

STRATEGIC GROUP 1: REDUCING CLIMATE AND ENVIRONMENTAL RISKS

Results case report 3: Advancing regionally aligned national air quality strategies in the Indo-Gangetic Plain and Himalayan Foothills

The challenge: Across the Indo-Gangetic Plain and Himalayan Foothills (IGP-HF), persistent atmospheric pollution has evolved into a systemic crisis, undermining the environment, economy, and the health of millions. This challenge is driven by a complex interplay of diverse emission sources, unique topographical constraints, and specific meteorological conditions, along with the ‘mountain-barrier’ effect of the Himalayas, triggering recurrent high-pollution events. In these instances, particulate matter concentrations are often found to be far above the World Health Organization’s daily standards. While localized stop-gap measures offer promise, they remain too fragmented to address the systemic scale of the air quality crisis in the IGP-HF. This struggle is rooted in a persistent ‘science-to-policy’ gap, where the historical absence of long-term national strategies and a unifying regional vision prevents countries from mobilizing and aligning essential policies and investments. Furthermore, existing policies often ignore the transboundary dynamics of shared airsheds, leading to uncoordinated actions that fail to account for the regional movement of pollutants. Consequently, with efforts scattered across various agencies and a lack of centralized ownership, inadequate institutional capacities, and governance deficits continue to hinder the channeling of the large-scale investment required for effective, integrated action.

ICIMOD contribution: To address this gap, ICIMOD has pioneered a long-term engagement model with its RMCs to ensure technical support is deeply integrated with national priorities. Supported by local implementing partners, this model ensures that ICIMOD’s regional expertise translates into tangible, sustainable action at the national level. By aligning regional expertise with local ownership, ICIMOD has accelerated progress through three strategic pathways:

Robust national strategy with regional alignment: Responding to member requests, ICIMOD advanced national clean air strategies in Bangladesh, Bhutan, Nepal, and Pakistan. This integrated pathway aligns national priorities with regional airshed dynamics, addressing air pollutants and short-lived climate pollutants (SLCPs) in an integrated manner. These frameworks enhance policy coherence, resource efficiency, and coordinated investment.

Science-Policy-Finance Dialogues: ICIMOD convened high-level officials from Bangladesh, Bhutan, India, Nepal, and Pakistan. These dialogues transformed air quality knowledge and management

practice into a shared regional investment priority, facilitating critical knowledge exchange and coordinated action across borders.

Sectoral action: Beyond theory, ICIMOD provides direct [technical support in key sectors](#), including brick kilns, residential heating, bioenergy, and monitoring infrastructure. This hands-on collaboration has built deep institutional trust and paved the way for more ambitious national policies.

Capacity strengthening: By training government officials, technical staff, and early-career researchers, ICIMOD has conducted skills transfer. This investment in human capital empowers stakeholders to manage complex air quality data and implement evidence-based strategies independently.

Developmental partnerships: To address the regional nature of pollution, ICIMOD partnered with the World Bank to enable transboundary dialogue. This collaboration has enhanced policy literacy and built confidence necessary for collective mitigation across the HKH.

Private sector partnership: Through strategic private-sector partnerships, ICIMOD has catalyzed technical advancements in brick manufacturing, biomass, and residential heating. This engagement platform empowers private enterprises to align their innovations with national air quality goals, strengthening their advisory role and collaboration with government stakeholders.

The result: Nepal and Bhutan have made significant efforts in investing national resources for developing their [National Air Quality Management Action Plan](#) and National Clean Air Action Plan, respectively. These processes are structured around key pillars, including comprehensive emission [inventory development](#), source apportionment and source-receptor modelling, policy gap analysis, innovative financing roadmaps (such as green bonds and green budget tagging), monitoring and evaluation systems, and real-time progress dashboards. Integration of GESI and communication components further strengthens national ownership and implementation of readiness. Consultations successfully clarified implementation pathways and fostered joint ownership across ministries and departments. ICIMOD, with partners such as The Energy and Resources Institute (TERI), India, (formalized) and IIT Kanpur, India, (in progress), is supporting both governments in developing implementable national action plans. In Bhutan, air quality and climate planning are being strategically aligned through integrated SLCP and air quality actions. Bangladesh and Pakistan have also recognized the value of policy gap analysis and innovative financing mechanisms. Collectively, these outcomes demonstrate a change from fragmented responses to a regionally informed, nationally owned pathway for air quality management in the IGP-HF.

Cross-cutting issues

Gender

Gender marker: Gender-Aware

Explanation for gender marker: These regionally aligned national action plans have been conceived with the idea to well integrate GESI and appropriate communication priorities into the framing. For example, during the inception workshops for both these action plans, integration of GESI and Communication priorities were presented to the respective governments. Although continued efforts will be required for these priorities to bear fruit.

Climate change mitigation

Climate change mitigation: High integration

Explanation for climate change mitigation: Air quality management directly supports climate mitigation by targeting SLCPs like black carbon and methane. Unlike CO₂, these pollutants have intense, immediate warming effects; reducing them provides a ‘double win’ by simultaneously slowing global temperature rise and improving public health through cleaner, breathable air. ICIMOD’s approach in Bhutan serves as a successful case model by aligning air quality management directly with national carbon-neutrality

Climate change adaptation

Climate change adaptation: Low integration

Explanation for climate change adaptation: linked through biodiversity protection

Biodiversity

Biodiversity: Medium integration

Explanation for biodiversity: Air quality management protects biodiversity by curbing nitrogen and Sulphur deposition, preventing soil acidification and ecosystem collapse. Reducing ground-level ozone and crop residue burning safeguards plant health, soil microorganisms, and habitats for pollinators. This integrated approach ensures resilient forests and agricultural landscapes while protecting endangered species from toxic haze.

Identifiers

Reported intervention: AAB-2: Climate change and air quality

Other contributing ICIMOD interventions:

Contributing external partners: World Bank

Projects/funding sources: CARA-HIREAP/FCDO

Geographic scope: Regional

Country(s): Bangladesh; Bhutan; Nepal

Linkage to results dashboard

Focus of change: Change in policies for creating an enabling environment for investment

MTAP specific outcome: Accelerated investment in key polluting and greenhouse gas (GHG)-producing sectors in the region based on high-quality evidence and updated knowledge

2026 target outcome: At least four government institutions and two private sector organizations from targeted RMCs (Bhutan, Bangladesh, India, Nepal, and Pakistan) allocate budget resources and invest in scaling up low GHG, clean, energy efficient, and gender responsive solutions

Main pathway: Institutional capability

Primary LTIA: 3-Air quality

Primary HLO: 1-Policy, practice and investment

Primary SDG: SDG 13 (climate action)

Other SDG or global targets: SDG 3 (good health and well-being), 11(sustainable cities and communities), 8(decent work and economic growth), 17 (partnership for the goals)

Acknowledgements

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Reference for evidence

Ref	Title	Ref Date	Author	What the evidence indicates (Reference: Page No.)	Evidence	Access
1	Framework for Sustainable Biomass Energy Roadmap Development	Nov 2025	ICIMOD	Outlines a framework for developing national biomass energy roadmaps that promote cleaner energy solutions and reduce emissions from residential heating and biomass use, supporting sectoral actions contributing to national air quality strategies (Pg 1)	Cleaner Biomass Roadmap	Private
2	Executive summary on roadmap for biochar	Dec 2025	ICIMOD	Summarizes feasibility findings and policy considerations for biochar-based carbon removal and	Biochar Policy Summary	Private

	carbon removal in Nepal: Cross-learning from feasibility assessment in India and Nepal			biomass management, informing national policy discussions and strategies to reduce emissions and support climate-friendly air quality interventions (Pg 2)		
3	Status of Air Quality in Bhutan: A Fact Sheet	Dec 2025	ICIMOD	Provides evidence on Bhutan's air quality status, pollution sources, and trends, supporting policy dialogue and informing the development of the National Clean Air Action Plan and broader air quality management strategies. (Pg 2)	Bhutan Air Report	Private

Photos

Title	Date	Photo credit	Photo link
Kathmandu's skies after intense forest fires around the valley. Like many IGP-HF cities, rapid growth has worsened air quality from transport, homes, and fires -underscoring why Nepal's NAQMAP is critical to drive coordinated, long-term clean-air action.		Jitendra Bajracharya	Photos

Other Communication materials

Title	Type	Date	Link
Third Hindu Kush-Himalaya Science-Policy-Finance Dialogue	News Article	2025-11-26	Third HKH SPFD
Nepal begins work on first National Air Quality Management Action Plan	News Article	2025-09-04	Media Coverage
First-ever National Clean Air Action Plan underway in the country	News Article	2025-09-16	Media Coverage