagnostics and so on, and this legal monopoly prevents other companies from producing the said patented pharmaceutical products. Often this monopoly is abused by the patent holder, which leads to charging higher prices for pharmaceuticals, thereby preventing the people and governments from

buying the newly efficacious medicines. In other words, the high prices of medicines restrict the developing countries to fulfill their human rights obligations pertaining to the right to health and the right to science. Another TRIPS provision that has a direct impact on access to medicines and vaccines is trade secret[1] protection. The current regulatory framework for the marketing approval of generic production of vaccines and biotherapeutics insists on following the manufacturing process of the originator – the company that first obtained the marketing approval of the vaccine/biotherapeutics – to waive the clinical trial requirements.

Since the originator companies protect the manufacturing process as a trade secret, generic vaccine and biotherapeutic producers end up in repeating the clinical trials, which involve considerable money and time. Although originator companies submit the details of the manufacturing process to the medicine regulatory agencies in the dossiers submitted for the marketing approval, the TRIPS Agreement prevents regulatory agencies from disclosing such information without taking measures against unfair commercial use. The only exception to the above rule is when such disclosure is necessary to protect the public. However, there is no clarity about the scope of the exception, i.e., if the regulator agencies can provide the information to potential manufacturers to fast track the production. Thus, these provisions of the TRIPS Agreement cumulatively aid in creating the monopoly of power to the pharmaceutical transnational corporations (TNCs).

Nonetheless, the TRIPS Agreement contains certain provisions to prevent abuse of monopoly or provide medicines at an affordable price, commonly known as flexibilities. One of the most important flexibilities is the use of patents without the authorisation of the patent holder known as compulsory license (CL), which allows other manufactures to produce the patented medicines without the permission of the patent holder. Generally speaking, there are two types of compulsory licenses – compulsory license granted on the request of the private entities and compulsory license initiated by the government (government use license). The use of these flexibilities enables other companies to manufacture the product to ensure economic accessibility and meet the demand. Thus, the flexibilities are critical to ensure access to medicines and other health products.

However, these flexibilities have only a limited utility[2] in a pandemic situation due to the several reasons. First, the range of health products such as diagnostics, therapeutics, vaccines, personal protective equipment (PPE) and ventilators required to respond to COVID-19 is enormous and many of them are protected with different IP rights including patents, trade secrets and copyrights. The use of TRIPS flexibilities in the public health context is limited to patents and many countries do not have CL provisions for copyrights, trade secrets and industrial designs. Further, products like vaccines are protected with a large number of patents while many patents are in

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1 https://academic.oup.com/jiplp/article/15/11/849/5998264

2 https://msfaccess.org/compulsory-licenses-trips-waiver-and-access-covid-19-medical-technologies

the pipeline. Issuing CL at this stage may raise enormous pressures from the patent holders and developed countries too. Further, the patent is given on a case to case basis and is product-specific. In a pandemic, we need to develop new products, and the IP can have a chilling effect on innovation, because innovators who do not own the IP in a particular technology might be reluctant to use the IP-protected technology for innovation. Therefore, new approaches are required to remove the IP barriers to scale up the production of COVID-19 health products. Currently, there is inequitable access to various COVID-19 health products, including vaccines. Countries having high income are getting vaccinated 30 times faster[3] than the low income. COVAX, the international mechanism to ensure equitable access to vaccines, could not fulfill its promise of providing timely access to 2 billion doses covering 20 per cent of the population living in the low and middle income countries (LMICs). It is worthwhile to note that this 20 per cent vaccine coverage is not enough to provide effective protection to the population in LMICs, as it requires vaccination of 80 to 90 per cent of the population.

The current situation demands taking urgent measures to remove the monopoly in vaccine manufacturing and scale up the production of vaccines. Waiver of TRIPS[4] obligation for the protection and enforcement of IP rights facilitates the removal of an important barrier to the local production or replication of IP-protected health products or technology.

What is the importance of the patent waiver proposed by India and South Africa at the WTO? Please explain its significance for developing countries like India in terms of local production and distribution of vaccines.

KM GOPAKUMAR

The TRIPS waiver proposal[5], if adopted, would provide the required policy space to WTO members to do away with protection and enforcement of copyrights, industrial designs, patents and trade secrets. It would also enable the local producers in Global South to produce the therapeutics, vaccines, diagnostics and other health products required for COVID-19 response without the fear of IP infringement.

Currently, the production and supply of these products are concentrated in a few countries. Five countries produce 75 per cent[6] of COVID19 vaccines. As a result, the existing producers are not in a position to meet the demand or provide these products at affordable prices. The waiver could enable the

3   https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/

4   https://msfaccess.org/india-and-south-africa-proposal-wto-waiver-ip-protections-covid-19-related-medical-technologies

5   https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669R1.pdf&Open=True

6   https://www.business-standard.com/article/current-affairs/india-among-wto-s-5-member-nations-to-produce-75-of-world-s-covid-vaccines-121072200061_1.html

removal of the legal barriers for the scaling up of the production of health products through the diversification of manufacturing.

The WTO members are currently engaged in text-based negotiations to finalise the decision of the waiver. The US has declared its support for the waiver of IP rights in the context of COVID-19 vaccines and this announcement resulted in the support of a few more developed countries. However, three WTO members – the EU, the UK and Switzerland – are blocking the progress in the negotiation stating that they do not believe in the idea of waiver. These three WTO members do not support the idea of diversification of COVID-19 vaccine production without the control of originator companies and, therefore, are pushing for technology transfer through voluntary licensing, which gives the control to the originator companies.

Further, the EU submitted a draft proposal[7] for a ministerial declaration reiterating the existing flexibilities related to the CL provisions under Article 31 of the TRIPS Agreement, which was already clarified as part of the Doha Declaration on the TRIPS Agreement and Public Health 2001. For instance, the EU proposal seeks to clarify that present pandemic constitutes a national emergency and therefore there is no requirement of prior negotiations before the issuance of a compulsory license. Under Article 31 (b) of the TRIPS Agreement, a CL can be issued without prior negotiations in the case of national emergency or other circumstances of extreme urgency or in cases of public non-commercial use. However, Para 5 (c) the Doha Declaration in 2001 states: "Each member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises, including those relating to HIV/ AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency." Thus it is clear that a WTO member has the right to issue a CL without a prior negotiation in the current and future pandemic. Further, the EU demands[8] treating its draft proposal at equal footing with the waiver proposal, which was initiated as a separate agenda item under Article IX of the Agreement Establishing WTO.   Article IX allows the WTO General Council to temporarily waive the obligation under any WTO Agreements.

How can the pharmaceutical companies monopolise COVID-19 vaccine production given that these companies have received large amounts of public funds for their research?

KM GOPAKUMAR

One of the conventional justifications for IP protection is that it is a mechanism to facilitate the recouping of research and development (R&D) costs by preventing the free-riding of the invention. However, in the case of COVID-19, these vaccines were developed with the aid of huge public

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7   https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W680. pdf&Open=True

8   https://twn.my/title2/wto.info/2021/ti210708.htm

funding to the tune of US$93 billion[9]. Many governments provided financial support to fund R&D expenditure and manufacturing costs through advanced market commitments. Thus, there was complete de-risking of the COVID-19 vaccine development, production and distribution. For instance, Moderna received nearly 100 per cent public funding[10]. Similarly, the AstraZeneca vaccine received 97 per cent public funding[11]. Although Pfizer did not receive any financial aid for the vaccine development, its partner Bion-tech[12] received public funding from the German government. Moreover, Pfizer received an initial advanced market commitment worth US$1.95 billion[13] to support the vaccine development.

Irrespective of public funding, these companies refused to share the technology to scale up the production, which is necessary to address the unmet demand. Many governments that provide the money to develop vaccines are not taking effective measures to facilitate the diversification of the production base. This shows that governments need to put access friendly conditions   such as open licensing and affordable price to fund innovation in health products. There is an urgent need to revamp the governance of the health innovation system to prevent the socialisation of risks and privatisation of profit.

What are some of the other roadblocks to equitable global vaccine supply in addition to the patent waiver?

KM GOPAKUMAR

A patent is one of the IP barriers. Apart from patents, trade secrets also play an important role in the scaling up of the production of the vaccines. The details of the vaccine production process, including chemistry and control mechanisms, are kept as a trade secret. The current regulatory framework[14] for providing the marketing approval often insists on the replication of clinical trials if a generic vaccine producer is not following the manufacturing process of the originator. This is a time and resource consuming process that exacerbates the cost of the generic product.

Therefore, lifting the trade secret is also an important step to end the vaccine monopoly. In the Indian context, the government has to take measures by sharing the manufacturing process with potential manufactur-

9   https://healthpolicy-watch.news/81038-2/

10 https://www.forbes.com/sites/judystone/2020/12/03/the-peoples-vaccine-modernas-coronavirus-vaccine-was-largely-funded-by-taxpayer-dollars/?sh=6eafae7f6303

11 https://www.medrxiv.org/content/10.1101/2021.04.08.21255103v1

12 https://www.reuters.com/article/health-coronavirus-germany-vaccine-idUSKBN2661KP

13 https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-announce-agreement-us-government-600

14 https://twn.my/title2/briefing_papers/twn/Trade%20secrets%20TWNBP%20Jun%202020%20Gopakumar%20et%20al.pdf

ers to scale up the production. Apart from the IP barriers, there are other bottlenecks to scale up the production such as the supply of raw materials, equipment and machinery for vaccine production. However, these bottlenecks can be addressed with various policy measures such as financing. The scaling up of the product can also result in the enhancement of raw material supply and equipment. However, the IP barrier cannot be addressed effectively at the national level because it is emanating from an international obligation to protect and enforce IP rights.

India has been at the forefront of multilateral vaccine diplomacy efforts, as have China and Russia. While the efforts are appreciated on humanitarian grounds, would you agree that economic or geopolitical interests drive the distribution of these vaccines to friendly lower-income countries? Corollary to this, in the absence of a coordinated international vaccine distribution policy, irrespective of who produces, many poor and vulnerable countries in Africa, Latin America and the MENA region are being left behind and waiting for vaccines. Should vaccine distribution be left to the impulses of economic and political interests?

KM GOPAKUMAR

In April 2020, the UN General Assembly adopted a resolution[15], which entrusted the UN Secretary-General to work with WHO to develop an equitable framework for vaccine distribution. This was followed up with the World Health Assembly resolution[16] in 2020, which entrusted the WHO Director-General to develop an equitable framework for the global vaccine distribution. As per this global allocation framework, 20 per cent of the population were prioritised[17], which includes health workers, senior citizens and people with comorbidities.

However, developed countries did not adhere to this framework and started grabbing vaccine doses using advanced market commitments, i.e. giving bulk orders in advance during the development stage of the vaccine. Countries like Canada accumulated vaccine doses to the extent of providing 9 doses per person[18]. This complete disregard to the global framework left the developing countries without adequate doses even to cover 20 per cent of the population. Further, these developed countries allowed their vaccine manufacturers to enjoy monopoly profit. This huge supply gap in developing countries is being filled up by supplies from Russia, China and India. Russia not only supplied vaccines, but also provided liberal technology transfer to facilitate production in developing countries. The reluctance of developed countries to treat COVID-91 vaccines as a global public good and their quest to protect the commercial interest of their vaccine makers resulted in this situation. Therefore, the role of China, Russia and India

15 https://undocs.org/

16 https://apps.who.int/gb/ebwha/pdf_files/WHA73/A73_R1-en.pdf

17 https://www.who.int/publications/m/item/fair-allocation-mechanism-for-covid-19-vaccines-through-the-covax-facility

18 https://www.nature.com/articles/d41586-020-03370-6

should not be dismissed as vaccine diplomacy. Ideally, the vaccine should be treated as a global public good and there should be a legally binding mechanism to ensure the availability and affordability of vaccines, especially to meet health emergencies.

Let us have a look at the global vaccination rollout and how it is connected to the economic recovery of countries. Please share your views. In addition, what is the status of the Indian vaccination rollout, and what it spells?

KM GOPAKUMAR

The inequity in vaccines production and supply defeats the very purpose of vaccination, i.e., the effective response to COVID-19. There should be substantial coverage of the world population at the shortest possible time to have the desired effect of the vaccination. The current inequity results in the denial of vaccination to a substantial percentage of the population, especially those who live in developing countries. This inequitable access would result in new variants of the virus and can even threaten the safety of those already vaccinated. Thus, nobody is safe until everybody is safe. Further, people in developing countries with little social security need to restart their normal economic activities. This could be possible only through massive vaccination. Thus, vaccine inequity compromises both the economic and health securities of people.

Although the first dose of administered vaccine crossed 420 million in India[19], the number of people who obtained the required two doses is only 90 million, which is a very small percentage of the population. India needs to achieve nearly 1,900 million doses to cover 70 per cent of the population for any meaningful level of vaccine protection. This means another 1,500 million doses are to be administered. The stumbling block in this regard is the availability of required doses. Currently, there is a duopoly in the market and these two companies with their optimum capacity are not in a position to meet the requirements. The Government of India needs to take urgent steps to scale up vaccine production. Towards this purpose, it has facilitated the technology transfer of Covaxin to six firms[20] but there is an urgent need to take proactive steps to facilitate the technology transfers of various COVID-19 vaccine to all potential manufacturers.

COVID-19 has been a wake-up call for countries concerning their healthcare systems. How do we in India prepare for equally exceptional circumstances in the future, as certainly, this is not the last pandemic?

KM GOPAKUMAR

COVID-19 reinforces the urgent need to have a robust healthcare system, which is the backbone of any health emergency preparedness and response. In the absence of a publicly funded functioning healthcare system, the

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19 https://pib.gov.in/PressReleasePage.aspx?PRID=1738433

20 https://www.thehindubusinessline.com/news/three-more-firms-get-the-nod-to-produce-covaxin/article34567892.ece

government is incapacitated to respond to COVID-19 eventualities. Currently, the healthcare system in India is dominated by private actors and nearly 70 per cent of the ailments are treated in private hospitals. The COVID-19 situation requires inpatient care to a certain percentage of the infected population. The lack of a functioning public healthcare system slowed down the prevention, control and treatment efforts. Moreover, the dependency on private healthcare facilities resulted in the overcharging of COVID-19 diagnostic and treatment.

Similarly, lack of public health infrastructure prevents the government from stepping up the track, trace, test and treat mechanism. Apart from the healthcare system, lack of administrative infrastructure to reach out to people also affected the ability of the government to provide the required social security during the pandemic. For instance, though there is free provisioning of food through the public distribution system, lack of ration cards or other documents prevents a large section of the people from availing the benefit. Likewise, the government needs to invest in public health and administrative infrastructure. Currently, the public investment in health is around 1 per cent of the GDP[21], which needs to be enhanced to 5 per cent to 6 per cent without any further delay. Despite promises[22], this has not happened, and the people had to pay the price for it. There is no other shortcut.

21 https://www.indiaspend.com/india-spent-1-of-gdp-on-public-health-for-15-years-result-is-vulnerability-to-crises/

22 https://www.nhp.gov.in/nhpfiles/national_health_policy_2017.pdf

Interview with Marlisle Richter of South Africa on South-South perspective on a more egalitarian approach to vaccine production and distribution

THOKOZILE MADONKO

CONNECT WITH OUR GUESTS:

Dr Marlise Richter has worked in the health and human rights field for twenty years and has served in several South African NGOs and civil society coalitions. She was a researcher at Project Literacy, the AIDS Law Project, the Treatment Action Campaign, the Reproductive Health and HIV Research Unit and more recently served as the Head of Policy Development and Advocacy at Sonke Gender Justice. She current serves as Senior Researcher at the Health Justice Initiative working on issues of health equity.

What are the main issues you want to raise about the rapidly changing pandemic panorama on equitable, accessible and affordable COVID-19 vaccines, drugs, therapeutics, and equipment and the South versus North imbalance in global trade, investment and financing?

MARLISE RICHTER

The last two years have been overwhelming for probably everyone everywhere.

Most of us have lived with increased anxiety, uncertainty and a deep sense of sadness and loss for the many close to us – and those further away – who are scared, very ill, dying or who have succumbed to COVID-19.

This state of grief and insecurity has encouraged us all to ask some much needed questions about the structural, social and political issues that have brought about and sustained the COVID-19 pandemic. Many have realised that these issues necessitate radical and urgent change and that we need to prioritise social and environmental justice more than ever. At the same time, others have used the pandemic to rake up extraordinary profits, exploit fear and to violate human rights. For example, Oxfam[1] noted in September 2020 already how 32 of the world's largest companies were likely to increase their profit by $109 billion for that year.

For me, the most burning issues relate to the concerns I raise above, namely the consolidation of capitalism; the ever widening gulf between the poor

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1   https://www.oxfam.org/en/press-releases/pandemic-profits-companies-soar-billions-more-poorest-pay-price

High income countries: 1 in 2 people, or

53.79%

have been vaccinated with at least one dose as of Aug 11, 2021.

WHO

Low income countries: 1 in 61 people, or

1.63%

have been vaccinated with at least one dose as of Aug 11, 2021.

WHO

Diagram A: Vaccination progress globally (as of 11 Aug)
Source: COVID-19 Data Futures Platform (https://data.undp.org/vaccine-equity/)

and the rich and between the Global South and the Global North; the environmental disregard that catalysed this pandemic[2]; and the lack of genuine global solidarity. If all lives were indeed deemed equal, it would have been impossible for some low to middle income countries to have less than 1% of their populations vaccinated[3] at this point in time, while more than half of the population of high income countries have had at least one dose of a COVID-19 vaccine (see Diagram A)

What is the TRIPS agreement and why are its flexibilities not enough to counter the issue of fair and just access to vaccines worldwide? What do you have to say about the COVAX facility.

MARLISE RICHTER
I have read KM Gopakumar's (Gopa) excellent response to this question, and I have little to add aside from noting some more critiques of COVAX. I believe people need to continue asking some tough questions about the COVAX initiative and to resist the argument that a TRIPS waiver is not necessary as COVAX "will provide". As Dr Catherine Kyobutungi[4], Director of the African Population and Health Research Centre points out: "The way COVAX was packaged and branded, African countries thought it was going to be their saviour."
Gopa has already said that COVAX's (uninspiring) aim is to have 20 per cent vaccine coverage for low and middle income countries by the end of this year. It has already fallen behind on its own forecasts. The contracts

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2   My favourite billboard this year is from PETA and reads "Tofu never caused a pandemic. Try it today".

3   https://www.ox.ac.uk/news/2021-07-22-urgent-need-covid-19-vaccine-equity-un-oxford-research

4   https://www.nytimes.com/2021/08/02/world/europe/covax-covid-vaccine-problems-africa.html

and agreements forged through COVAX remain a secret[5] and are not open to public scrutiny when a pandemic necessitates more transparency, not less. Most importantly, COVAX works within the paradigm of safeguarding patent rights, rather than insisting that COVID-19 vaccines are a global public good.

We cannot approach future pandemics in this way.

While South Africa and India were proposing a vaccine waiver, Pfizer and BioNTech were signing an agreement with The BioVac Insitute in Cape Town to produce mRNA COVID-19 vaccines for the African continent. Doesn't this show that the TRIPS waiver isn't really necessary to help create production in the Global South?

MARLISE RICHTER

The Biovac Institute agreement[6] was indeed celebrated and particularly so as it would mark the first company in Africa to help manufacture an mRNA vaccine. Of course, this is very necessary. The African continent imports 99% of all the vaccines it uses[7], not just for COVID-19. The continent –as well as countries across the Global South – has to build manufacturing capacity and increase their pandemic readiness. This requires political will, strategic vision and intensive investment – as well as the flexibilities that the TRIPS waiver would allow to deal with intellectual property barriers to scale up.

It is important to highlight that the agreement between the companies does not include a license[8] for BioVacto to actually manufacture the mRNA vaccine – all the active ingredients would still need to be imported from Europe. A key component of enhancing vaccine development is the transfer of technical knowledge. My colleague Fatima Hassan[9] pointed out how the current arrangements foster dependence. She said:

"To expand global manufacturing capacity means that countries/ manufacturers must also have the freedom to produce the drug substance and to make their own production, supply and pricing decisions. We would all like to see the full terms of the agreement (of The Biovac Institute) and ask Pfizer why it can't issue a full licence to multiple manufacturers. Why does it choose to play God – in a pandemic?"

5   https://www.nytimes.com/2021/01/28/world/europe/vaccine-secret-contracts-prices.html

6   https://www.news24.com/fin24/companies/health/sas-biovac-to-use-deal-with-us-based-immunitybio-to-boost-local-vaccine-creation-ceo-says-20210320

7   https://www.nature.com/articles/d41586-021-01048-1

8   https://www.businesslive.co.za/bd/national/health/2021-07-21-pfizer-deal-to-make-jabs-in-sa-a-stepping-stone-to-bigger-things/

9   https://www.dailymaverick.co.za/article/2021-07-21-pfizer-covid-19-vaccine-to-be-filled-and-finished-in-south-africa-for-exclusive-african-use/

Figure 3. Gendered barriers to COVID-19 vaccines

Diagram B: Gendered Barriers to COVID-19 vaccines Source: https://asiapacific.unwomen.org/en/digital-library/publications/2021

How do you think gender plays out within the pandemic as a whole, and particularly concerning vaccine equity?

MARLISE RICHTER

Medical anthropologist Paul Farmer[10] and my former colleague from the AIDS Law Project and the Treatment Action Campaign, Mark Heywood[11], have written very eloquently about how diseases spread along the fault lines of inequality, and how ill-health in turn makes inequalities so much more severe.

Gender – as do race, class, nationality, etc. – plays a powerful part in the pandemic. For instance, it impacts on the measures available to keep oneself safe from COVID-19 infections – how one contracts the virus and how one might recover from it or be more serious. Gender also impacts one's ability to access healthcare, the quality of services available to one, the amount of care work one has to do to keep others safe or cope with infection, the precarity of one's livelihood and on whether one can access a vaccine or not.

I like this diagram provided by the Asia-Pacific Gender in Humanitarian

10 https://www.jstor.org/stable/10.1086/382250?seq=1

11 https://library.fes.de/libalt/journals/swetsfulltext/13092692.pdf

Action Working Group as it depicts some of these complex gender dynamics in relation to vaccine equity. It is situated within the context of Asia and the Pacific, but many of the points hold for other countries too – particularly in the Global South (see Diagram B).

I would like to include a concrete example from South Africa to illustrate some of the dynamics in the diagram.

I have worked in the field of sex work, health and human rights for close to 15 years, and am acutely aware of what a devastating impact the pandemic has had on the sex work context. Many sex workers' livelihood strategies have been destroyed by the pandemic. Severe lockdown regulations mean fewer clients and thus fewer resources, while some of the law enforcement practices in South Africa have been absolutely brutal, and sex workers have been an easy target. We are still waiting for the outcome of an investigation into the mysterious death of Robyn Montsumi[12], a female sex worker who had been in custody at my local police station in April 2020.

A number of sex workers have had poor experiences with healthcare services. Research[13] has documented healthcare worker prejudice, discrimination and sexual moralism towards sex workers. I am concerned about how sex workers would access the COVID-19 vaccines and that they would need to do so from the same health system that has often alienated them. How would sex workers obtain good, evidence-based information about vaccines? Would they know how to register for the vaccine? Would they have mobile data to do so? Would they have sufficient transport money to get to the vaccination site, and also to make another trip later on if they are on a regimen that requires a second jab? Some sex workers are undocumented and it is currently not clear how South Africa's vaccine registration system will deal with people without official documentation[14].

Vaccine equity requires that everyone – no matter what their circumstances – has an opportunity to be vaccinated. It reminds me of the picture explaining the difference between equity and equality in relation to a soccer match (see Diagram C below). True vaccine equity would practically mean that special strategies and resources must be directed towards the most marginalised and underserved populations to enable them to access vaccines, and for them to be safe. It requires that the health system understands the many diverse communities it serves, their material realities and the barriers that many face in seeking healthcare and to actively work to overcome these – much like providing boxes of different heights for the soccer spectators in Diagram C.

12 http://www.sweat.org.za/2020/05/29/press-statement-how-did-robyn-montsumi-die-in-the-custody-of-mowbray-police-station/

13 https://link.springer.com/content/pdf/10.1007%2F978-3-030-64171-9_8.pdf

14 https://www.dailymaverick.co.za/article/2021-07-26-leave-no-one-behind-we-must-urgently-address-vaccination-of-undocumented-migrants-and-asylum-seekers/

Diagram C: The difference between Equality and Equity. (Source: https://medium.com/inspired-ideas-prek-12/whats-the-difference-between-equity-and-equality-in-education-ef20971e7fda)
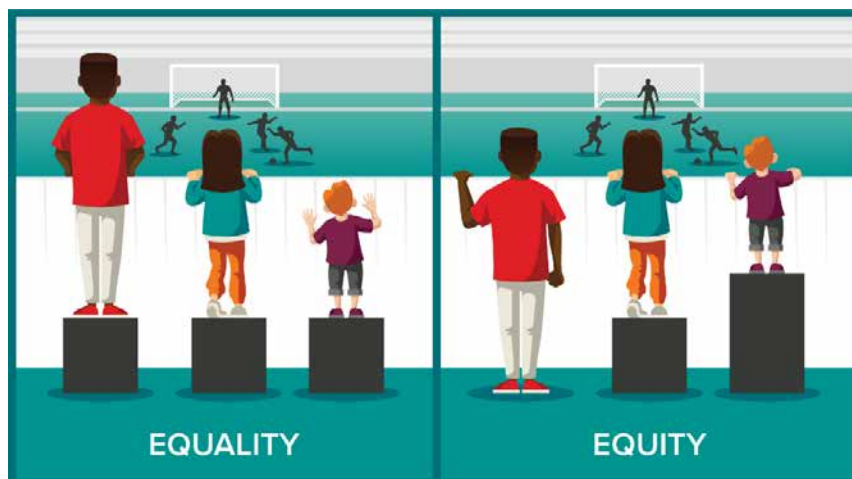
What are some of the other roadblocks to equitable global vaccine supply in addition to the patent waiver?

MARLISE RICHTER

I am going to interpret "supply" broadly here and speak to factors beyond the actual chemical compound.

Some challenges to supplying vaccines to people include: How to transport the vaccines from manufacturers to the actual sites where they will be injected, keeping the vaccines at the correct temperature, having appropriate facilities where large numbers of people could be vaccinated without posing an infection risk as well as having sufficient and knowledgeable personnel to administer the services. The New York Times[15] recently described it as the "difficulty getting doses from airport tarmacs into people's arms". It gives the example of how the US has donated 500 million Pfizer doses of vaccine through COVAX at a cost of around $3.5 billion. This amount is partly being funded by redirecting funds the US promised Global South countries to support their vaccine programme. The NYT notes that "Short on funding, those countries have had a hard time buying fuel to transport doses to clinics, training people to administer shots or persuading people to get them."

I would like to add a South African example from the work of my organisation, the Health Justice Initiative[16]. South Africa's vaccine rollout was initially planned based on health equity, public health principles and international ethical guidelines such as those produced by the Strategic Advisory Group of Experts on Immunisation (or 'SAGE[17]', an entity that advises WHO). Our Department of Health's original thinking was to

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15 https://www.nytimes.com/2021/08/02/world/europe/covax-covid-vaccine-problems-africa.html

16 https://healthjusticeinitiative.org.za/

17 https://www.who.int/groups/strategic-advisory-group-of-experts-on-immunization

prioritise healthcare workers and then work according to a system based on age brackets (the older you were the sooner you would get vaccinated) and co-morbidities. Yet, with our actual vaccine rollout, the criteria of co-morbidities have strangely been dropped, and we are petitioning[18] for the urgent inclusion of such. Yet, ironically, the department recently announced a dispensation for "special groups" that includes amongst others, athletes representing South Africa and for those who require work or study related travel.

If South Africa's unconditional commitment were to supply vaccines equitably, it would not have deviated from its original strategy in this way. Or it would have provided clear, evidence-based reasons for deviating.

COVID-19 has been a wake-up call for countries concerning their healthcare systems. How do we prepare for equally exceptional circumstances in the future, as certainly, this is not the last pandemic? What in your view would be the best/ most visionary way forward for addressing them?

MARLISE RICHTER

I believe that the COVID-19 pandemic has not only shown us how absolutely critical it is to invest intensely in health but that the same should hold for social and environmental well-being. This requires a radical rethink of our national/ regional/ global priorities, the values we hold, who should lead us, and how we distribute power and resources.

A practical entry point might well be the current deliberations on a radical reconsideration of the Sustainable Development Goals and Agenda 2030, which could unlink the SDG targets from growth targets[19].

I believe that the popular pandemic slogan "No-one is safe until everyone is safe" is a valuable piece of wisdom that should be used to measure all our efforts towards global solidarity – whether in the midst of a devastating pandemic or not.

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18 https://healthjusticeinitiative.org.za/2021/08/10/hji-petition-calling-for-the-prioritisation-of-all-adults-living-with-a-comorbidity-in-the-vaccine-programme-in-sa/

19 https://www.nature.com/articles/d41586-020-02002-3

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RAJNI BAKSHI is a Mumbai-based author. Her books include: Bazaars, Conversations and Freedom: For a market culture beyond greed and fear (Penguin, India, 2009 and Greenleaf, UK, 2012), which won two Vodafone-Crossword Awards; Bapu Kuti: Journeys in Rediscovery of Gandhi (Penguin, India, 1998), which inspired the Hindi film Swades starring Shah Rukh Khan; Long Haul: The Bombay Textile Workers Strike 1982-83 (BUILD, India, 1986). Rajni has also written several monographs including Trusteeship: Business and the economics of well-being (2016); Civilizational Gandhi (2012); An Economics for Well-Being (2007); Let's Make it Happen: A backgrounder on New Economics (2003); A Warning and an Opportunity: The Dispute over Swami Vivekananda's Legacy (1994).From 2013 to 2016 Rajni was the Gandhi Peace Fellow at Gateway House: Indian Council on Global Relations, a Mumbai based foreign policy think tank. She serves on the boards of Child Rights and You (CRY), Citizens for Peace (CfP) and the Centre of Education and Documentation (CED). She is also a member of the Executive Committee of the Gandhi Smriti and Darshan Samiti, an autonomous

body under the Ministry of Culture, Government of India. Rajni has a BA in Journalism and Political Science from George Washington University and an MA in Philosophy from the University of Rajasthan. ➤

GAURAV DWIVEDI works with the Centre for Financial Accountability (CFA) and is based in Bhopal. He graduated as an engineer and completed his post-graduation in management studies from Pune University. He has been researching and documenting privatisation, reforms and public private partnership projects in public services with a focus on water supply, sanitation and sewerage for more than a decade. His work includes several publications on these themes. He is currently researching and monitoring mega infrastructure development projects like smart cities and industrial corridors with a focus on their financial aspects in India. ➤

MIRZA ZULFIQUR RAHMAN is Visiting Research Associate at Institute of Chinese Studies in New Delhi . He holds a PhD in Development Studies from the Department of Humanities and Social Sciences, Indian Institute of Technology, Guwahati, Assam. He completed his Masters of Philosophy from the Diplomacy and Disarmament Division, Centre for International Politics, Organisation and Disarmament, School of International Studies, Jawaharlal Nehru University, New Delhi. His areas of interests include research on Northeast India, mainly on issues relating to transboundary water sharing and hydropower dams, roads and connectivity infrastructures, conflict and insurgency, peace building, development politics, migration and cross-border exchanges. He is committed to grassroots based alternative community work and development models. He is an avid photographer. ➤

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RANJAN K PANDA, a Master in Sociology, has nearly three decades of experience in leading several water and environmental initiatives in India. A known water and climate expert, he convenes many advocacy networks and writes for various publications. He has delivered lectures in seminars, workshops and universities all across the globe, and led several campaigns for conservation of rivers, water bodies and forests. His areas of interests have been water, environment, climate change/ justice issues in both rural and urban areas. He is a strong advocate of community centric governance of natural resources for sustainable development. In 2010, NDTV gave him the first "Green Hero" award. He was recognised as Mahanadi River Waterkeeper by the New York based global 'Waterkeeper Alliance'. ➤

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KAUSTUBH DEKA teaches at the Department of Political Science, Dibrugarh University, Assam. Formerly he was with the Centre for North East Studies and Policy Research, Jamia Milia Islamia, New Delhi. He has been a Fellow at the Hindu Centre for Politics and Public Policy, Chennai, where he looked into the issue of youth and political participation in the context of India's Northeast. He holds a doctorate from the School of Social Science, Jawaharlal Nehru University, New Delhi. His academic interest includes besides others, issues of ecological politics in Northeast India, trends of youth politics and identity assertion in the region as well as inquiries into understanding the category of Northeast India. ➤

DOLLY KIKON is a lecturer at the School of Social and Political Sciences, University of Melbourne, Australia. Her research focuses on the political economy of extractive resources, development initiatives, gender relations, customary law and human rights in Northeast India. Before coming to the University of Melbourne, she led an interdisciplinary research project at the Department of Anthropology, Stockholm University. Her work focused on the increasing trend of outmigration among upland societies in Northeast India. The project titled "The Indian Underbelly: Marginalization, Migration and State Intervention in the Periphery," examined the expansion and outcomes of developmental activities of the Indian state in areas associated with economic backwardness, subsistence agriculture and armed conflict. Prior to obtaining her doctoral degree in Anthropology from the Stanford University, Dr. Kikon worked as a human rights lawyer and a community organiser in India. Focusing on land rights among tribal communities in Northeast India, her legal advocacy works extensively dealt with constitutional provisions with regard to land and resource ownership, as well as autonomy arrangement for securing ethnic rights and guarantees.
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SEEMA BHATT is an independent consultant based in India and works on issues related to ecotourism, biodiversity and climate change. She holds a Master's degree in Environmental Studies from the Yale School of Forestry and Environmental Studies. Her particular focus of work is on strengthening the links between conservation of biodiversity and livelihoods of local communities. She views ecotourism as one such link and has coordinated two projects on ecotourism as the South Asia Coordinator for the USAID supported Biodiversity Conservation Network. She has since then worked extensively with various other ecotourism projects in India and other parts of South Asia. She has co-authored a book, Ecotourism Development in India, published by the Cambridge University Press. She is a Fulbright research scholar and was based at the Center for Responsible Travel (CREST) in Washington DC where she explored the feasibility of ecotourism certification in India. Seema is also at present the honorary vice president of the Ecotourism Society of India. ➤

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NEEMA PATHAK BROOME has studied environmental science and completed a post graduate diploma in wildlife management. She is a member of Kalpavriksh, coordinating the Conservation and Livelihoods programme. She is part of the team monitoring implementation of conservation laws and policies, in particular the Wildlife Protection Act and Forest Rights Act (FRA), 2006. Her main area of interest is conservation governance, particularly indigenous peoples' and community conserved territories and areas (ICCAs). She has been involved with documentation, research, analysis and advocacy related to inclusive conservation governance and ICCAs in India and South Asia. She also coordinates a local process of participatory conservation governance in Bhimashankar Wildlife Sanctuary in Maharashtra. ➤

SHRISHTEE BAJPAI, a researcher-activist based in Pune, is a member of environmental action group Kalpavriksh. Her current research is focussed on exploring alternatives to mainstream democratic governance models, documenting worldviews of indigenous communities and networking. She helps in coordinating a process called the Vikalp Sangam (Alternative Confluence), which aims to bring together practitioners, thinkers, researchers, and others working on alternatives to currently dominant forms of economic development and political governance. She is a core team member of global platform similar to and partly inspired by the Indian process called the Global Tapestry of Alternatives. Shrishtee is also involved in organising Rights of Rivers dialogue in India next year, and in research and advocacy for recognising rights of rivers in India. ➤

MUKESH SHENDE has done his masters in Social Work from TISS, Mumbai. He works for strengthening local self-governance system and livelihood of the Scheduled Tribes and other traditional forest dwellers through the implementation of the FRA, 2006. He is associated with Amhi Amchya Arogyasathi (AAA) and currently monitoring projects like Promotion of Sustainable Tribal Livelihood supported by SWISSAID India and Employability and Skill Enhancement of the Persons with Disabilities supported by Paul Hamlyn Foundation, UK. His interest areas are empowering critical communities and leaders to protect and govern their resources. He is involved in research, documentation, and programme planning at the organisational level. ➤

AVANTIKA HAFLONGBAR, a Jamia Millia Islamia graduate, worked in the social service sector and lived in Delhi for 12 years before returning to Haflong, where she grew up. In this quiet and beautiful town, she collaborated with her husband Daniel Langthasa to start an NGO called TRYST Network. Her love for traditional textiles led Avantika to start ROOHI, a label that works with local craftswomen to reinvent traditional textiles and motifs. ➤

NENA SEITZ is a graduate in cultural and social anthropology from Philipps-Universität Marburg, Germany. Her research interests focus on post-colonial power structures and environmental anthropology. These include political ecology and the ontological turn as well as the role of local knowledge systems and networks in a highly globalised world. Her studies also focused on the geographical region of South Asia and parts of West Asia. From May to October 2019, she was a trainee at HBS India. ➤

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SONAL JAIN is the co-founder of Desire Machine Collective (2004) and project Periferry. She works at the intersection of art, ecology, technology and activism. Her practice spans film, video, photography, digital media, public intervention, curation and writing. She has written a feature film script and is a published author. She has taught at the premiere art and design schools of India like the National Institute of Design and shown her work at prominent venues of the world: Solomon Guggenheim Museum, New York and The Venice Biennale. ➤

JYOTI AWASTHI has been associated with development sector for more than two decades and has worked with NGOs like ActionAid and Christian Aid where she managed and implemented a range of social development programmes with NGOs across India. Her work has largely revolved around the issues of urban poor, including slum

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SALAM RAJESH is a media professional and an environmental activist based in Manipur of the Northeast India. He has been associated with the Loktak fishers since the past 23 years. He advocates and campaigns for the rights of the fishers, and for conservation of Loktak biodiversity. He is a member of Technical Committee, Manipur State Wetlands Authority. He is associated with IUCN Commission on Environmental, Economic and Social Policy and the Indigenous Territories and Community Conserved Areas Consortium. ➤

NANDINI THOCKCHOM, primarily trained as a teacher, has been a human rights defender since 1996, when she was drawn to the cause of human rights when schools in Manipur got closed after the killing of Thokchom Netaji, a 15-year-old student. Thereafter, she expanded the sphere of her activities creating awareness on human right issues. Her teaching skills came in handy while holding workshops and creating aware-ness among the people on the issues. She was a member of the High-Level Committee on the Status of Women, Government of India between 2012 and 2014. Her office Indigenous Perspectives remains committed to the issues of fisherfolks in Manipur be-sides other human rights commitments. She is now authoring a book on the culture of food in Manipur amidst the impact of globalization. ➤

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**Investigating Infrastructure
Ecology, Sustainability & Society**

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