

## Mapping emission inventories in Nepal, Bhutan, India, and Bangladesh

### 1. Background

Air pollution is a global problem significantly affecting the Hindu Kush Himalaya (HKH) region both in dense urban areas and rural territories. In India, one of the most polluted countries in the world, more than 80% of the population is exposed to a concentration of  $PM_{2.5}$  exceeding the National Air Quality Standard of  $40 \mu\text{g}\cdot\text{m}^{-3}$  annually, which surpasses the WHO recommendation of  $5 \mu\text{g}\cdot\text{m}^{-3}$ . The Indo-Gangetic Plains (IGP) and the Himalayan Foothills region stand out as the area with the highest population-weighted  $PM_{2.5}$  levels ( $>100 \mu\text{g}\cdot\text{m}^{-3}$ ).

An emissions inventory is crucial, forming one of the three fundamental pillars – emissions, observations, modelling – necessary for effective air quality management strategies. Without an emissions inventory, it becomes challenging to identify the main sources of pollution or areas of priority investment. Only a few countries in the HKH have developed emission inventories. For instance, Nepal has developed a version but it is currently out of date.

### 2. Objectives

The objective of this consultancy is to gather up-to-date information on the state of emission inventories in ICIMOD's four regional member countries: Nepal, Bhutan, India and Bangladesh. Additionally, it seeks to develop an analytical model to understand the dynamic relationship between emissions and energy, particularly for the residential sector. By changing the activity level (energy consumption for example) we can modify the emissions and then with a chemistry transport model we can evaluate the impact of this change on concentrations. This information can be used to demonstrate the policy responses required and how to address pollutant emissions.

### 3. Scope of the work

This project aims to gather up-to-date information on the state of development of emission inventories in four HKH countries – Bangladesh, Bhutan, Nepal and India with a focus on IGP. The review will identify country-specific data on activity data used (fuel consumption, number of vehicles, technologies applied, industrial processes, solvents used, quantity and type of biomass burned) and main sources of air pollution. This will enable targeting the main emission sectors for future policies and improving or creating emission inventories based on available data and additional required data.

As residential energy use is a well-known source of air pollution and contributes to health issues, special emphasis will be put on this sector. Thus, the Consultant should provide a spreadsheet to calculate emissions in the residential sector, categorised by fuel and installation type. Ideally, this calculation will be based on the activities and emission factors collected during the

inventory review and is specific to the HKH countries. Nevertheless, if this data is unavailable, default data will be used and extrapolated to the HKH region using proxies such as population.

#### 4. Work plan

The Consultant must describe in their proposal a framework with milestones and comprehensive deliverables for the following outputs:

- **Review of scientific literature on national emissions inventories**, whether spatial or not, available in the four HKH countries: Nepal, Bhutan, India, Bangladesh (e.g. collection of Emission Factors Mapping of the main sources of emission at national scales)
- **Bibliographical review of existing inventories** to avoid redoing already accepted scientific outcomes by the scientific community
- **Interviews with the regional organisations operating in the region:** CCAC – focus on the SLCs emission inventories; UNEP – focus on the 25 Steps to Clean Air in Asia and the Pacific; check the latest version of EDGAR released in Q2 2024; and creation of a multi-criteria grid summarising the level of maturity on the capacity to estimate emissions in the four countries
- **Develop an emission inventory methodology for Nepal** for the residential sub-sector which is the likely largest emitter in Nepal

For the second output, ICIMOD will support the Consultant in finding the best interlocutors in the regional organisations.

#### 5. Detailed tasks and deliverables

This project will be divided into two main tasks to be conducted simultaneously.

##### **Task I: Review of scientific literature addressing relevant emission inventories in the four countries of the HKH**

This task will rely on desk review and interviews as follows:

- Review of scientific literature on national emissions inventories, whether spatialised or not, available in the HKH: Nepal, Bhutan, India, Bangladesh
- Review of air pollutant inventories developed by the governments of the four HKH countries. It is important to note that air pollutant emission inventories are not always readily accessible online and support from local authorities is often required to obtain methodological guides and emissions database.
- Analysis of existing GHGs emission inventories
- Analysis of the international global emission inventory (EDGAR), last available version

The interviews will focus on available data and the main emitting sectors. For the governmental agency, additional questions on governance, organisation, methodology for emissions inventory construction and challenges faced must be raised.

Planned interviews:

- Interview with representatives of the authorities in charge of the emissions inventory in the four HKH countries
- Interviews with international organisations

## **Task II: Creation of a dynamic calculation tool to determine emissions based on fuel and technology for the residential sector**

Task II is based on several steps and depends heavily on Task I and the data available:

- Meeting with ICIMOD to refine requirements for this tool
- Identification of the emission sources in the residential sector: activities (heating/cooking/ electricity generation), fuel types (wood, coal, LPG), and appliance types
- Collection of regional emission factors
- Design of a user-friendly spreadsheet with easily modifiable input data and formulas to calculate emissions of air pollutants and GHGs. This spreadsheet should contain QA/QC procedures to minimise errors. A result visualisation through chart and graph to be provided in the spreadsheet.
- Test between the Consultant and ICIMOD to guarantee reliability of the results, efficiency of the tool and its simplicity of use
- A user guide to be provided to ICIMOD to detail the required input data and explain the emission estimation methodology
  - a. Detailed interview notes from regional organisations
  - b. Literature review report
  - c. Emission inventory report

## **6. Team**

The proposed resources must be part of the project team for the time period specified. Additional resources must be included in the technical proposal with roles, responsibilities, and expertise.

<b>Responsibilities</b>	<b>Role and expertise in the project</b>
<b>Project Director</b>	Team leader
<b>Expert in air pollution and industry</b>	Project coordinator
<b>Project Engineer</b>	Technical coordinator
<b>Energy Project Engineer</b>	Expert in residential sector

## **7. Timelines and deliverables (outputs)**

The contract period is for one year from the date of signing.

Deliverable	Deadline	Payments
Detailed interview notes from regional organisations	15 August 2024	20%
Literature review report	15 November 2024	50%
Emission inventory report	31 December 2024	30%

## 8. Proposal

### Technical proposal

The bidder must submit the technical proposal, including but not strictly limited to the following items:

1. **Technical approach and methodology:** The bidder should explain their understanding of the objectives of the assignment, approach to the services, and detailed methodology to obtain the output.
2. **Work plan:** The bidder should propose the main activities of the proposal, content and duration, milestones, detailed log frame, detailed consultative measures, adoptive measures, baseline indicators, impact indicators measures, targets, and delivery date to achieve the project output. The proposed work plan should be consistent with the technical approach and methodology. The bidder must propose a management and operation plan. The bidder must also include the project management approach including quality management and headquarter dedicated team.
3. **Organisation and experts:** The bidder should propose the structure and composition of their team, mentioning their qualifications, roles, responsibilities, skills, and expertise as requested in Section 6. The bidder should list the main discipline of the assignment, key expert responsible, and the proposed technical and support staff. Submitted staff CVs should not exceed three pages each.
4. **Relevant past experience:** The bidder must include the details of similar projects and similar past experience of their organisation and experts in the last five years relevant to this RFP.
5. A Consortium is allowed for this RFP. The bidder should be either a company (single legal entity) or a consortium of companies. In the case of a consortium, the bidder consortium shall submit a valid agreement among the members.

### Financial proposal

The bidder should provide the financial quote with the breakdown of all the costs and include the tax in the budget (refer to the table provided below):

- Breakdown of the experts needed, number of days required, quantity, rate
- Breakdown of other costs, unit, quantity, rate

## **9. Reporting**

Monthly reporting to ICIMOD for progress updates is required, with the report format subject to ICIMOD's approval.

## **10. Proposal submission**

The completed proposal should be submitted through email to [consultancy.int@icimod.org](mailto:consultancy.int@icimod.org) by **5 PM (Nepal Standard Time), 10 May 2024**. Two separate files – technical and financial proposals – should be submitted.

## **11. Evaluation**

The service provider will be selected on the basis of the highest-ranked technical proposal (60% weightage) and the lowest-cost financial proposal (40% weightage).

The service provider will be selected on the basis of the highest cumulative scores obtained in the technical and financial proposals using the following formula:

- Technical score = Score obtained based on technical proposal (total 100)
- Financial score = Score obtained based on financial proposal (total 100)
- Total score = 60% of technical proposal + 40% of financial proposal

The service provider scoring the maximum score based on the criteria will be awarded. However, the service provider should score at least 70 points in the technical proposal.

## **12. Ethical consideration**

The Consultant will be required to take all the necessary actions to handle the collected data responsibly (see ICIMOD Responsible Data Policy) to ensure data privacy, anonymity, and confidentiality.

## **13. Our commitment to the prevention of sexual harassment**

ICIMOD is committed to the prevention and redressal of sexual harassment at the workplace and promoting the welfare of children, young people and adults and expects all staff, consultants, and volunteers to share this commitment. We will do everything possible to ensure that only those who are suitable to work within our values are selected to work for us.

## **14. Confidentiality/non-disclosure**

All material issued in connection with this ToR shall remain the property of ICIMOD and shall be used only for the purpose of this procurement exercise. All information provided shall be either returned to ICIMOD or securely destroyed by unsuccessful applicants at the conclusion of the procurement exercise.

During the performance of the assignment or at any time after expiry or termination of the Agreement, the consultant shall not disclose to any person or otherwise make use of any confidential information which s/he has obtained or may obtain during this agreement relating to the partner organisation/ICIMOD, the respondents or otherwise.

The consultant will be required to sign a non-disclosure / confidentiality agreement as part of their undertaking of this work.

### **15. Intellectual property, copyright, and ownership of all prepared information**

The consultant shall retain all rights to pre-existing (background) intellectual property or materials used by the consultant in the delivery of this study. All arising intellectual property, ideas, materials, or processes formed in contemplation, the course of, or as a result of this study shall be passed to ICIMOD without restriction.

The consultant shall warrant that all arising intellectual property, materials and/or products produced in pursuit of this study shall be original and shall not infringe on any third party's claim. All technical or business information, in whatever medium or format, originated, collated, or prepared by or for the consultant in contemplation, course of, or as result of this assignment shall be transferred to ICIMOD without restriction on completion and shall not be used by the consultant for any other purpose without express written permission of ICIMOD.

Copyright of all arising documents, data, information, or reports produced by the consultant under this agreement shall belong to ICIMOD and will be passed to ICIMOD without restriction. Such documents, data, information, and reports shall not be used by the consultant for any other purpose other than in conjunction with this assignment, without the express written permission of ICIMOD's Head of Programme Funding.