

Climate and Environment Program (CEP)

Research and Learning Agenda





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Introduction

IPA's Climate and Environment Program

Innovations for Poverty Action's (IPA's) sector programs engage with researchers and partners to identify the most policy-relevant knowledge gaps where rigorous impact evaluations and high-quality data can help decision makers to design, support, and scale cost-effective programs. Sector staff develop research projects based on these priorities and share the relevant evidence broadly and strategically. The Climate & Environment Program (CEP) is a new sector program that brings together researchers, policymakers, practitioners, and funders to develop and advance a strategic research and policy agenda focused on solutions in the sector that simultaneously improve climate and environmental outcomes and the welfare of poor and vulnerable households. While IPA already has extensive experience in this sector, CEP enhances our ability to develop projects with the greatest policy impact and share useful evidence with partners.

Sector context and CEP's mission

Climate change and environmental degradation have far-reaching consequences, and their adverse effects disproportionately affect those living in poverty. threatening to reverse significant advances in global poverty alleviation. At the same time, climate and environmental projects are deeply linked to poverty reduction, as ecological sustainability is necessary for human well-being and livelihoods (Lanks et al, 2023).

There are many examples of policy interventions with synergies between development, climate, and environmental outcomes. For instance, climate resilience strategies—such as resilient agricultural practices and climate-resilient infrastructure—are essential to safeguard vulnerable households from current and future climate shocks (for example, Boucher et al. 2024; Premand & Stoeffler, 2022). Emissions mitigation strategies can also increase human welfare given the significant co-benefits that clean technologies and transitions can offer communities, if implementation is done in an equitable way (for example, Visser et al, 2019). Similarly, protecting our environment is not only beneficial for nature and

wildlife; it is essential for public health, wellbeing, productive livelihoods, and a thriving economy, and many interventions can support sustainable livelihoods while conserving the environment (for example, Del Valle et al. 2019; Saavedra, 2025). At the same time, development programs can impact climate and environmental outcomes, even if they do not have an explicit objective of doing so (for example, Ferraro and Simorangkir, 2020; Alix-Garcia et al. 2011 regarding conditional cash transfers). Better understanding these different mechanisms and synergies would help improve the long-term sustainability of our policies and our knowledge of the ways we can (or can't) pursue resilient and sustainable development.

To identify the most impactful, cost-effective, and scalable interventions to achieve these objectives. we need a systematic and evidence-based approach in the sector. The climate and environmental sector has a good track record of using science to diagnose problems and inform decision making, but it rarely uses rigorous impact evaluation methods to assess the impacts of the policies designed to solve climate and environmental problems (Alpizar & Ferraro, 2020). With IPA's approach of generating evidence of the effectiveness of interventions and policies using the most rigorous methods available and ensuring that the evidence gets used by policymakers, IPA can help the climate and environmental sector improve the welfare of the poor while adapting to climate change and protecting our planet.

CEP will align its work to global objectives delineated in multiple agreements and frameworks, like the 2015 Paris Agreement, the 2021 Glasgow Agreement, and the 2022 Kunming-Montreal Global Biodiversity Framework. These international agreements set ambitious goals and emphasize coordinated action to reduce emissions, protect ecosystems, and promote adaptation measures in an equitable manner. However, gaps in financing and implementation hinder progress. For example, estimated annual adaptation needs are expected to reach USD 160-340 billion by 2030 and USD 315-565 billion by 2050 but remain vastly underfunded (Adaptation Gap Report 2022). At the same time, there is little clarity about which specific policies are the most effective to achieve these goals and how to do them in a scalable, cost-effective and equitable way. CEP will help identify the most impactful and cost-effective solutions to close the financing and implementation barrier.





Priority Topics and Research Questions

This Research and Learning (R&L) agenda identifies strategic priority areas where evidence and IPA's experimental approach could be key in helping decision makers advance their climate and environmental objectives in a way consistent with development objectives. The agenda is not an exhaustive list of important topics or evidence gaps in the climate and environment sector, nor is it binding, but it will guide CEP in prioritizing its efforts, and provides examples of the kinds of policy-relevant research questions that could be explored.

Because of our express link to improving the welfare of the poor while achieving climate and environment objectives, CEP will focus on five broad topical objectives:

- Protecting ecosystems, biodiversity, and natural resources while supporting sustainable livelihoods
- Reforming food systems for triple wins of increased incomes, resilience, and sustainability
- Reducing the vulnerability of low-income populations to climate shocks
- Supporting the clean energy transition with cobenefits to the poor
- Advancing sustainable urbanization in low-income countries and neighborhoods.

Below, we outline each topic, explain the focus areas where IPA can make an impact, and provide examples of relevant research questions.



Objective 1: Protecting ecosystems, biodiversity and natural resources while supporting sustainable livelihoods

The alarming scale of ecosystem and biodiversity loss demands urgent action. The IPBES Global Assessment Report (2019) highlights that human activities have significantly altered most natural systems, with 25% of assessed animal and plant species—approximately 1 million—facing extinction due to agricultural expansion, overfishing, and land degradation. While global forest loss trends have slowed, tropical and subtropical regions continue to experience concerning declines. These ecosystems are vital for human well-being, particularly for low-income and vulnerable groups like indigenous communities, who rely on them for health, livelihoods, and cultural identity. For instance, land degradation has reduced productivity in 23% of the global terrestrial area. exacerbating poverty and inequality.

To address these challenges, CEP aims to identify impactful and cost-effective strategies for protecting, restoring, and managing ecosystems while supporting the livelihoods of vulnerable communities. This aligns with international frameworks such as the Kunming-Montreal Global Biodiversity Framework and initiatives like 30x30.

There are several policies that CEP is interested in studying under this objective. For example, in forestry

ecosystems, evidence suggests that interventions like ecotourism, community forest management, agroforestry, and Payment for Ecosystem Services (PES) have the biggest potential to reduce deforestation while improving livelihoods (Hajjar et al. 2021). PES has shown particular promise as it has been studied through rigorous evaluations (Box 1). Beyond forests, similar approaches can be applied to mangroves, grasslands, coastal areas, and aquatic ecosystems to protect biodiversity and natural resources, like water. through conservation efforts or more efficient use in agriculture and households. Other interventions may focus on wildlife conservation, such as marine pay-torelease programs or improving enforcement against poaching and trafficking. These strategies can also contribute to health outcomes and conflict prevention in resource-constrained areas.

Given the scale of this challenge, CEP will prioritize not only identifying the most impactful strategies but also understanding how to design these strategies better to improve their scalability and cost-effectiveness. This understanding includes actions to ensure the financial sustainability of these strategies, such as leveraging innovative financing mechanisms and regulatory frameworks to compensate for conservation. To guide this work, two overarching focus areas will be explored.





Focus area 1.1: Which are the most impactful and cost-effective interventions to protect ecosystems, biodiversity, and natural resources while supporting the communities that depend on them?

EXAMPLE RESEARCH QUESTIONS:

- How do different conservation strategies (e.g., PES, agroforestry, protected areas with ecotourism, community-based forest management, etc.) compare to each other in terms of conservation and welfare impacts? What is the most costeffective combination of restrictions, incentives, and non-financial support?
- How can contract design and targeting in PES be used to maximize both deforestation and welfare impacts? Are these strategies more efficient than separate cash transfers for deforestation and poverty reduction? Do different designs have different distributional impacts?
- How can the existing evidence from impact evaluations in the forest conservation sector be transferred to the conservation of other ecosystems, such as rivers, coastal areas, and marine ecosystems?
- What are the impacts of recognition and protection of indigenous land rights on sustainable land use and natural resource management?
- Can restoring previously degraded natural resources reduce or prevent conflicts in resource-stressed regions? Can different resourcesharing agreements between communities prevent conflict? What conditions are needed?
- What are the environmental impacts of poverty alleviation interventions (e.g., cash transfers, livelihoods programs, labor market programs, microfinance, insurance)? How can economic interventions be designed to ensure the environmental impact is not negative?

Focus area 1.2: How can we scale policies and finance to protect ecosystems, biodiversity, and resources?

- What contract characteristics and targeting can increase cost-effectiveness and scalability of PES?
- Which interventions could reduce the costs and improve scalability of ecosystem restoration?
- How can newer technologies, such as satellitebased remote sensing or LIDAR, reduce monitoring costs while maintaining or improving compliance?
- What innovative techniques and instruments can be used to measure important outcomes such as biodiversity or ecosystem services at scale? How can these be used for programmatic applications as well as research?
- Can high-quality evidence for the impact and additionality of programs funded by carbon markets induce more people to purchase offsets (and direct their purchases to sources demonstrating causal impact)?
- How do different benefit-sharing mechanisms in REDD+ and carbon credits programs affect local participation, forest conservation outcomes, and community welfare?







Objective 2: Reforming food systems for triple wins of increased incomes, resilience, and sustainability

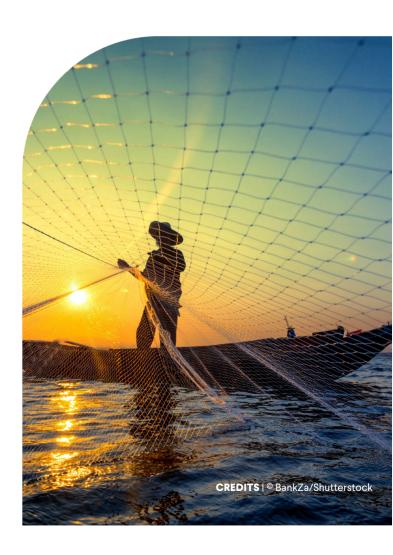
Agriculture is the primary source of income for most poor households in developing countries (World Bank, 2016) and is thus a major channel through which climate change impacts vulnerable populations. Studies suggest that, globally, climate change has slowed agricultural total factor productivity by 21% since 1961, with even larger effects in Africa and Latin America (Ortiz-Bobea et al., 2021). At the same time, agriculture is among the highest-emitting sectors in many developing countries and is one of the main drivers of deforestation and environmental degradation through frontier expansion (Climate Watch, 2024; Global Forest Review, 2024). Transformational changes in food systems are urgently needed to address poverty. food security, climate adaptation and mitigation, and environmental sustainability. This objective aligns with international frameworks such as FAO's Strategy on Climate Change 2022-2031 and target 10 of the Kunming-Montreal Global Biodiversity Framework.

Climate-smart agriculture (CSA) offers a critical approach to achieving triple wins: increasing productivity and incomes, enhancing resilience to climate shocks, and reducing greenhouse gas emissions and deforestation where possible. CSA encompasses a wide range of practices, technologies, and approaches tailored to local contexts, including agroforestry systems, crop diversification, improved seeds resistant to climate shocks, efficient irrigation systems, integrated soil fertility management, sustainable livestock practices, and precision agriculture techniques. It also incorporates risk management strategies like weather forecasting, crop insurance schemes, and farmer field schools. While most CSA research focuses on crops, these approaches can also be applied to livestock, fishing, and aquaculture.

Despite extensive research on CSA's short-term impacts on productivity and farm-level economic benefits—particularly in high-income countries—significant evidence gaps remain. For example, adoption rates for many CSA agricultural credit and insurance products remain low among small-scale farmers (J-PAL, 2024), although innovative approaches, such as coupling them with other CSA technologies, continue to be tested (Boucher et al. 2024; Casaburi and Willis, 2018). Similar adoption challenges persist

for other CSA practices (<u>Bridle</u>, et al 2019). There is also limited research on scaling CSA practices nationally or regionally while ensuring they remain locally grounded. Additionally, few studies measure environmental impacts or explore how to tailor CSA strategies for long-term environmental sustainability, climate resilience, and poverty alleviation.

To address these gaps, CEP will prioritize innovations that enhance adoption and scalability of CSA practices while measuring their long-term impacts on resilience, incomes, and sustainability. It will also advance research in underexplored subsectors such as livestock, fishing, and aquaculture.





Focus area 2.1: How can we support farmers and fishers to adopt technologies and practices at scale that would help them adapt to the impacts of climate change while increasing productivity and incomes?

EXAMPLE RESEARCH QUESTIONS:

- What are the productivity and welfare impacts of key CSA practices and technologies? How do short-term productivity impacts of different CSA strategies translate into long-term incomes and resilience?
- What cost-effective strategies can ensure high adoption of CSA practices and technologies among poor producers?
- Which combinations of CSA technologies or practices yield the greatest overall impacts, particularly for low-income producers?
- Does actively involving local communities in the decision of which CSA to implement and how to implement them in their locality improve the adoption and effectiveness of CSA? Can it support the effectiveness of programs that aim to scale CSA practices and technologies nationally?

Focus area 2.2: How can we reduce the environmental and climate impacts of the agriculture sector while protecting food security and livelihoods?

EXAMPLE RESEARCH QUESTIONS:

- What are the land use and environmental impacts of agriculture interventions aimed at increasing productivity and incomes? (e.g., subsidies, insurance) How do these in turn impact long-term productivity of the agriculture activity?
- What forest governance policies can be used to ensure that an increase in agriculture productivity (particularly livestock) does not lead to an increase in deforestation? (avoid the Jevons Paradox)
- What interventions can increase the sustainability of aquaculture businesses? What is the impact of aquaculture activity on the health of nearby fisheries and on fishers' profits?
- What strategies can help low-income producers benefit from environmental-friendly certifications that allow markets access (e.g., "deforestation-free", "sustainable fishing")?

Objective 3: Reducing the vulnerability of low-income populations to climate shocks (beyond food systems)

Low-income populations are highly vulnerable to climate hazards, including both slow-onset processes like long-term changes in temperature or precipitation, and rapid-onset extreme events such as hurricanes, droughts, heatwaves, and flooding, which in many cases are affected in frequency and intensity by climate change (IPCC, 2022). These impacts disproportionately affect poorer communities, as they have higher vulnerability and these impacts typically represent a higher share of their assets and resources (Hallegatte, et al., 2017, IPCC, 2022). Addressing these risks requires interventions that enhance resilience and adaptive capacity in infrastructure and social systems.

CEP will focus on identifying impactful measures to help vulnerable populations adapt to climate shocks and cope with natural hazards and climate change. For example, potential measures could include financial incentives to take up resilience measures, social protection programs, nature-based solutions (e.g., mangrove or forest conservation to safeguard from flooding or reduced productivity), or improved

climate information systems. They can also include more specific adaptations to these hazards, such as technology to withstand indoor or outdoor extreme heat, infrastructure modifications to withstand increased flooding or drought, or similar. Even though most adaptation finance currently comes from national, regional and local governments (Allan et al, 2019), suggesting the predominance of government action, it will also be important to find market-based approaches that can complement public investments to scale these solutions and finance, such as private-sector innovations in technology, financial services or resilient construction materials.

Building on the I<u>PCC's conceptualization of vulnerability</u>, CEP will aim to investigate strategies that reduce sensitivity—such as resilient infrastructure and diversification—and enhance adaptive capacity. Research will emphasize cost-effective approaches that improve long-term resilience while addressing the unique needs of low-income populations.



Focus area 3.1: What measures can be taken to reduce the impacts of climate change and natural hazards in infrastructure and social systems?

EXAMPLE RESEARCH QUESTIONS:

- How can forest, mangrove, and reef conservation and restoration be incentivized in connection with their resilient benefits? How can this encourage support and produce benefits to poor populations?
- How can infrastructure, technology, and regulation be used to protect outdoor workers from extreme heat? How can they be used to reduce risks from extreme heat indoors?
- What financial incentives and zoning regulations can be used to discourage low-income housing in areas exposed to natural hazards or using vulnerable construction materials and designs?
- How can financial products incentivize the adoption of diversified energy sources at the household or community level to enhance resilience during disasters?
- How can local and provincial governments be supported and incentivized to ensure infrastructure—particularly water, transport, and energy—is climate-resilient?

Focus area 3.2: What interventions can support vulnerable populations to adapt and cope with climate shocks and what design features can increase their effectiveness?

- What types and features of financial products and services can help vulnerable households build resilience and recover more quickly in the face of climate shocks?
- What is the relative effectiveness of cash transfers vs. in-kind assistance vs. financial products in helping households recover from climate shocks? Does effectiveness vary across the income spectrum?
- Are cash transfers and other types of assistance more impactful in helping households recover from climate shocks if they are transferred in anticipation of the shock rather than afterwards?
- What school and home-based interventions can protect cognitive and non-cognitive development in early childhood from the impacts of climate change and climate shocks (such as extreme heat)?
- What is the most effective way to communicate information from early warning systems to ensure household preparedness and recovery to climate shocks?
- What is the impact of climate resilience interventions on patterns of internal migration and displacement in vulnerable communities?







Objective 4: Supporting the clean energy transition with co-benefits to the poor

Transitioning to cleaner and more sustainable economies is essential for achieving sustainable development and keeping global temperature rise below international targets. Reports like the IPCC Sixth Assessment and the World Bank Climate Change Action Plan emphasize that mitigation efforts must align with development pathways and prioritize a just transition. These transitions offer significant co-benefits, such as improved health, education, and economic opportunities, but targeted strategies are needed to ensure low-income populations benefit and to achieve widespread adoption of these technologies and practices. In this sense, CEP will support research that not only increases the adoption of cleaner technologies and more sustainable practices, but that also benefits, supports, and protects low-income populations in the process.

The energy sector is an essential area to achieve these transitions. For example, interventions can support the adoption of renewable energy technologies in underserved areas, aiming to reduce energy poverty while supporting broader development goals. While many of these clean technologies have been thoroughly tested in labs or high-income contexts, experimental research is needed on ways to increase take up in low-income contexts and can help better understand the development, climate, and environmental benefits. For example, experimental

research has shown that adoption of off-grid solar lighting and improved cookstoves is sensitive to pricing but can increase when health benefits are emphasized, or when users can test them. Transportation is another critical area where clean and efficient energy transitions can yield co-benefits. For instance, encouraging mass transit, electromobility, or the replacement of old polluting vehicles reduces emissions while improving accessibility and productivity. Scaling these solutions will require experimenting on combinations of incentives, investments in infrastructure, and communication strategies.

Additionally, these transitions will require aligning incentives to encourage cleaner activities while discouraging unsustainable ones. As countries phase out subsidies or levy taxes for high-carbon goods like gasoline or unsustainable agricultural practices, there is a risk of negative impacts on low-income populations if adequate compensation mechanisms are not in place. Experience has shown that poorly designed reforms can lead to social resistance and political challenges. In this sense, CEP also aims to advance rigorous research to reduce these economic shocks and enable a successful transition through effective compensation policies and communication strategies.



Focus area 4.1: Which are the best strategies to increase the adoption of clean energy and technologies with co-benefits?

EXAMPLE RESEARCH QUESTIONS:

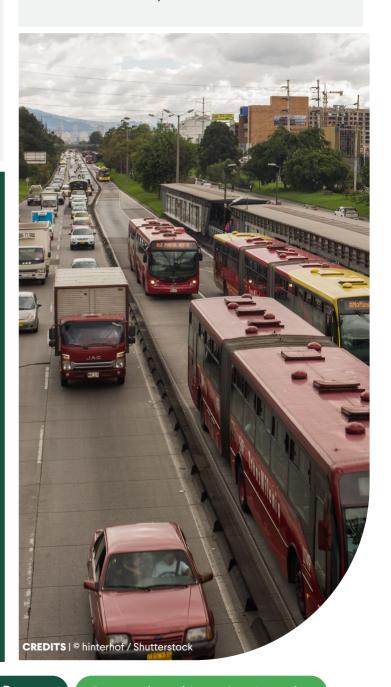
- How can we ensure high adoption of clean energy technologies in low-income settings?
- What mechanisms can be put in place to support maintenance and sustained use of these technologies once they are installed?
- How do various community engagement approaches affect the uptake and proper use of clean cooking solutions?
- What is the impact of electrification through mini grids on local business development, education outcomes, and health in rural areas?
- What mechanisms can be implemented to encourage the replacement of old, inefficient and polluting vehicles in favor of more efficient alternatives?

Box 2: CEP intersection with other IPA sectoral programs

While this agenda focuses on CEP's objectives and focus areas, other IPA sectoral programs also have relevant research and learning priorities for the climate and environment sector. These priorities have not been covered in detail in this document. For instance, IPA's Entrepreneurship and Private Sector Development Program supports research examining innovative policies to assist firms in adapting to climate change and enabling them to be drivers of green growth and innovation. IPA's Financial Inclusion Program supports research examining how financial instruments can be harnessed to help build resilience to climate change. Similarly, IPA's Social Protection Program supports research evaluating programs that help vulnerable populations withstand and recover from shocks, including climate-related, as well as create economic opportunities to help build resilience. IPA's Peace and Recovery Program supports research at the nexus of climate-conflict, such as preventing conflict in resources-constrained environments. Within the program, the Displaced Livelihoods Initiative funds innovative research that informs strategies that help internally displaced persons and refugees, including climate migrants, achieve self-reliance.

Focus area 4.2: How can low-income countries protect poor populations while discouraging environmentally harmful and emission-intensive practices?

- How can we protect vulnerable groups during fuel or agriculture subsidy reforms using different compensation mechanisms? What is the effect of complementing these with communication campaigns?
- How can equitable carbon trading schemes support energy transitions while supporting economic development?





Objective 5: Advancing sustainable urbanization in lowincome countries and neighborhoods

Urban systems play a critical role in climate mitigation and sustainable development, as highlighted in the IPCC's chapter on cities and settlements. With the majority of the global population now living in cities, urbanization presents both opportunities and risks. Cities can adopt efficient, low-carbon systems that improve air quality, public health, and productivity, or risk being locked into unsustainable, high-carbon pathways. Sustainable urbanization offers co-benefits like reduced pollution, better resource management, and enhanced well-being. However, sometimes these benefits do not reach low-income neighborhoods.

The IPCC identifies three key strategies for reducing emissions in cities: (i) promoting compact, walkable urban areas through spatial planning and sustainable infrastructure; (ii) decarbonizing urban energy

Focus area 5.1: How can cities encourage a sustainable transformation as they grow and how can they ensure low-income residents receive the benefits?

EXAMPLE RESEARCH QUESTIONS:

- How can cities incentivize the building of green infrastructure? What are the socio-economic and resilience impacts on their residents? (for example, lower heat stress from trees)
- How do green infrastructure investments (e.g., urban forests) affect housing affordability and displacement risks in low-income neighborhoods, and what policy safeguards can be taken?
- What behavioral, informational, technological, and financial strategies can be used to reduce unnecessary energy and water consumption in resource-constrained cities? How do social norms and interactions between neighbors affect adoption in low-income settings?
- What is the impact of improving last-mile connectivity on the use of mass transit systems in rapidly growing cities? How can this improve connectivity of low-income neighborhoods and what are the productivity gains?

systems with net-zero-emissions technologies; and (iii) enhancing carbon sequestration with green infrastructure like urban forests. Beyond emissions reductions, cities can address waste management, air and water pollution, and inefficient energy use—issues that disproportionately affect low-income neighborhoods. These solutions can improve health outcomes while fostering social equity.

While some aspects of energy, transport, and resilience are covered under other objectives in this R&L agenda, this CEP objective aims to achieve a better understanding of approaches based on urban transformations that benefit vulnerable populations. Research is needed to evaluate the speed of uptake for sustainable urban strategies, their mitigation impacts, and co-benefits to guide resource allocation. This includes data systems to monitor progress effectively.

Focus area 5.2: How can cities develop better systems that reduce waste, air and water pollution in underserved areas?

- What are the impacts of different waste management approaches (e.g., communitylevel initiatives) on reducing local-level pollution and improving health outcomes for poor communities?
- How do monitoring and enforcement systems complement improved services to ensure the cleanness of low-income neighborhoods? How does real-time air/water quality monitoring with community reporting mechanisms affect policy responsiveness and pollution reduction in highexposure zones?
- What kind of financial incentives could support the development of cleaner waste management systems in urban areas?
- Do pollution mitigation subsidies for small businesses (e.g., grants for cleaner cookstoves or waste-processing microenterprises) reduce localized air/water contamination more effectively than punitive regulations in lowincome areas?



Partner with IPA

Partnership is at the heart of our work. IPA builds partnerships with governments, nonprofits, academic institutions, foundations, and companies—ranging from large multilateral organizations to small local associations. What unites these partners is a shared commitment to using evidence to reduce global poverty and improve climate and environmental outcomes. We believe the most effective solutions are locally-grounded, which is why we have established a strong, locally-led presence in 17 countries and continue to invest in building partnerships with organizations based in the places where we work.

If you are a <u>practitioner</u>, <u>policymaker</u>, <u>researcher</u>, <u>donor</u> or other actor interested in achieving climate and environmental objectives while improving the lives of people living in poverty, we want to work with you.

If you are interested in collaborating with us, please reach out to cep@poverty-action.org or contact one of our country offices that is most relevant for your work.

