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Allin-Wayra: advancing equitable and transparent use of small sensors through a global community of practice

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Small sensor technologies are rapidly expanding access to atmospheric observations, offering new opportunities to complement regulatory air-quality monitoring and to address persistent data gaps. However, the benefits of these technologies are unevenly distributed, and their effective use is constrained by variability in data quality, limited transparency in data processing, and unequal access to technical capacity and guidance. These challenges are particularly acute in low- and middle-income regions, where monitoring infrastructure and institutional resources remain limited.

The “Allin-Wayra: Small Sensors for Atmospheric Science” (<https://igacproject.org/activities/allin-wayra-small-sensors-atmospheric-science>) initiative was established within the International Global Atmospheric Chemistry (IGAC) Project to build a global, inclusive community of practice around responsible sensor use, with a strong focus on equity, capacity building, and transparency. Core activities include community workshops, an international webinar series, conference sessions, the co-development of open-access repositories and guidance resources, and targeted efforts to improve accessibility and dissemination.

This presentation reflects on early lessons learned from launching and coordinating a distributed global community, highlighting strategies for inclusive engagement, cross-regional and cross-disciplinary co-creation and mechanisms to sustain participation beyond individual projects, while gaining insights from other sensor communities of practice. We discuss practical challenges in balancing scientific rigor with accessibility, fostering trust in emerging technologies, whilst encouraging cross-sectoral collaboration (policy, business, non-profit and scientists). By sharing these experiences, we aim to identify how community-driven governance can co-create more equitable and impactful environmental research practice and decision-making.

