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# Shaping the Right Incentives for Firms to Facilitate Climate Adaptation and Improve Environmental Quality

*This piece is also available on the Abdul Latif Jameel Poverty Action Lab (J-PAL)'s [website](#).*

“Most of the real costs of climate change are going to be experienced by people who live in poor countries,” expressed Esther Duflo, J-PAL co-founder, and affiliate, during the [2023 Spring Meetings of the World Bank Group](#). Research has [shown](#) that higher temperatures have been associated with lower productivity and economic growth rates for lower- and middle-income countries (LMICs). Given that today’s [LMICs are poised to contribute 60 percent of world gross domestic product \(GDP\) by 2030](#), it is increasingly imperative to provide a persuasive business case for firms in LMICs to respond to environmental challenges and adapt to climate change. As LMICs work to reconcile growth and environmental needs, providing appropriate policy incentives that do not discourage growth can encourage LMIC-based firms, which may often act as passive entities affected by climate change or engage in locally harmful practices like air and water pollution, to transform into proactive catalysts for environmental adaptation, progress, and innovation.

IPA and JPAL have supported numerous rigorous research studies exploring diverse questions related to climate change and sustainable development. In particular, since 2020, the [King Climate Action Initiative \(K-CAI\)](#) at J-PAL has funded several randomized evaluations addressing these questions as well as scaling projects aimed at amplifying the impact of research findings. The following existing randomized evaluations conducted by researchers affiliated with J-PAL and IPA suggest some ways that firms can overcome barriers to adaptation and improve environmental quality. This blog presents some of those findings and highlights some questions to guide future research on how firms in LMICs can respond to environmental challenges, and in some cases, how to limit the potential harms of their business operations on nearby communities.



People walking in narrow street with full of food stalls during daytime in India (Photo by [Elle](#) on [Unsplash](#))

## Balancing financial and environmental goals

*The provision of training and information when introducing new technology could align firm owners' incentives with broader social concerns about reducing pollution and emissions. In a K-CAI funded project in [Niger](#), a practical and interactive training on how to adopt an environmental technology, designed to encourage land restoration and climate change adaptation, led to a higher adoption of said technology, resulting in increased agricultural output and reduced land turnover. Similarly, in [Bangladesh](#), another K-CAI study is assessing the role of information in the adoption of energy-efficient motors for stitching machines in the leather goods and footwear manufacturing sector.*

*On the other hand, information or technology alone may be insufficient to align the incentives of firms with social concerns. For instance, in [Pakistan](#), researchers attempted to introduce a new production technology to soccer ball manufacturers to help minimize waste and reduce costs. However, many firms did not take up the innovation. Their workers, who were paid per item produced, blocked adoption because the new technology slowed them down and they did not share in the benefits from reduced input costs. Only when workers were offered a bonus payment to demonstrate competence in the new technology to the*

firm's owners did adoption rise.

*Financial incentives could have an impact on technology adoption, but their design should consider the timing of costs.* A study in [Zambia](#) on agricultural technology subsidies revealed that while financial incentives increased technology adoption, they did not guarantee sustained usage. However, rewards for ongoing use did result in greater adoption after one year. The results from this study suggest that when there is uncertainty regarding the timing of costs and benefits, long-term incentives might promote sustained technology usage more effectively than incentives focused solely on initial adoption.

*Governments often strive to address environmental concerns.* However, their policies may not provide sufficient incentives for firms to comply. In [India](#), the state of Gujarat's third-party environmental audit system was found to produce unreliable information about industrial plant pollution, likely because auditors were paid by the company that was the subject of the audit. Researchers evaluated the impact of a reform to increase auditor independence, and found that they were more likely to report pollution levels truthfully and plant pollution decreased in response.

In the state of Punjab, the government paid cash transfers to farmers after agents verified that they stopped burning crop residue—a practice that degrades local air quality—for several months. But this policy was not enough to meaningfully change the behavior of the farmers, who may have been skeptical that they would ever receive payments or lacked the resources needed to finance alternative crop management equipment in the meantime. A [study](#) revealed that farmers were more likely to stop burning crop residue when they received payments upfront, rather than, after verification of compliance. Such cases demonstrate the need for policymakers to carefully consider the incentives of businesses when attempting to address environmental concerns.

*Similarly, government regulation that enables firms to reduce their costs of compliance may also be more successful in achieving desired environmental outcomes.* For example, a current K-CAI funded [scaling project](#) in India is based on a [study](#) that examined the impact of a particulate matter emissions market on air pollution, which allowed for the buying and selling of pollution permits among firms. Historically, the Indian government has used a command-and-control approach that mandates firms to reduce emissions by a prescribed amount, but these can impose a high cost of cutting emissions on businesses. In the study, firms randomly assigned to participate in the emissions market not only demonstrated perfect compliance with the program and lower abatement costs, but also reduced their pollution emissions by around 20 to 30 percent compared to those operating under the status quo system.

## Research questions to move forward

Despite growing awareness and interest in environmental sustainability, there is still a gap in

the evidence regarding the environmental practices of LMIC-based firms. Developing a business case for firms—particularly micro-, small-, and medium-sized enterprises (MSMEs), which are more vulnerable to environmental shifts—to respond to environmental challenges requires building a body of rigorous evidence to inform action. We propose a series of open research questions below for stakeholders to shape their research or policy agendas.

**Building resilience and mitigating threats:** What strategies can be used to build resilience among MSMEs in the face of environmental threats? What are the potential environmental risks that these businesses face, and how can these risks be mitigated? What can be done to increase MSME owners' knowledge about the potential risks to their businesses caused by climate change, as well as ways to manage these risks?

**Encouraging innovation among MSMEs:** MSMEs can be highly agile and innovative compared to larger firms, and are often on the front line of confronting the impacts of climate change and environmental degradation. Can MSMEs play a role in creating innovative solutions to problems posed by climate change and other environmental threats? How can these innovative MSMEs be identified and supported?

**The role of firms in adaptation:** Much of the adaptation to climate change among LMICs in the coming years may be achieved by large migration of people from rural to urban environments, and building resilient infrastructure there. What role do firms have to play in this shift? What can be done to improve their employment capacity to absorb new labor from rural areas? How can firms be encouraged or supported to provide services like transportation, food delivery systems, and garbage collection, which enable high-density areas to thrive?

**Addressing barriers to the adoption of sustainable practices and technologies:** What specific barriers prevent firms from adopting sustainable practices and technologies? Though some research exists on the topic, there is a need for a deeper understanding of these barriers. Are these barriers primarily related to financial constraints, knowledge gaps, lack of awareness, and misalignment of incentives within firms, or are there other factors at play? Similarly, what incentives have proven most successful in encouraging firms to do so? Do these incentives vary across different types of firms?

**Understanding the benefits of renewable energy for economic activity:** How does the adoption of climate-friendly technologies impact the profitability of firms? It is important to consider not only the immediate costs of adoption but also the potential for long-term savings and profitability. Do firms gain reputational benefits by adopting climate-friendly goals? How do these benefits vary in local and global markets?

The identified promising areas for future research intersect with K-CAI at J-PAL, which is currently funding research into scalable solutions for climate change, and [IPA's Entrepreneurship and Private Sector Development](#) program, which examines the effectiveness of innovative policies with the potential to assist firms in adapting to new challenges brought by climate change and enables businesses to be drivers of green growth and innovation.