



## Private Enterprise Development in Low-Income Countries

### Understanding Regulatory Cost and Effectiveness: Evidence from India

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*We compile a unique dataset on India's controversial environmental clearance (EC) process, the system through which large investment projects receive government approval before breaking ground. In the mining sector, we find that EC may be an inefficient tool for environment protection: though the process is more stringent for mines with larger environmental risk, it gives preferential treatment to mines in politically aligned areas, and almost all mines ultimately receive clearance.*

## Background

As the Indian government pursues a set of ambitious development goals, it is working to streamline its complex system of permitting and licensing regulations. India's controversial Environmental Clearance (EC) process, in which capital investment projects obtain approval from the state or central government before breaking ground, is at the core of these efforts. While the EC process applies to a range of sectors, we focus on the mining sector, the centrepiece of Prime Minister Modi's strategy to renew rapid economic growth and poverty alleviation in India. The mining sector contributed about 2.1% to India's GDP in FY14, of which about 31.4% derived from non-coal mines. The lengthy EC process is meant to limit environmental harm, but it may exact substantial costs by slowing development of new mines, and it may distribute these costs unequally. However, little reliable data exists to document India's EC process, and its impacts remain unclear. We compile a unique repository of data on the EC process for non-coal mines that were granted clearance between 2006 and 2016, allowing us to explore for the first time the regulatory burden of this controversial process.

## The environmental clearance process

The current EC process was established by the Environmental Impact Assessment (EIA) Notification of 2006 and is overseen by the Ministry of Environment, Forests, and Climate Change (MoEFCC).



The project proponent first submits an application to the MoEFCC, including a basic project description and a set of proposed Terms of Reference (TOR) for the environmental impact assessment (EIA). The central-level Environmental Appraisal Committee (EAC) finalizes the TOR, after which the project proponent undertakes the EIA and holds a public hearing. The EAC then reviews the completed EIA during a monthly meeting and recommends that MoEFCC either grant or reject the application. Finally, MoEFCC notifies the project proponent of its clearance/rejection decision.

## Research questions and methodology

We seek to address the following questions on this controversial process:

- Is the EC process fair? Do mines with similar environmental and social risks receive similar regulatory scrutiny, or are companies with political connections favoured?



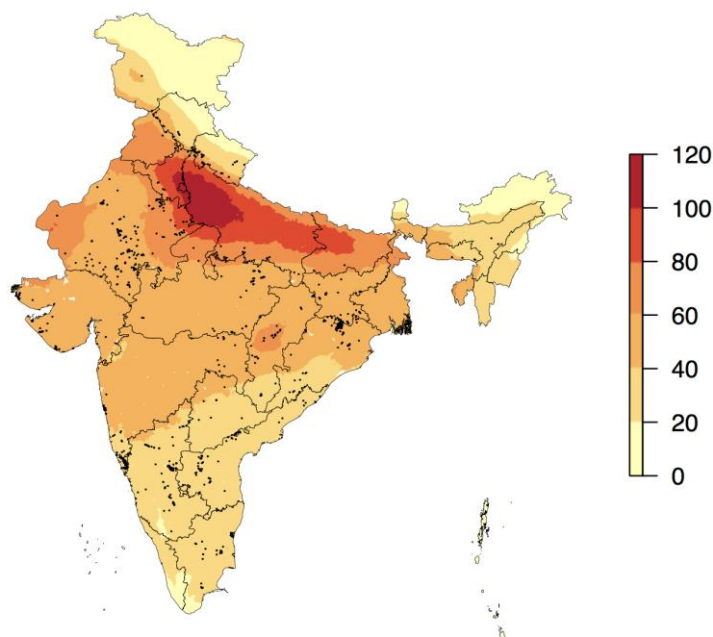
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- How does the stringency of the EC process influence mines' environmental compliance?

Fully answering these questions requires information on mines' EC applications, mine characteristics, pre- and post-clearance environmental outcomes at mining sites, and parent companies' financial performance. We have compiled an unprecedented dataset on nearly all of these characteristics for non-coal mines granted clearance between 2006 and 2016. We first collected data on mines' EC applications from a comprehensive public online database published by the Ministry of Environment, Forest and Climate Change. To correct for inaccuracy in this data, we supplemented it with detailed information on mine characteristics and EC applications extracted from mines' clearance letters and with data on mine characteristics from mining lease information at the Indian Bureau of Mines. We then filled out this robust dataset with GPS coordinates for mine locations and with publicly available, high-resolution satellite data on ambient air pollution and vegetation<sup>1</sup>. We are continuing to supplement this comprehensive repository with financial data on mine parent companies.

We use these broad data to explore the role of regulatory discretion in the EC process, analysing the extent to which mines' environmental risk<sup>2</sup> determines stringency. We define EC stringency either as application duration or as the extent to which a project skips or is skipped by others in the line for clearances. The median monthly EAC meeting considers 16 projects, so we can think of projects that skip more than 15 others as having meaningfully skipped their cohort.

**Figure 1:** Map of ambient air pollution across India



*Note:* Measured by satellite data, and mining locations.

We focus this analysis on the role of political connectedness of mine parent companies. In the absence of company-specific measures of political connections, we define political connectedness as alignment of a mine's parliamentary constituency representative with the ruling party of the Lok Sabha, India's directly elected central parliament. We restrict our analysis to mines in constituencies with close elections, where political alignment is plausibly randomly assigned and, therefore, where aligned and non-aligned

<sup>1</sup> Mine locations were identified by and purchased from ML Infomaps, an Indian company. We use MODIS and LANDSAT satellite data for land cover and PM<sub>2.5</sub> concentration.

<sup>2</sup> Proxied by characteristics like mining method and area, and parent company characteristics, like having received a previous clearance.



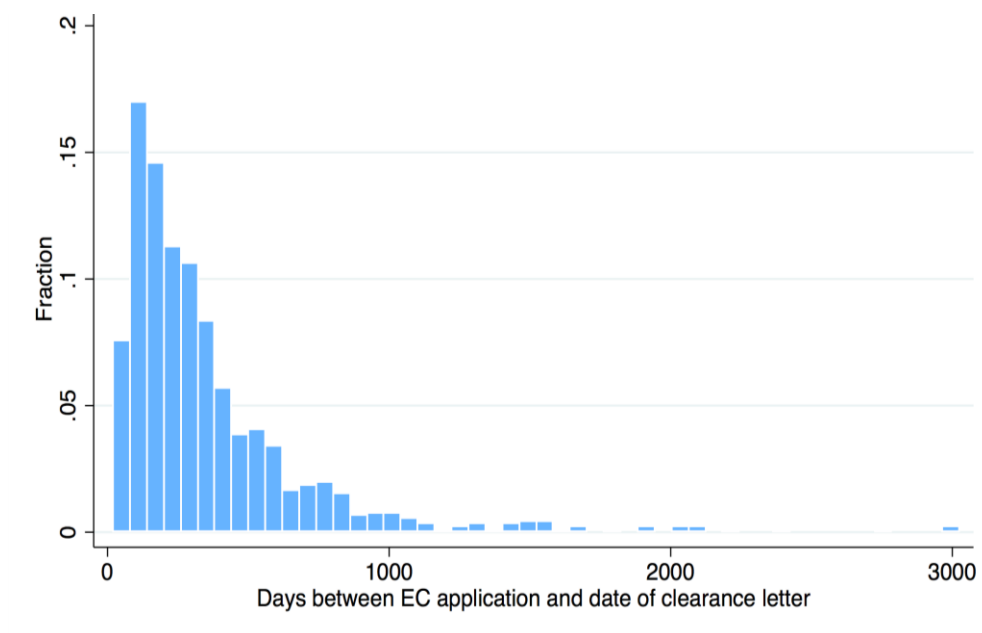
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constituencies may have similar political characteristics. In addition to this measure of political connections, we evaluate differential treatment of mines from companies that have previously received a successful clearance, and which are thus “experienced” in the EC system.

### Preliminary findings

In total, our sample includes 913 mines with information for our full set of application characteristics. The EC process varies widely in stringency within this sample. The median mine has EC duration of about 259 days, though the distribution is heavily right skewed, with some mines enduring an EC process that takes almost 10 years (see Figure 2 below). The distribution for queue skipping, or the extent to which a mine skips other mines in the line for clearance, is similarly skewed: while the median project skips 28 other projects in the queue, some mines are skipped by up to 600 other projects. Since the median EAC meeting considers a cohort of about 16 projects, the median project is skipping ahead to a different application cohort.

**Figure 2:** Distribution of total EC duration in days.



Political alignment also varies significantly in our sample of mines. In total, 46.4% of mines that received clearance between 2006 and 2016 applied from parliamentary constituencies that were aligned with the central ruling party. We restrict the sample where we look at the effect of alignment on stringency to the 353 mines located in close election constituencies; of these, 40.4% are in politically aligned parliamentary constituencies.

We find that EC stringency typically responds to environmental risk as we would expect. Large mines take longer to clear and tend to be skipped by more projects, as do violation cases, or projects that have previously mined or expanded mining capacity without receiving the requisite environmental clearance. Mines with greater extraction efficiency (output per hectare) are met with slightly lower stringency. We find, also, that the connectedness of a mine’s parent company and constituency significantly impacts clearance duration. First, mining projects submitted by companies that have previously received a clearance, and which are therefore “experienced” in the EC system, undergo a less stringent EC process. Similarly, mines in politically aligned parliamentary constituencies receive substantially less stringent clearance. The impact of political connectedness increases as the queue of applications for clearance increases, suggesting that connections become increasingly salient when the system is overburdened.



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### Policy implications

EC stringency does correspond somewhat with measures of the environmental risk of a given mining application, like mine area and output efficiency, so the EC process is at least partially fulfilling its mandate of more carefully considering particularly harmful development projects. However, it is not fully fair: politically aligned mines receive markedly less stringent treatment, skipping and delaying valuable clearances for mines of similar environmental risk in non-aligned areas.

Furthermore, while EC duration and extent of queue skipping fluctuate, almost all mines are ultimately granted clearance. Therefore, the clearance process' primary tool for environmental protection is the assignment of environmental compliance conditions to mines as they receive clearance. However, only about 42% of mines submit required compliance reports after being cleared. If the enactment of clearance conditions does little to change mines' environmental performance post-clearance, a clearance process that only sanctions environmentally harmful projects through longer clearance durations and the assignment of additional conditions could impose large regulatory costs while failing to improve environmental outcomes.

### Moving Forward...

We will extend our analysis by more closely linking regulatory discretion in the EC process to environmental outcomes. Using MODIS and LANDSAT satellite data, we are working to develop measures of mines' temporal and spatial compliance with clearance conditions. That is, we will measure whether mines have been operating beyond their permitted areas or whether they began mining prior to clearance. We can then investigate the following questions:

- If politically connected firms receive less stringent clearances, does that translate into weaker environmental compliance?
- Alternatively, do projects that take longer to clear have incentives to bypass regulations?