



Decentralising the Development-Conservation Trade-off: Evidence from Forestland Diversions in India

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We examine a policy reform in India that decentralised the approval decision to legally deforest land parcels, to study how it shapes the development-conservation policy trade-off faced by governments. Using rich data on the universe of deforestation applications and their approval outcomes, we find that decentralising the decision-making from the central government to states significantly increased the number of applications received by the latter, despite a fall in the approval probability. Structural estimates indicate that while state governments (as compared to the center) put a 11% lower weight on economic development (vis-a-vis conservation), they also have 15% lower application cost as well. This results in a lower quality and higher volume of projects being proposed and approved, leading to more deforestation without much economic development. From the lens of a dynamic model, we show that while state governments in fact do value economic development more in the long-term, they optimally choose to be more stringent in their short-term approvals in response to lower costs and more lower quality applications received by them.

Introduction

With growing concerns surrounding natural resource depletion and associated climate change, governments across the world face the task of balancing economic development with environmental conservation. This trade-off is especially pronounced in low- and middle-income countries, who while susceptible to climate change, strive to bridge the gap in economic development with the more advanced economies. The governance structure surrounding the legal extraction and management of natural resources is therefore of special importance in these countries, since these institutional frameworks shape the incentives and behaviour of various stakeholders, which ultimately determines how these trade-offs are resolved. In this paper, we shed light on this development-conservation trade off by examining the effect of a governance policy reform in India that expanded the scope of decentralised policy-making in the context of converting forest land for economic development projects.

Policy Context

The context of our research is India, where all forest land is state property. Hence, any economic project (such as road or railway construction, canal irrigation, etc.) that requires the diversion of forest land needs approval from the government. The approving authority (state or central government) is determined based on the size of the land that is proposed to be deforested. All applications are made to the relevant ministry of the state government, which verifies the



application details, assesses the project quality, and forwards it to their respective Regional Offices, located in various state capitals. For very small projects, with size below 5 Ha., the decisions are made by a high-level bureaucrat in the Regional Office.

For years prior to 2004, the approval decision for projects between 5-20 Ha. was decided by state government officials, which consisted of a committee in the Regional Office, along with Indian Forest Service officials, and representatives of the state government. However, applications with land size above 20 Ha. were forwarded directly to the Ministry of Environment and Forests of the central government for approval. Our empirical methodology exploits a policy reform. An amendment to the Forest Conservation Act in 2004 increased this approval threshold from 20 Ha. to 40 Ha. Therefore, the approving authority for projects between 20-40 Ha. (henceforth, 'mid-sized' projects) changed from the central to the state government in the post-2004 period.

Data and Methodology

We assemble a novel source of data to examine the impact of this policy reform. Specifically, we put together the universe of applications received for the diversion of forest land submitted for approval spanning four decades, between 1980-2019. The data are available from the website of the Ministry of Environment, Forest and Climate Change (MEFCC), Government of India. They allow us to extract various details pertaining to each proposal, such as the area of land to be diverted (i.e., project size), its location (state and district), economic purpose of project, date of application, various stages of the approval process, and final decision. For our primary analysis, we focus on applications received during 1990-2009 in the size range of 10-100 Ha. The final sample therefore consists of 3,111 projects, with an average (median) project size of 32.3 Ha. (24.4 Ha.).

A unique policy change in 2004 allows us to study the effect of decentralisation. To elaborate, historically, the approval decisions for smaller projects with an area of up to 20 Ha. were made by state governments, while the central government was the approving authority for projects greater than 20 Ha. A policy change in 2004 doubled this size threshold to 40 Ha., thus increasing the share of projects assessed by state governments (from 48% to 66%). We examine the impact of this policy change to study the impact of decentralising the decision-making process and its impact on deforestation and economic development.

Descriptive Analysis

Infrastructure, irrigation, and natural resource projects account for around 85% of the total number of applications and forest area covered under them. Health and education facilities account for around 1% of the applications and area covered, while the rest (13%) are categorised into an "other" category because no specific economic purpose was mentioned for these projects in the data. Similarly, Northern states account for 36% of the projects and 34% of the forest area, followed by the Eastern states (around 30% of applications and area), Western states (around 20% of applications and area), and Southern states (15% of projects and area). Lastly, around 75% of projects are approved on average and the approval probability is increasing in the project size, going from about 70% for smallest projects in the sample, to about 82% for the largest. While infrastructure-related

projects are more likely to be approved (83%), and projects that do not have a specific stated purpose are least likely to be approved (60%).

Results

We begin our analysis by exploiting this policy reform and establishing three key empirical facts on the impact of this decentralisation on project applications and approvals. First, we find that decentralising the approving authority for mid-sized land parcels between 20-40 Ha. from the center (before 2004) to states (after 2004) increased the number of applications received by states. Second, we find that state governments have in fact, a *lower* probability of approving projects on average, as compared to the center. Third, we find that after the policy reform that decentralised decision-making to states, mid-sized projects (that were directly affected by this policy change) located in districts where citizens have stronger preference for forest conservation i.e., those districts with above-median forest cover, saw a 10 p.p. decrease in their approval probability. On the other hand, districts where citizens did not exhibit a strong preference (with below-median forest cover) saw a 5-8 p.p. increase in project approvals. Taken together, the above facts -more applications and a lower approval probability- suggest that state governments receive more, but lower quality applications. This could be because of a different preference that states might have on the economic valuation of the project (as compared to the center), or because applicants face a lower cost of applying to the state (relative to the center), or both.

To rationalise the above patterns, we develop a theoretical framework that models applicants' decision to apply and consequently, governments' decision to approve a project. When deciding to apply, an applicant trades-off the expected net benefit from the project (if it is approved) with a (government-specific) cost of application (denoted by λ). On the other hand, the key trade-off faced by a government g in making its approval decision is the weight it puts on the economic value of the project (denoted by b_g), relative to the cost of deforestation. The model therefore generates predictions for the optimal approval and application decisions by each government and applicant respectively, depending on governments' preference weight (b_g) and application cost (λ_g).

The model highlights two channels through which the impact of decentralisation can be measured: first, the change in the probability of approval conditional on application due to differential preferences for conservation between the state and center. Our calibration exercise indicates a 11% decrease in the approval probability *conditional* on applying i.e., state governments prefer forest conservation as compared to the center. A second channel speaks to the lower cost of application (λ) that along with b , drives the selection of projects that now make applications. Our structural estimates indicate that the cost of application is 15% lower under state governments as opposed to the center. This implies that 18% more projects that would not have applied under the central government, now apply under state governments. The selection effect, therefore, attenuates the direct positive effect of decentralisation on conservation. Put together the average probability of approvals is now 13% lower after the policy reform, which when coupled with a 18% increase in application volume, implies a small net increase of 3% in deforestation due to decentralisation.

Taken together, our results imply that decentralisation leads to a fall in the average quality of approved projects due to adverse selection driven, which in turn is driven by a lower cost of application and a rise in deforestation. We confirm this implication by examining trends in district level forest cover and nightlights. We find that districts that were more exposed to the decentralisation reform (due to greater prevalence of mid-sized projects at baseline) also experienced lower growth in nightlights and forest cover in the post-2004 period.

Policy Impact

Researchers and policymakers are increasingly studying reciprocal relationship between economic development and the environment, triggering debates in less-developed countries about sustainable ways of developing, as well as understanding how individuals adapt to it. The development-conservation trade-off is especially pronounced in low- and middle-income countries, who while susceptible to climate change, strive to bridge the gap in economic development with the more advanced economies.

Moreover, our study is different from previous studies in the literature, which tend to focus on contexts where any form of resource extraction (deforestation or water pollution for example) is either illegal or undesired, providing a clear objective for the government to reduce it. In contrast, our context focuses on legal deforestation for the purposes of legitimate economic activity and thereby, provides us with a unique opportunity to study how governments at different levels trade-off environmental considerations with economic development differently and its consequences on the quality of projects that are proposed and approved. We show that the preference of each government, as well as the differential cost of applications that applicants face, can impact how stringent they are in approving projects, which in turn impacts the selection of projects that they receive. As we show in our case, this can lead to lower quality projects being proposed (and approved), leading to more deforestation without much economic development. To the extent that governance structures are similar across low- and middle-income countries, our findings can inform the nature of policymaking in them.

Moving Forward

As a part of the STEG grant, we have digitised the universe of applications for deforestation from 1980-2019. While we only use a subset of these years (and applications) for the current project, we propose to use the larger dataset to examine other policy reforms that could help understand policy making in these contexts. Specifically, we propose to examine the formation of the National Green Tribunal, which was established in 2010 and opened the window for citizens to challenge the governments' forestland diversion decisions. This was a landmark decision in terms of directly incorporating citizen preferences in policymaking, which we intend to study in the future.

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