ICIMOD

Short-term Consultancy: Upgrading ICIMOD's existing Air Quality Dashboard

Action Area: Air
Strategic Group: Climate and Environmental Risks

ToR

About ICIMOD

The Hindu Kush Himalaya (HKH) region stretches 3,500km across Asia, spanning eight countries – Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan. Encompassing high-altitude mountain ranges, mid-hills, and plains, the zone is vital for the food, water, and energy security of up to two billion people and is a habitat for countless irreplaceable species. It is also acutely fragile and vulnerable to the impacts of the triple planetary crisis of climate change, pollution, and biodiversity loss.

The International Centre for Integrated Mountain Development (ICIMOD), based in Kathmandu, Nepal, is an international knowledge organisation focused on the HKH region, working since 1983 to deliver greener, more inclusive, and climate-resilient development. Our work is guided by our [Strategy 2030](#), [Medium-Term Action Plan V (2023–2026)](#) and the associated Results Framework, and our various [policies](#). Learn more on our [website](#).

Background

ICIMOD's Action Area on Air has been developing and deploying air quality dashboards across the HKH region, included customised dashboards for government partners in its Regional Member Countries (RMCs). These dashboards serve as a comprehensive and interactive tool that integrate data from multiple sources and provide analytical and visualisation features to support air quality monitoring assessment.

Though these dashboards have proven to be effective, the current version of the ICIMOD [air quality dashboard](#) has several limitations, particularly regarding usability across different devices, overall user-friendliness, the availability of advanced analytics, and its capacity to provide the level of insight required by policymakers.

To address these limitations, ICIMOD has initiated the development of an upgraded air quality dashboard, which aims to offer a more user-friendly, responsive, and accessible interface, ensuring compatibility across all screen sizes and devices. The new version of air quality dashboard will focus on improving user experience (UX), simplifying analytical workflows, and enhancing visual clarity while maintaining the scientific integrity and analytical depth of the existing tools.

Consultancy overview

This consultancy will support ICIMOD in redesigning and upgrading its existing air quality dashboard into an advanced, integrated, and user-friendly analytical platform that enables seamless visualisation, comparison, and automated reporting of air quality data across the HKH region. The assignment will involve assessing the current air quality dashboard system and data workflows; designing a scalable and secure system architecture; and developing and integrating multi-source datasets, including in-situ monitoring, satellite-derived estimates, and model outputs. The consultancy will establish

a standardised framework for satellite–ground data comparison through statistical and visual analytical tools, enhance data analytics, and visualisation functionalities for generating publication-ready outputs, and implement automated reporting systems for monthly, seasonal, and annual air quality assessments. The upgraded system will be tested, deployed, and optimised for performance across devices, followed by comprehensive technical documentation, user training, and final handover, ensuring long-term sustainability, usability, and impact for researchers and other stakeholders.

Aim and specific objectives

The purpose of this consultancy is to redesign and upgrade the existing dashboard into an integrated, advanced data-driven analytical platform that enables seamless visualisation, comparison, and automated reporting of air quality information along with the following objectives:

- **Integrating multi-source historical data**: enabling the ability to ingest, store, and display long-term historical datasets from in-situ monitoring stations alongside satellite-derived PM2.5 estimates (e.g., derived from Aerosol Optical Depth), enabling systematic comparison between ground-based observations and satellite products.

- **Standardising satellite and ground data comparison framework**: developing a structured analytical module to support consistent comparison between satellite-derived PM concentrations and in-situ monitoring data, including temporal alignment, statistical evaluation, and enhanced visualisation outputs for validation and interpretation through regression and correlation analysis.

- **Enhancing data analytics and visualisation features**: improving data analytics features and visualisation functionalities to generate clear, publication-ready graphics, including daily, monthly, annual comparative trends, seasonal variability plots, monthly and annual summaries, and multi-year comparative analyses (for e.g. seasonal or event-based comparisons over a period of 5 years).

- **Automating data structure for reporting**: designing a standardised data architecture and reporting framework that allows automatic generation of monthly, seasonal and annual air quality status reports for key pollutants through pre-configured templates and dynamic data linking. These reports should be downloadable in a PDF and PNG formats.

- **Incorporating smart alerts and user engagement features:** integrating automated pop-up and notification functionalities to
(i) trigger alerts when pollutant concentrations exceed national ambient air quality standards or limits set by the World Health Organization (WHO)

(ii) display dynamic health-risk or advisory messages
(iii) include dashboard analytics such as visitor/access counters and geographic user interaction metrics to track platform reach and engagement.

Scope of work

To achieve the objectives, the consultancy will undertake the following key activities in close coordination with ICIMOD:

Task 1: Assessment and system design

- Assess the existing air quality dashboard, including architecture, performance, database structure, UI/UX, and device compatibility.
- Evaluate existing data sources (in-situ, remote sensing satellite, and model-based) and review existing data processing and management workflows. Conduct consultations with ICIMOD's technical teams to identify usability challenges and desired functionalities. Follow software requirement specifications provided by ICIMOD.
- Develop a system architecture that supports modular integration, scalability, and security.
- Define data flow, database schema, and backend framework. Develop a detailed implementation roadmap with clear methodologies, deliverables, and timelines. Submit an inception report outlining implementation strategy.

Task 2: Development, integration, and testing

- Implement the approved design using appropriate technologies. Integrate various datasets including in-situ measurements, model-based outputs, and satellite observations. Incorporate satellite-ground data validation and correlation analysis, where the system evaluates the consistency between satellite observations and in-situ measurements. If strong agreement or correlation is observed, present validated comparison results; otherwise, include appropriate disclaimers highlighting uncertainties, limitations, and possible reasons for discrepancies.
- Develop interactive visualisation modules such as pollutant comparison tools, time-series trend charts, automated report generation tool and geospatial maps ensuring self-explanatory detailed analysis of datasets for researchers, policy makers and public. Ensure smooth performance and optimised data loading across all devices and browsers.
- Introduce analytical tools for comparing air quality parameters across pollutants, regions, and time periods. Integrate functionalities that allow for downloading and exporting of data.
- Conduct rigorous system testing with ICIMOD's team and incorporate feedback. Validate system performance and data accuracy against defined benchmarks, and

finalise a beta version of the upgraded air quality dashboard for review prior to full deployment.

Task 3: Deployment, documentation and handover

- Deploy the upgraded air quality dashboard on ICIMOD's host network. Configure system security settings, data pipelines, and automated update mechanisms. Conduct final performance testing post-deployment and confirm system stability.
- Prepare detailed technical documentation including system architecture, data management workflows, and configuration guides. Develop Standard Operating Procedures (SOPs) for upgraded air quality dashboard management, maintenance, and troubleshooting. Prepare a user manual and conduct user training sessions and/or workshops for ICIMOD staff and partner institutions on air quality dashboard operation and updates.
- Finalise the system based on ICIMOD's feedback and approval. Provide post-deployment technical support for a defined period to ensure smooth operation and issue resolution. Submit a final handover report summarising activities, key outcomes, and recommendations for future enhancement.

Deliverables

The consultant will accomplish the following deliverables:

Deliverables	Description	Timeline (2026)
System assessment and requirement analysis report	- Review the existing air quality dashboard to assess its architecture, functionality, and device responsiveness. - Identify system limitations, usability challenges, and data integration gaps. - Summarise functional and non-functional requirements for the upgraded air quality dashboard.	20 April
Inception report and implementation	Prepare a comprehensive inception report summarising the understanding of tasks, detailed work methodology, implementation schedule, and key milestones for upgraded air quality dashboard development and deployment.	30 April

Beta version of upgraded air quality dashboard along with a technical document detailing its system architecture, data processing, and functionalities	• Develop and deploy a beta version of the upgraded air quality dashboard integrating datasets from in-situ monitoring stations, model simulations, and satellite sources. • Implement key functionalities such as interactive visualisation, pollutant comparisons, report generation, and data download options. • Ensure responsive design across desktop, tablet, and mobile devices. • Conduct comprehensive testing (unit, integration, cross-browser, and performance) to ensure stability and accuracy.	10 May
Deployment and configuration report, , and SOPs	• Deploy final version of the upgraded air quality dashboard on ICIMOD's designated server. Configure hosting infrastructure, security settings, and data backup processes. • Validate deployment success and system readiness for end-users. Prepare detailed documentation covering system architecture, database schema, source code structure, and maintenance procedures. • Develop SOPs for dashboard management, data integration, updates, and user support.	15 May
Final handover of upgraded air quality dashboard and project completion report.	• Submit a final report summarising all tasks, outcomes, challenges, and recommendations for future enhancements.	20 May

	• Provide post-deployment technical support for a defined period and complete formal handover of source code, documentation, and credentials.	

Reporting and supervising

The consultant will work closely with ICIMOD's Action Area Air Lead and Intervention Manager–Air Quality Monitoring. All deliverables will be reviewed and approved by the project team before finalisation.

Qualifications and experience

The proposed team should comprise the following key experts with relevant qualifications and experience.

1. Lead Web Developer

- Master's or equivalent in Computer Science, Geoinformatics, Environmental Science, Data Science, or relevant field.
- A minimum of 5 years of professional experience in software system design, Geospatial Information Systems (GIS) platforms and dashboard development.
- Proven experience in leading multidisciplinary technical teams or managing relevant projects.
- Demonstrated institutional experience in developing or upgrading dashboards, web portals, or data visualisation platforms for scientific or environmental applications.
- Strong expertise in both frontend and backend development, with proven programming experience in languages such as Python or Fortran, including scripting in Unix/Linux environments for data handling and processing workflows.

2. GIS Analyst

- Master's degree or equivalent in Computer Science, GIS, Geomatics, or relevant field.

- A minimum of 3 years of experience in developing geospatial web applications or dashboards. Experience in developing analytical modules for environmental datasets, including time-series analysis, regression, correlation analysis, and statistical validation of model or satellite data against in-situ observations. Familiarity with API-based data integration and handling geospatial datasets from multiple sources.

Technical evaluation criteria

The technical proposal will be evaluated on a **100-point scale**. A minimum score of **60%** is required to qualify for financial evaluation.

Criteria	Max score	Details
Quality of proposal and approach	20	Clarity and structure of the proposal; understanding of AQ dashboards or decision-support platforms; robust methodology, and reporting; and approach to assessment, gap analysis, and recommendations.
Organisational experience	20	Experience in developing dashboards, GIS and environmental platforms; integrating air quality and remote sensing data; GIS, database and cloud expertise; and delivering similar regional projects.
Human resources	20	Qualifications and depth of experience (3-5 years) of the specialised team members listed above. .
Proposed timeline and deliverables	20	Feasibility of completing tasks within proposed timeframe 20 May 2026
Management and operational plan	20	Clarity of project management and coordination structure with ICIMOD and stakeholders

The consultancy will be selected based on 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 weightage score = 60% of technical proposal + 40% of financial proposal

The consultancy scoring the maximum weightage score based on the criteria will be awarded. However, the service provider should score at least 60% in the technical proposal.

Duration and timeline

The contract period for this assignment is for two months (eight weeks).

Terms of payment
Payments will be made upon satisfactory completion of deliverables as follows:

Milestone	Payment (%)
Approval of the Inception report and implementation plan.	30%
Final technical documentation and final handover of upgraded air quality dashboard, and project completion report.	70%

Method of application
The completed proposal should be submitted through email to
consultancy.int@icimod.org by 6 pm (Nepal Standard Time, UTC+05:45), on **30 March**

2026. Two separate files of technical and financial proposals should be submitted along with the valid legal documents as follows:

- Company registration certificate
- Tax registration certificate (i.e. VAT/PAN/TPIN registration)
- Tax clearance or annual tax return of the last fiscal year
- Audit report of the last 3 years

For further inquiries or to submit proposals, please contact:

consultancy.int@icimod.org +977-1-5275222 | ICIMOD | Kathmandu, Nepal.

ICIMOD's core values

Our core values are integrity, neutrality, relevance, inclusiveness, openness, and ambition. These values are an expression of our culture and are central to the guiding beliefs and principles of our work and behaviour. Our core values will lie at the heart of ICIMOD operations and delivery. They will underpin everything we do and frame how we work with our partners. They reflect our founding intentions and the balances we seek to hold, while equipping ourselves for the future.

Diversity, equity, inclusion, and safeguarding

ICIMOD's consultant selection process is based on the qualifications and competence of the applicants. As an employer, ICIMOD is committed to promoting diversity, equity, and inclusion, and offers equal opportunities to applicants from all backgrounds and walks of life, including but not limited to gender, age, national origin, religion, race, caste, ethnicity, sexual orientation, disability, or social status. ICIMOD strongly encourages applications from all eligible applicants, especially women, from all parts of the HKH region.

ICIMOD is dedicated to establishing and upholding a safe and nurturing work environment, where all its employees can participate fully and meaningfully without fear of violence, harassment, exploitation, or intimidation. Any type of abuse or harassment, including sexual misconduct [including child abuse], by our staff, representatives, or stakeholders is not condoned or tolerated.