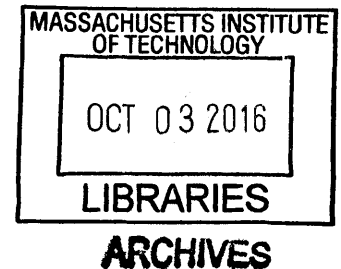


**URBANIZING THE FRINGE**  
**Armatures for Reterritorialization of Rurban Ecologies**

by

Mayank Ojha

Bachelor of Architecture  
Chandigarh College of Architecture, 2011



SUBMITTED TO THE DEPARTMENT OF ARCHITECTURE IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

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Signature of Author: \_\_\_\_\_

Department of Architecture  
August 2016

**Signature redacted**

Certified by: \_\_\_\_\_

Miho Mazereeuw

Assistant Professor of Architecture & Urbanism  
Thesis Supervisor

Accepted by: \_\_\_\_\_

**Signature redacted**

Takehiko Nagakura

Associate Professor of Design and Computation  
Chair of the Department Committee on Graduate Students



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# **URBANIZING THE FRINGE**

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*Armatures for reterritorialisation of Rurban Ecologies*

**Mayank Ojha**  
SMarchS (Urbanism)  
Thesis, spring 2016



## THESIS COMMITTEE

---

*Advisor*

**Miho Mazereeuw**

Assistant Professor of Architecture & Urbanism  
Department of Architecture

*Readers*

**James Wescoat**

Professor, AD/Urbanism Group Head &  
Acting Director for Aga Khan Program

**Brent D. Ryan**

Associate Professor, City Design & Development Group Head  
Department of Urban Studies & Planning

**Eran Ben-Joseph**

Professor, Department Head  
Department of Urban Studies & Planning



# URBANIZING THE FRINGE

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*Armatures for Reterritorialization of Rurban Ecologies*  
by  
**Mayank Ojha**

*Submitted to the Department of Architecture on August 5, 2016  
in partial fulfillment of the requirements for the  
Degree of Master of Science in Architecture Studies*

## Abstract

### Keywords:

*neoliberalism, deterritorialization,  
fringe, armatures, industrial  
urbanism, rurbanization, new village*

### Thesis supervisor:

**Miho Mazereeuw**

*Assistant professor of Architecture &  
Urbanism  
Department of Architecture*

25 years after India initiated its landmark reforms for economic liberalization, it continues to be challenged in balancing rapid economic growth, inclusive development and environmental sustainability. As the world seeks ways to curtail emissions ahead of a critical juncture in climate change, India's choice – representing 17.5% of humanity, of a growth-propelled, market-led development pathway has the potential to offset global efforts with irreversible consequences.

Kalinganagar, located in the resource rich northeastern peninsular belt, is a paradigmatic case of neoliberal industrial urbanism. Here, the demand for commodities and resources from a burgeoning, globalized, aspiring middle class subordinates communities depending on natural environments within their localities for livelihood security and most material needs. Habitats of its indigenous populations, once marginalized rural hinterlands, are now sites of multilateral contestations as neoliberal policies and governance enable their transformation into geographies of extraction. The ensuing severance of linkages between communities and their landscape results in the loss of a critical interest group in the preservation of natural ecologies.

In an impasse between fallacious optimism and cynical pessimism, the thesis explores the synergetic prospects of grassroots governance and liberal capitalism, for a rurban model of regional development.





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# 1

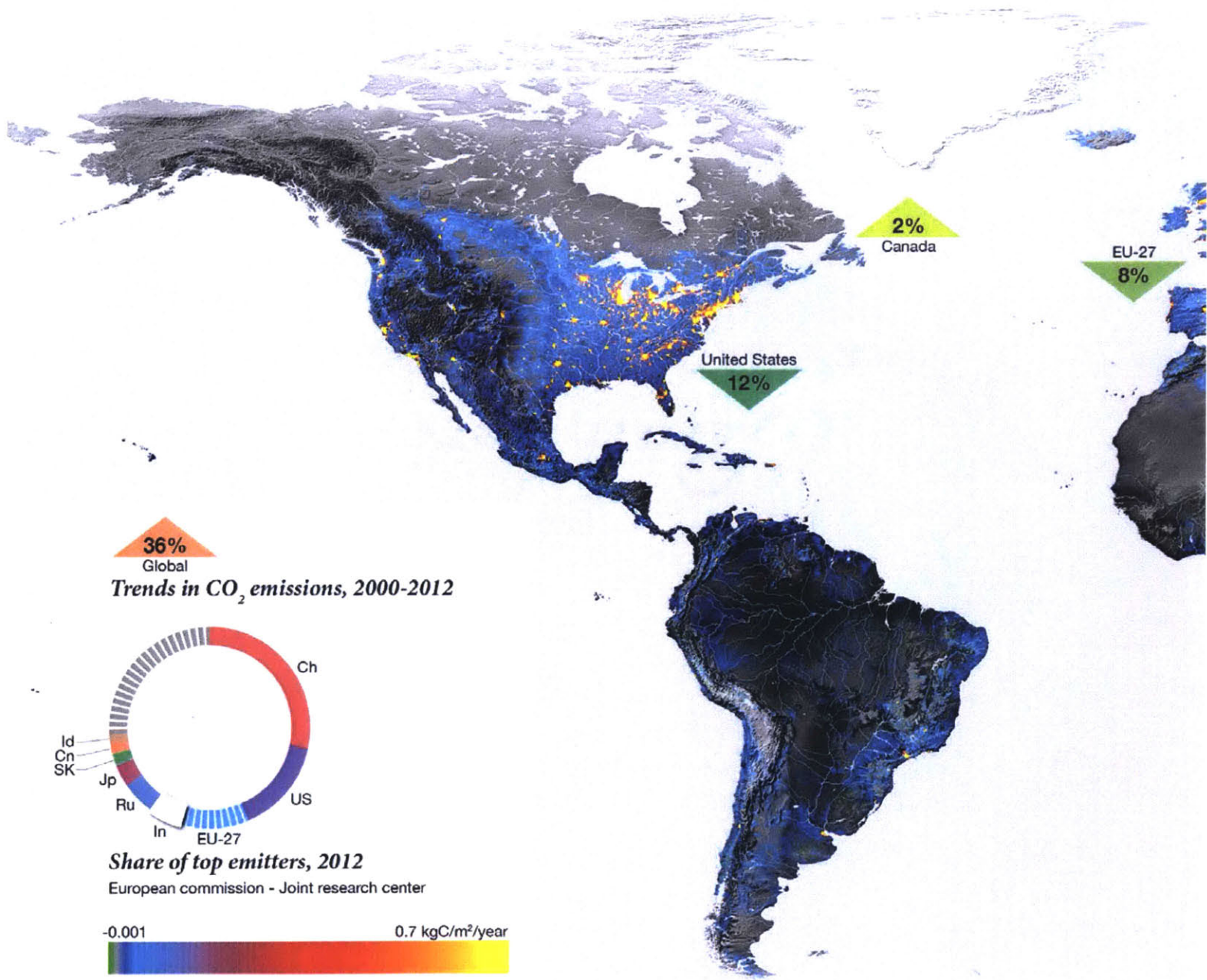
## INTRODUCTION

*“What China was in the American imagination in the 1990s and 2000s, India will be in the next two decades – a cavalcade of superlatives, a focus of fears.”*

Charles C. Mann<sup>1</sup>

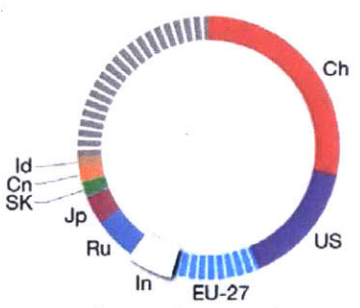
India is at a critical juncture. In 2014, India overtook China to become the world’s fastest growing large economy. Amidst a slowdown witnessed in mature, developed nations, China’s economy, which had spearheaded global growth for over three decades after its Communist Party approved an opening up of its economy in 1978, is gradually showing signs of maturity. Economists and market speculators across the world posit India as the next major destination for global capital, manufacturing industry and urban development.

This opportune perception arrives at a time when the nation is faced with massive poverty, infrastructure deficiency, large-scale internal migration, and lags far behind other parts of the world in terms of socio-economic indicators. The aspirations of a burgeoning middle-class demand ease of doing business, access to natural resources and a liberalized policy environment. The elected governments on the other hand, over the past couple of decades, have sought to channelize these mandates by steering through major structural reforms – in continuation of a transition of India’s economy towards an open, free-market system. The imperative is strengthened with a focus on bringing millions out of poverty, develop critical infrastructure, pay off its debts owed to global financial institutions and eventually meet its aspirations of joining the league of rich, developed nations – and a regional power.



**36%**  
Global

**Trends in CO<sub>2</sub> emissions, 2000-2012**



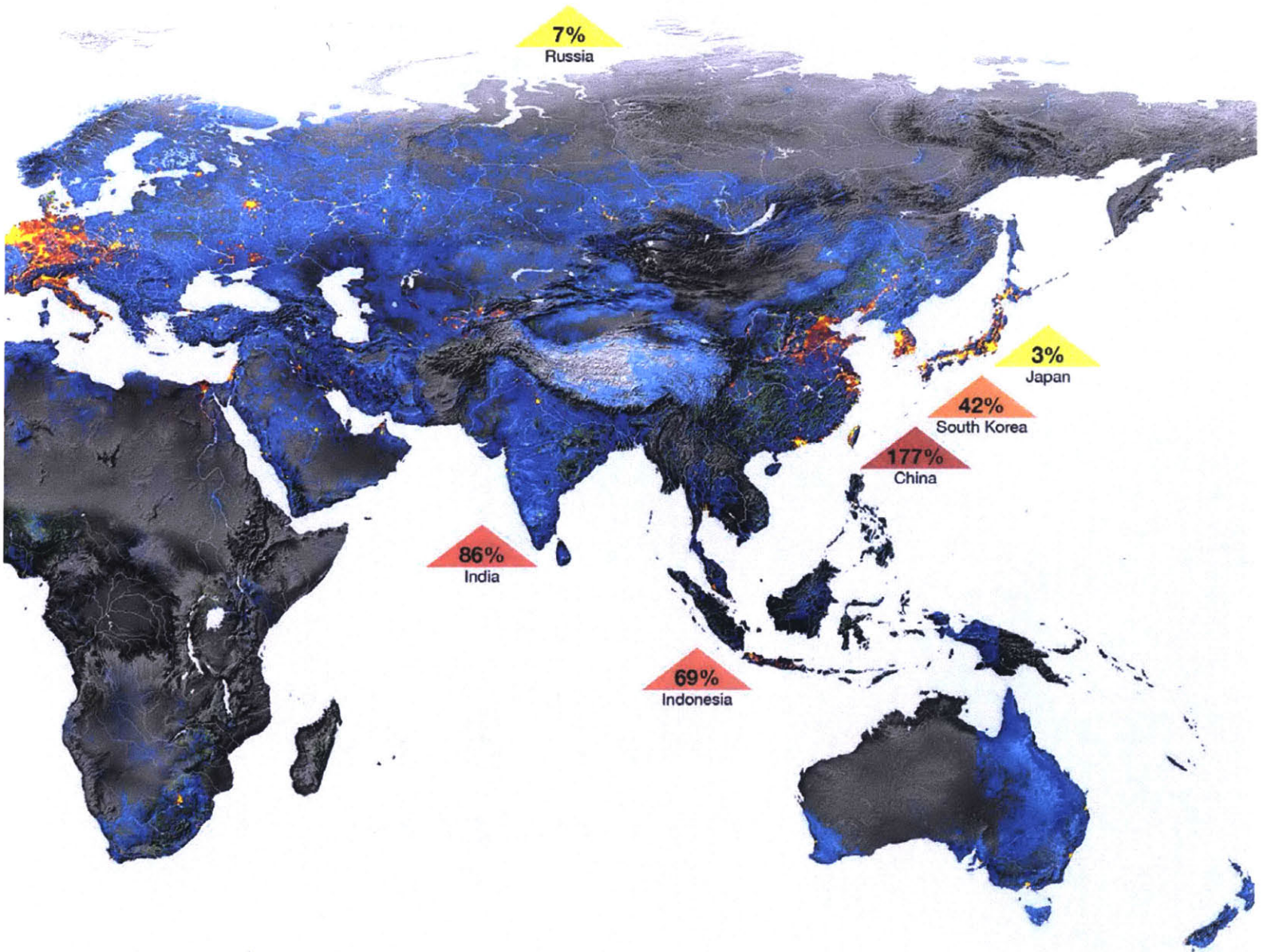
**Share of top emitters, 2012**

European commission - Joint research center



**Fossil fuel CO<sub>2</sub> emissions**

For year 2000 (FFDAS ver 2.0)



However, with the given scope of growth in India, an emulation of the Chinese model of accelerated industrialization and resource extraction is poised to have damaging implications. As humans face a major challenge in curtailing global emissions to prevent irreversible consequences, India's inevitable reliance on cheap, but harmful sources of energy for its industrialization ambitions have the potential to offset the efforts of the rest of the nations. Concomitantly, the impact of such a development trajectory would be worst felt by India's own marginalized communities, which owing to their present patterns of subsistence are most at risk. The thesis deals with this compelling issue of proposing a framework for designers and planners to strategize systemic solutions and steer the course of development.



In Chapter 2, the thesis analyzes the historical trends, which have led to a dominant view – as popular perceptions and amongst decision makers, of a utilitarian focus on economic growth as a means of social development. It also relates these conceptions with the associated sites and geographies, proposed by various leaders and visionaries, with conflicting ideas to focus the state's planning initiatives and trajectories of development – whether through cities or villages.

Chapter 3 introduces the project's site at Kalinganagar and the larger northeastern peninsular belt region. Located in the Sukinda valley, which holds a contested position amongst the world's top ten most polluted places,<sup>2</sup> the territories present an exemplary case of a paradox of





plenty. Beyond this clichéd position, the thesis argues about the specificities of region while showcasing Kalinganagar as a paradigmatic example of post-reforms industrial urbanism in India – a precedent for many greenfield, heavy industry and mining based ‘growth’ centers, whether already proposed or still to come.

In Chapter 4, a deeper analysis of territories and their existing village settlements around the industrial complex enables a framework to understand the systemic impacts of such rapid industrialization, and its consequent urbanization on local inhabitants. The region comprises of a high proportion of India’s indigenous inhabitants, which are directly dependent on natural resources and hence, the most vulnerable to their exploitation and degradation. It highlights the unique challenges that emerge as a result of an accelerated socio-economic transformation of these communities, while incumbent agencies lack frameworks and tools to address them. With the help of field interviews and observations, it elucidates the mechanisms responsible for a destabilization of linkages between the territory’s landscape and inhabiting communities.

The fifth and sixth chapters define a conceptual framework and an actionable strategy for exploring solutions to the posed challenges – present and projected. It consolidates the opportunities enabled by a convergence of decentralized forms of governance, liberalized capitalism and a reversion to villages as potential development nodes. Here the thesis asks the question; what form of urbanism will might emerge when the primacy in planning is neither awarded to economic growth, nor to humans alone, but to the relations between humans and nature.





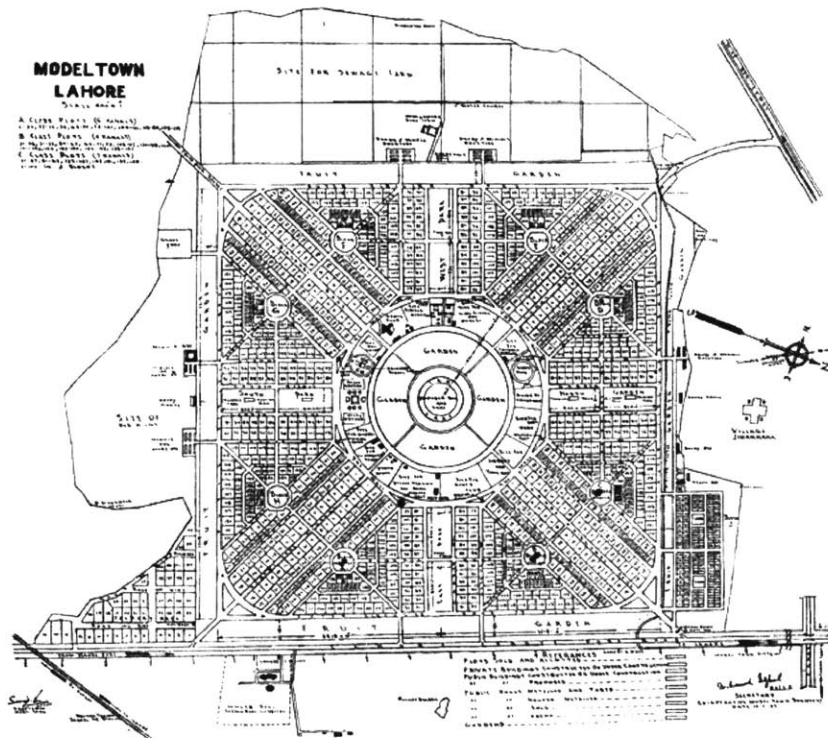
# 2

## A NATION OF VILLAGE REPUBLICS

*20<sup>th</sup> century development models*

Chakrabarty (2009) in his lecture on Indian Modernity distinguishes between two overlapping movements of nationalism in the first half of the 20<sup>th</sup> century, under the British colonial rule. The first, he refers to as a “cultural nationalism” which began around the late 19<sup>th</sup> century and was prevalent till the independence of India in 1947. The second, “political nationalism” emerged around the year 1920 and was influential in the drafting of the Indian constitution. An analysis of the proponents of these movements, and the sites that were central to the propagation of their ideas – villages and cities, can be directly mapped onto the first and second forms of nationalism. Within this framework, the thesis asserts that there is an underlying, common thread between different ideas in terms of their approach towards development pathways. This emanates from a belief in economic uplift and mobility as the primary means for achieving social change.

As contemporary leaders frame new visions and models of development for 21<sup>st</sup> century urbanization, it becomes pertinent to analyze some key paradigms, which have been debated and experimented before. Some of these ideas, abandoned in favor of those, which suited contemporary needs at different times in history, find relevance again in light of major changes in the political and economic environment along with the issues being faced. At various moments, a convergence between dominant paradigms, specific imperatives, their dissemination and mass mobilization towards actionable plans, played a determinate role in shaping patterns of urbanization. This governed the focus of urban planning and design expertise across the spectrum of rural and urban areas, and influenced the relations between communities, their physical environment as well as patterns of living and working.



**Fig 2.1 Internalizing development**  
 Layout plan of Model Town, Lahore; conceived and designed to house the indigenous elite in this suburban development, emulating colonial settlements.

### From improvement to development

The European modernist urban planning movements, and their proponents working in India, played a key role in apportioning the focus of city reformers and administrators over methods of addressing urban growth. Urban local bodies under the British Indian government, faced with congestion and increased rural to urban migration in cities, established a number of Improvement Trusts in the first decades of the 20<sup>th</sup> century. Goptu (2001) identifies in these undertakings, a “specific brand of civic nationalism... with town governance and urban development as its rallying focus, rather than notions of political enfranchisement or democratic rights for all citizens.”

Congested inner city areas often required major land acquisitions, neighborhood clearances and constant retrofitting for the provision of infrastructure and utility networks. An emerging necessity to employ Haussmannian methods of urban renewal, initially favored by administrators to reclaim congested areas for the middle classes, faced criticism from the citizen groups. Notable town planner and sociologist Patrick Geddes, who propagated his ideas of “conservative surgeries” and regional analysis to address urban issues, failed to have a lasting impact through his works with the improvement trusts. The trust’s members

perceived his recommendations to be impractical and financially unfeasible, even too radical at times. The need for teams of expert town engineers and the ensuing political effects of a perceived, cumbersome process drove city authorities to look for other alternatives.<sup>1</sup>

Around this time, the ideas of Ebenezer Howard's garden cities and Tony Garnier's *Cite Industrielle* were influential amongst British town planners who were responsible for the development of racially segregated, colonial suburbs, for British expatriates not desiring to live in these cities. Geddes, who was one of Howard's leading proponents in India, was far more influential on consolidating town-planning ideas for greenfield, model towns. After his tryst with the various improvement trusts, Geddes went on to recommend new planned towns in suburban areas of existing cities in his town planning reports (Glover, 2012).

Consequently, the prevailing dogmas for means of addressing social change through settlement planning got interchanged over the course of their realizations in India. These comprised of methods for improvement – a gradual transition of social ecologies, and development – “proper distribution of beings and activities on a territory in accord with normative standards and goals.”<sup>2</sup> The inefficacy of improvement methods in urban areas and the emergence of planning models for the development of new towns were influential in shaping the trajectory of urbanization towards greenfield developments and an aversion to address the issues of existing settlements. As discussed later in the chapter, the post-independence state patronage to new towns further strengthened this belief.

### **Strategic design for village reconstruction**

However, a parallel, counter movement also took place during the same period, with a focus on rural areas of the hinterland. Glover (2012) traces the conceptualization of rural and urban spaces as dichotomous concepts – influencing Indian nationalists and intellectuals, from the point of view of European orientalist. The 19<sup>th</sup> century works of Thomas Maine and John Stuart Mill contrasted the thriving Indian rural landscape with that of rapidly industrializing Britain. Socio-political scientists appreciated the former's advanced systems of social contracts, juridical forms and cohesions arising over economic and ecological imperatives – postulating the continuity of ancient village systems in

India and giving rise to the concept of ‘village communities’. Specifically, the erasure of common ownership of land and management of resources by Settlement and Enclosure acts in favor of private ownership – in its entirety in the British countryside and rapidly changing the Indian landscape – was variedly critiqued by nationalist ideologues. Thus, while in different parts of the world, the villages were believed to be having a purer form of native culture in contrast to urban areas, it was in India that they acquired a microcosmic status with regards to the Indian civilization in 19<sup>th</sup> century (Jodhka, 2002).

*“The Indian village has thus for centuries remained a bulwark against political disorder, and the home of the simple domestic and social virtues. No wonder, therefore, that philosophers and historians have always dwelt lovingly on this ancient institution which is the natural social unit and the best type of rural life —self-contained, industries peace-loving, conservative in the best sense of the word. I think you will agree with me that there is much that is both picturesque and attractive in this glimpse of social and domestic life in an Indian village. It is a harmless and happy form of human existence. Moreover, it is not without good practical outcome.”*

Sir WW Bart

Quoted by M. K. Gandhi in Hind Swaraj

These conceptualizations framing a dichotomous outlook of cities and villages led Gandhi to exalt India’s villages. Maine’s works along with other champions of village communities, featured directly in the bibliography of Gandhi’s famous Hind Swaraj – a manifesto for Indian home rule. He saw cities as the source of corruption, unhappiness, misery and disease, for their dependence on machinery, industrialization and large-scale production took away the essence of Indian civilization. Here, he presented the villages-life as an alternative and conceived of a new, independent India to be constructed as an assemblage of autonomous, self-reliant, egalitarian village republics – with subsistence agriculture and decentralized craft production. Explaining his idea, Gandhi wrote:

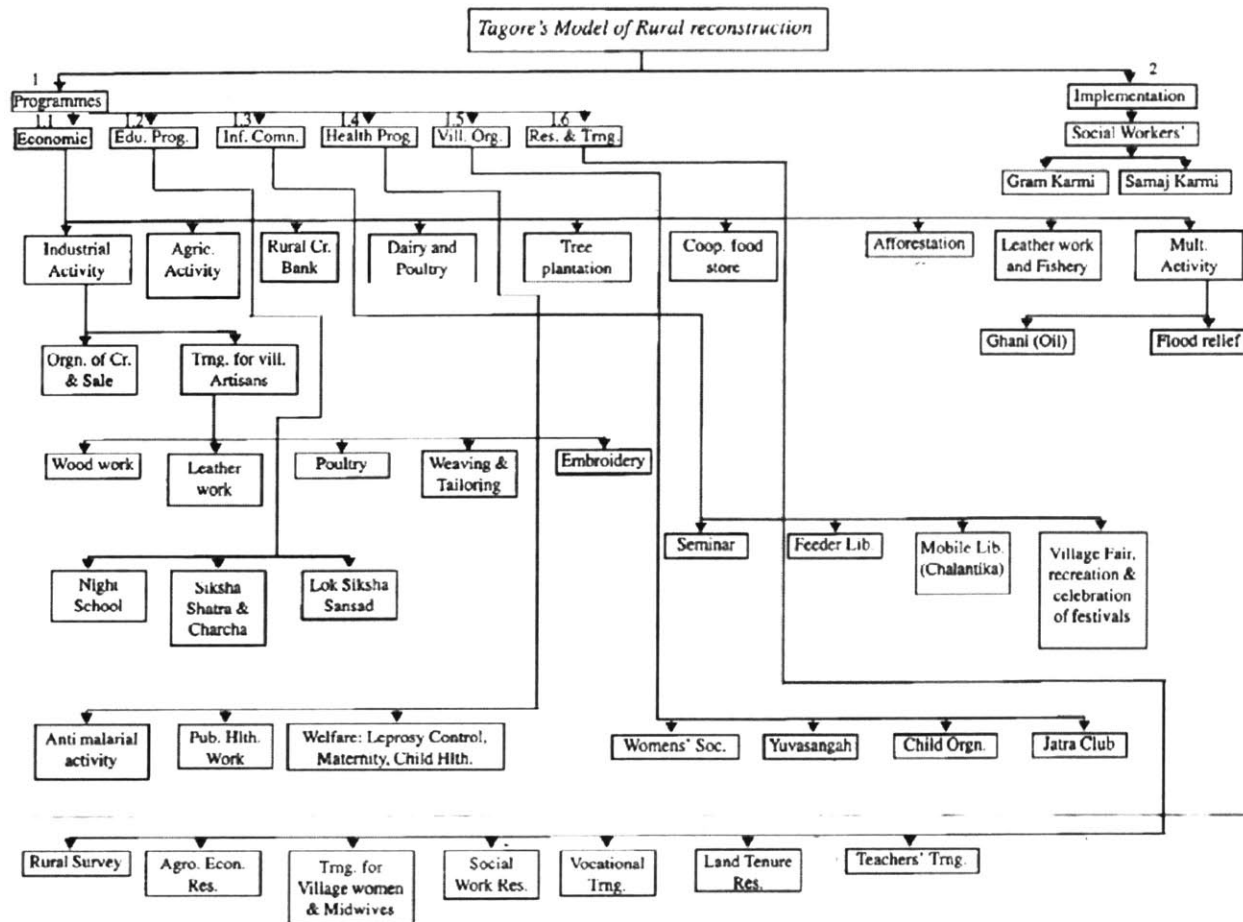
*“My idea of village swaraj is that it is a complete republic, independent of its neighbours for its own vital wants, and yet interdependent for many others in which dependence is a necessity. Thus every village’s first concern will be to grow its own food crops and cotton for its cloth. It should have a reserve for its cattle, recreation and playground for adults and children. Then if there is more land available, it will grow useful money crops... The village will maintain a village theatre, school and public hall. It will have its own waterworks, ensuring clean water supply. This can be done through controlled wells or tanks... As far as possible every activity will be conducted on the co-operative basis... The government of the village will be conducted by a Panchayat of five persons annually elected by the adult villagers, male and female, possessing minimum prescribed qualifications. These will have all the authority and jurisdiction required... Any village can become such a republic today without much interference even from the present Government whose sole effective connection with the villages is the exaction of the village revenue... Here there is perfect democracy based upon individual freedom.”*

M. K. Gandhi

Village Swaraj, 1942







**Fig 2.2 Rural reconstruction model of Tagore**

Gandhi's ideas were disseminated by a coterie from all walks of life, who further helped mobilize a vast army of village level workers – immersed across the rural landscape to work in village uplift programs. Amongst them, J.C. Kumarappa led the movements in various regions while calling for a new economic order for village centric, egalitarian growth with the community at the forefront.

Rabindranath Tagore, in contrast to Gandhi's aversion to cities, envisioned the relation between cities and villages framed over "sympathetic mutuality", and his rural reconstruction efforts were aimed at transforming this relation from that of exploiter and victim. As an exceptional *zamindar* or landlord, while most of his peers absent and residing in cities, Tagore was not against private ownership or enclosure of commons per se, but instead sought to work towards the welfare of his tenants – as a moral responsibility of the employer towards its employees. In his programs, he laid special emphasis on economy, including collective, cooperative farming on scientific lines

and local handicraft, along with education, health, village organization, research and training as well as means of knowledge communication based on traditional folklore. These were preceded by general surveys and investigations into the economic and social problems of each village being targeted.

*“If we could free even one village from the shackles of helplessness and ignorance, an ideal for the whole of India would be established. That is what occurred to me then and that is what I still think. Let a few villages be rebuilt in this way, and I shall say they are my India. That is the way to discover the true India.”*

Rabindranath Tagore  
City and Village, 1928

The cultural nationalists, through their writings and developmental work, were engaged in a dialogue with the west on expounding the Indian conceptualization of ‘civilization and civility’, in the aftermath of the First World War. According to Chakrabarty, while the West was seeking beliefs and ideals in high morality for internationalism and cooperation, Gandhi and Tagore felt that a reversion to traditional Indian rural ways of life could provide these answers. At the same time, they led by example for fellow Indian reformers to undergo an immersive process for indigenous development models through scalable, strategic designs for village uplift and rural reconstruction. Together, the visions and developmental works of Gandhi and Tagore constructed an indigenous models of village centric, community led development and self-management of resources. The movement reached its heights around India’s independence,<sup>3</sup> diminished in the post-independence phase and made a comeback along with other government reforms in the post-liberalization period.

### **The new town stint**

If Tagore was a proponent of a symbiotic relation between villages and cities, Jawaharlal Nehru – India’s first prime minister approached these spaces as temporally set apart by stages of development. Along with B.R. Ambedkar, who exhibited a staunch aversion to the empowerment of village local bodies, India under Nehru adopted a development trajectory wherein, for inhabitants of rural India to uplift – socially and economically, they had to migrate to cities. The preferment of Indian villages on the grounds of them being unfettered by the influence of cities

was deconstructed by another stream of social scientists, supporting the political nationalists in their debates against the revival of village republics.<sup>4</sup>

*“The love of the intellectual Indian for the village community is of course infinite, if not pathetic... I hold that these village Republics have been the ruination of India... What is a village but a sink of localism, a den of ignorance, narrow mindedness and communalism? I am glad that the Draft Constitution has disregarded the village and adopted the individual as its unit”*

Dr. B. R. Ambedkar

Parliamentary debate against empowerment of village republics, 1949

Nehru's reading of traditional, Indian village societies revealed a different conception of nationalism from his own. In his book, *The Discovery of India*, Nehru states that the village societies exhibited strong cultural and social ties while they were politically weak. His ideas for development called for equitable political and economic democracy, which he believed could not be achieved under the system of autonomous village republics. Moreover, his differences with Gandhian ideas on the inevitability and necessity of industrialization and urbanization required a state backed migration of rural inhabitants to new, industrial towns.

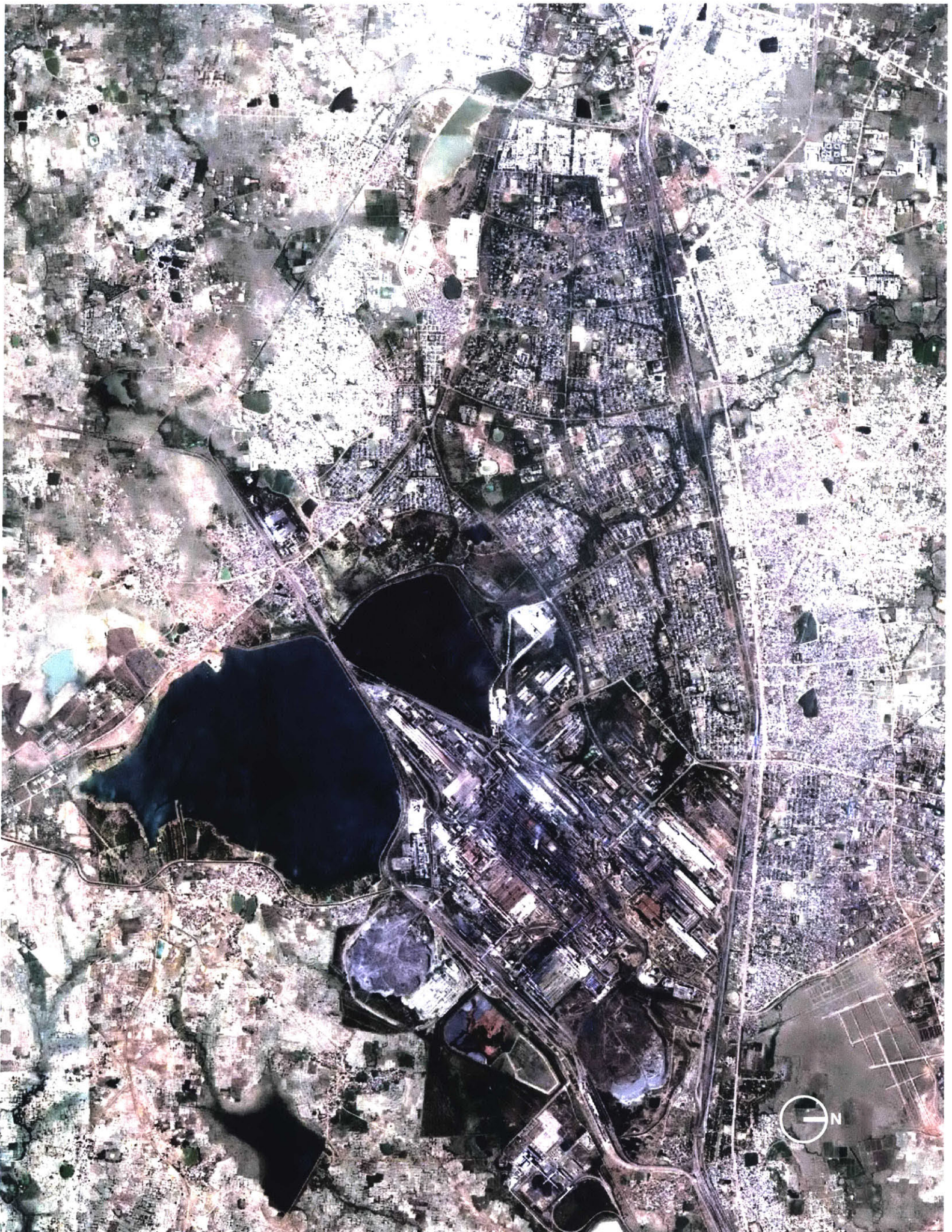
*“...agriculture can produce wealth but it will produce more wealth (if) more people are drawn from agriculture and put in industry. In fact, in order to improve agriculture we must improve industry. The two areas allied”*

Pt. Jawaharlal Nehru

Address to the Associated Chamber of Commerce, Calcutta, 1947

Nehru's vision of achieving modernity and nation wide development through urbanization and industrialization were realized in the aftermath of India's independence and partition. The need for diluting an ensuing communal bitterness, rehabilitation of refugees and migrants and the achievement of economic stability and self-sufficiency, provided Nehru with an opportunity to translate his beliefs on ground. Nehru had been involved with village reconstruction projects with the American architect Albert Mayer in the years running up to India's independence, covering as many as 500,000 villages and broadly following Gandhi's framework of uplift programs. However, post-independence with him as prime minister, cold-war dynamics<sup>5</sup> between the Soviet Union – which he admired for its socialist, central planning, and the USA, led him to abandon these programs. The second five-year plan

**Fig 2.3 Bhilai Steel City**  
With Bhilai steel plant, planned workers township to its west, and the sprawl towards the north.



formulated for the years 1956-61, prioritized industrial development and saw the development of four greenfield steel towns, in addition to administrative cities like Chandigarh, Bhubaneswar and various townships for resettling partition refugees. These steel towns at Bhilai, Rourkela, Durgapur and Bokaro constitute a special case in the lineage of industrial urbanism in the Indian context as well as amongst global geographies associated with steel production.

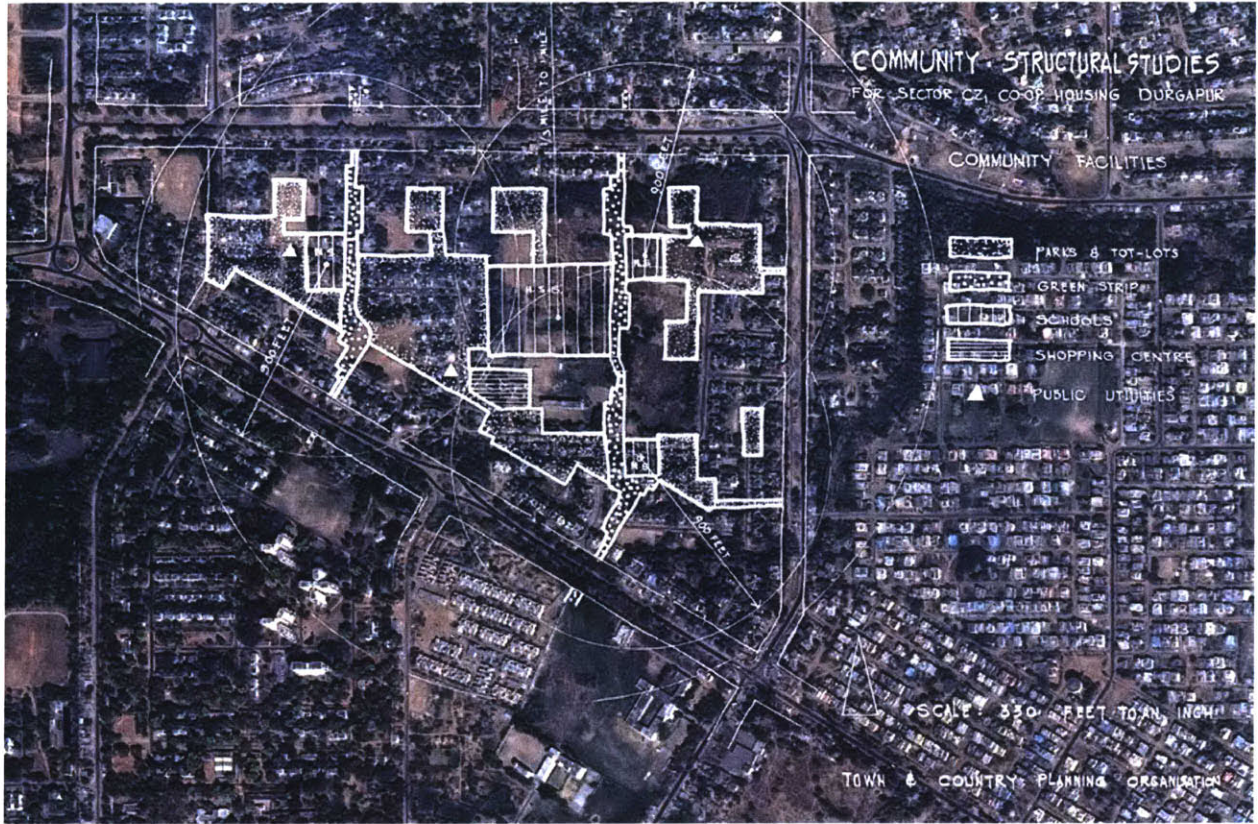
The intrinsic links between steel production, industrialization and urban growth led to Nehru's conception of steel cities as temples of modern India. While the steel plants were developed with the imperatives of import-substitution industrialization, the design of townships took on an additional role of forging a new identity for modern Indian nationals. The modernist ideologies shared between Nehru and the designers of steel cities and other new towns emanated from a belief in urban planning as a means for social engineering to achieve normative goals. As a result, the steel towns evolved with innate characteristics of state paternalism, for which Nehru enjoyed wide public legitimacy in the post-independence scenario. In these cities, all forms of civic institutions and social infrastructure were developed and managed by the state run steel plant's authorities. To this day, the inhabitants of these cities employed with the steel plants uphold its prestige against the organically emerged older cities in their respective states.

In contrast with the village-centric development model, the development of steel cities was collapsed traditional forms of social organizations – based on associational ties, and made use of statistical calculations for their designs. Roy (2007) highlights that decisions ranging from land acquisitions, housing development, amenities and infrastructure in the townships were based on linear estimates for the number of workers required for a tonne of steel produced. In addition, workplace hierarchies were directly mapped onto an urban territory – with homogenous residential clusters and neighborhoods housing 'workforce' based on income, or rank at the steel plant. Thus, while village reconstruction workers adopted an immersive, incremental, strategic model of development; the modernist designers for new towns and steel cities employed scientific knowledge for a static, total design to achieve normative goals.

**Fig 2.4 Residential sector at Durgapur**

Neighborhood layouts designed by J.A. Stein, based on walking distances with schools, parks & community centers as centering devices.

**Fig 2.5 Generic worker housing (Clockwise from top-left) Rourkela, Bokaro, Bhilai & Durgapur**



The steel towns marked a major shift in positions over various paradigms with regards to models of development. Touted as exemplary cases of state led national development, they steered the debates over the focus of planning from villages back to cities. They galvanized a belief that community efforts for rural reconstruction cannot compete against the role of the state as the sole driver of economic growth and social development, legitimizing the state's planning process. This received widespread public legitimacy as the planning, design and development of complete townships along with the steel plants, was meant to minimize state liabilities for welfare and emphasized employment rather than maximization of profits. Also, a large proportion of the population that was displaced, or dispossessed, was redeemed by inclusion into the state-driven development process. Nevertheless, individuals, families or communities seeking socio-economic mobility, beyond the footprints of new towns, were left with no choice but to migrate. The transition towards modernity as a process, at once became historical as well as spatial, while the means provided by the state were largely workfarist.

## **Conclusion**

The first half of the 90's decade saw a slew of reforms, which reopened the debates over various paradigms for development pathways, as well as the role of state, markets and civil society for their achievement. At the same time, they redefined the geographies of planning focus as centers for development. Consequently, new sets of configurations of imperatives, dominant paradigms, landscapes and the demographic mix; prevail at these geographies. In consonance with Chakrabarty's assertion of the two forms of nationalisms in conflict in the post-liberalization period, the following chapter analyzes the manifestation of this clash at the fringes of neoliberal geographies. Here, ideas of self-reliant village republics converge with altered forms of paternalism; manufacturing industry exits the domain of cities and establishes, and transforms new geographies; while the conventional state actors leading growth and development adopt a mediatory roles. The thesis analyzes these reordered configurations; and projects the impact of a manifestation of contestations and clashes onto emerging patterns of urbanization in an upcoming industrial region.







The New Economic Policy authored by Manmohan Singh and Narasimha Rao in 1991 took India away from its decades-long socialistic policies. It was roundly criticised as a capitulation to the International Monetary Fund and World Bank.

# 3

## MANUFACTURING THE FRINGE

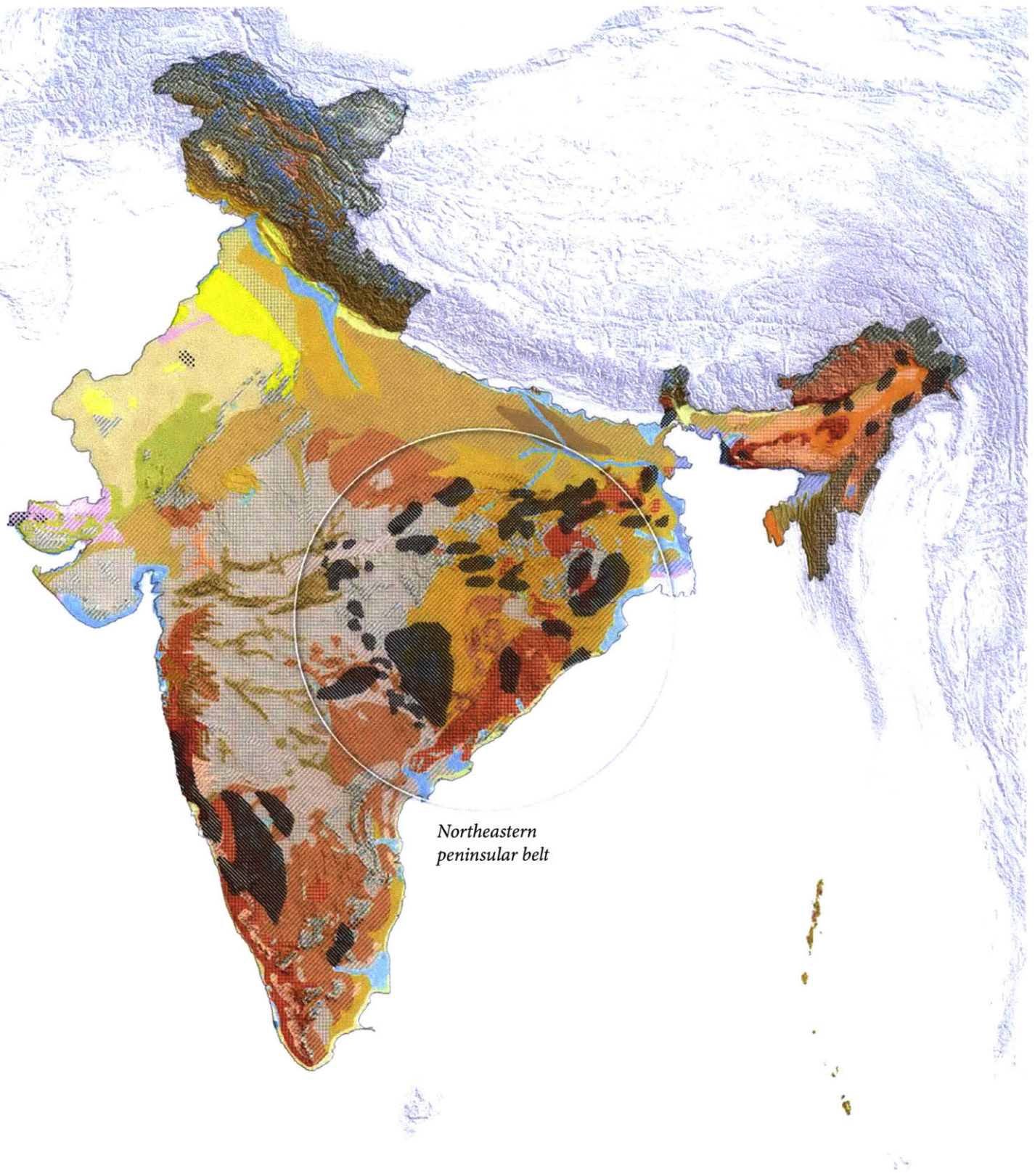
*Neoliberal geographies of the Northeastern Peninsular Belt*

The collapse of Fabian socialism in the last decades of the 20<sup>th</sup> century in the Indian context led to major structural and policy changes, along with an emergence of new geographies with unprecedented characteristics. Nehru's model of development, dominant for a period of four decades since independence, had resulted in stagnating growth, dwindling foreign exchange reserves and inefficient governance – while socialist ideologies across the world were questioned in the aftermath of the fall of the Soviet Union. In the year 1991, India was forced to borrow loans from world financial institutions, at the condition of opening up its economy to the free market. The Government of India under the leadership of Prime Minister Narsimha Rao and Finance Minister Manmohan Singh, subsequently undertook major structural reforms towards deregulation, decentralization and liberalization. These reforms marked the commencement of India's macro-economic transformation, in alignment with the global project of neoliberalization.

**Fig 3.1 An R.K. Laxman cartoon**  
“Dr Manmohan Singh and Prime Minister Rao in 1991: India's economic liberalisation was then seen as imposed on India by the IMF”

*“Neoliberal ideology rests on the belief that open, competitive and unregulated markets, liberated from state interference and the actions of social collectivities, represent the optimal mechanism for socioeconomic development.”*

Peck, Theodore & Brenner



*Northeastern  
peninsular belt*

**Fig 3.2 Soil map of India**  
Showing major coal reserves,  
and their concentration in NEPB

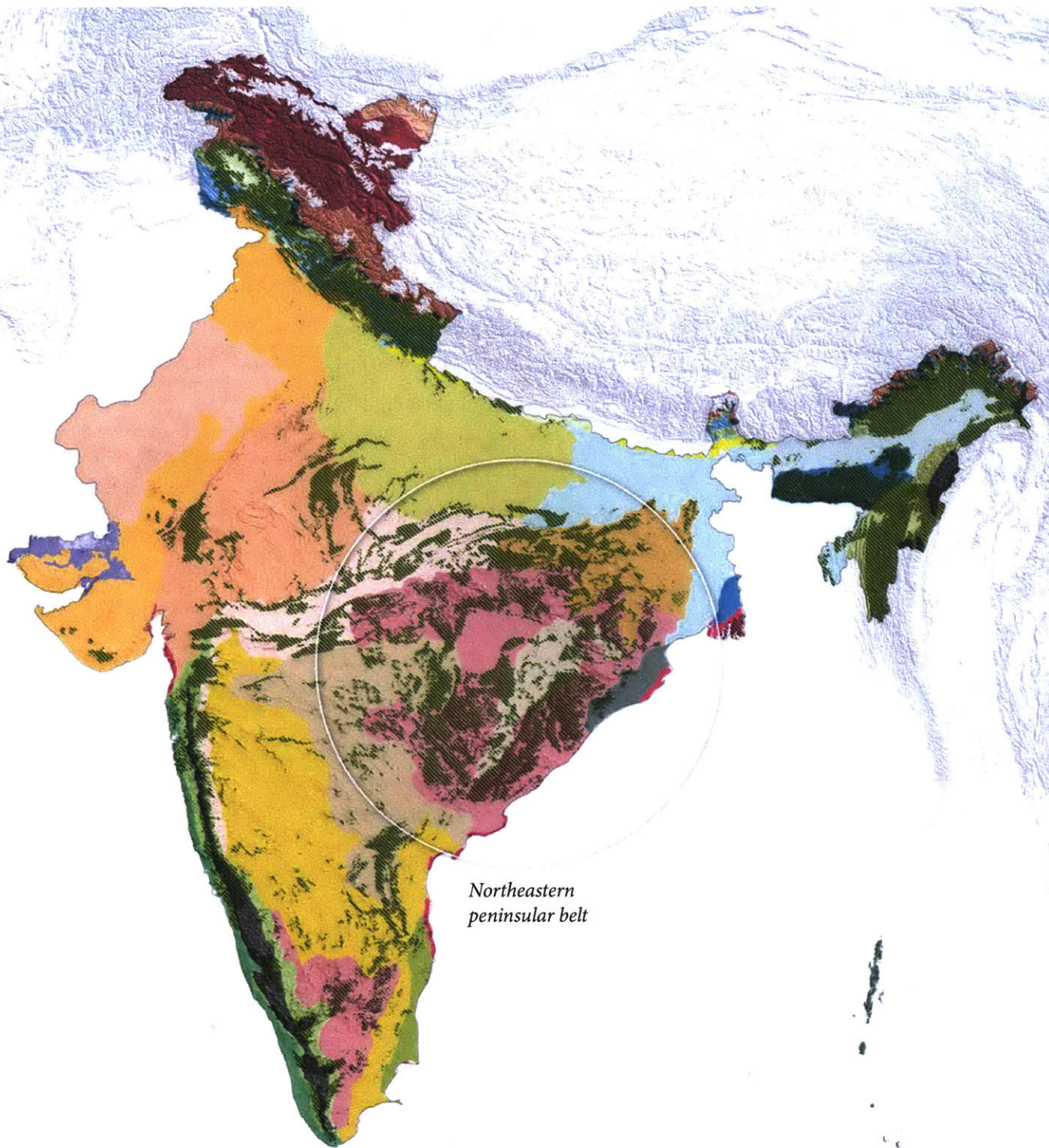
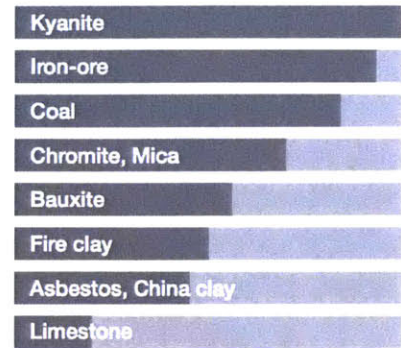


Fig 3.3 India, ecoregions & forest reserves

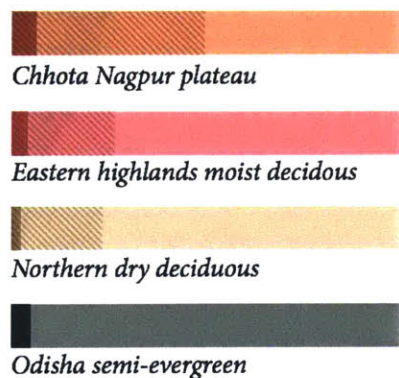
The thesis identifies the northeastern peninsular belt (NEPB) of India as one such region, undergoing rapid transformation initiated by the 1990's reforms. India's mineral wealth is acutely concentrated in the eastern states of Jharkhand, Odisha, Chhattisgarh, including parts of Bihar and West Bengal. Host to industrial cities and huge minefields developed across various periods in the 20<sup>th</sup> century, it accounts for all of India's Kyanite, 93 percent of its iron-ore production, 84 percent coal and 70 percent mica, along with large quantities of bauxite and asbestos. Well developed transport infrastructure and the proximity of shipping ports make it an attractive destination for setting up resource extraction and processing plants – specifically in the heavy industrial sector. Steel production alone, as a key industrial indicator, is targeted to increase from the current 92 million tonnes per annum to 300 million tonnes by 2025.<sup>1</sup> The favorability of the region and a post-liberalization environment is set to uphold the NEPB's dominance in the industrial geography of the nation. However, a singular focus on rapid economic growth in NEPB also engenders unique conflicts and contestations among the state, corporations and native inhabitants.

From an ecological perspective, the NEPB also remains host to India's few remaining, intact ecoregions, the largest concentration outside of the Himalayan mountain regions. Its rich biodiversity is protected in national parks accounting for 7% of the regions total area. In terms of ecological vulnerability, the NEPB ranks the highest among India's regions as extensive mining, rapid industrialization and accelerated urbanization stresses its natural resources.

Additionally, the NEPB is also home to India's native population, officially recognized as the Scheduled Tribes. A large proportion of these tribal communities inhabit the forest regions of NEPB, practicing forestry, shifting cultivation and livestock rearing – directly dependent on its natural resources. While they comprise of 8.6% of India's total population, the tribal people account



**Fig 3.4 NEPB's share of select mineral resources of India**



**Fig 3.5 Ecoregions in NEPB**  
Protected (dark), Intact (hatched) & cleared. A 2.4% net tree cover loss (>50% canopy, 2001-10) was recorded for the region

for over 50% of persons displaced due to mining, industries and development projects.<sup>2</sup> Overall, the region's inhabitants lag far behind the national average on most human development indicators. As a result, the region remains a stronghold for far left movements and violent extremism (Banerjee, 2010), with disenfranchised populations in a perpetual revolt against the state, which exercises eminent domain for the appropriation of agricultural and forest lands for development.

In this otherwise typical case of a paradox of plenty, and the impacts of industrialization and urbanization; a reversion to the ideas of cultural nationalists, lends specificity to the neoliberalization process in India. Part of the structural reforms of devolution of the central government's authority, an amendment to the constitution in 1992 laid out frameworks for granting autonomy to village local bodies over self-management of its resources.<sup>3</sup> This engenders opportunities to curb distress migration out of villages, as well as to empower the village local bodies with systems of grassroots

Fig 3.6 Protest against bauxite mining project in Niyamgiri



democracy, to directly negotiate with the state governments and industrial corporations against the appropriation of village resources for capitalist, growth centric development.

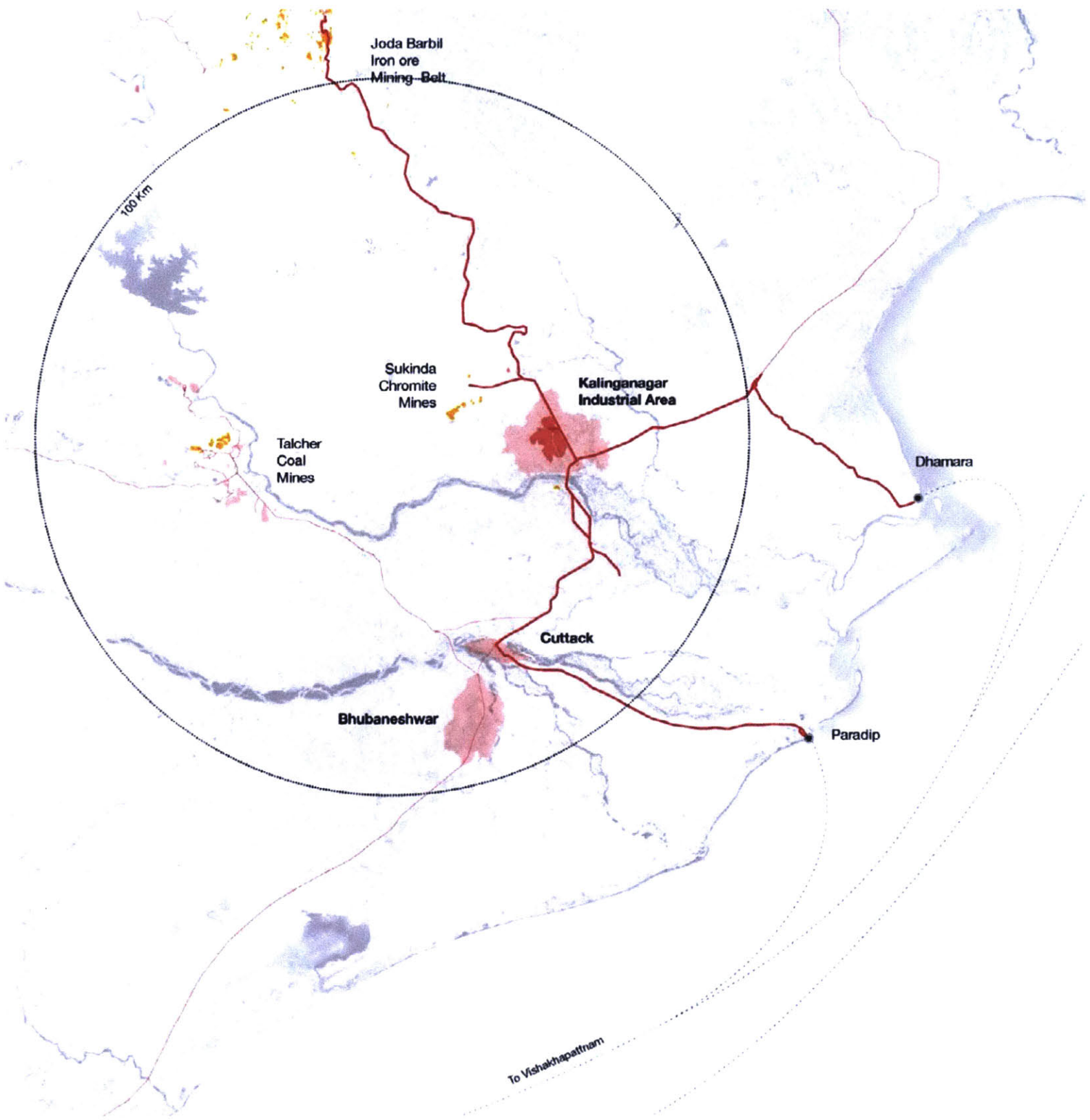
However, with different state governments competing with one another to woo capitalist investment, both domestic and foreign, the devolution of powers as framed by the central government, has been reluctantly implemented. This is especially true for the mineral rich states in the NEPB, where empowerment of local bodies stands in direct conflict with the interests of state governments, backed by strong mandates for economic growth from the elite and urbane, middle classes. The thesis analyzes a paradigmatic case of industrial urbanism within this context, to project the emergent fringe urbanization in the NEPB.

### **Kalinganagar – an introduction**

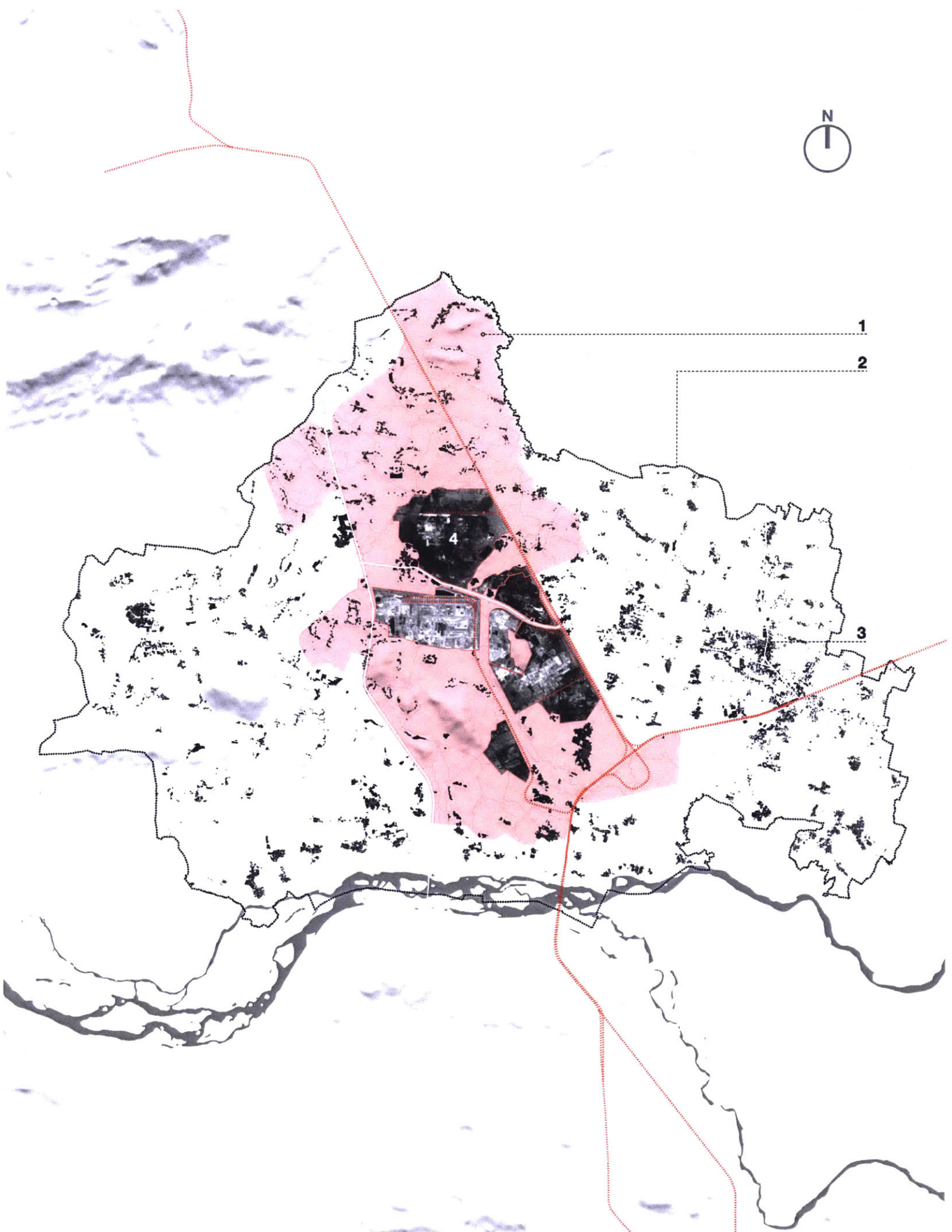
The upcoming greenfield industrial complex at Kalinganagar is a paradigmatic example of industrial urbanization in the North-Eastern Peninsular Belt of India. Pitched as a nominee for a National Investment & Manufacturing Zone – a steel production and downstream hub in the metals segment, it is strategically located at the cross-flows of raw materials, along trunk routes connecting major cities and the coastal ports of Paradip and Dhamra.

Concurrent with the national level reforms, various acts<sup>4</sup> from the post-independence era, which proved to be counterproductive towards industrial decentralization, were removed. These had resulted in the mineral rich eastern states witness its ‘resource curse’, as extensive resource extraction with its allied negative externalities failed in translating into socio-economic development. Coupled with a mining boom owing to escalating demand for iron-ore in China, Biju Patnaik, the Chief Minister of Odisha, promised to deliver a second steel plant in the state and trigger rapid industrial growth - as a means to replace “poverty with prosperity.”<sup>5</sup>

**Fig 3.7 Kalinganagar, Odisha**  
Showing raw-material sources  
and transport linkages







1

2

3

4

However, unlike the industrial complexes or steel cities of the pre-reforms era, the state government limited its role by creating parastatal corporations, only to broker expropriated land, develop and manage infrastructure and provide environmental clearances for multi-national manufacturing corporations to setup facilities. Since the land acquisitions took place in 1990, before the 1992 Panchayati Raj act, the Industrial Development Corporation of Odisha (IDCO) managed to avoid the need for majority consent from village local bodies. This paved the way for multi-national corporations to apply for land for steel production in the nearly 13000 acres of Kalinaganagar industrial complex. After a stalled start, mired by changes in the state's governing party – disobliging towards the project, a recession in steel market deterring industrialists, and an ambiguous rehabilitation policy for displaced persons;<sup>6</sup> steep increases in global steel prices between 2003 and 2008 led to industrial corporations lining up to sign MoU's with the state government. As of 2015, 12 medium and large scale iron and steel production units are in operation, with the proposed steel output to reach 18 million tonnes a year to become the world's largest steel production hub at a single site.

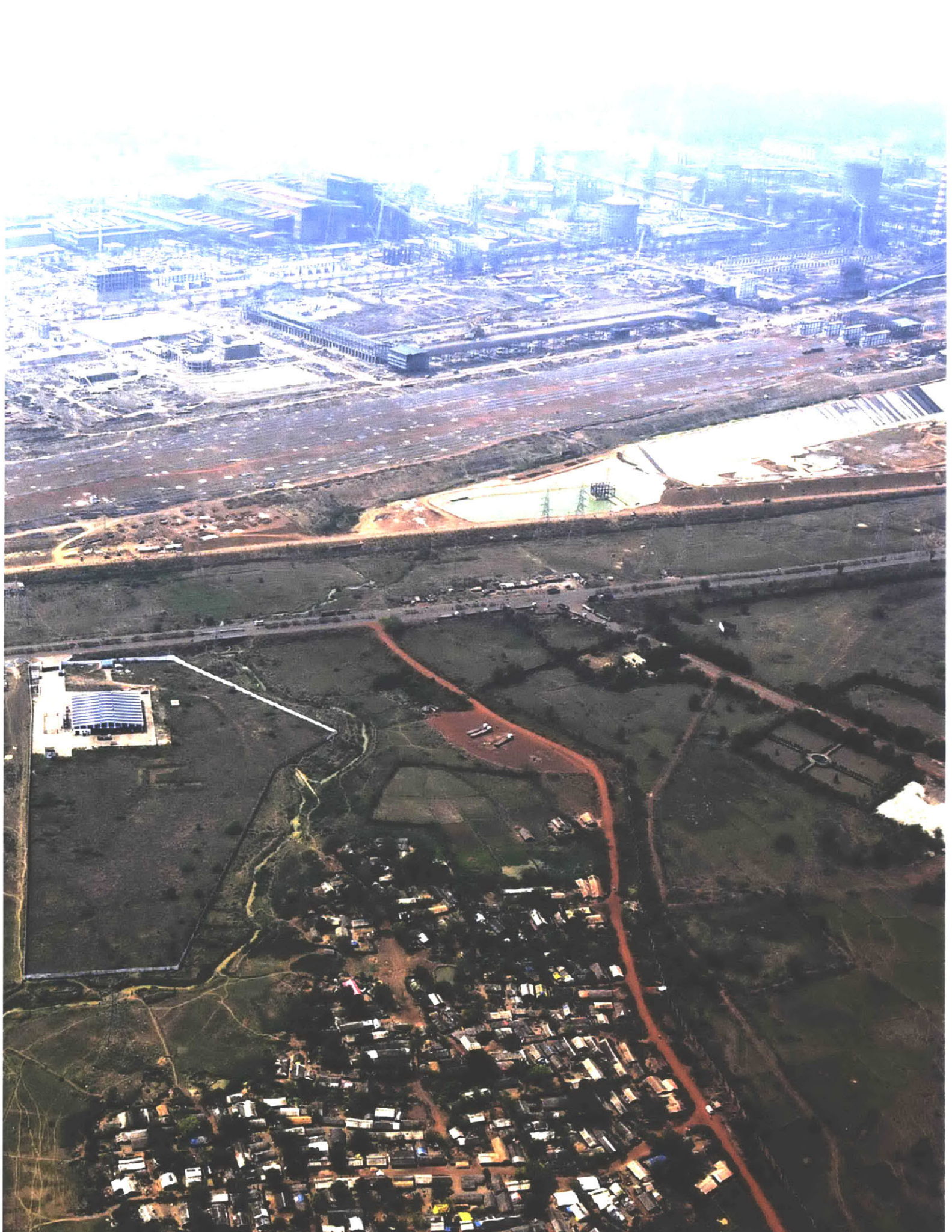
From observations of the emerging patterns of densification and socio-economic changes, in territories surrounding the industrial complex, the thesis projects the trajectory of urbanization to evolve into an assemblage of 'rurban centers',<sup>7</sup> enmeshed with enclaves for a transient population. They also share certain characteristics with the long vaunted Asian desakota regions.<sup>8</sup> While the set of features, exhibited by areas undergoing transformations at Kalinaganagar, are potentially similar across territories of the NEPB, a systematic study of similarly emerging areas is required to generalize the findings.

**Fig 3.8 Kalinaganagar**

1. Proposed National Manufacturing zone (NIMZ)
2. Kalinaganagar Development Authority boundary
3. Vyasaganagar town Municipality
4. Existing steel plants

**Planning dichotomy**

The planning for urbanization of areas surrounding the industrial complex occurs in a stark contrast with that for the zone of production itself. This is a result of multiple parastatal



agencies responsible for development, under loosely coordinated frameworks. The Kalinganagar Development Authority (KNDA) acts a licensing and regulatory agency with urban development under its purview. The industrial complex remains a semi-autonomous enclave within KNDA's area. The development of infrastructure and support facilities for industries are managed and executed by a special purpose vehicle, Jajpur Cluster Development Association (JCDC), a joint venture between the member industries at the complex and IDCO. While the industrial corporations fund JCDC, along with the state government and a seed fund from the central government; a lone municipal body for the Jajpur Road town and various village local bodies not only lack revenue bases and sources of capital for developmental works, but also is understaffed and lacks planning expertise.<sup>9</sup>

Patterns of urbanization, under this dichotomous approach, exhibit tendencies of major challenges in various domains, as resource mobilization and planning attention favor zones of economic production over those for human habitation, and the natural environment. This dichotomy further governs the following emergent characteristics.

Under a restructured urban housing market in a neo-liberal environment, the provision of affordable housing for an influx of migrant workers, wage laborers and the urban poor – whether or not employed at the industrial complex, becomes a responsibility of local bodies.<sup>10</sup> Contractualization of labor implies that industrial corporations only hire senior managerial staff as direct, on-roll employees whereas lower paying manual labor jobs are outsourced to labor contractors and sub-contractors.<sup>11</sup> These contractors maintain an oversupply of wage seekers, hire non-native, in-migrant workers and prevent unionization. As a result, any legal provisions for welfare and housing of contract workers are easily bypassed. In the absence of efficient delivery of affordable housing options, slums and squatter settlements – as are common across all industrial cities in India, continue to grow

**Fig 3.9 Tata Steel plant at Kalinganagar Industrial complex**

After a short-lived boom from iron-exports to China, the government of Odisha mandated large mining corporations to set up manufacturing facilities within the state.

around the industrial complex.

Apart from class distinctions amongst the labor, divisions based on income, industry or occupation, origin of birth, etc. are also mapped onto the territories. While the logics of economy, infrastructure corridors and proximity to small town centers govern the development of gated enclaves for the industry's managers and officers, in-migrating wage seekers agglomerate in and around existing villages. As a result, in the absence of centralized town planning, the territory develops with uneven densities, an intense mixture of land-uses – juxtaposing agricultural, residential, industrial, logistic, trade and service activities in close proximities.

**Fig 3.10 (opposite)**  
Accelerated, unplanned urban sprawl around the Jajpur Road railway station

Such patterns of urbanization scattered across the landscape at relatively low densities render the proactive development of centralized, distributive utility networks unfeasible. While private

**Fig 3.11 (below)**  
The once agricultural villages are sites of contrasting forms and activities



Urbanizing the fringe



developers and local bodies, catering to the gated enclaves and high-income neighborhoods, provide off-grid systems of power generation (diesel generators, solar panels), water supply (deep bore wells) and sewage systems (septic tanks, soak pits); the enmeshed layer of worker colonies, slums and existing villages either altogether lack such utilities, or rely on mobile, service providers<sup>12</sup>.

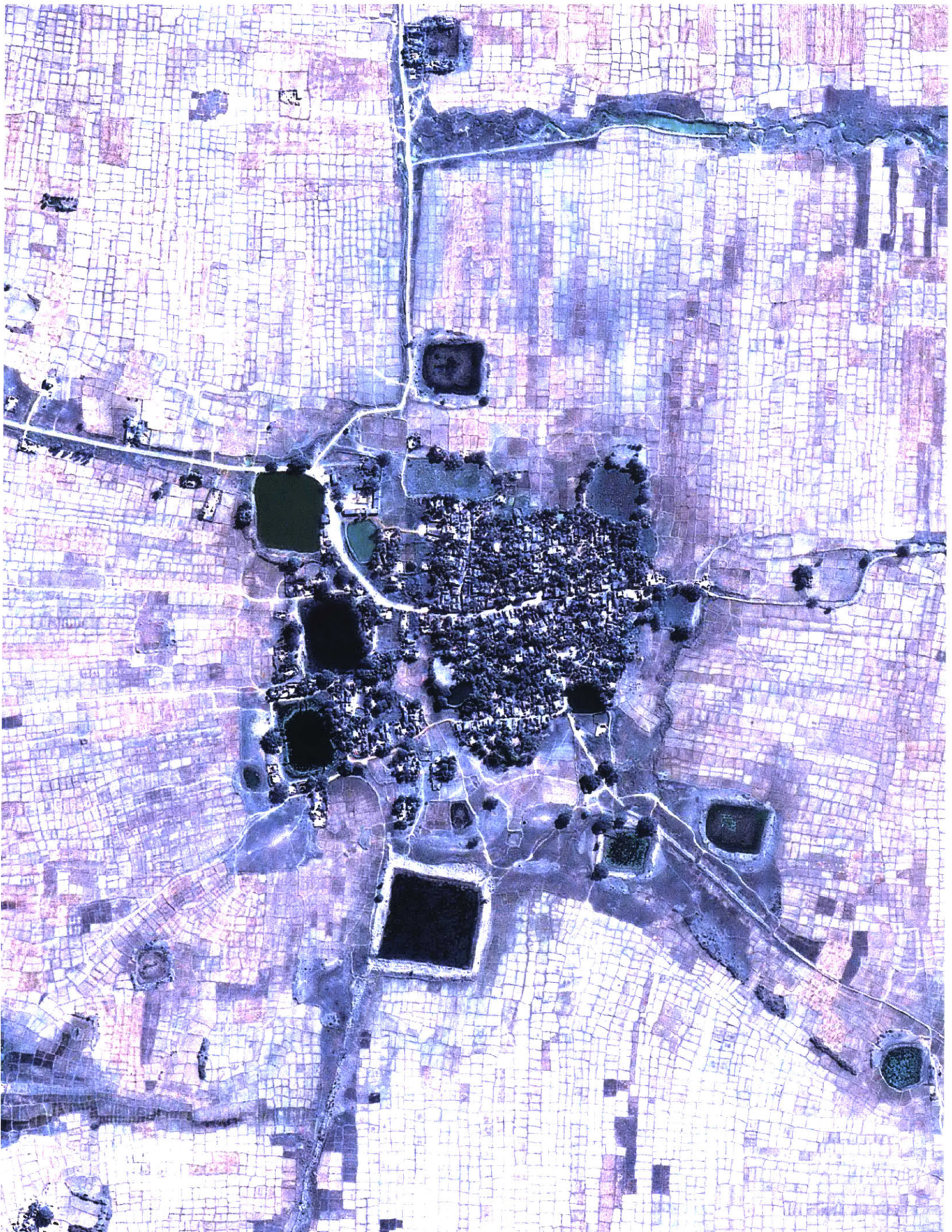
### Natural ecologies

*“The ecological patterns of holdings, tanks and wells is linked with the patterning of rural habitations... the compact village settlement is well adapted to the mode of life and farming in the rice zone, its scattered distribution of holdings and characteristic management of irrigation and drainage by rural community. Like the large number of varieties of paddy adapted to the local conditions of soil, rainfall and the level of flood, like the co-operative agricultural and irrigation practices and the self-government of the rural community, the forms of rural agglomeration are largely in adjustment to natural conditions.”*

**Radhakamal Mukerjee**  
Man and his habitation

While the climate and environment of the NEPB and Kalinganagar falls within the larger sub-continental monsoon zones, the specificities of natural events have shaped the relations between the landscape and their inhabitants in ways different from other paddy growing regions. Rainfall is acutely concentrated in the monsoon months and the region experiences droughts alternating with heavy flooding and cyclones, with increasing frequency over the years. Coupled with low population densities, lack of irrigation networks and robust water management systems; intensive wet-paddy cultivation is rendered unfeasible. Majority of the inhabitants practice rainfed, subsistence agriculture

**Fig 3.12**  
Village Janha, southeast of the industrial complex. Image shows its agricultural revenue lands and rain water storage tanks





limited to one paddy crop per season, with patchy cultivation of vegetables or legumes in the lean months. A large proportion of the communities indulge in forestry, whether timber or non-timber based, along with livestock rearing, aquaculture, sericulture, etc. – again, mostly for livelihood security. With increased industrial and urban activity, labor contractors easily attract surplus labor from local households to work contract jobs for supplementary income, although at much lower wages than the migrant, semi-skilled labor.

Despite a high rate of in-migration into these territories, the nature of migration is cyclical and transient. Distress migrants from forest regions, areas of low agricultural productivity, as well as development induced refugees, flock to industrial and mining centers in large numbers during the lean months, and revert before the commencement of monsoons<sup>13</sup>. At the same time, even amongst the high earning employees of industries and urban services, only a small proportion resides in these areas permanently. A majority of them commute from their native towns or distant cities on weekly basis, joining their families on weekends. Moreover, after the end of their tenure, even those with families return back to major urban centers and capital cities. Thus, such territories of extraction lack major urban areas as their nuclei, instead, the minefields and industrial zones replace them as anchoring hubs. This in turn affects the mobility of native inhabitants,<sup>14</sup> who are under bondage to contractors or hiring agents, as the sole sources of income security.

Kalinganagar and similar territories are also at the receiving end of ambiguities amongst agencies and individuals over ownership and management of resources – resulting in legal twilight zones. While these are discussed in greater detail in the next chapter; with regards to projected patterns of urbanization, a lack of clarity amongst various definitions classifying areas as villages, areas in transition, towns, cities – for administrative and development purposes, prevents accountability of elected bodies. Within the area

of KNDA, several villages can be classified as ‘urban’ – in census terms, or are eligible for the formation of a municipal body, either in terms of density, ratio of persons engaging in non-agricultural activities or total population. However, since none of them meet all criteria – mandatory according to the stringent criteria, village areas with luxurious gated enclaves on hand, and those with dense industrial worker slums, are required to be provided with amenities and services by the village local bodies. These ambiguities further lead to multi-lateral contestations over common pool resources, where disenfranchised native populations, directly dependent on them for subsistence, are vulnerable to further marginalization.

### **The fringe condition**

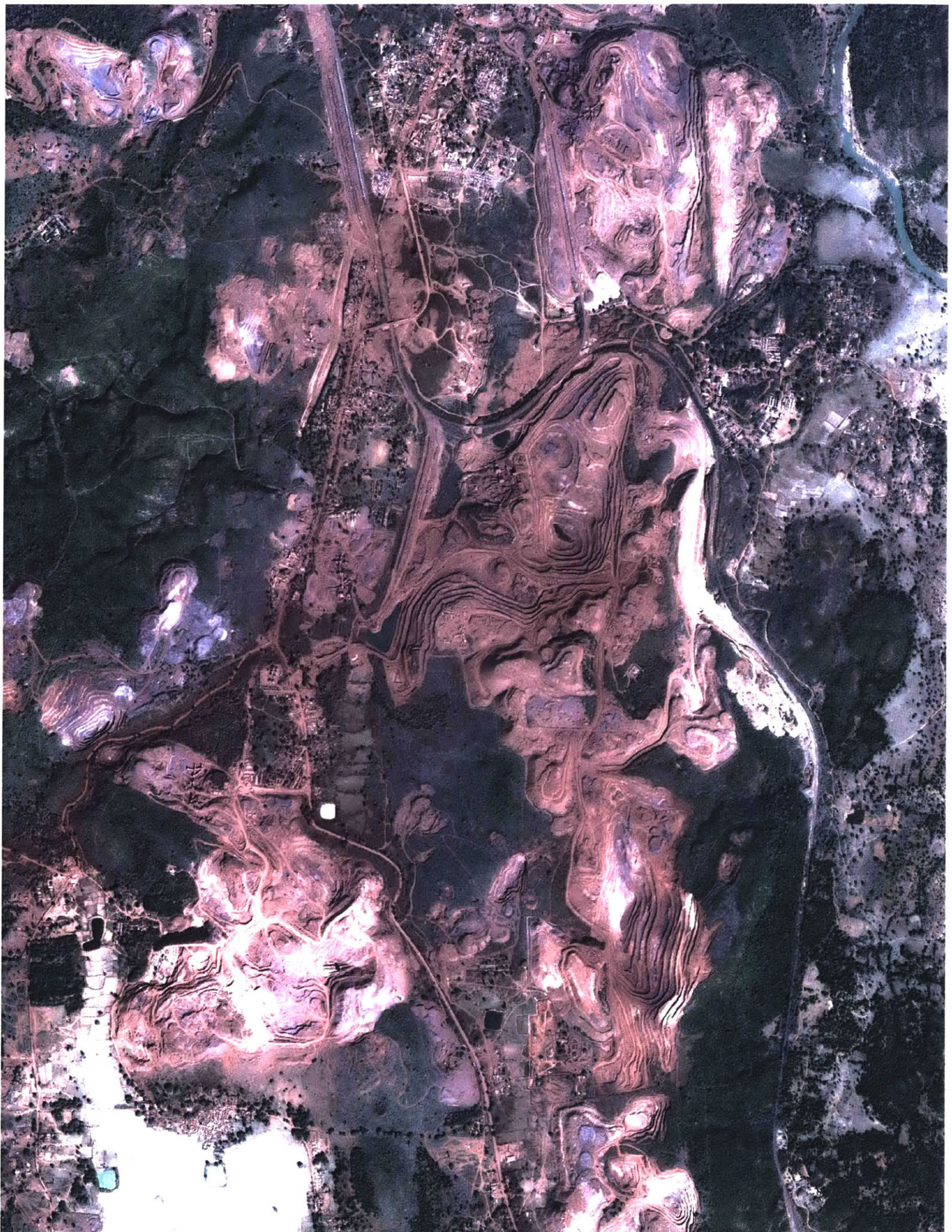
The thesis argues that such territories – surrounding the industrial complex and comprising of existing rural settlements, native inhabitants and natural landscapes in the NEPB; as the ‘fringe’ geographies of neoliberal urbanism. These territories of extraction and production rarely cater to the needs of the native inhabitants; and instead favor commodities of exchange value, for a globalized, consuming class – oblivious to the local impacts of their consumption. The transformation of these territories from indigenous habitats to territories of extraction, is enabled by specific changes in the policy environment, modes of production, roles of state and markets, etc. – under an overarching project of neoliberalization.

This stands in contrast with what are defined as neoliberalization’s frontiers – the cities.

*“...cities have become crucial sites in the propagation of neoliberal projects... Global cities, slums, marginalized rural hinterlands, minority ghettos, zones of accelerated resource extraction; these are all interconnected points on the shifting map of neoliberalized uneven development.”*

Leitner et. al. (2007) draw upon Lefebvre's argument of complete urbanization of the world, while claiming that amongst these territories with varying degrees of urbanization, cities inherently contain the seeds of resistance and are the forerunners of contesting neoliberal urbanization.

The thesis distinguishes the 'marginalized rural hinterlands' being transformed into 'zones of accelerated resource extraction' from cities – the frontiers, as neoliberalization's fringes. It argues that the fringe is a condition, which occurs at territories where resource rich regions have been laggards in the race of industrialization and modernity – a paradox of plenty, and witness rapid industrialization and large-scale resource extraction. It emerges as a function of a discrepancy in the economic value of a resource, amongst the host territory's inhabitants and those in need of it, with the latter in a hegemonic position supported by a state-corporate nexus. The fringe condition triggers wide-scale socio-economic transformations, wherein the native inhabitants are either absorbed into the dominant modes of production and ways of life, or are excluded in the process.





# 4

## MECHANISMS OF DETERRITORIALIZATION

*Kalinganagar Steel (City)*

As the fringe condition is enacted upon the territories at Kalinganagar, its existing village settlements emerge as the sites of multilateral contestations. Here, welfare policies and frameworks protecting marginalized populations – either as legacies of pre-reforms era, or novel instruments attempting to balance dispossession, are in direct confrontation with the state government's efforts to trigger rapid economic growth. The thesis argues that these villages – the settlements along with their resource-scapes pertaining to the fringe condition, undergo a systemic deterritorialization.<sup>1</sup> The conceptual framework of deterritorialization here, is used closest to its anthropological meaning, wherein due to external stimulations – the relations between communities and their landscapes are destabilized.

The following sections elaborate on the impact of ensuing transformations as observed during field trips, along with conversations and semi-structured interviews with the inhabitants of villages surrounding the industrial complex. Inspired by Geddes' methods for regional reconnaissance, various villages were selected along the watersheds of two seasonal streams to analyze the fringe condition. Empirical observations were further corroborated with remote sensed imagery analysis – hydro-geological, agriculture and settlement patterns, statistical analysis using data from census of India, as well as village revenue maps

for tenure and ownership information.

### **Legal twilight zones – migration & settlement**

The specific patterns of traditional village settlements in the region are a direct function of its hydrogeology. Before the setting up of the Sukinda kingdom in the 8<sup>th</sup> century AD,<sup>2</sup> the region was ruled by smaller, tribal chieftains. With the area heavily forested even until the late 19<sup>th</sup> century, forest dwelling tribes practiced shifting cultivation, forestry and hunting. Village settlements emerged near foothills and higher, lateritic outcrops, where the tribal clans cleared forests, cultivated the relatively fertile seasonal streambeds and drew water from naturally occurring springs.

*“The surface of the district falls according to its natural features into three main division. To the west a strip of high sterile land and rocky hills covered with thorny bamboo or scrub jungle and intersected by narrow valleys. The greater part of this region is occupied by the permanently-settled estates of Sukinda... once the strongholds of almost independent border chieftains and still known as killas or forts.”*

*“We have evidence that systematic cultivation probably did not begin in the tract under report till some 1500 years ago, but that the earliest cultivation was probably in 800 BC... Hiouen Thsang (629 to 645 AD) travelled from Jajpur to Khandagiri through thick forests. Even in the reports of the last settlement sixty years ago damage from wild animals is a frequent cause of low assessment.”*

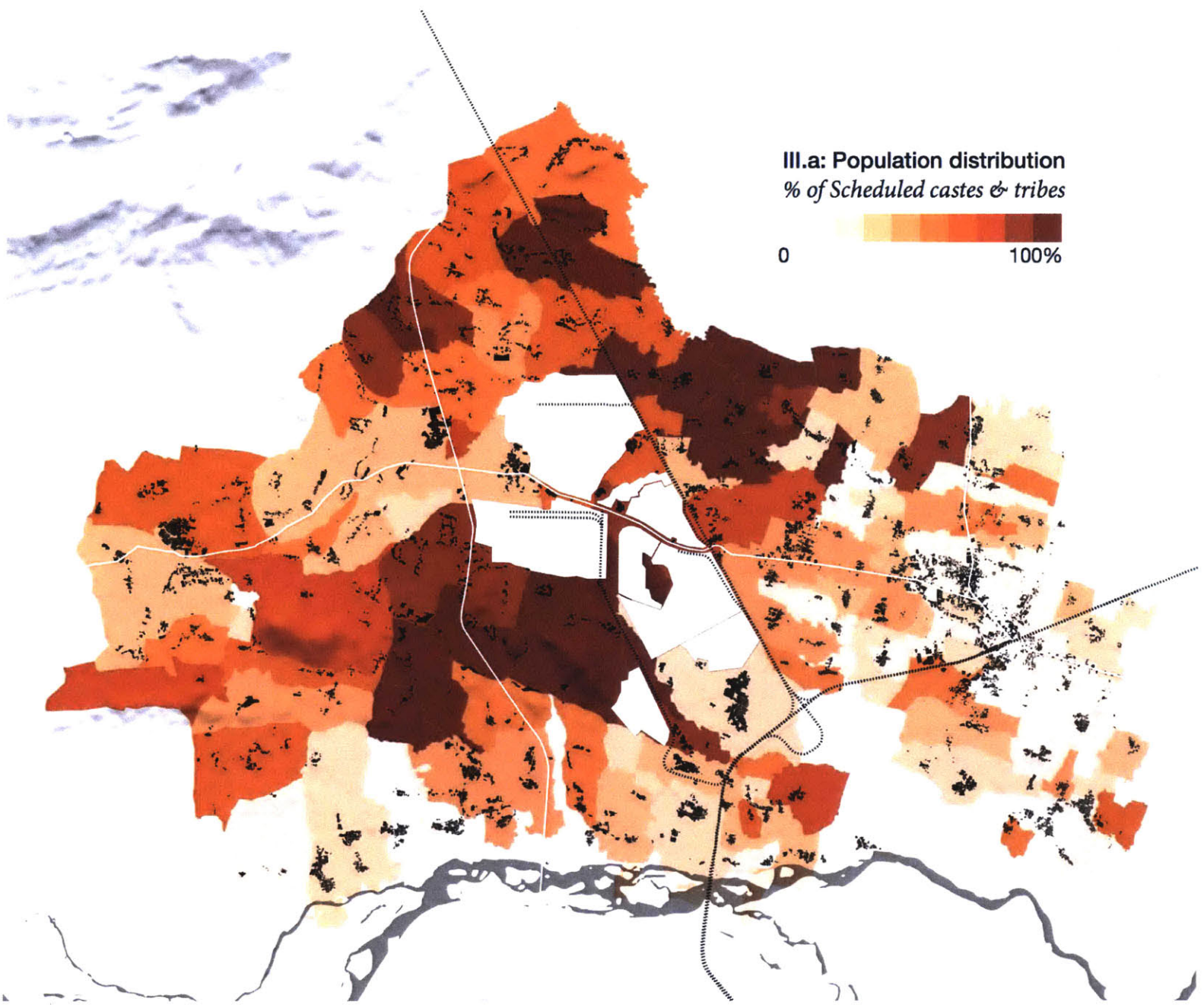
S. L. Maddox

Extracts from report on survey and settlement in Orissa, 1900

The process of disenfranchisement of indigenous tribes finds its roots amongst the British colonial government's organization of territories for the imperatives of revenue maximization. While a

### **Fig 4.2 Subsistence homesteading**

Indigenous communities from neighboring forest areas continue to migrate and settle at flatlands, bordering the hill regions. They homestead unoccupied, unowned 'government' lands for subsistence.

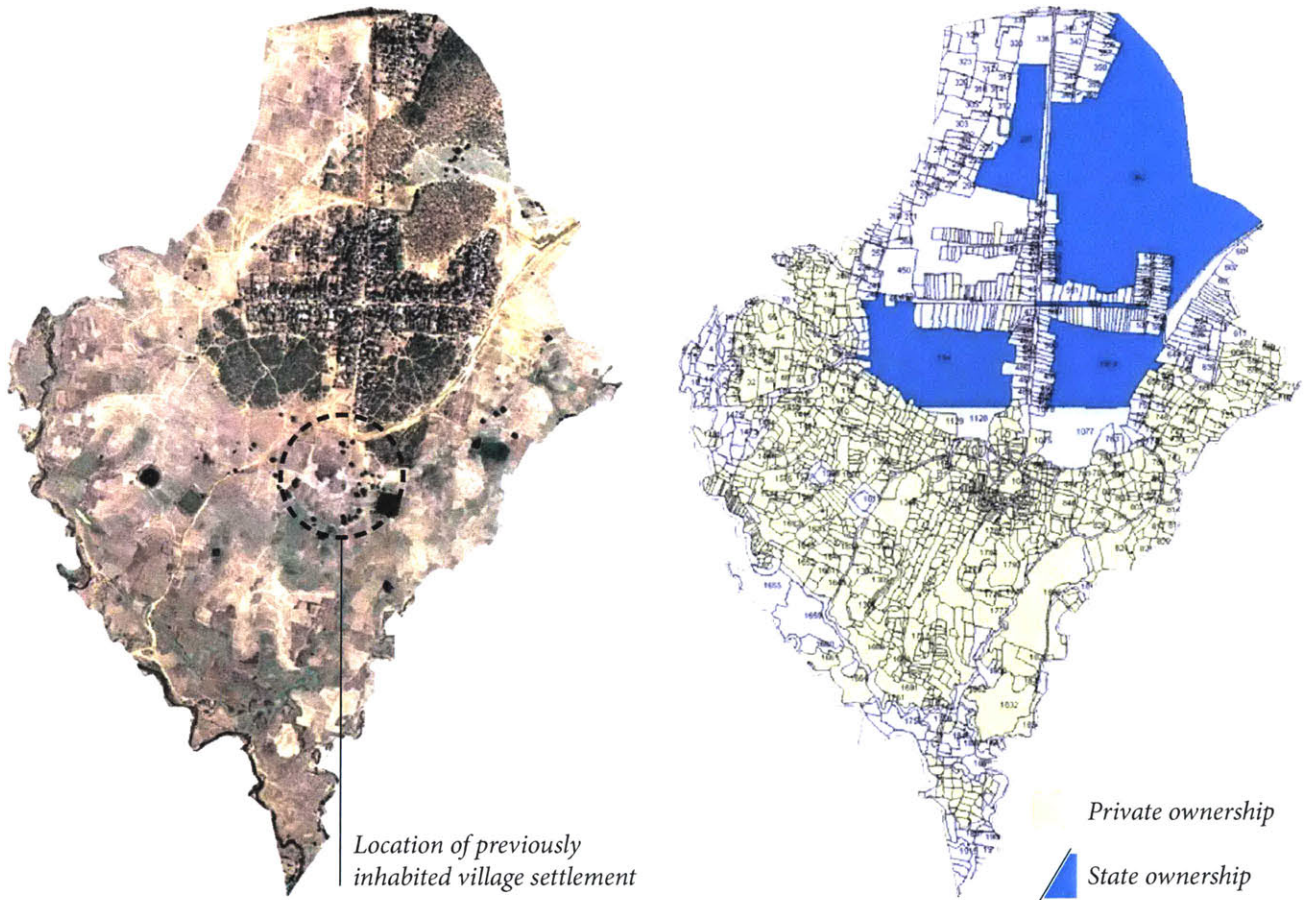




majority of tribes practicing *jhum*, or slash-and-burn cultivation in the highland forest regions were taxed with the implementation of plough cess or hoe taxes, the lowland regions were appropriated and controlled by installing subordinate rulers. The ruler of Sukinda was granted the status of a zamindar, or landlord in 1804. In order to generate enough revenue to pay the colonial government, the ruler invited forest tribes from neighboring regions to settle as tenants on his estate. The British colonial government, in accordance with the Orissa Tenancy Act of 1913, undertook a land settlement survey for the estate in 1928, whereby settlers and cultivators were provided with copper plaques as proof of tenure on the principle of homesteading.<sup>3</sup> The remaining uncultivated lands not under possession of any individual or families were demarcated as non-revenue, government lands or forestlands.

After India's independence in 1947, the Government of Orissa implemented the Estate Abolishment Act (1952) and assumed ownership of all land belonging to the ruler of Sukinda estate, while the forestlands continued to be managed by the State forest departments (Kumar, 2015). Until the acquisition of lands for setting up the Industrial complex in the early 1990's, despite several movements and activism, no new land settlement surveys were undertaken barring select cases. Entire communities of erstwhile forest dwellers, which settled in the region since 1928 by the traditional processes of migration and homesteading unutilized lands for subsistence, became unauthorized encroachers in their native territories. Moreover, any momentum gained by grassroots movements demanding land rights was lost in the post-reforms period. Hereby, land came to be seen as a contested resource, between under-represented subsistence farmers and parastatal companies seeking to allocate unencumbered land to corporations and industrial houses.

The State government, in its failure to provide land tenure, not only excluded a vast majority of rural poor from availing benefits



**Fig 4.3 Pending land-settlements**

Inhabitants of village Bambilo relocated their settlement a century ago within the village boundaries, as the old habitation became congested & overpopulated.

(Top) Village square at its cross-roads, with a shelter for community gatherings

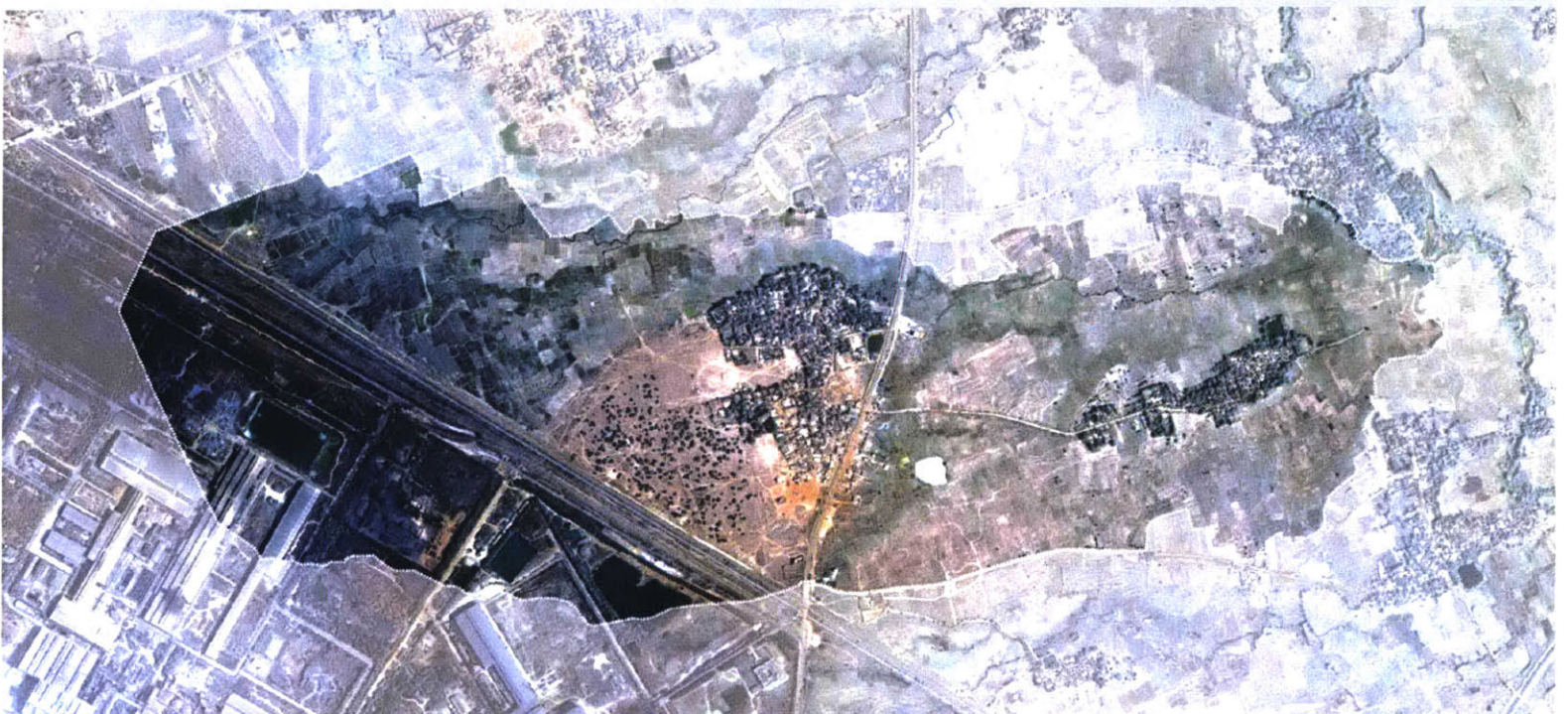
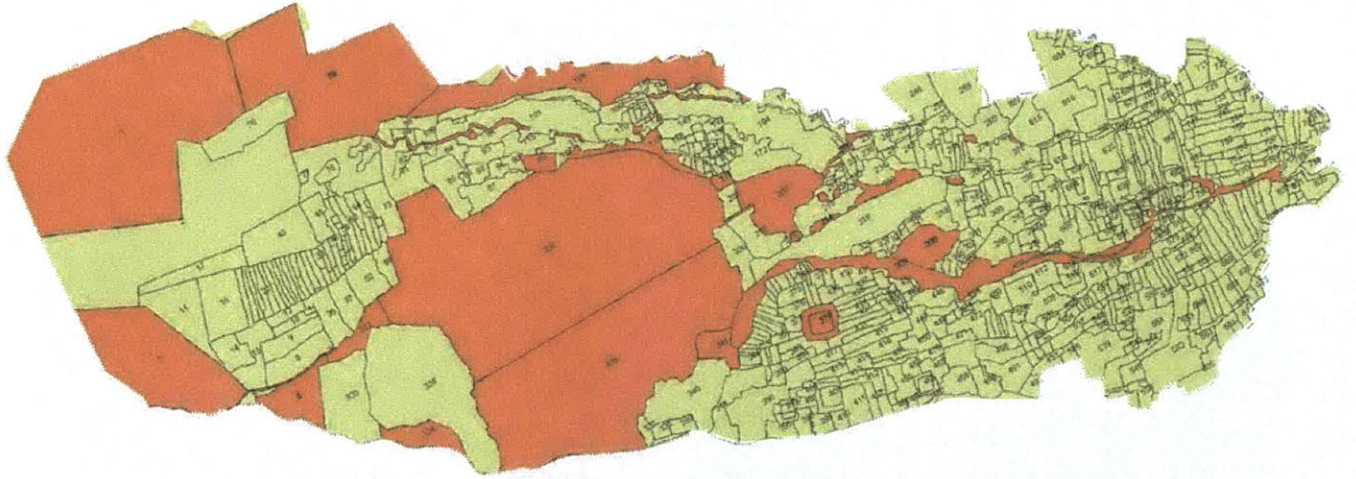
(Bottom) As seen in the revenue records map, while agricultural, or revenue land is privately owned, none of the village's inhabitants possess tenure documents for their present homesteads.

from its welfare schemes, it also remained apathetical towards community development initiatives. As older village settlements became crowded, or sources of water failed to suffice the needs of their growing populations, its inhabitants dismantled and rebuilt their mud huts, relocating to more suitable locations. In the process, wide streets with abutting rectilinear lots were laid, aligned to the cardinal directions, new wells were dug and gathering spaces and squares were developed at crossroads. As a replicable model, more than 30 such villages were redeveloped towards the west of the industrial complex. Online land records substantiate the plight of inhabitants as they lack tenure for their new homesteads, while only a few older households possess ownership documents for land long abandoned and under cultivation at present.

Such discrepancies between documentation of ownership, usage rights and on-ground habitation patterns, owing to the history of territorialization, is the principal cause of vulnerability and marginalization of native inhabitants. Across the zones earmarked for the industrial complex and the larger urban development area, existing villages comprise of varying proportions of populations









**Fig. 4.3 (above)**  
Laterite stone quarry at village Mulasar. The village local body denied claims of the state government's Revenue Inspector to obtain royalty over mining activity, and instead allowed the village inhabitants, classified as Below Poverty Line to mine stones for construction of permanent residential structures with funds received under the Rural housing scheme (Indira Awas Yojana).

inhabiting these legal twilight zones, and in most cases they belong to Scheduled Caste or Scheduled Tribes communities.<sup>4</sup> They are at a greater risk of eviction and exploitation by private developers and the parastatals, which are not obliged to compensate displaced persons in the absence of proof of residence. In addition, tenant farmers and sharecroppers not only tend to lose their homesteads but their sources of livelihood as well. For these sections, the promise of 'development' triggered by rapid industrialization, instead casts them as development-induced refugees – in a perpetual state of cyclical migration from forests to rural areas, urban areas and back.

### **Commons, commodities and contestations**

The implementation of liberalization reforms has given rise to multi-lateral contestations with a multiplicity of agencies and organizations now responsible for the management and governance of the commons. Under the colonial rule and tenancy acts, the territory was organized into homestead lands, agricultural or revenue lands and finally, the common property resources. With the devolution of powers to state governments and urban or village local bodies, the commons were split amongst various elected, hierarchical organizations as well as non-elected, parastatal companies – with ambiguities over boundaries,

**Fig. 4.4 (opposite)**  
Village Mangalpur abutting the Industrial complex. Land ownership and usage, before and after 1991.



Fig. 4.5

In villages closer to the Brahmani river, seasonal flooding is an annual phenomena. Over the years, the village inhabitants constructed a system channels to direct flood waters, and water storage tanks to collect the same for irrigation and fishing. Over the past decade, with village local bodies being granted revenue generation powers, they auction tanks to private contractors for commercial fishing. This not only deprives the marginalized village inhabitants from an important, free source of food, but since the village inhabitants stopped participating in a collaborative effort to maintain these tanks, their resilience and effectivity against flood mitigation has significantly dropped. Moreover, sand mining at the banks - whether auctioned by village bodies or illegal, further aggravates the impacts of monsoon flooding.

responsibilities and accountability. As the marginalized, landless sections of village communities are directly dependent upon the natural landscape and resources, their rights are at the forefront of being quashed between contested claims amongst different interest groups.

Communities organized over systems of paddy cultivation into *solidaire* cooperatives<sup>5</sup> witness a loosening up of ties, with state expropriations and changes in economic and ecological imperatives. With nearly 80% of the annual precipitation in the region concentrated in the monsoon months of June through September; the traditional systems of water management and irrigation comprised of an elaborate network of springs, wells, ponds, and storage and recharge tanks. In most villages, tanks were dug in a collaborative effort of community members, whereas a few belonged to extended families. While the post-independence period saw *gram panchayats* – the elementary, village local bodies in the government hierarchy – appropriate majority of this water infrastructure, the reforms provided these bodies with powers to earn revenue from common pool resources.<sup>6</sup> Despite being elected bodies intended for grassroots governance and village self-reliance – through local management of common pool resources, their corporatization yields varied results contingent upon the will of elected members – which in the case of Kalinganagar, almost always belong to elite groups in the social hierarchy.







The issues of water scarcity and inefficient management were aggravated with the setting up opening of chromite mines as well as the commencement of steel production in the industrial complex. The flattening of forested hills and mounds for ore-extraction and stone mining, which acted as natural reservoirs trapping rainwater in the fissures of its rocks and gradually discharged it over several months through natural springs – the only sources of fresh water for many villages, led to their drying up. In their place, shadow landscapes emerged in the form of slag mounds, ash ponds and abandoned quarries, contributing to the leaching of heavy metals and contaminants into the ground water. Moreover, despite a ban on industries from drawing ground water for their processes, many plants continue to use deep bore wells, resulting in a drop in water tables around the industrial complex. Yet, there are little to no incentives for village local bodies to invest in water management infrastructure, while the state government banks upon mega-dams and irrigation canals to primarily suffice the needs of the industry – resulting in further land acquisitions and population displacements.

Low-lying lands surrounding eruptions of natural springs have long been under paddy cultivation through a system of micro-channels and gullies transferring water between small-landholdings of many households of a village. However, since such areas are documented as government lands, there are no frameworks or regulations preventing their transfer for other land-uses. Many such headwater areas have already been buried under steel plants while private real estate developers line up to purchase others, not only displacing active cultivators but also affecting the downstream discharge of water.

Likewise, demand for housing and urban development, spawned by the mining and industrial activity in order to accommodate an influx of skilled and semi-skilled migrant workers, jeopardized the rights of untenured village inhabitants to forests, pastures and cultivable lands. Embracing the legacy of colonial forest protection

**Fig. 4.6**

Destruction of hills for various mining activities - laterite, limestone, chromite, iron-ore, bauxite, etc. As natural reservoirs for rainwater storage, the hills are surrounded by natural springs which act as perennial sources of fresh water. Extensive mining and clearing of forest cover has resulted in many of these springs to dry up.



**Fig. 4.7**

Spring eruptions near foothills. These areas have traditionally been under community, cooperative paddy cultivation - owing to a near perennial supply of fresh-water. Under land settlement surveys, these stream beds and headwaters were classified as government lands. However, with deforestation over hills, the absence of frameworks for their protection and urban pressures pose a threat to these natural features and dependent communities.



laws, the State forest departments until recently,<sup>7</sup> exercised a militarized control over forestlands, barring village inhabitants dependent on its produce for subsistence needs to collect even minor, non-timber forest produce. On the other hand, private timber contractors continue to fell trees with the department often turning a blind eye. In case of afforestation programs undertaken by the state government for a range of imperatives, only a few were aimed at empowering the local population<sup>8</sup> – and even they remain at risk owing to receding water table and urban pressures.

### **Paternalism - self-reliance to dependency**

In an attempt to balance dispossession, and mitigate economic impacts of increased industrial and urban activity, welfare schemes provided by the government often prove counterproductive, with systemic consequences. Paddy cultivation in the region traditionally formed a hinge between socio-cultural patterns as well as fragile economic relations amongst the village communities. Its byproducts in the form of thatch continue to be used as the dominant roofing material, providing livelihood opportunities to skilled weavers in every village, while mud from the fields is used to plaster and repair walls. Fodder collected from rice fields for cattle is exchanged for cow-dung to be used as cooking fuel. Households with surplus land offered it to tenant farmers and sharecroppers for cultivation, in exchange for half of the total produce, while surplus produce was distributed among the landless families of the village. With the implementation of government schemes providing rice at highly subsidized prices of Re. 1/Kg, the incentive for most cultivators to participate in food production was lost. Households with cultivable lands that failed to produce rice, enough to suffice their family needs, discontinued its cultivation. On the other hand, cultivators with larger landholdings remark that even during years with better than average monsoon rainfall, paddy surplus is rarely sold at markets. As purchase prices dropped substantially, and village labor sought industrial and construction jobs, post-harvest processing and logistical costs rendered it economically unviable for cultivators to practice commercial agriculture. While

**Fig. 4.8**

Cashew plantations on 'government wastelands' under a 1970's afforestation program by the state government. Parcels of land were leased to marginalized families from surrounding villages, especially those belonging to scheduled tribes. Even though many of these lands were previously cultivated by tribal families, the state expropriated them for soil conservation programs. While the families were given authority over sale of produce in lieu of their maintenance, frequent cyclones and receding water table have offset any benefits.



neoliberalization reforms in theory entail a shift from welfare to workfare schemes,<sup>9</sup> a surge of such attenuated appeasement schemes for the rural poor by state governments aid in freeing up land and labor for industrial development at the cost of allied economic activities and inter-community relations.

*"Paddy has developed a strikingly similar landscape, broadly similar from the Ganga to Yangtze... but no other way of life... has led to the evolution of a cultural system so stable and permanent as that associated with the great paddy plains of Monsoon Asia."*

O.H.K. Spate and A.I.A. Learmonth

Fig. 4.9 (opposite)  
Paddy ecosystem

Fig 4.10 (below)

Construction workers walk past makeshift refreshment stalls. With every new steel plant in its construction phase, the territories witness a surge of migrant labor. "...contractors hire us for Rs. 200 a week, while migrants from Bihar, U.P. are paid upto Rs. 700 a week. We cannot grow our rice anymore... how do we survive when nowadays, atleast Rs. 10,000 a month is needed to raise a family?"

- Respondent, Village Mangalpur

The promise of growth-induced-development, with industries being a catalyst, seems to lose its gleam amongst the village inhabitants who initially welcomed the initiatives at the expense of their lands and sources of livelihood. In the absence of skill development training and investments in their education, the only work opportunities available for the locals comprise of contract labor jobs. Semi-skilled and skilled workers are hired from amongst migrants from distant locations, through a network



of sub-contractors and hiring agents. While such tasks see a surge during the construction phase of a new steel plant being setup, once production commences in the plant, it only offers obligatory wage labor to a few households with documented proofs of their lands being acquired. Nonetheless, the wages paid to native inhabitants and migrant laborers are highly skewed in the favor of the latter. Without alternate sources of income from agriculture or traditional village activities, and faced with rising commodity prices due to short supplies and high demand, erstwhile landowners and self-reliant households have been thrust amongst the lowest ranks of socio-economic hierarchy in an upcoming industrial town.

Within the village settlements, however, neo-liberal industrial activity in their vicinity has provided an opportunity for the State, to extend its reach to long ignored areas by exercising an altered form of paternalism. In continuation with the neo-liberalization reforms agenda, the government of India in 2013, mandated large companies to spend a minimum of 2% of their annual profits towards social welfare, in the name Corporate Social Responsibility (CSR).<sup>10</sup> It further specifies that each company must draft its own CSR policy and ensure that annual targets are met and are in its compliance. At Kalinganagar, with as many as five eligible companies and many more in the pipeline, the ambiguities of State directives with regards to CSR have resulted in projects being undertaken as means of publicity, quelling resentment and a competitive showcasing of goodwill. The state government and local bodies, by taking a backseat in implementing rural development works in the surrounding areas, have opened the domain of public amenities and utilities as well for CSR activities to fill in the gaps. Such sporadic, uncoordinated interventions remain outside the purview of democratic scrutiny, thereby failing to address the immediate needs of village inhabitants and marginalized communities – which demand asset creation and livelihood opportunities apart from development of critical infrastructure and amenities. Thus, while the liberalization reforms were followed by decentralization and devolution of

**Fig 4.11 - CSR activities by steel producing corporations**  
(Clockwise from top-left) a) Water pumps and taps in village Jamupasi, b) Solar street lighting at Khandara, c) Shops at Danagadi, d) Stitching center at Manatira, e) Skill development center - english speaking and computer basics, f) Community center at Sansailo





powers to village local bodies – with claims of reverting to the Gandhian idea of self-reliant, self-governed villages and community led development; the emerging politico-economic environment highlights a greater dependency on the state as well as large corporations. By ensuring this perpetual dependency of the territory's inhabitants on the productivity of industrial operations, mandatory CSR activities vindicate the government's plans to aid corporations with their growth and expansion.

## **Conclusion**

The transformation that the Kalinganagar area is undergoing, as a result of its forced inclusion amongst the fringes of neoliberal, urban geographies, involves a concurrent deterritorialization. This unfolds through a severance of linkages – socio-cultural and economic, between sections of indigenous communities from their native landscape, as well as amongst different community groups. Unlike their predecessor steel cities, or new towns of the pre-reforms era of state backed migrations – where socio-economic mobility required spatial displacement, and hence a breakdown of traditional systems of social organization based on kinship links and associational ties; the convergence of a history of selective enfranchisement & marginalization, along with neoliberal governance and industrialization diminishes the capacity of these communities to participate in the developmental process.

In such scenarios, fringe territories lose a crucial interest group for the preservation of natural ecologies – landscapes and resources. For the local communities, their significance transcends the modest reasons of livelihood security; but also shape cultures and belief systems. Among them, the indigenous tribal communities revere small and large hills, forests and even sites of freshwater springs for their life sustaining provisions, while they mark village territories with the gravestones of their elders. A transition into the urban-industrial way of life,<sup>11</sup> thus not only erodes these linkages, it also aids in corporatized state institutions, industries

and urban developers in acquiring consent for the exploitation of fringe landscapes in the name of rapid economic growth and poverty alleviation.





# 5

## TOWARDS RURBAN ECOLOGIES

*Alternate futures*

*“Deterritorialization must be thought of as a perfectly positive power that has degrees and thresholds... is always relative, and has reterritorialization as its flipside or complement.”*

Deleuze & Guattari

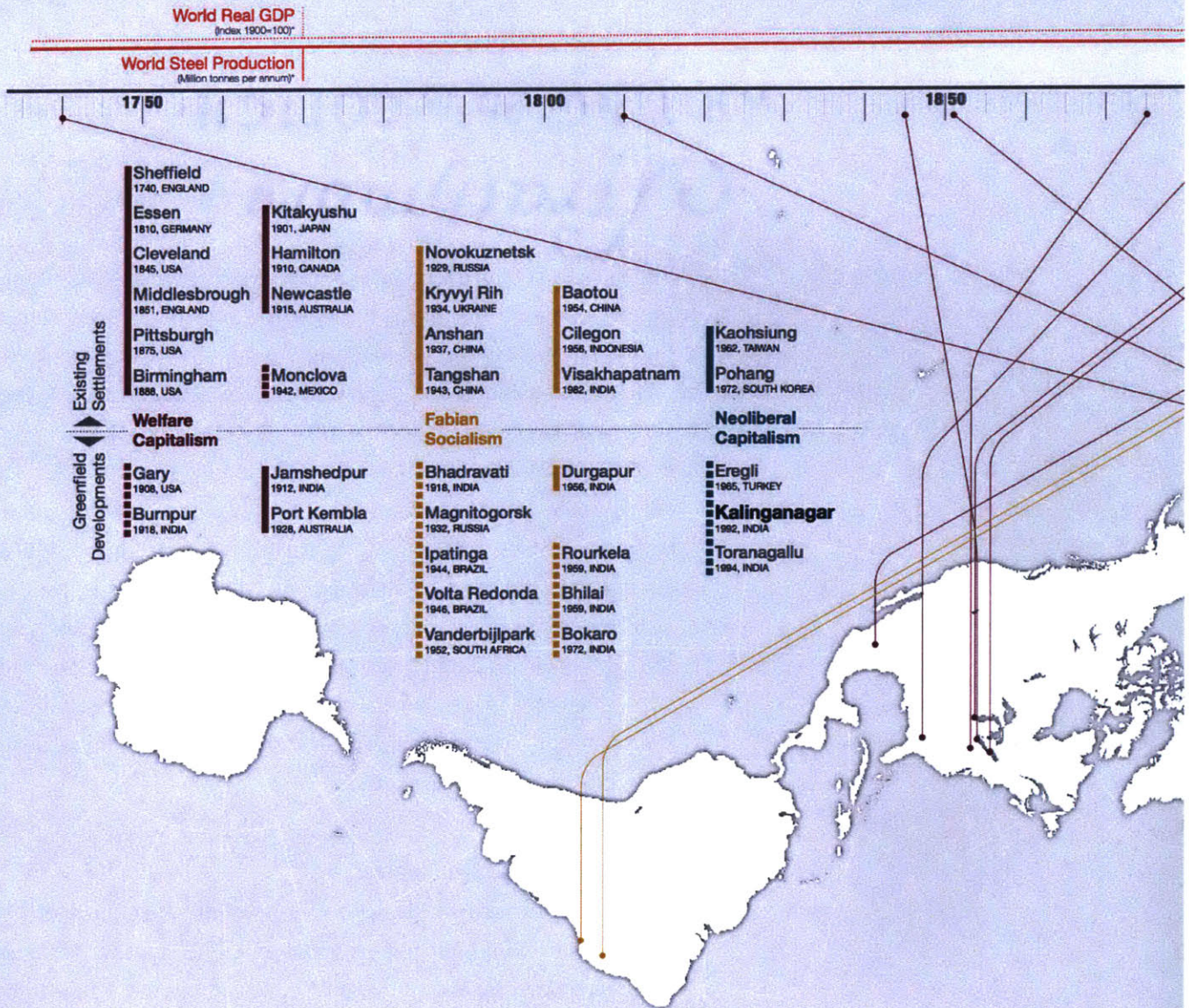
A thousand plateaus

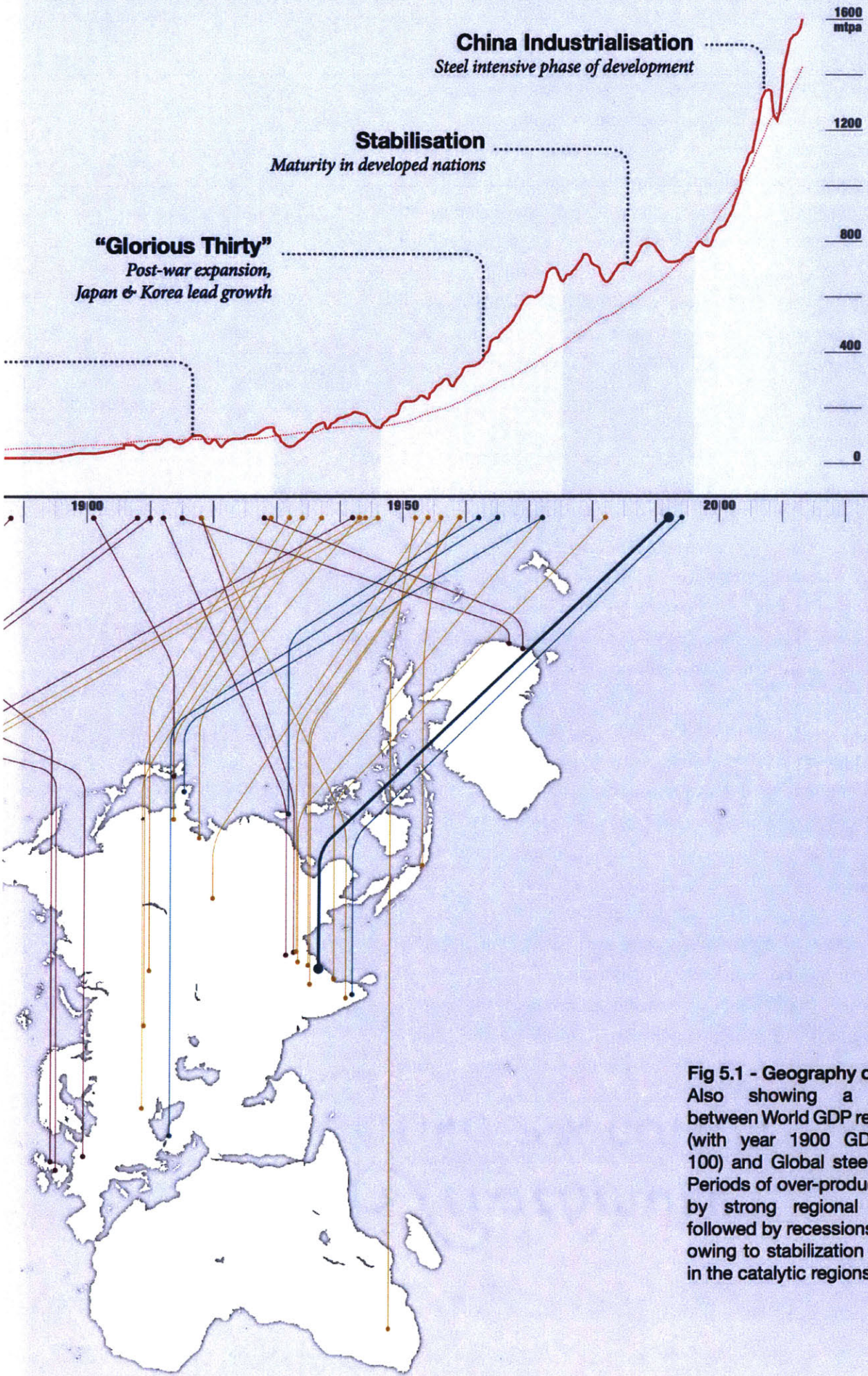
The villages in fringe territories – as sites of conflicts and contestations, innately possess the seeds for resisting neoliberal urbanization. As industrial activity at Kalinganagar gradually dislodges traditional systems of livelihood and organization of communities, there is a need to channelize emerging forms of urbanism – the physical and immaterial components, organizational and performative aspects. This requires an alternate model of development with a potential to contest the extractive, resource intensive industrialization itself. The thesis proposes a framework for balanced development, which upholds the primacy of a need for environmental conservation, and re-establishes links between the territory’s landscapes and its inhabitants. The following sections, while highlighting the virtualities triggered by deterritorialization at Kalinganagar, focuses on key concepts which help in framing normative strategies for their actualization.

### **Dissipative industrialization**

Heavy manufacturing industry, by virtue of its dependency on globally traded commodities as raw materials as well as international markets, is characterized by boom-and-bust cycles. This cannot be emphasized in a better way, than the case of steel production, which has been associated with industrialization and development since the beginning

# Western Industrialisation ..... Large scale steel production, pre-war national era





**Fig 5.1 - Geography of steel cities**  
 Also showing a comparison between World GDP relative growth (with year 1900 GDP as index 100) and Global steel production. Periods of over-production backed by strong regional growth are followed by recessions and slumps owing to stabilization and majority in the catalytic regions.

of the Industrial Revolution. What were once booming industrial towns in the west, witnessed major recessions at various times in the late 20th century. While American and European steel industry took about two centuries to be outcompeted by East Asian Giants, the recent materials critical point in China's rallying growth has forced open-market regimes in different parts of the world to adopt protectionist measures.<sup>1</sup> With a closure of major steel production facilities, towns and cities with a diverse economic base aids their resilience against a localized recession, whereas mono-towns have been synonymous with bankruptcy, shrinking populations as well as rollback of amenities and welfare schemes.

However, the primary rights to territories, in the context of this shifting nature of the fringe condition, and with state governments acting as brokers for corporations and providing unencumbered land ambiguously cleared off of environmental regulations, are signed off in favor of industries. State governments in these regions fail to acknowledge the fact that over increasingly short time spans, heavy industry and allied manufacturing processes relocate over functions of resource availability and cheap labor, dynamics of transportation costs and laxer regulatory environments.

The thesis proposes an acknowledgement of this nomadic nature of the dominant modes of industrialization, while arguing for the governments to warrant a catalytic role, engendering local asset creation and livelihood security over the course of such industry's tenure within a territory. The potential for multi-national corporations in charge of industrial processes to aid in the economic resilience of the inhabitants lies in the convergence between the central governments frameworks for empowering village local bodies, and the legitimacy of the idea of social responsibility on behalf of publicly traded corporations. As temporary guests upon a territory, concepts of social responsibility and welfare need to be reimagined to foster self-reliance and community enterprise for uplift of village inhabitants in the fringe territories, for its unforeseen, yet inevitable post-industrial future. With such measures aiding in a greater strength of representation for marginalized communities, the eventual exit of industry can thus be better negotiated.

**Fig 4.2 & 4.3**

Development and maintenance of urban infrastructure in case of mono-towns is linked to the productivity of the city's primary economic base. Here, (top) workers housing complexes marked unfit are set to be demolished - as the last remaining families continue to inhabit them. (Bottom) School run by the Bokaro Steel Plant authorities in a low-income neighborhood. Post-liberalization, the authorities in a bid to liquidate their assets rolled-back their services starting from low-income neighborhoods. Schools, hospitals, water supply and electricity connections in such neighborhoods remain dysfunctional for over two decades.







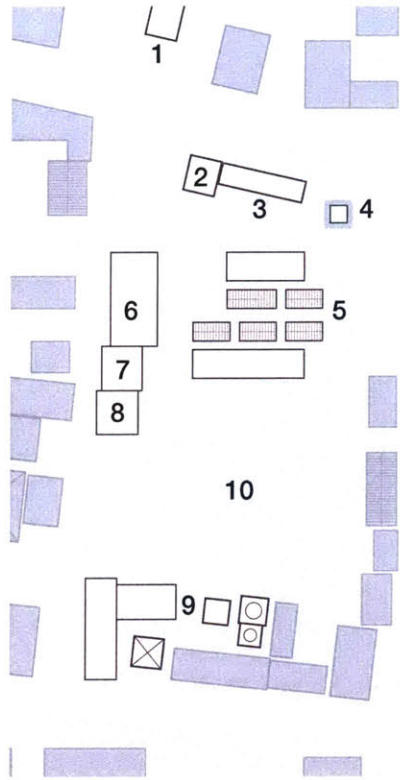
### **A Zoe-centric<sup>2</sup> approach**

Analyzing the issues with regards to fringe urbanization, and the negative externalities of an economic-growth focused model, from the perspective of human-to-human injustice alone conceals the opportunities for exploring frameworks for equitable, sustainable development. Instead, it gives credence to the neoliberal framework by fostering a need for state/corporate paternalism, in turn perpetuating a situation wherein economic growth and social development exclusively benefit a few. However, an outright rejection of the inevitable industrialization, and consequent urbanization – a reversion to a Gandhian model of development, similarly excludes the marginalized from their various benefits. This impasse is articulated from a fact that such a reversion can only be sustained with a drastic reduction in global population.<sup>3</sup>

In order to provide alternate conceptions for corporate social responsibility and state welfare and complying actionable strategies, the thesis proposes a zoe-centric approach of stewardship – of the territory's natural ecologies and all life forms. As described in the previous chapter, a collective responsibility of all inhabitants towards their natural landscape has a greater potential of reciprocity – not only beneficial for the nature dependent, marginalized communities, but for generations of future inhabitants as well. The current, neoliberal development model provides this opportunity whereby, for communities seeking socio-economic mobility need not migrate to cities or new town developments, as was the case in the pre-reforms era with state backed rural-to-urban migration. Thus, as native communities continue to inhabit their native landscapes, there is a greater scope for re-establishing the dislodged linkages for reciprocal benefits.

### **Grassroots democracy**

The devolution of powers to village local bodies, wherever implemented to its fullest extent, has enabled the reach of government agencies responsible for providing safety nets and livelihood security. At the same time, movements to provide legal protections to the rights of forest dwellers and those dependent on forest areas within their village boundaries have successfully resulted in constitutional amendments, such as the Forest Rights Act<sup>4</sup> – granting autonomy to village bodies. These have not only transformed the relation of the state with regards to the rural, peasant classes, but have also empowered democratic



**Fig 5.4 - Danagadi square**

1. Office of State Revenue Inspector
2. Anganwadi - free meals for children below age 5 & expecting women
3. Village local body developed shops for rent
4. Community well
5. Covered shelters for weekly market
6. Rajiv Sewa Kendra - micro-finance schemes, exchange for employment guarantee schemes
7. Office of Sarpanch - village local body head
8. Women's self-help groups office
9. Temple complex
10. Multi-purpose space for weekly markets, religious functions, etc. (below spread)

**Fig 5.5 (opposite)**

Chicken coop set up under the women's self-help group scheme at Sansailo. Financed by the State Bank of India, the project however, failed tragically with the death of most poultry birds. The women's group complained that no training was imparted for the space requirements and the poultry supplied was of a foreign breed, requiring large amounts of feed, vaccinations and constant monitoring. The group is engaged in legal battles over delay in repayment of loans.







institutions as the mediums for resisting oppression and exploitation.<sup>5</sup>

At Kalinganagar, a large proportion of village inhabitants lack franchise due to an absence of tenureship records. In other villages, where tribal communities are in a numerical minority, they lack strength of representation and the village elite often corner welfare schemes towards their uplift. While such instances are a result of a lack of awareness, improper implementation or negligence, a growing network of non-governmental organizations aids local bodies with accomplishing incomplete reforms and be granted with greater autonomy. On the other hand, employment guarantee schemes, loan dispersals for small-scale enterprises and credit subsidies for self-help groups – all require proof of tenureship, with the village local body as a nodal agency for their delivery. Elected members thereby, have an incentive to compete amongst other candidates to deliver these schemes and services while managing local resources – either to be used by inhabitants for livelihood, or auction them to obtain revenue for developmental works in the village.

This competitiveness amongst village local bodies requires a coordinated approach for addressing regional scale environmental issues emanating from rapid urbanization of the fringe. With water systems shared amongst the urban, industrial and natural ecologies, the thesis proposes this inter-village coordination to develop across sub-watersheds – of the various streams and rivulets crisscrossing the village territories and the industrial complex.

### **Rurbanization**

Development of greenfield townships – akin to pre-reforms era steel towns, are no more favored for their high political and economic costs. Growing resistance against land acquisitions and displacement, high cost of resettlement and rehabilitation, has prevented the governments from centrally planning whole new cities. On the other hand, an alternative approach of land pooling for town planning schemes require high initial capital for a community led zonal planning. In the case of Kalinganagar, the gradual pace of land reforms, irregularities and ambiguities between common property resources and private ownership, further inhibits this approach.

In its place, another opportunity at the fringe emerges from a widespread

acknowledgement of an in-between, rurban form of urbanization as distinct from cities and villages. Mukherjee (1956) describes ‘rurban centers’ as rural-industrial growth nodes in his call for a planned rurbanization to address congested, industrial cities. These mid-20th century ideas have re-emerged with the present national government unveiling a “Rurban mission” for integrated rural development.

*“It is the culmination of rural and urban... The mission will reduce pressure on the cities and provide a new avenue to the village people... People in villages have been sending their children to cities for good life, education, hospitals, internet. But in the cities, jhuggi jhompris (squatter settlements) have been coming up as people continued to migrate from villages. Nobody thought about planning, providing facilities... So even going to cities became difficult... Should we then leave such people to their fate? Should we compel people to live in jhuggi jhompris? We cannot. That is why we came up with this Rurban Mission”*

Narendra Modi

14th Prime Minister of India, speech at launch of Rurban Mission<sup>6</sup>

The thesis, within this momentum of village-centric development models, envisions the villages at Kalinganagar as “rurban centers” of growth, with the village bodies assuming their role as cooperative agglomerations instead of competing micro-corporations. These villages, owing to their climatic and economic patterns – resulting in low dependency on intensive agriculture, have a huge potential as thriving hubs of gig economies, as majority of the inhabitants undertake multiple economic activities for livelihood security. These range from food production to livestock rearing and dairy farming, various forms of forestry, aquaculture, cottage industries producing handicrafts, etc. The thesis proposes an augmentation of such existing systems under a coordinated, cooperative approach for the village economies to be able to contest the lure of exploitative contract labor jobs in the industrial complex, while providing employment opportunities for seasonal migrants from other regions as well.

### **Community management of commons**

*“The primary issue... is not that humans area changing nature, but that nature is ceasing to be common... it is becoming private property and exclusively controlled by its new owners”*

Michael Hardt and Antonio Negri

Multitude, 2004

Hardt and Negri (2004, 184) explain how as a result of neoliberalization, global corporations assert their power over local governments, which themselves are becoming ever more unaccountable towards nature and society, to acquire means of operating without regard for their environmental impacts. They argue that the definition of 'property' no more restricts itself to land and movables, but organisms, flora and fauna as well as traditional knowledge bases.

Villages of Kalingangar and successful pre-reforms government initiatives offer valuable insights to contest this enclosure of new forms of property by hegemonic forces. Systems of managing village commons under the purview of village local bodies for their use by local inhabitants have been successful in resisting private enclosure. At the same time, traditional knowledge governed village communities to protect and preserve drought resistant plant species with multiple uses. With increasing pressures of urbanization and the ensuing socio-cultural transformations necessitate measures for efficient management of commons, for both conservation of nature as well as livelihood security.

### **Conclusion**

With this conceptual framework for urbanizing the fringe, the thesis proposes a reterritorialization that is both literal – requiring strategies to re-organize land based on use and tenure, and cultural – ways of re-establishing and strengthening linkages between communities and their landscape. In the next chapter, the thesis discusses one way of actualizing the potentials exhibited by the fringe condition, where an inevitable densification and redevelopment of existing villages aids in environmental conservation while balancing the livelihood needs of the present and future inhabitants.





# 6

## ARMATURES FOR RETERRITORIALIZATION

*A framework*

*“What is evidently needed is a synthesis of the several positive elements: decentralization and empowerment of village communities along with a moderation of appetite for resource consumption from Gandhism; equity and empowerment of the weaker sections from Marxism; and an encouragement of private enterprise coupled to public accountability in an open, democratic system from liberal capitalism.”*

Madhav Gadgil & Ramachandra Guha

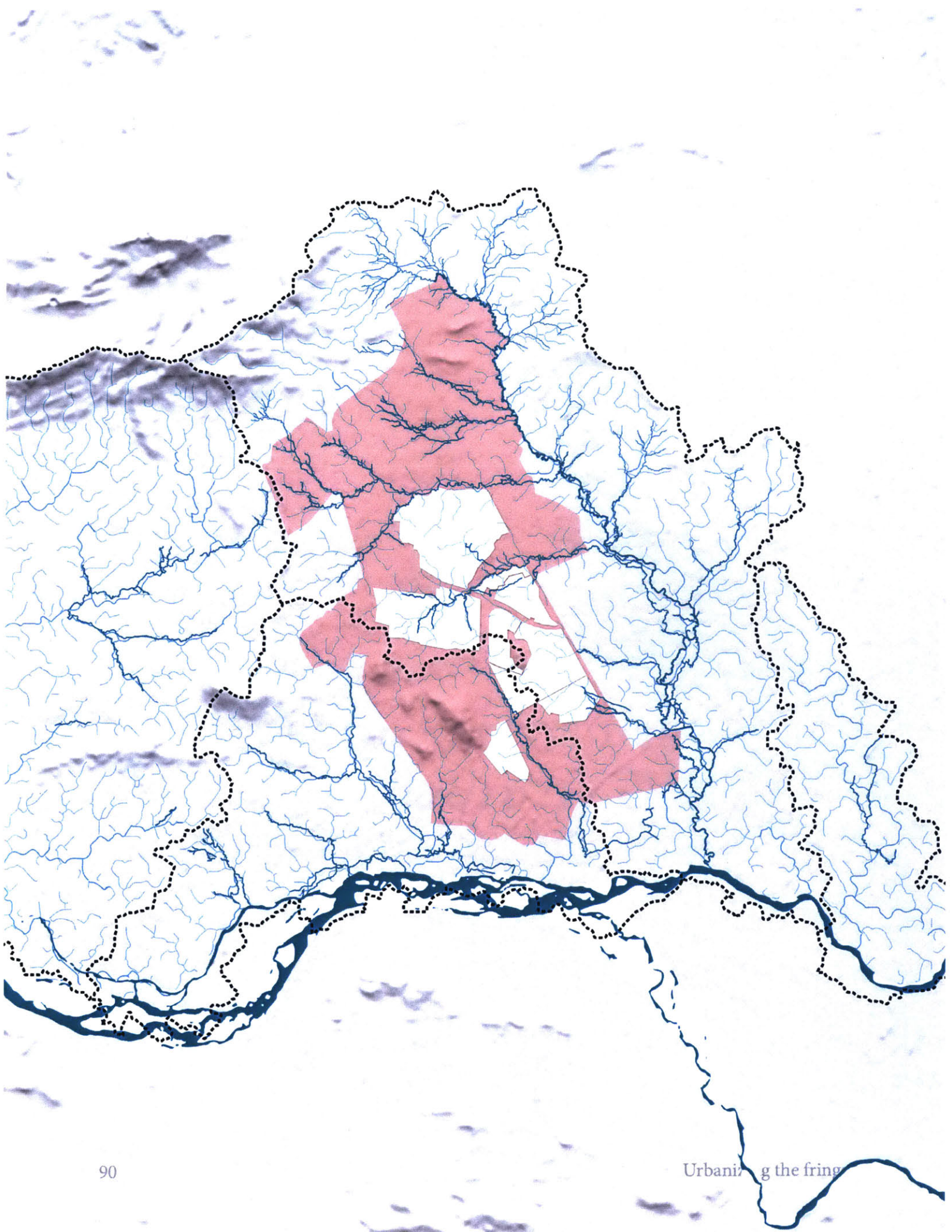
Ecology and Equity

The thesis proposes a re-organization of territory for strengthening the relation of communities with their landscape. This requires an alternative envisioning of domains and a new rationale for intervening, in order to explore solutions for balancing equitable, sustainable development and ecological conservation.

The proposal centers upon an integrated development of individual watersheds – as domains of action for planners and designers of neoliberal fringes. It delineates individual watersheds; analyzing shallow divides of surface and ground water flows, as a first step towards affecting a reterritorialization, replacing the arbitrarily drawn village and forest boundaries for units of development. This in turn enables the formation of watershed development authorities, to coordinate between individual village local bodies.

### **The watershed and its sectors**

Revisiting Patrick Geddes’ analytical methods for a valley region, the thesis proposes an analysis of the watershed regions – appending





“nature-occupations” with a layer of existing and projected impacts of neoliberal industrialization on the natural landscape and village inhabitants. In the case of the Ganda nala watershed, selected here to illustrate the methodology, the project divides the watershed into several ‘sectors,’ identified for their requirement of unique strategies to address a combination of the following imperatives. Depending on the relation of water flows to the projected impact on the natural landscape, the sectors occur either in the upstream regions, mid-valley or downstream of the industrial complex.

### **Ecological imperatives**

Springs & headwaters protection

Natural forests conservation & Forest buffer restoration

Open-pit quarry remediation

Riparian buffer restoration

Wastewater, industrial discharge & iron-tailings treatment

Ash pond and slag dump impact mitigation

### **Socio-economic imperatives**

Agriculture intensification

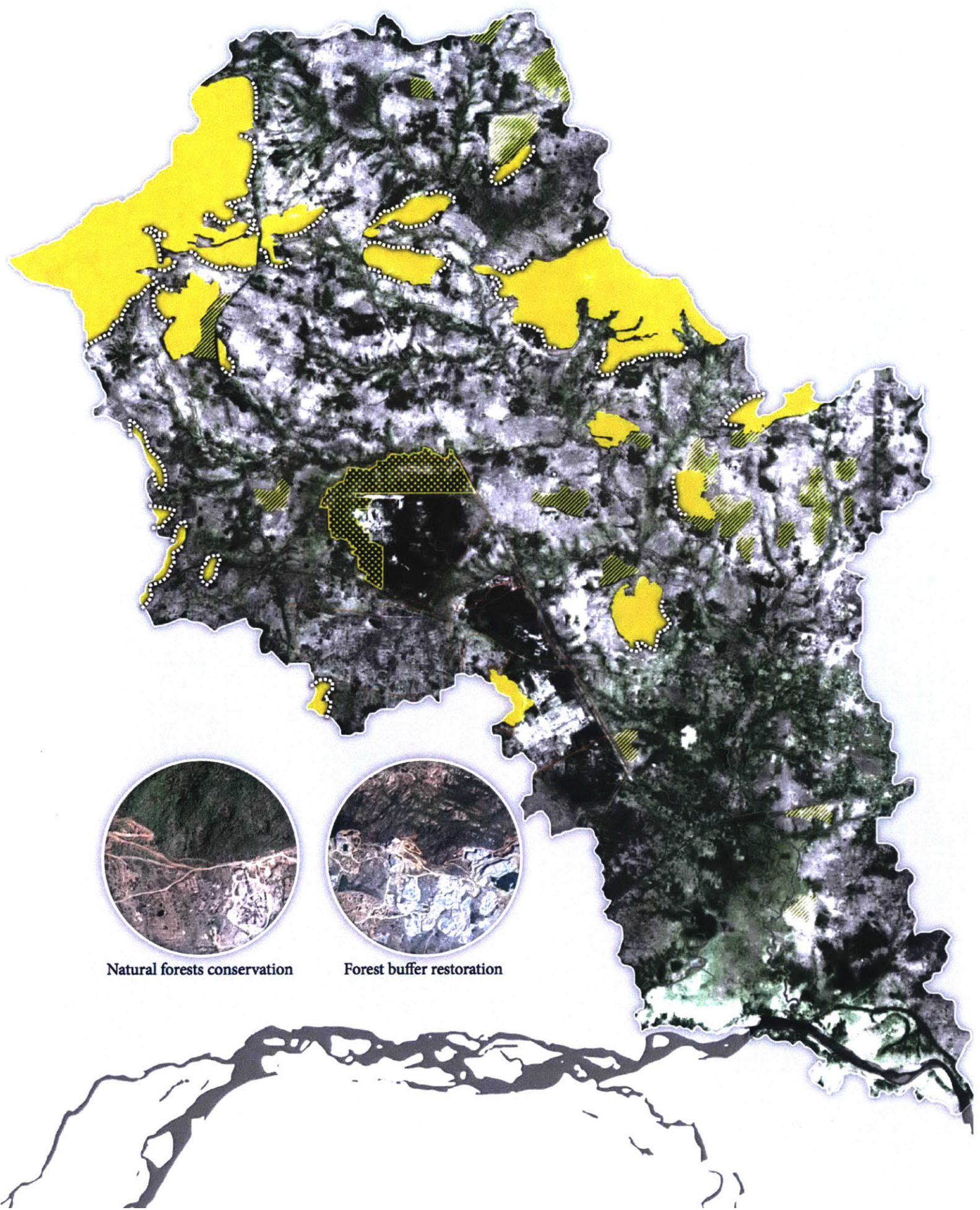
Urban growth – for village expansion and migrant accommodation

Flood control

Tenure security – for marginalized, tribal populations

Livelihood security – for native inhabitants

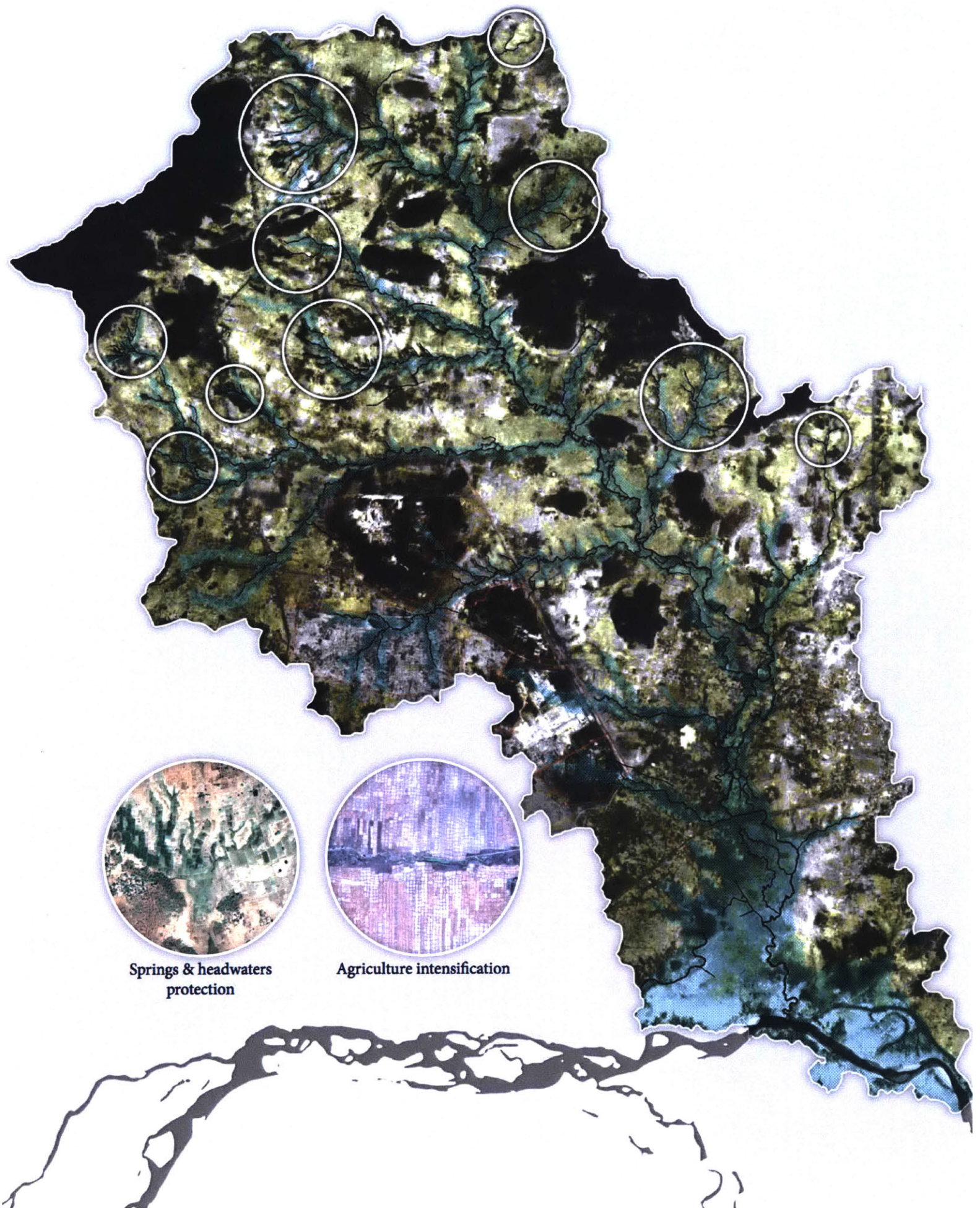
For tackling these sets of imperatives concurrently, as well as reinforcing the link between communities and their landscape, the thesis proposes a system design for sectors of a watershed, under a common framework comprising of three components.



Natural forests conservation

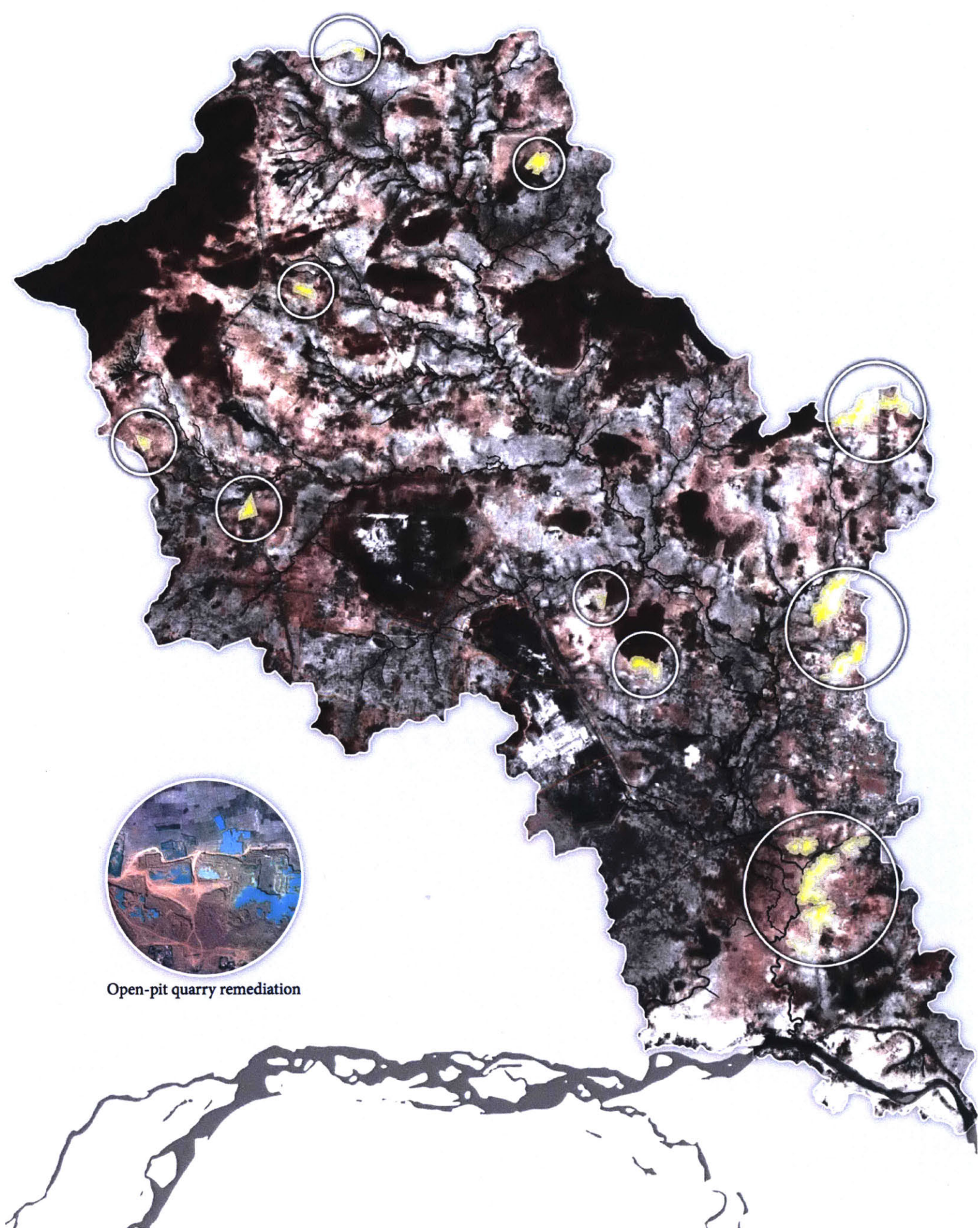


Forest buffer restoration



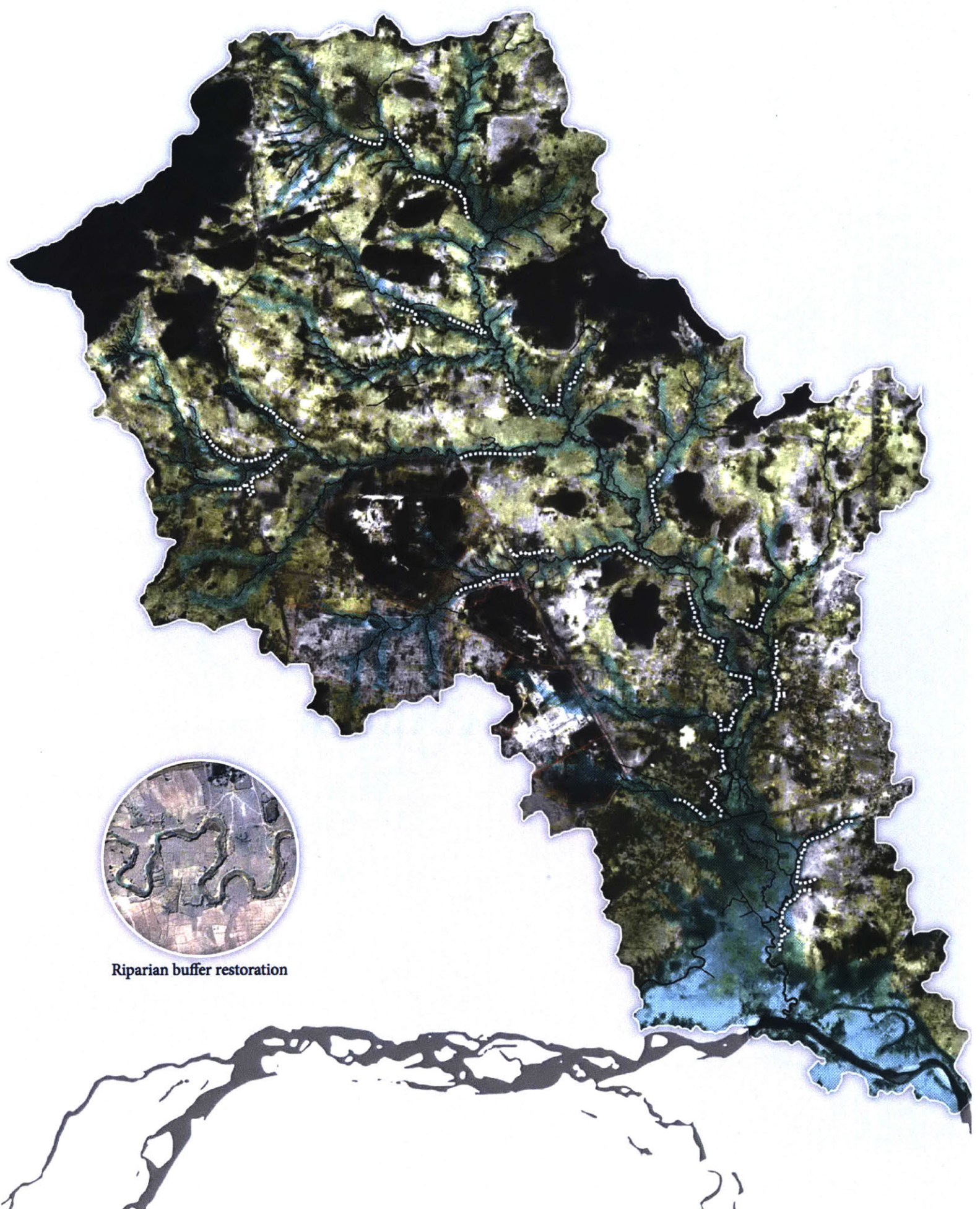
Springs & headwaters protection

Agriculture intensification

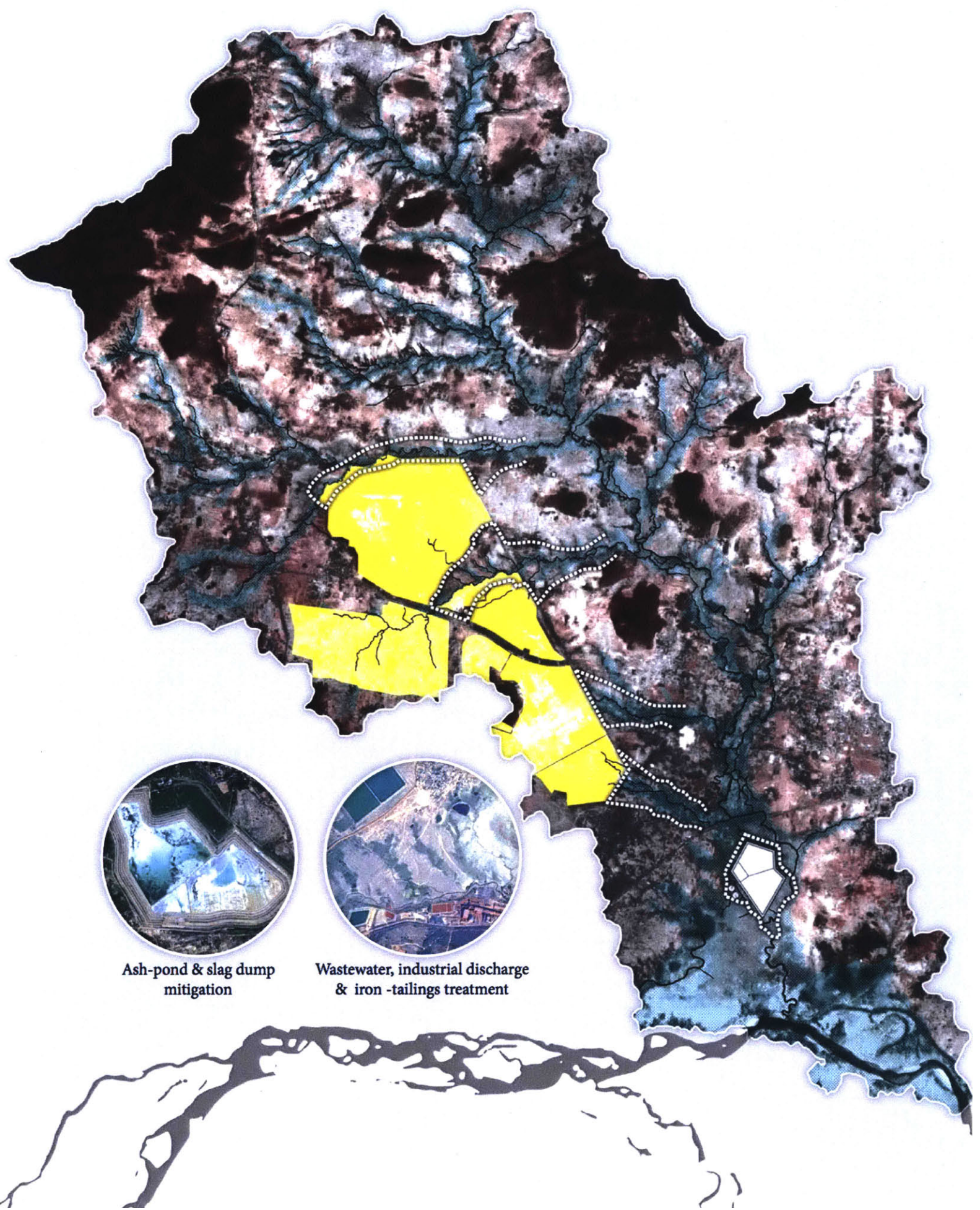


Open-pit quarry remediation





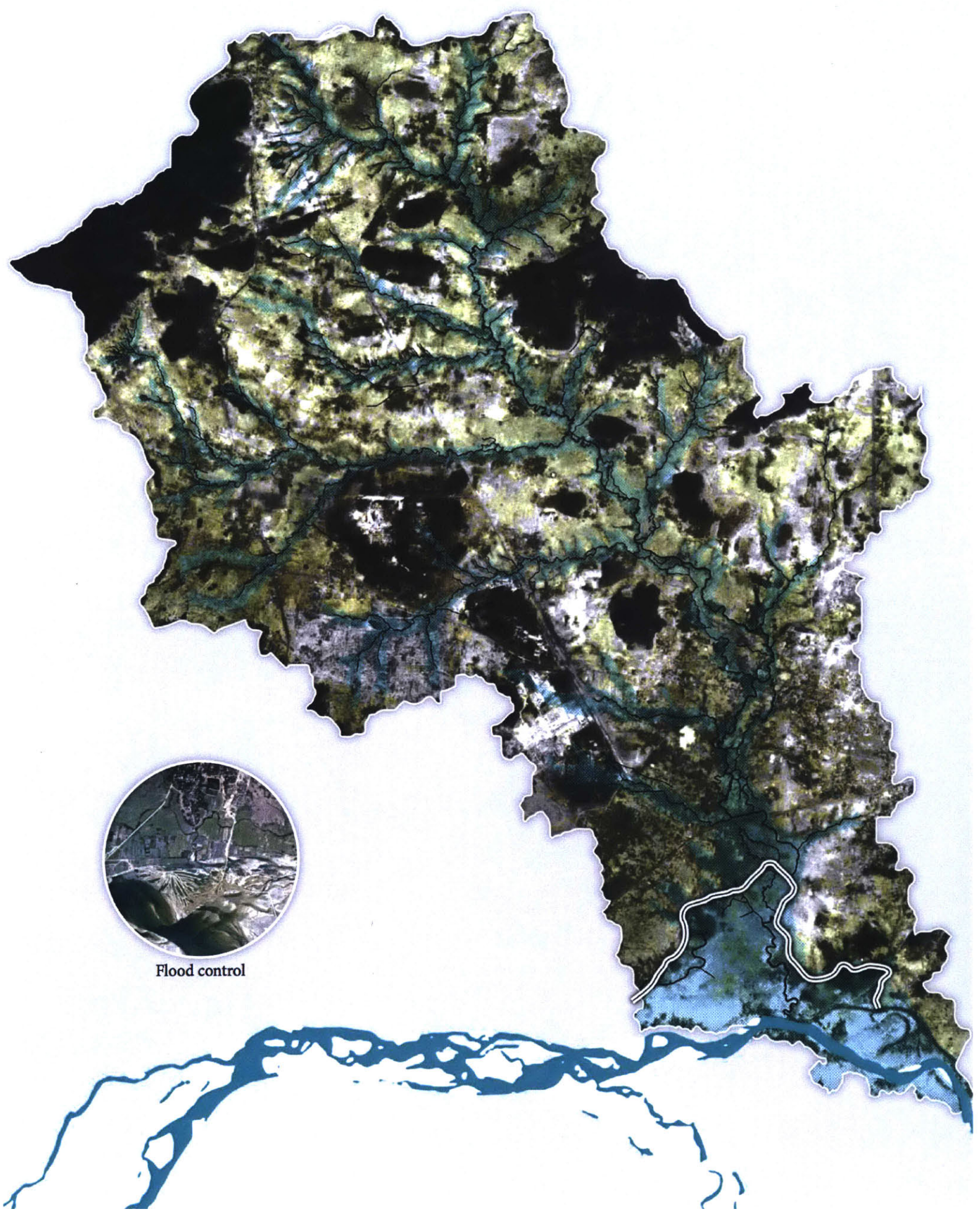
Riparian buffer restoration



Ash-pond & slag dump mitigation



Wastewater, industrial discharge & iron -tailings treatment



Flood control

### **Infrastructure networks**

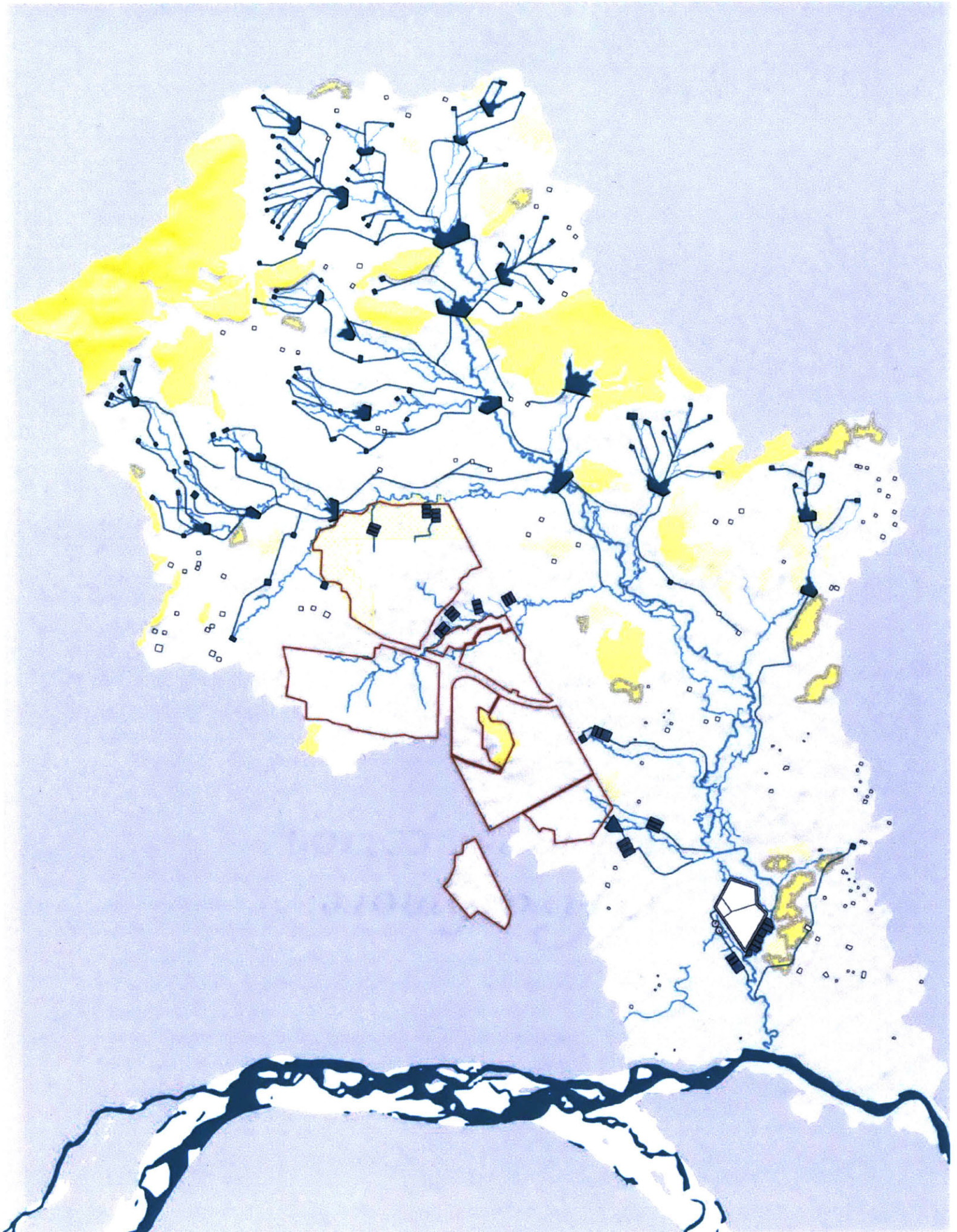
The first involves the augmentation of territorial linkages through networks of key infrastructure. In case of Kalinganagar, the region's specific hydrogeology, and rainfall patterns, as well as the need to mitigate detrimental effects of exhaustive mining, rapid industrialization and accruing urban growth require robustness of water management systems. As a contested resource between the urban, industrial and natural ecologies, strengthening of existing systems of water storage, irrigation channels and recharge wells, is recognized as the foremost intervention, for its potential to stimulate the required reterritorialization. This component is envisioned of as additive layers of support infrastructure, where new systems – local or regional in scale, append existing systems, according to changing needs of sectors in a watershed.

### **Seed complexes**

The larger infrastructure networks enable the performance and evolution of localized, sector scale 'seed' complexes, incentivizing the development of village economies. These act as support centers which provide centralized facilities for a program mix, designed towards the facilitation of specific products and services. The thesis proposes the existing villages and hamlets as decentralized production zones, hinged around these seed complexes, which further link them to other sectors of the watershed and the larger region. Unlike the additive infrastructure layers, these complexes are transformative in nature – with spaces, buildings and facility modules appended or removed alongside an evolving economy.

### **Program mix**

Apart from the physical interventions of infrastructures and seed complexes, the thesis proposes a kit of strategies pointedly matched against the sector's various imperatives. These comprise of top-of-the-chain economic activities, which are labor intensive and depend on natural resources for products of use value, and allied services. The thesis analyzes and proposes such activities, which exhibit a potential to contest the large-scale production model dependent on resource extraction, with those creating a net-positive impact on the natural environment – along with a vested, economic interest of local inhabitants in its maintenance and conservation. Over time, the proposed strategies



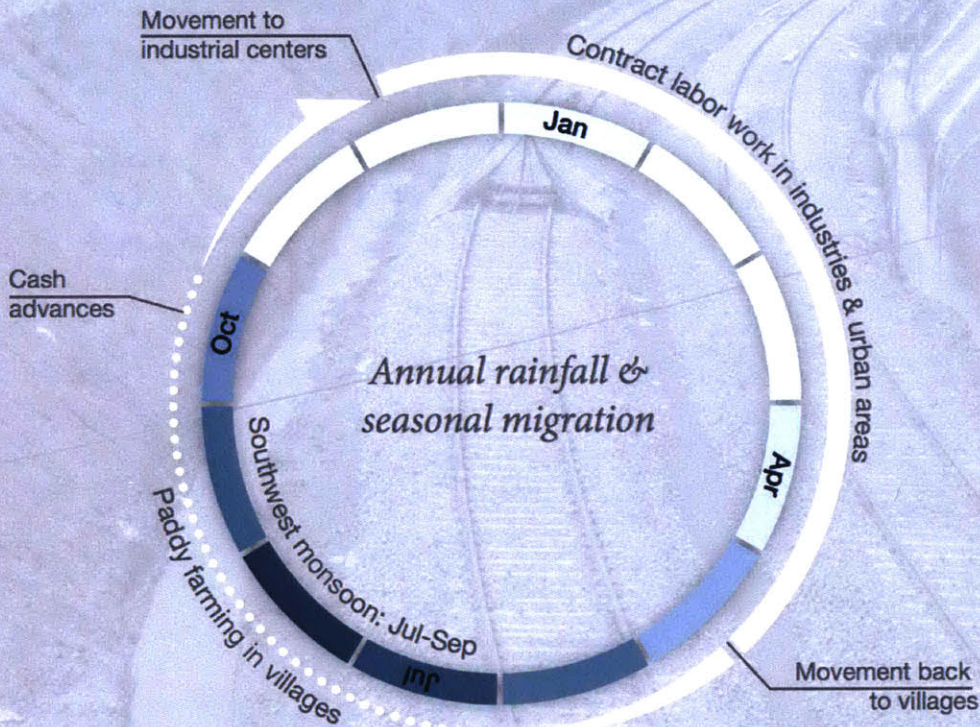
evolve with an increase in complexity and diversity, adding to the resilience of a sector's economy, society and ecology.

To support the thesis and elucidate the proposal, two sectors in the Ganda Nala watershed are taken up as pilots with the aim of devising strategies for reterritorialization. The project analyzes the specific issues faced by the clusters of villages and hamlets in each of the sectors, as potential nodes for development upon the territory. The additive, transformative and emergent properties of the proposed framework's components are emphasized by projecting abstract transects, representative of select sectors, over snapshots at year zero, +5 and +15 years.

### **Headwater sectors**

The first sector reflects the situation typical of uplands and foothill areas. Here, the hydrogeology creates undulating lateritic rock formations wherein there is no direct surface runoff from the hills, but instead rainwater seeps through the rock fissures and emerges as natural springs in depressions, once the saturated groundwater table meets loamy soils. Traditionally, farming communities have utilized these areas for growing multiple paddy crops due to a perennial water flow, while the springs provided fresh water for consumption and domestic use.





Lac culture

Integrated fish-farming

Sericulture

Livestock rearing

Poultry farming

Bamboo cultivation

Steel / coal by-product utilisation

Horticulture

Intensive paddy farming

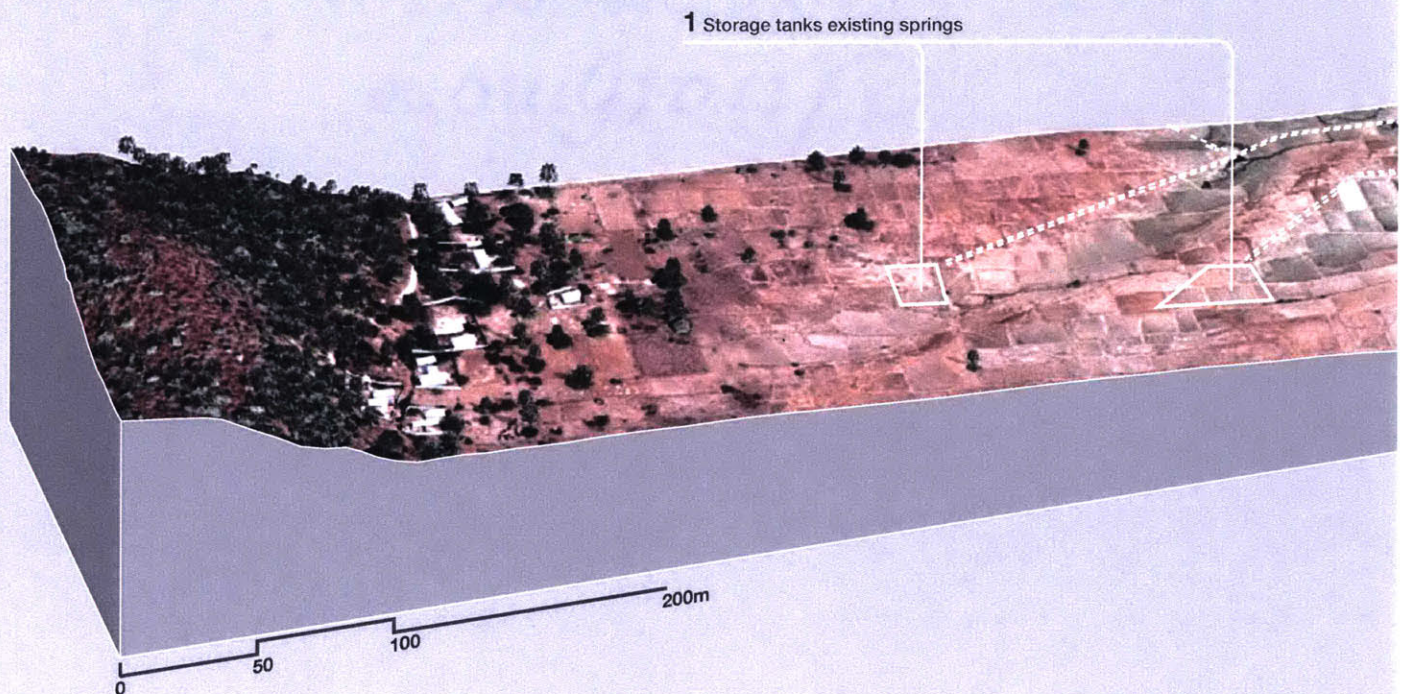
Legumes, grass & forbs cultivation

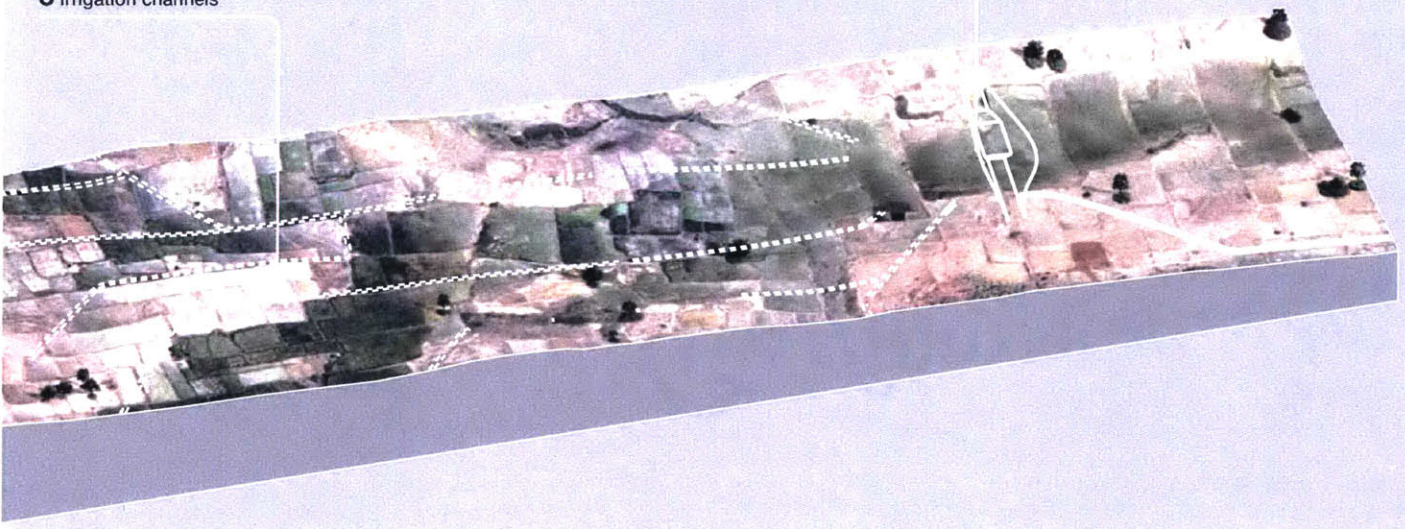




Many villages comprising these sectors have a high percentage of tribal populations, with migration from neighboring forest regions and homesteading continuing till date. The land surveys and settlement processes marked large tracts of such headwater areas as government lands, as village communities indulged in cooperative systems of agriculture, in contrast with privately owned farms in other areas. With increasing land demand for urbanization and allied industrial spaces, there are no legal frameworks to prevent construction activity in headwater areas. This would not only result in displacement and loss of livelihood for families directly dependent, but will deprive downstream communities from sources of fresh water.

The project proposes the construction of check-dams at locations where the headwaters aggregate into a stream, along with storage tanks at points of spring eruptions. Ground granulated slag, a by-product of steel production, accumulating around the industrial complex in the form of vast mounds, can be processed along with cement to obtain a marine-grade concrete – providing the requisite, locally produced materials for the dams. Water from storage tanks is then drawn into a system of irrigation channels, which run along ridges and eventually carry discharged water into the check-dam reservoir. This forms the infrastructure component of the project proposal.



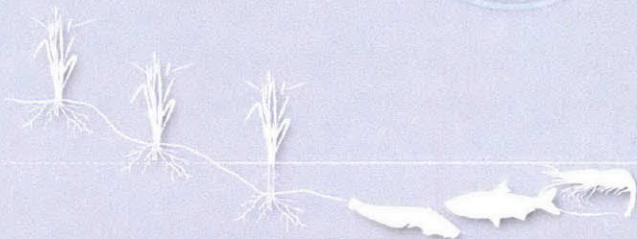


2 Check dam at headwaters convergence

3 Irrigation channels

To address economic uplift and tenure security for landless families, the proposal's second component comprises of the establishment of fish hatcheries and a spawn-rearing center at the location of a spring eruption. The elected village local bodies, with greater autonomy over its resources, awards land articulated by irrigation channels to landless families residing in villages and hamlets around the headwaters. As upstream locations relative to the location of the industrial complex, free from effluent discharge and air-borne pollutants, the project proposes agriculture intensification for this sector. The irrigation infrastructure and seed complex allows the practice of a farm-pond system of food production, using indigenous species of rice for different seasons alongside aquaculture. The barren, uncultivable land near homesteads is used for free-range poultry farming and animal husbandry, specifically pig farming. In addition to meat production, poultry droppings and pig manure is used as fish feed in the lateral trenches of integrated fish farms.





Rice cultivars  
Biali (upland),  
Dalua (lowland),  
Sarad (flooded)

Freshwater fish  
Rohu (*Labeo rohita*)  
Katla (*Catla catla*)  
Mrigal (*Cirrhinus cirrhosus*)  
Magur (*Clarias batrachus*)  
Prawn (*Macrobrachium rosenbergii*)

**6** Broadcasting nurseries  
For wet varieties of paddy

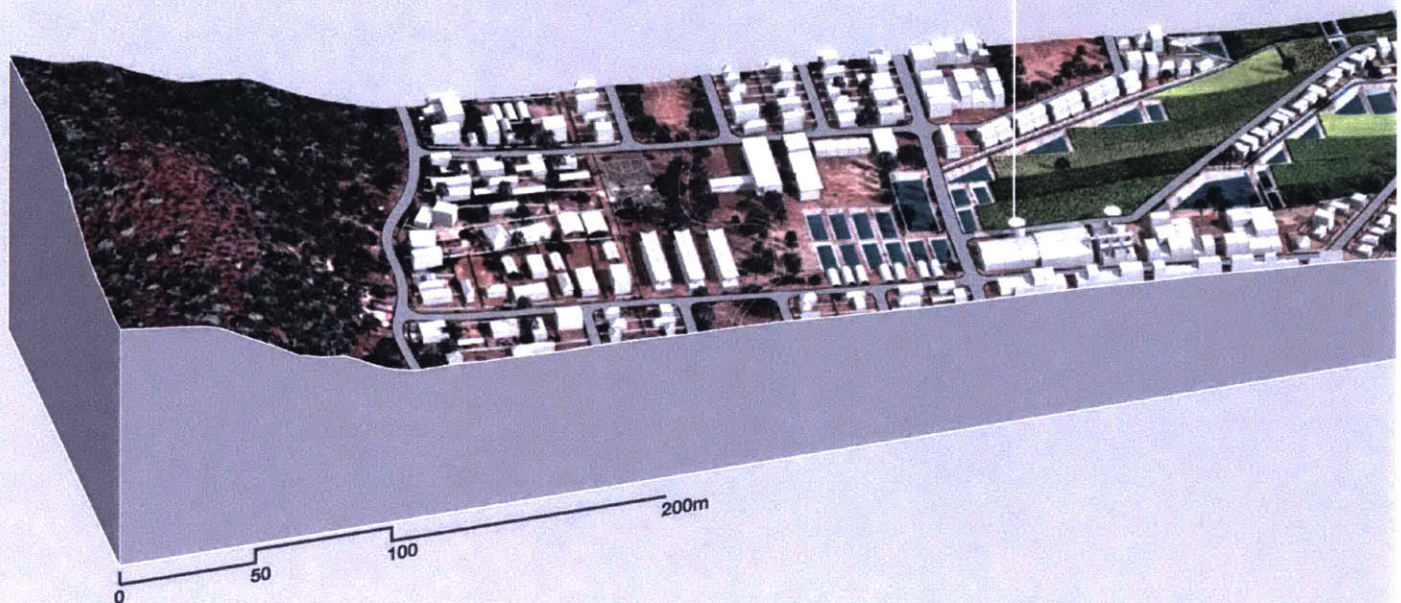
**5** Farms + Ponds  
For integrated fish farming in  
lateral trench system



The development of centralized, piped distribution networks for fresh water remains a concern in rural areas. In case of *desakota* patterns of fringe urbanization, gig economies emerge with individuals filling in this gap, supplying water from freshwater sources and treatment plants to households. For the rural ecologies in Kalinganagar's sectors, the project envisages similar networks of community water suppliers to deliver basic utilities from treatment plants attached with water storage tanks, to homesteads. The infrastructure layer is further appended by the installation of micro-hydroelectric power stations at the check dams to trigger the next phase of development. Energy generated at these plants is used to operate cold-storage and freezer facilities at the seed complex, allowing expansion of aquaculture businesses, in addition to the setting up of rice processing and flour mills.

The thesis asserts that patterns of urbanization dependent on singular, economic modes of production generate generic forms – evident across suburbs in major towns and cities. The fusion of diverse modes of natural economy, and an interdependent, *solidaire* community, leads to autonomous architecture, social life and settlement patterns. The infrastructure networks for the headwater sectors govern unique patterns of urbanization. The development of housing and livelihood cooperatives for permanent inhabitants and seasonal, temporary migrants, engender a need for innovation in spatial and building typologies – resulting from the proposed trajectory of reterritorialization.

7 Rice processing & flour mill, cold storage facilities for aquaculture



*Poultry  
farming*

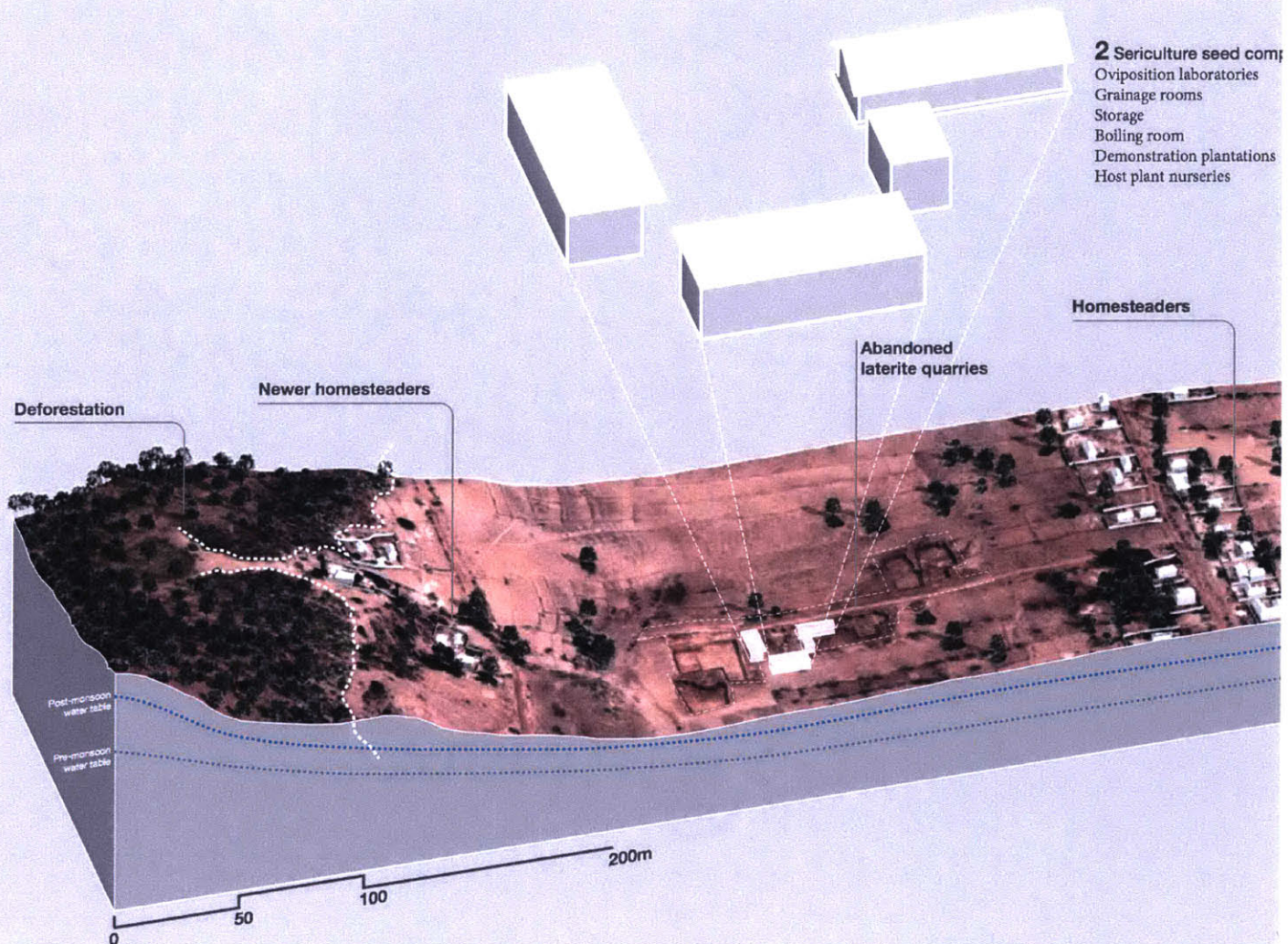


Poultry breeds:  
Gujun, Hansi,  
Dumasi, Veeraguda,  
Dhinki, Vanaraja  
Duck breeds:  
Orissa khaki, Moti  
hansa, Raj hansa

## Mid-stream sectors

The second set of transects addresses mid-stream sectors of the watershed. Here, loss of vegetation along stream banks result in unchecked sediment flow, affecting downstream water quality. Illegal limestone and laterite stone mining also affect these areas. Apart from the entailing deforestation, loose rock and gravel results in landslides and give rise to flash floods – affecting biodiversity and rendering agricultural lands along streams unsuitable for fishing or cultivation. Air pollution and receding water table as a result of industrial activity, aggravates the problem of low productivity in case of paddy farming. On the other hand, lack of livelihood opportunities in these areas force inhabitants to seek exploitation prone contract labor jobs.

The strategies proposed for these sectors comprise of sericulture and lac-culture in the first phase. Both processes provide a high labor-to-wage ratio, while in the case of sericulture, 56% of the final value of silk is benefitted by the growers. The seed complex houses starter facilities in the form of demo-plantations and training centers, plant nurseries, grainage facilities and oviposition laboratories for rearing silkworms and lac insects.



Sericulture



Silk moth  
(*Antheraea mylitta*)



Asan (*Terminalia tomentosa*),  
Arjun (*T. arjuna*)

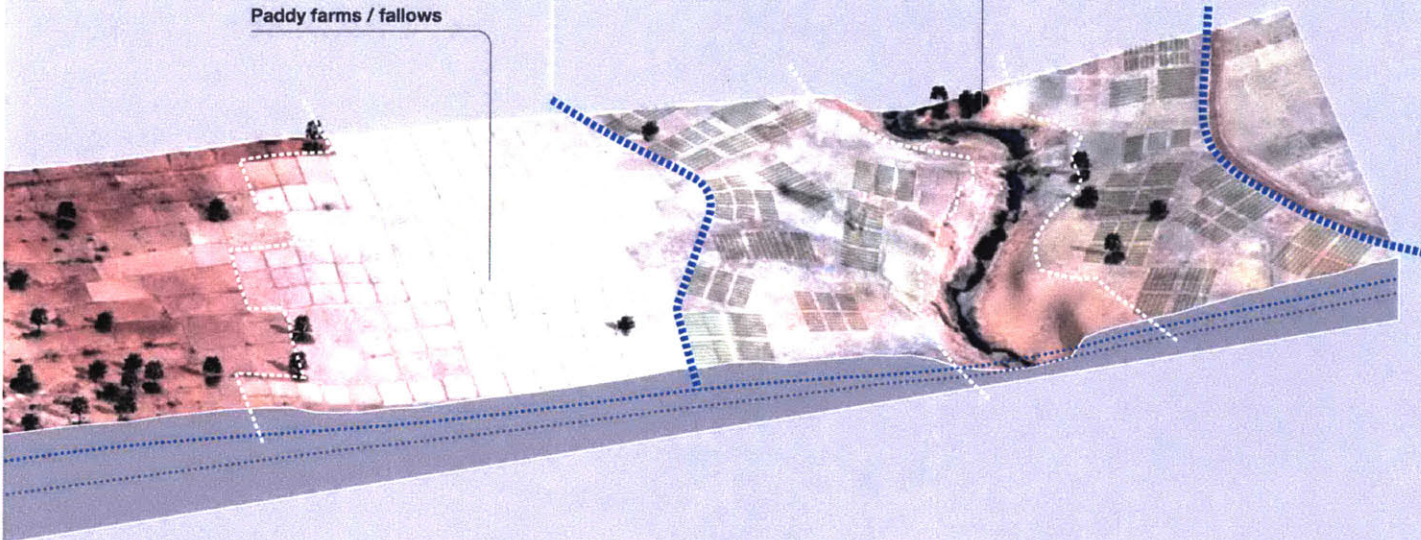


Sal (*Shorea robusta*)

1 Irrigation channels  
Connected to upstream check dam

Riparian zones

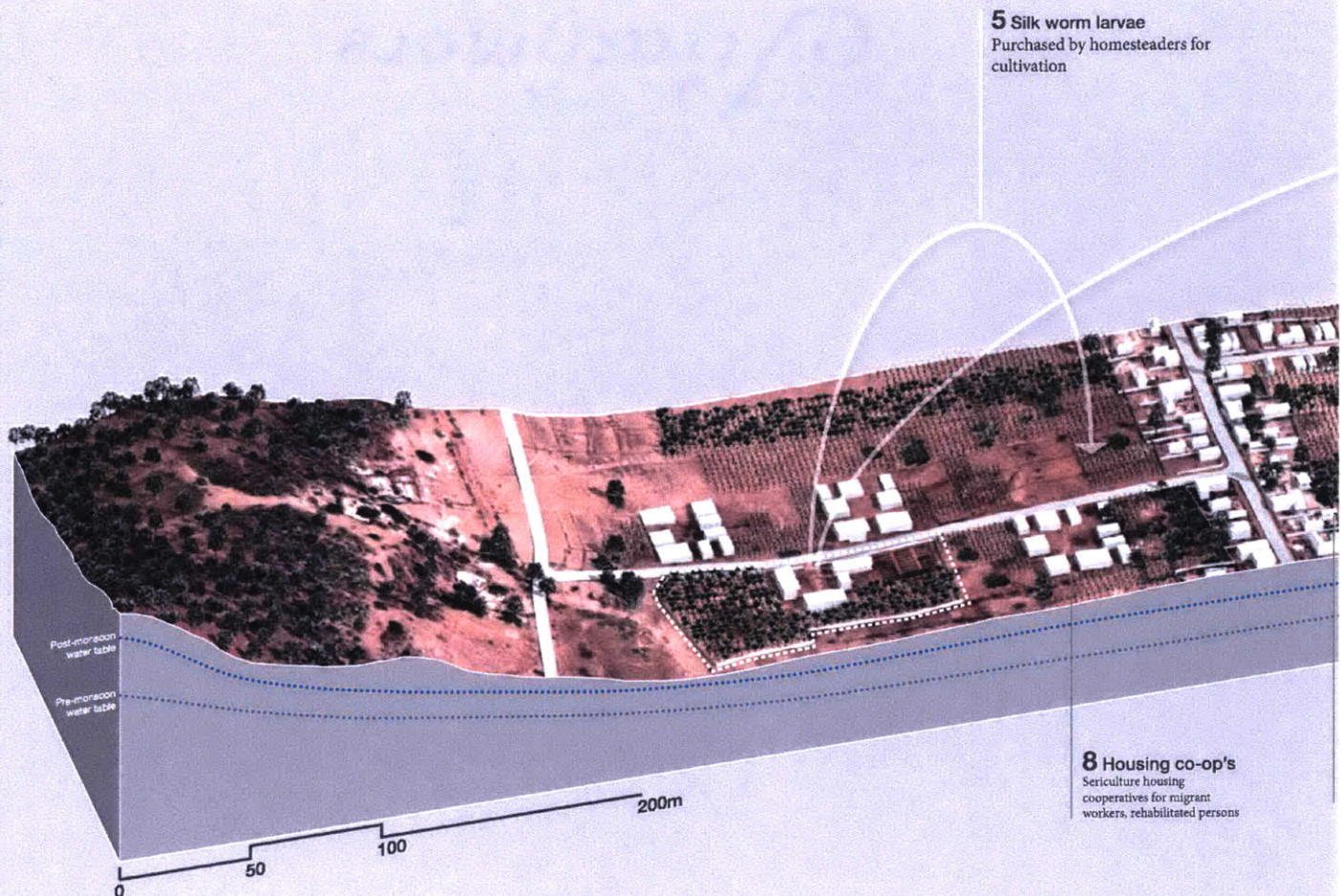
Paddy farms / fallows

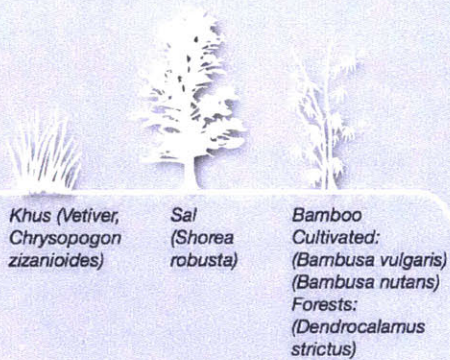




The infrastructure component of the proposal connects to the upstream development of water storage, irrigation channels from which demarcate the riparian zones in these sectors, preventing homesteading for residential uses. Tertiary channels fed from the main ones irrigate parcels of land along the stream banks, allowing inhabitants from villages to setup plant nurseries for rearing various host plant species for commercial scale sericulture and lac-culture, aided by facilities in the seed complex. From here, individual entrepreneurs and homesteaders, seeking to shift away from paddy cultivation, procure saplings. Grainage facilities in the seed complex provide larvae for backyard rearing, and mature cocoons are sold back for auctioning to silk manufacturers.

Sericulture and lac-culture both, being seasonal activities, generate employment opportunities during the lean, summer months for an influx of seasonal migrants competing for contract jobs in the industrial areas. At the same time, the residents of villages in these sectors can partake allied activities such as livestock rearing, bamboo and legumes cultivation to provide resources required for the core activities. Nurseries and plantations of host species for sericulture and lac-culture demand a regular supply of manure, thereby making rearing of cattle a lucrative enterprise.





*Khus (Vetiver, Chrysopogon zizanioides)*

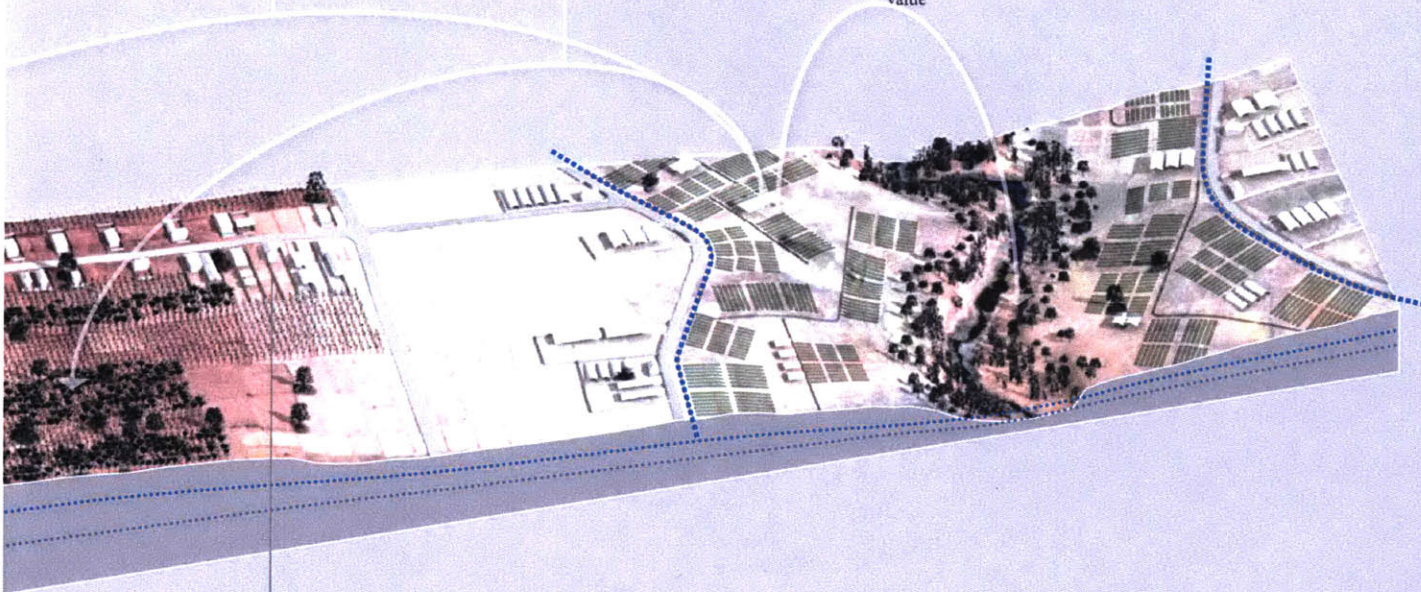
*Sal (Shorea robusta)*

*Bamboo*  
Cultivated: (*Bambusa vulgaris*) (*Bambusa nutans*)  
Forests: (*Dendrocalamus strictus*)

**3 Plant nurseries**  
Dispersal of initial lot of host plant seeds to cooperative nurserie

**4 Host plant saplings**  
Procured by homesteaders, maturity takes upto an years

**6 Bamboo, vetiver & Sal**  
Species aiding in arresting soil erosion, along with commercial value

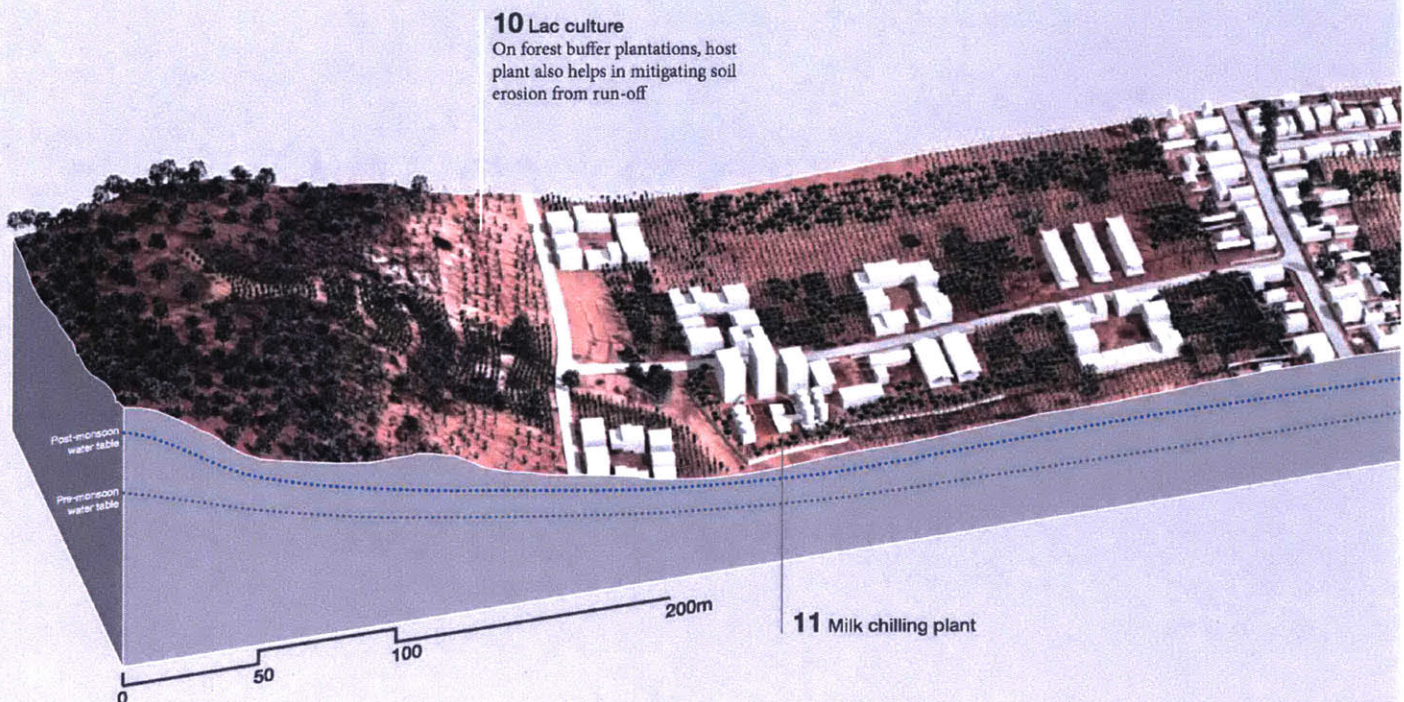


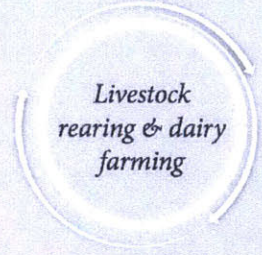
**8 Land regularization**  
Homesteaders and cultivators more than 10 years

**9 New homestead lots**  
Site & services, developed by Village Local Body

On the other hand, cultivation of bamboo along riparian buffer zones not only provides steady income, but helps in soil conservation and stream bank engineering to arrest sediment flow. Along with the local host species, *asan* and *arjun*, the roots of bamboo plants also help in lifting up groundwater. Drought resistant varieties of lentils – *arhar* or *moong*, provide for a protein-rich diet for human consumption, fodder for livestock and when planted along forest buffer zones at foothills, check soil erosion from surface run-off.

Over the next phase, the project proposes the adoption of downstream activities by the inhabitants of the village clusters engaged in the sector's core activities. In the case of sericulture, as the demand for plant nurseries wanes after the development of plantations, activities and facilities initially seeded by the seed complex are now decentralized – transferred to homesteads, while it transforms to assist downstream activities of reeling and weaving. Grainage activities including oviposition – involving controlled mating of silk moths and production of eggs, boiling and processing of cocoons, reeling of silk thread and weaving takes place within the homesteads. The requirement of chilling plants for surplus milk production, resulting from livestock rearing initially for manure, is fulfilled by adding a separate module in the seed complex, allowing it to be supplied across the watershed region after processing. A bio-gas plant module utilizes cow-dung for power generation for the sector's energy requirements. The decomposed slurry from the plant is combined with basic slag, another steel production by-product rich in phosphorous, to obtain an excellent natural fertilizer for afforestation on hill slopes, sericulture plantations as well as community managed strip plantations at riparian buffer zones.





Banana (*Musa balbisiana*)  
Dwarf Cavendish,  
Robusta, Champa,  
Patkapura



Lac insect  
(*Kerria lacca*)



*Flemingia semialata*



Cow breeds:  
Tharparkar, Binjharपुरi,  
Ghumsuri, Khariar  
Buffalo breeds:  
Chilika, Kalahandi



Ber (*Ziziphus mauritiana*)



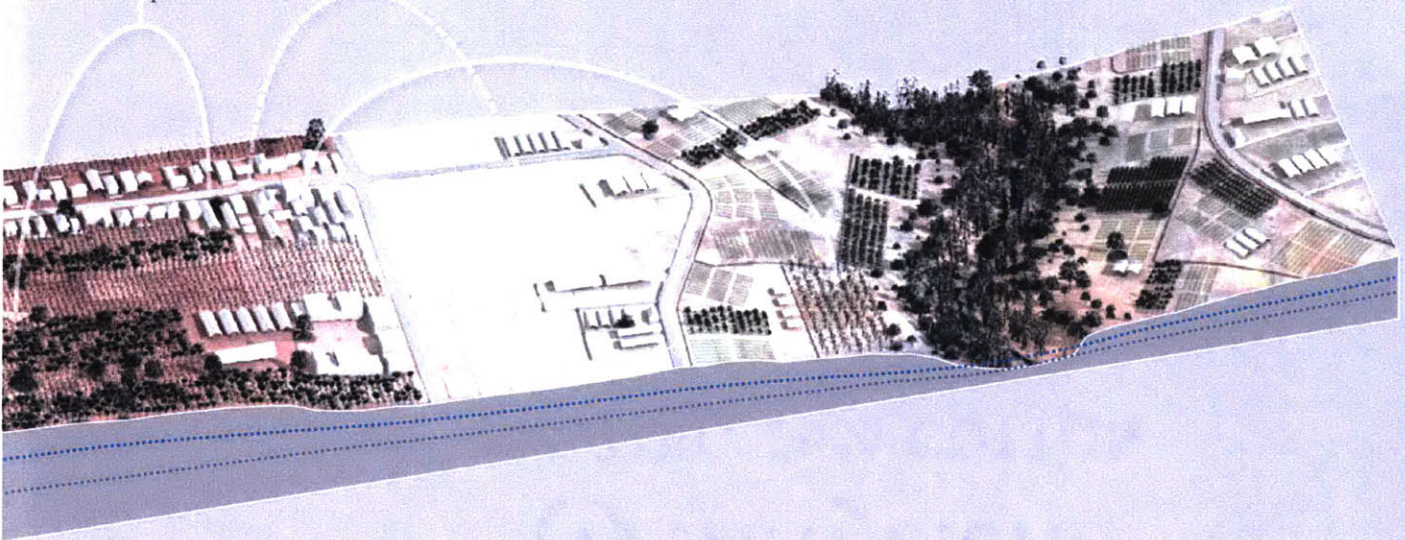
Kusum (*Schleichera oleosa*)



Palash (*Butea monosperma*)

**12 Livestock rearing**

Fodder from cultivating legumes on fallow land; provides manures to nurseries, plantations; surplus milk production sold at chilling plant.



The three components of the proposed framework – the infrastructure networks, seed complexes and a kit of strategies, together constitute the armatures for affecting the desired reterritorialization. These armatures assist in the socio-economic and physical transformations, confronted by the territory and its inhabitants in response to amplified industrial and urban activity, by creating economic linkages between them. In doing so, they help in arresting emigration for the otherwise development induced refugees and provide livelihood security to local inhabitants as well as the in-migrating wage seekers. The thesis envisions that with an increased strength of representation owing to socio-economic mobility, without a dependency on the corporations, the inhabitants engage in a dialogue with them and the state over the tenure of minerals based, heavy industry.

## NOTES

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### Chapter 1

- 1 Quoted in Wired Staff, “Solar or Coal? The Energy India Picks May Decide Earth’s Fate,” WIRED, November 30, 2015, <http://www.wired.com/2015/11/climate-change-in-india/>.
- 2 Blacksmith Institute, “The World’s Worst Polluted Places the Top Ten” (New York City: Blacksmith Institute, 2007).

### Chapter 2

- 1 See Goptu (2001) for her account of the history of urban renewal and town planning.
- 2 Rainbow (1992) analyzing Tony Garnier’s *Cite Industrielle*, emphasizes the project of modernity as inherently normative.
- 3 See Mayer (1958) for the Etawah pilot project; Chitrakoot rural development model (Kakuta, 2003); Shantiniketan & Shriniketan experiments (Gupta, 2008)
- 4 “The typical India village was not self-sufficient even in the days of primitive communications, and it is absurd to talk of ‘reviving’ something that never existed.” Srinivas (1956) on industrialization and urbanization of rural areas; he exclaims that as a result of colonialism, the rural spaces were already embedded in the global economy and not immune to global shocks.
- 5 Refer Mayer (1958) for his report on the Etawah pilot project and Sackley (2013) on the cold-war dynamics influencing its eventual

cessation.

### Chapter 3

- 1 “An Overview of the Steel Sector - Ministry of Steel, Government of India,” accessed August 4, 2016, <http://steel.gov.in/overview.htm>.
- 2 “The Samatha Judgment and the Fifth Schedule of the Constitution,” *Issues of India*, September 6, 2012, <https://socialissuesindia.wordpress.com/2012/09/06/the-samatha-judgment-and-the-fifth-schedule-of-the-constitution/>.
- 3 The 73rd Amendment to the Indian Constitution officially recognized a third tier of government, creating legal frameworks for grassroots democracy. The Panchayati Raj (or local self-rule) system began to be implemented by 1996, with provisions to village, block and district level bodies for implementing development works, levy taxes and fees, etc. See: “The Orissa Panchayat Raj Finance Commission (Miscellaneous Provisions) Act, 1993,” accessed August 4, 2016, <http://www.lawsofindia.org/pdf/orissa/1993/1993OR28.pdf>.
- 4 “...efforts at industrial decentralization were undone by policies of freight equalization, which ensured that the price of minerals taken from the resource triangle of eastern India was more or less the same across the country. Hugely discounting the importance of transport costs in this way did little to encourage the establishment of resource-processing industries in eastern India, as opposed to the extractive industries, which seem to have imposed on the region a version of the ‘resource curse’...” (Corbridge, 2011)
- 5 “Industrialization will open up employment opportunities to the educated unemployed, will generate man days for the unskilled poor, the cash-strapped state will earn revenue to taxes royalties land sales etc. And in the near future the poor land of Orissa will overflow with milk and honey. This was the message being disseminated from assorted quarters – the corporate media, the government, the international aid agencies, the funded NGOs, the World Bank, the institutional intellectuals - and it appeared to have some takers.”

(Pradhan, 2006)

- 6 The state government developed its first Rehabilitation & Resettlement policy for Kalinganagar in 1998, with the provisions including; 1) 1/10th of an acre lands to each displaced family, 2) employment of at least one family member by the industrial plant's company, and 3) compensation for loss of property. However, this faced resentment due as, according to Mishra (2013), the existing socio-economic conditions and low aspirations for mobility fueled apprehensions and fear against loss of 'real' assets – land, cattle, etc. in exchange for monetary ones. As the inhabitants lacked required skills and education for employment in the industry, they were averse to settle for the only eligible jobs of daily laborers.
- 7 Mukherjee (1968) borrows the term 'rurban' from American sociologist Charles J. Galpin as a distinct social and urban unit along a sliding scale between villages and cities.
- 8 Terry McGee provides the classification of conurbations as desakota regions in his 1991 essay 'The emergence of Desakota regions in Asia: Expanding a hypothesis.' See Brenner (2014, 121-37).
- 9 The KNDA comprises of 161 revenue villages with a total population of 154,397 (Census of India, 2011), spread over an area of 458.78 sq.km. It operates from a temporary office at Kalinganagar, while majority of its senior members reside in the state's capital at Bhubaneshwar. The comprehensive development plan for a projected population of 500,000 was outsourced to a private consultant, and the authority limits its role to regulate its implementation.
- 10 See Peck et. al. (2009, 60). Mechanisms of neoliberal urbanization - restructuring urban housing markets.
- 11 Parry (2013) in his analysis of labor dynamics at Bhilai's steel plant post-liberalization provides a lucid account of the plight of contractual labor.



- 12 Graham, Marvin (2001), question the assumption of a need for monopolized, distributive utility networks and infrastructures as a prerequisite for neoliberal cities, or the sustenance of urban life, with discussions on their “splintering” across the globe.
- 13 Umi Daniel, “Odisha Migration: Over One Lakh Odia Workers Migrated to Other States in 2014,” *Odisha Migration*, June 16, 2014, <http://orissamigration.blogspot.com/2014/06/over-one-lakh-odia-workers-migrated-to.html>.
- 14 “...the non-connectivity off this Hamlet has larger implications than what has been mentioned. For example, people rarely get opportunities to visit markets and engage in trading activities and the situation gets worse during the rainy season. Until recently, a person occasionally visited these privileges to purchase goods in bulk. Later on, the villagers discovered that they versus selling the product at a cheaper rate than the actual market price. Thereafter, they stopped trading with that middleman and are now selling the goods in weekly markets. This case is a perfect example of knowledge asymmetry, which results from geographical isolation. Here, the buyer had better knowledge of price of goods done the seller and took advantage of their lack of this awareness as well their inaccessibility to the markets.” Skillshare International India, *State of the Adivasis in Odisha 2014: A Human Development Analysis* (SAGE Publications India, 2014). 51.

#### Chapter 4

- 1 The concept of deterritorialization is borrowed from Deleuze & Guattari’s (1987) argument, and further appropriated in cultural anthropology to frame a destabilization of community relations to a place, especially in cases of emigration.
- 2 Survey and Settlement reports prepared under the British colonial rule in India. See Dalziel, 1934 and Maddox (1900)
- 3 Author interviews. The original copper plaques have gradually been replaced by the Government of India with paper based tenureship

documents, while the former – are not recognized anymore.

- 4 The Scheduled Tribes and Scheduled Castes are classification of communities as defined by the Constitution of India for targeted affirmative action towards socio-economically ‘backward’ communities. See Madhu Sarin, “*Scheduled Tribes Bill 2005: A Comment*” *Economic and Political Weekly*, 2005.
- 5 *Mukherjee (1943) identifies the role of paddy cultivation in rain-fed regions of monsoon Asia, in determining patterns of social organization and the rural way of life.*
- 6 *The devolution of powers to village local bodies or Gram Panchayats as framed by the central government, have been undertaken by various state governments to different degrees. See Rabindra Kumar Behuria, “Panchayati Raj in Odisha: An Overview” Editor’s Note, n.d., 94, accessed August 8, 2016.*
- 7 See Oliver Springate-Baginski, Madhu Sarin, and M. Gopinath Reddy, “Resisting Rights: Forest Bureaucracy and the Tenure Transition in India,” *Small-Scale Forestry* 12, no. 1 (March 2013): 107–24, doi:10.1007/s11842-012-9219-x.
- 8 Skillshare International India, *State of the Adivasis in Odisha 2014: A Human Development Analysis* (SAGE Publications India, 2014), Box 5.4, 46.
- 9 See Peck et. al. (2009).
- 10 Shashank Sharma, “Making CSR Mandatory in India-A Flawed Approach,” *International Journal of Social Science and Humanity*, 2013, 33–35, doi:10.7763/IJSSH.2013.V3.188.
- 11 Gadgil & Guha (1995) provide a provocative classification of India’s population as “ecosystem people”, those directly dependent on a localized footprint for most material needs, and the “omnivores” – a

globalized consuming class. A third, they refer to as the “ecological refugees”, which comprise of displaced ecosystem people lacking the means to make a transition into omnivorous lifestyle.

## Chapter 5

- 1 See, Peter Day, “The Rise and Fall of Britain’s Steel Industry,” *BBC News*, May 22, 2016, <http://www.bbc.com/news/business-36337180>. A materials critical point is a phase where, as a result of rapid industrialization and capacity building in manufacturing sector, a country or a region ends up producing more materials than needed, whether domestically or also including demands for exports.
- 2 Chakrabarty (2013), talk on the problems with anthropocene and climate change debates. Here zoe-centric, from the greek word ‘zoe’ for life, expands the present ethical debates, which are centered upon humans as the agents and beneficiaries for framing policies.
- 3 “State of World Population 2009” (United Nations Population Fund, 2009), <http://www.unfpa.org/publications/state-world-population-2009>.
- 4 Refer “The Forest Rights Act,” *The Forest Rights Act*, accessed August 8, 2016, <https://forestrightsact.com/>.
- 5 Chatterjee (2008) in “Democracy and economic transformation in India” argues that the convergence between three-tiered system of electoral democracy and postcolonial capitalism, especially following the 1990’s reforms, has given rise to an altered form of peasantry. This “political class” negotiates and manipulates democratic institutions – although to different degrees, for livelihood security and welfare.
- 6 S.P. Mukherjee, “All You Need To Know About National Rurban Mission,” *The Logical Indian*, February 26, 2016, <http://thelogicalindian.com/news/all-you-need-to-know-about-national-rurban-mission/>.

## ILLUSTRATION CREDITS

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2.1 – Glover (2005)

2.2 – Ray, et. al. (2005)

2.3 – Google Earth

2.4 – Community structural studies as presented in Durgapur’s master plan report by Town & Country Planning Organization of India. Town & Country Planning Organisation TCPO, *Durgapur Steel Township: General Development Plan* (New Delhi: TCPO, 1971).

3.1 – “R.K. Laxman - Indpaedia,” accessed August 5, 2016, [http://indpaedia.com/ind/index.php/R.K.\\_Laxman](http://indpaedia.com/ind/index.php/R.K._Laxman).

3.2 – Developed upon data from Food and Agriculture Organization of the United Nations, “*The Digital Soil Map of the World*” GIS Shapefile, Version 3.6 (FAO/UNESCO, January 2003).

3.3 – Developed upon data for Terrestrial Ecoregions of the World. Data source, “Conservation GIS Data - The Nature Conservancy,” accessed August 6, 2016, [http://maps.tnc.org/gis\\_data.html](http://maps.tnc.org/gis_data.html).

3.5 – Data from Global forest watch, <http://www.globalforestwatch.org/country/IND>

3.6 – Dongria Kondh protest against Vedanta Resources at an earlier date, Niyamgiri, Odisha (Source: [survivalinternational.org](http://survivalinternational.org))

3.6 – Aditya Barve, Urban Risk Lab

3.7 – Photo by Miho Mazereeuw

3.10 – Google Earth

4.1 – Census of India, 2011

4.3 – Google Earth, Bhu-Naksha web portal for village revenue maps

4.4 – Ibid.

4.5 – Google Earth

4.7 – Google Earth





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