PEAK Urban

Governing for the local environment within corridor projects in India

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This brief describes the challenges of fragmented governance in India's Industrial Corridors with a focus on local environmental issues. It notes the current lack of linkages between economic objectives of industrial corridors and governance challenges in dealing with local environmental impacts, while arguing for a greater integration between economy and environment within the corridors. It suggests potential approaches and frameworks which can be employed to enable such integration.

In the last few decades, the Government of India has implemented large urban renewal and improvement projects that have focused primarily on urban infrastructure development. A more recent strategy has been to set up 'industrial corridors' connecting major states in India to develop industrial cities aimed at creating employment opportunities and fostering economic growth. The Government has approved the development of 11 corridors in four phases, as part of the National Industrial Corridor Development Programme to develop industrial cities.

Industrial corridors in India come with significant challenges and opportunities. While the gains of a functional industrial corridor would be significant, it is important for policymakers to also consider challenges for corridors, as part of a holistic approach to project planning and management.

Environmental aspects form a crucial component of infrastructure governance. Currently, Indian industrial corridors prioritise economic, industrial, and commercial goals without considering environmental challenges and their impacts on these goals. -

This brief describes the challenge of fragmented governance in industrial corridors and implications for their local environmental risks.

Recommendations and conclusions:

- Incentivise formal stakeholders in an industrial corridor to plan and mitigate for environmental impacts of their activities.
- All formal stakeholders should incorporate the following considerations into their Environmental, Social, and Governance (ESG) requirements:
  - Consider the impact of their work on the local environment, particularly regarding the availability and use of land, water, and ecosystems by local stakeholders and communities;
  - Plan for scenarios where changes to the local environment or resource availability affect economic and industrial activities within the corridor, including cascading effects down the value chain.
- All formal stakeholders should include regular and continuous processes to identify and involve other stakeholders who will impact or are impacted by the corridor.
- The nodal agency in charge of the corridor should set up a formal co-ordination mechanism between stakeholders to build common frameworks and processes for environmental governance.
- The nodal agency in charge of the corridor should lead the establishment of adequate funding mechanisms for local environmental impacts.

Can Industrial Corridor Governance in India Address Local Environmental Challenges?

Linking Environment to Economy in Industrial Corridor Governance

Reflecting broader trends in India, governance structures for industrial corridors are fragmented, with economic objectives (E.g.: high GDP growth or employment generation) delinked from other objectives such as environmental conservation or citizen participation in governance.

India's National Industrial Corridor Development Programme emphasises economic integration (see Box 1), connecting disparate sets of resources, communities, goods, and corporations into a cohesive whole that enhances the efficiency of economic activity within the country [1]. Presently, achieving a cohesive corridor requires surpassing local considerations to address national and state priorities. Industrial projects within corridors are often located outside local urban jurisdictions and local communities or planning authorities are usually excluded from the governance of corridor spaces [2].

The current governance structure ignores local environmental challenges, which may pose long term risks to the corridors. For example, in Tumakuru, Karnataka (a node in the Chennai-Bengaluru Industrial Corridor (CBIC)), weak, local, environmental governance frameworks imply that actors do not co-ordinate with each other on issues like groundwater depletion (See Box 2). Such environmental challenges, like groundwater depletion, are tied to local factors, which are not necessarily acknowledged within the larger economic goals of the corridor. Ignoring the impact of local environmental damage may affect the long-term sustainability of an industrial corridor.

Most industries require stable local environments for consistent production of output. Environmental factors add a significant degree of uncertainty to such production. For instance, Tumakuru is in a water-scarce region [3], and neglecting water management may affect the long-term viability of operating water-intensive industries here.

This may be true even if a factory or industry is not in an environmentally sensitive location. Industries are nodes in complex supply chains that stretch across multiple locations and the breakdown of supply due to local factors in one place can have a cascading effect across the network. In 2020, a fire at a semiconductor factory in Nobeoka, Japan, affected global production of advanced sensing devices used in automotive industries. This added to an ongoing global shortage of semiconductors [4]. Such effects are likely to increase if local environmental factors, such as heat risk, flood risk, or resource shortages, are not taken into consideration [1]. Connectivity itself may increase or transfer environmental risks across the region.

Environmental factors add a significant degree of uncertainty to such production

Bangalore, Bengaluru, Karnataka, India,

1 More examples of cascading effects are covered in [8], [9], and [10]

BOX 1: Summary of Industrial Corridor Governance in India

Source: National Infrastructure Corridor Development Corporation (nicdic.in)

Industrial corridors in India are presently designed at a scale above that of states (cross-state), but below that of the country (sub-national). They are usually conceived as "influence areas" lying 500 kilometres on either side of a pre-determined alignment, usually a railway track, highway, or pipeline (E.g.: The Delhi-Mumbai industrial corridor's (IC should be in uppercase here since we are referring to a specific one) influence area lies 500 kilometres on either side of a Dedicated Freight Corridor between Delhi and Mumbai).

Our findings show that industrial and economic development within the influence areas is conducted by complex networks of actors, including multiple governments, parastatal agencies, and special purpose vehicles (SPV), which are quasi-government organisations usually set up to channel funding to specific projects within the corridor. That also includes contracted private partners, and expert consultants, all functioning at various scales. These networks allow for a distribution of responsibilities and jurisdictions, allowing each actor to focus on a limited set of objectives, driven by specific incentives, while reporting to only a limited set of other actors.

Governance structures and processes to enhance economic activity within corridors are relatively sectoral, with a heavy presence of commerce, industry, and infrastructure bodies. Nationally, corridor development is co-ordinated by a nodal agency under the Ministry of Commerce & Industry, while state-level governance structures are usually headed by specialised infrastructure or industrial development parastatals (such as Gujarat's Infrastructure Development Board or (GIDB) acting as nodal agencies. Site-level interventions are also carried out by specialised bodies such as Development Authorities, operating directly under the state's nodal agency. It's rare to see urban local bodies or city corporations involved in corridor development.

11 Industrial Corridors:

- Delhi-Mumbal Industrial Corridor (DMIC)
- Amristsar-Kolkata Industrial Corridor (AKIC)
- Chennal-Bengaluru Industrial Corridor (CBIC)
- Vizag-Chennai Industrial Corridor (VCIC)
- East Coast Economic Corridor (ECEC)
- Hyderabad-Nagpur Industrial Corridor (HNIC)
- Hyderabad-Warangal Industrial Corridor (HWIC)
- Hyderabad-Bengaluru Industrial Corridor (HBIC)
- Bengaluru-Mumbal Industrial Corridor (BMIC)
- Extension of CBIC to Kochi via Colmbatore
- Delhi-Nagpur Industrial Corridor (DNIC)
- WDFC - Dadri-JNPT
- EDFC - Shanewal -Sonnagar-Dankuni
- East Coast DFC - Vijayawada to Kharagpur
- East West DFC -
  Bhusawai-Nagpur-Rajkharswan-Dankni
  Bhusawai-Nagpur-Rajkharswan-Andai
- North South DFC - Vijayawada to Itarsi

BOX 2: Governance and Environment in Tumakuru, Karnataka, India

Tumakuru, an industrial town 70 kms from the city of Bengaluru, Karnataka, has witnessed rapid urbanisation in the last few decades. Currently, the region has been declared a National Investment Manufacturing Zone (NIMZ), with several mega-industrial projects in various stages of development. The city is also being developed under the Smart Cities Mission. Additionally, Tumakuru is also being developed as a node on the Chennai-Bengaluru-Industrial Corridor (CBIC), by the Tumakuru Industrial Township Limited, a private company.

As a process, each industrial project carries out its own Environmental Impact Assessment (EIA) report. These reports are carried out in isolation and often do not account for the other. They do not take into consideration the impact that the projects may have on the local communities. Additionally, local communities are often excluded from the planning and decision-making processes.

For example, the report for the Industrial Township was carried out by Ramky Enviro Services Pvt Limited. It stated that Tumakuru proved to be a feasible site to develop the corridor as there were no ecologically sensitive areas such as wild life sanctuaries, national parks, or critically polluted areas within 10 kms radius of the site. There are also no coastal areas, flood plains or a river in the vicinity. Despite the environmental clearance, the repercussions of Tumakuru's urbanisation have been severe. Tumakuru's residents are grappling with issues such as changing air quality and depletion of ground water levels. An increase in the water-intensive industries such as automobile, manufacturing, food processing and textiles have caused adverse effects to the already fragile water system in the region. Furthermore, large tracts of agricultural lands are being converted into industrial land, also resulting in loss of livelihoods.

Current governance structures are also too fragmented to account for second-order effects of environmental events [5]. If floods or droughts damage long-term livelihoods of local communities, it may push more residents to shift occupations or locations or undertake supplementary activities to survive.

Such trends are already underway. Studies have covered this in Karnataka, where climate change impacts on farming have pushed state residents to migrate every six months to the capital city of Bengaluru to work as taxi drivers [6]. Such trends add challenges for industrial corridor governance, such as providing occupations, housing, education, and other forms of public goods for displaced populations.

Presently, most types of infrastructure planning do not explicitly address such challenges for transitory populations, and the consequences of such lacunae are severe. An illustration of this emerged during the 2020 COVID-19 lockdown in India, when gaps in adequate infrastructure for urban migrant workers (such as healthcare access, safe housing, and access to food) pushed them to move out of their work locations to travel (often on foot, for several thousand kilometres) back to homes in rural areas [7].

Recognising Local Environmental Factors and the Roles Played by Communities

Industrial corridors also provide an opportunity to build governance mechanisms that channel resources to address local environmental factors. Recognising that local environmental factors can pose risks for the entire region covered by a corridor, governance institutions and processes can be set up to address multiple local environmental considerations within the megaproject's influence area. Such institutions could link local populations, communities and governments with institutions managing the corridor project to address local environmental concerns.

Equally important is acknowledging the roles played by local communities in sustaining these ecosystems. Communities with long histories of active engagement with local ecosystems play key roles in long-term management of these resources. Most importantly, proper environmental clearance - procedures are crucial for evaluating the long-term health and sustainability of projects and their impacts on the region in question. This is particularly true for residents of the region.

Environmental Clearance (EC) is the procedure to get clearance from the government for the installation and modification (amendment) of certain projects. The main purpose is to assess impact of the planned project on the environment and people and to try to minimise the same. ECs are mandatory for projects that are likely to cause high environmental pollution.

Recommendations

1. **Regardless of their other responsibilities, each formal stakeholder in a corridor project should be required to plan for environmental impacts of their work.**

   In the current corridor governance structures, this is achieved by requiring an Environment Impact Assessment study, conducted for each project within a corridor, usually outsourced to a specialized agency. While we recommend retaining this process, we suggest that each formal stakeholder, public or private, also incorporate Environmental, Social, and Governance (ESG) norms as a fundamental requirement of any work they conduct, at any scale, related to the corridor. These norms should be specified beforehand and made publicly available.

2. **All formal stakeholders should incorporate the following considerations into their ESG requirements:**

   (a) Local site effects: consider the impact on the local environment, particularly upon the availability and use of land, water, and ecosystems by local stakeholders and communities;

   (b) Second-Order and network effect mapping: plan for scenarios where changes to the local environment or resource availability can affect economic and industrial activities within the corridor, including cascading effects down the value chain.

3. **All formal stakeholders include regular and continuous processes to identify and include other stakeholders who will impact or are impacted by the corridor in question.**

   A simple rule to follow would be to consider the stakeholders involved at the corridor-scale. In other words, a party should be considered a stakeholder if they reside or work in any part of the corridor's influence area for any significant period or if they impact/are impacted significantly by any governance process related to the development of the corridor. Significantly, this allows for urban local bodies or city corporations to be considered as key stakeholders within corridors, an uncommon situation at present.

4. **Set up a formal co-ordination mechanism between stakeholders to evolve common frameworks for environmental assessment, systemic environmental risk reduction, and environmental remediation (See: Box 3).**

   We recommend setting up this mechanism at a corridor-scale and include all stakeholders as identified by the processes listed above. The process should be anchored within a specified nodal agency operating at the corridor-scale, with no direct conflict of interest in performing such a role.

5. **We recommend setting up adequate financing mechanisms to enable corridor stakeholders to obtain funding to meet their local environmental objectives.**

   The emphasis here is on local environmental impacts. While there are existing funding mechanisms such as the Green Climate Fund, they are also tied to national and global targets, which may not adequately address local environmental contexts.

BOX 3: Using the Green Climate Fund's Enhancing Direct Access (EDA) Guidelines as a Governance Template (Illustration)

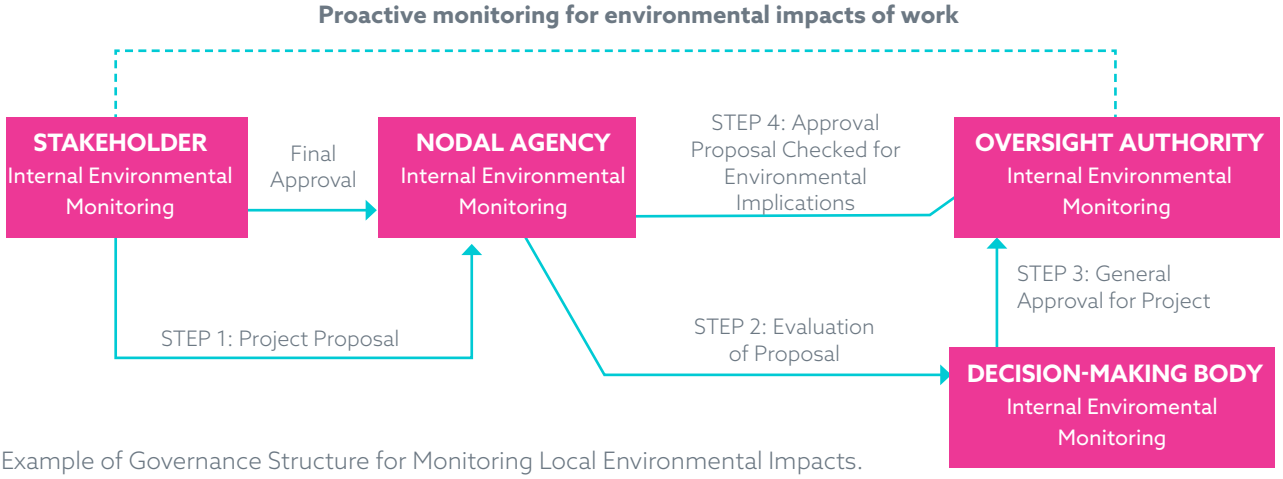
While designed primarily to address global climate financing goals, **the Green Climate Fund's (GCF) Enhancing Direct Access (EDA) Guidelines** offer a useful illustration for how devising governance frameworks can potentially address local environmental effects while also incorporating local stakeholder involvement.

The EDA is a GCF mechanism that provides direct access to climate funding for sub-national and local environmental projects. EDA guidelines do not specify a specific governance structure for such projects, but emphasize two key functions for any structure – (a) an oversight function; and (b) a decision-making function **(Pg 15 of the Guidelines Document)**.

The oversight function requires no conflict of interest among those who are entrusted with the oversight function, and those who make funding decisions. **The decision-making function** requires the establishment of a body which requires all relevant stakeholders to assess and/or select incoming subprojects, therefore requiring a greater frequency of meetings. This may, however, vary according to the national/local/regional context and specificities of each EDA proposal. The guidelines also recommend assigning a Project Manager to function as 'the secretariat' of the oversight and decision-making bodies, managing day-to-day operations of the project.

The two broad functions, along with the establishment of the manager serve as a useful starting point for establishing a governance structure to coordinate local environmental action within corridors. The structure composed of an oversight body, to pro-actively evaluate local environmental action by all corridor stakeholders, in tandem with a decision-making body, to accept proposals and funding requests from stakeholders for local environmental action. Furthermore, appointing a common executive office, such as a corridor nodal agency that functions as a secretariat for both bodies, ensures co-ordination between the bodies. However, such an agency allows for incorporating environmental action from stakeholders across scales, and sectors, while also maintaining oversight over such action. The oversight body can also undertake the responsibility of ascertaining second-order and network effects.

The case provided below is only for illustrative purposes, to demonstrate how examples of frameworks and best practices from around the world can be adapted to focus on local environmental action within corridor influence areas.



Example of Governance Structure for Monitoring Local Environmental Impacts.

The Steps describe how an individual project will be evaluated for environmental impacts while a more continuous process of proactive monitoring, as well as internal processes within each organisation take place in parallel.

BOX 4: Applying our recommendations to governance networks in Tumakuru, India (Illustration)

India has three levels of government: Centre, State and Local Governments, with local governments divided into urban and rural structures. Rural bodies include a Zilla Panchayat at the District level, Taluk Panchayat at the Taluk (a sub-district administrative unit) and the Gram (village) Panchayat. Urban local bodies are organised into Municipal Corporations, Municipal Councils or Town Councils, depending on population size. In Tumakuru, Karnataka, a node in the Chennai-Bengaluru Industrial Corridor, all these governing structures exist together. The districts, taluks and the villages are governed under the rural governance structures, while the city is governed by the City Municipal Corporation. Apart from this, there are also parastatals such as the Urban Development Authority that look at functions such as urban development.

The 74th Amendment to India's Constitution contains a clause (243 Q) that allows exception of elected local bodies for areas designated as industrial townships. This allows several parastatal agencies and new institutions to function outside the purview of the local governments. For example, the nodal development of the Corridor is being managed by "Tumkur Industrial Township Limited', a special purpose vehicle. (SPV should ideally be written with the first letter in upper case) Functions such as planning and environmental assessments are carried out by private consultants and agencies. For example, the Environmental Impact Assessment (EIA) report for the Tumkur Industrial Township was carried out by Ramky Enviro Services Pvt Limited.

A potential way of applying our recommendation structure to Tumakaru would require making three changes to the current governance structure. First, the state's Department of Environment, Forests and Climate Change should be included as an oversight authority for local environmental action, via a nodal agency for Tumakuru. For example, a newly established Corridor Assessment Cell, with the authority to evaluate and monitor local environmental action across all the stakeholders in area. Second, the nodal agency for corridor development in the state would be required to incorporate the participation of municipal corporations, village panchayats and other bodies previously left out, obtaining their inputs on environmental issues. Third, all stakeholders (old and new) would be required to frame and implement rules for environmental monitoring and action within their jurisdictions, under the co-ordination of the Oversight Authority. The implementation of these rules should be continuous and subject to frequent revisions, both internally and externally. These three changes should be accompanied by relevant supporting action, such as capacity building and funding across stakeholders.

The example above is strictly an illustration of a potential way in which our recommendations can be implemented in Tumakuru. Our general suggestion is for the state government to experiment with multiple such models prior to any implementation.

Conclusion:

Several proposed and new industrial projects by the central and state governments have situated themselves in small towns and new settlements like Tumakuru, posing key questions of labour and employment, livelihoods, and the environment. In particular, the environmental implications of these projects are likely to have far reaching effects on the shape that these new settlements take. Our research and case studies highlight that existing government structures are weak and ignore the impact of the corridor projects on the environment. The effects of this are already seen in towns such as Tumakuru, which are grappling with issues of pollution and ground water depletion. It is hence imperative that stakeholders within these industrial projects ardently plan for environmental impacts of their work and set up efficient mechanisms that meet environmental objectives.

This brief was authored by Amogh Arakali and Tanvi Bhatikar and the managing editor was Francisco Obando. It draws on key findings from the PEAK Urban research project, 'Manufacturing Cities: Planning, building and governing industrial infrastructure in Bangalore"

Further reading

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1. Generating new research grounded in the logic of urban complexity;

2. Fostering the next generation of leaders that draw on different perspectives and backgrounds to address the greatest urban challenges of the 21st century;

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In PEAK Urban, cities are recognised as complex, evolving systems that are characterised by their propensity for innovation and change. Big data and mathematical models will be combined with insights from the social sciences and humanities to analyse three key arenas of metropolitan intervention: city morphologies (built forms and infrastructures) and resilience; city flux (mobility and dynamics) and technological change; as well as health and wellbeing.

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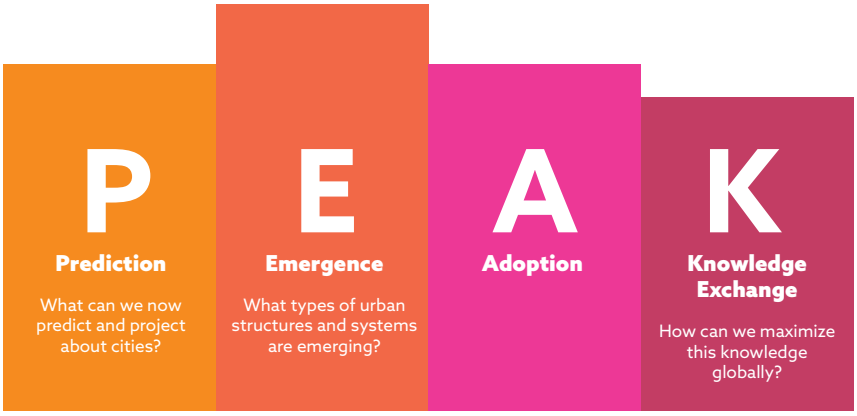
Our framework



The PEAK Urban programme uses a framework with four inter-related components to guide its work.

First, the sciences of **Prediction** are employed to understand how cities evolve using data from often unconventional sources.

Second, **Emergence** captures the essence of the outcome from the confluence of dynamics, peoples, interests and tools that characterise cities, which lead to change.

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Finally, the **Knowledge** component accounts for the way in which knowledge is exchanged or shared and how it shapes the future of the city.

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