



**I use weather
or rainfall data**

For Data Users and Institutional Partners



SetGMDI Project— EU COST Innovators Grant IG20136

A new source of rainfall data

Commercial microwave links—the point-to-point backbone connections that carry mobile network traffic—are sensitive to rainfall. As precipitation attenuates microwave signals, that attenuation can be converted into near-surface rainfall estimates along the link path. With millions of microwave links deployed across Europe, Africa, Asia, and the Americas, this represents an entirely new and largely untapped layer of global rainfall observation.

The scientific basis is well established, built over more than a decade of research by the OpenSense community and others. What has been absent is the infrastructure and governance to make this data accessible to meteorological services, hydrological agencies, and operational users at meaningful scale. SetGMDI is building that infrastructure.

Why commercial microwave link data?

Conventional rainfall observation networks—rain gauges and weather radar—have well-known limitations in spatial coverage, temporal resolution, and geographic reach. Commercial microwave link data offers a complementary source with distinct advantages:

Coverage where it matters

Microwave links are densely deployed in urban areas, where flooding causes the greatest social and economic impact, and in regions of Africa, Asia, and Latin America where conventional observation networks are sparse or absent.

Potential real-time availability

Attenuation data is recorded continuously as part of normal network operations, with no additional hardware required in the field. Data is routinely collected at daily or hourly basis,



*Tower with microwave link antennas
(source: arstechnica.com)*

however, newer systems increasingly support low-latency data delivery reduced to 15 or even 5 minutes depending on the network management system and hardware.

Path-integrated measurement

Link-based rainfall estimates represent path-averaged conditions rather than point measurements, offering a spatial integration that complements both rain gauges and radar.

Global scale potential

Even partial access to the world's installed base of microwave links would substantially expand the global rainfall observation footprint, with particular benefit for data-sparse regions.

Institutional framework and coordination

GMDI is being built in close coordination with the World Meteorological Organization, ensuring alignment with global weather observation standards and integration pathways into WMO data systems. The project coordinates with the International Telecommunication Union on recommendations for commercial microwave link data sharing, and engages with EU and national regulators on the evolving regulatory environment.

National meteorological services are active partners in the SetGMDI pilot studies—contributing domain expertise, validation data, and operational context. GMDI is designed to complement and strengthen existing observation infrastructure, not to operate in parallel to it.

Current status

SetGMDI is currently running pilot case studies with mobile network operators in Europe and Africa, testing the GMDI-CAP collection, archiving, and processing system under real operational conditions. The project is a 12-month EU COST Innovators Grant initiative that commenced in November 2024 at ITU Headquarters in Geneva.

First results from the pilot case studies will be available in mid-2026.

June 2025 Stakeholder Event

SetGMDI will host its first open stakeholder event in June 2025, bringing together pilot operators, national meteorological services, water industry representatives, hardware vendors, WMO, and ITU to review

Who is this relevant for

GMDI rainfall data and products are relevant across a broad range of organisations and applications:

National meteorological and hydrological services seeking to complement or validate existing observation networks. Flood forecasting and early warning centres requiring high-resolution, real-time rainfall input. Water utilities and river basin management authorities. Agricultural advisory services and rural water management bodies. Climate and hydrology researchers. Municipalities and urban drainage management services. International organisations working on global weather observation infrastructure and data access equity.

What products are being developed

The GMDI-CAP system—currently in pilot phase—is designed to produce a range of derived rainfall products:

Gridded rainfall products

Spatially aggregated rainfall estimates combining data from multiple links, suitable for broad distribution and integration into existing forecasting and monitoring workflows.

Area-averaged rainfall estimates

Rainfall summaries for defined geographic units such as river catchments, municipalities, or administrative regions.

Rainfall time series

Path-averaged rainfall intensity estimates associated with individual microwave link paths, available under appropriate data sharing agreements.

Weather-aware analytics

Derived analytical outputs combining rainfall estimates with network performance data, relevant to both operational meteorology and network management.

Products are at different stages of readiness. Gridded and aggregated products are expected to reach initial operational status earliest. More detailed products will follow as governance frameworks and operator agreements are confirmed.

Data access and sharing

SetGMDI is committed to making derived rainfall products as openly available as possible, within the constraints of data sharing agreements with contributing operators. A tiered access model is envisaged:

Aggregated gridded products, which do not disclose sensitive network information, are intended for open distribution. Area-averaged and intermediate products will be available to registered users and institutional partners. Detailed products including individual link time series will be available under data sharing agreements that include appropriate confidentiality provisions. Commercial licensing arrangements are a longer-term development as GMDI scales beyond the pilot phase.

At this stage, SetGMDI is particularly interested in establishing early collaborations with meteorological services, hydrological agencies, and operational users who can contribute to product validation and applied use case development

..... **Immediate operational value for network maintenance and fault diagnosis.**

..... **Derived rainfall estimates based on your own links, available for internal use and evaluation.**

first results and define the roadmap toward full GMDI implementation.

The event is open to all organisations with an interest in microwave link rainfall data—as potential data users, research collaborators, or institutional partners. It represents the first opportunity to engage directly with the project team and the emerging GMDI community.

Contact and further information

[Project coordinator name and title]
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SetGMDI is funded by the European Cooperation in Science and Technology (COST) as Innovators Grant IG20136. The project runs from November 2025 to October 2026.

Your network already senses rainfall. We help you make that visible — and valuable

Commercial microwave links are sensitive to precipitation. Every raindrop that crosses a signal path leaves a trace in the attenuation data your network already records. SetGMDI and the emerging GMDI initiative are building the infrastructure, legal frameworks, and partnerships to turn

that trace into something useful—for you, and for the world.

We recognise that sharing network data is a significant decision. GMDI is designed with that in mind.

What we ask

We work with path-averaged signal attenuation measurements and associated metadata—frequency, polarisation, path length, and approximate link position. We do not request customer data, network topology, or any information that would expose your infrastructure. Raw data remains your property at all times.

What you get back

Participation in GMDI is not a one-way street. In return for data sharing, operators receive:

Weather-aware network analytics

Understand which signal degradations and outages in your network are caused by rainfall and which are not. This has immediate operational value for network maintenance and fault diagnosis.

Rainfall products for your coverage area

Derived rainfall estimates based on your own links, available for internal use and evaluation.

A stake in what comes next

As GMDI matures, rainfall data from telecom networks has real commercial potential for insurers, water utilities, agriculture, and smart city applications. Operators who join early help shape the business models and benefit first.

Legal and organisational templates

We develop and share the collaboration agreements, data sharing frameworks, and governance tools that make participation straightforward and repeatable.

How your data is protected

Raw network data is treated as strictly confidential throughout. Only derived products, aggregated rainfall estimates that cannot be used to reverse-engineer your network, are shared externally, and only under defined conditions. You retain ownership of everything you provide. The framework has been developed in coordination with legal expertise and with input from operators already participating in pilot studies.

For those who want the detail, our collaboration agreement templates are available on request.

Who else is involved

GMDI is not an isolated research project. It is being built in active coordination with the World Meteorological Organization, the International Telecommunication Union, national meteorological services, and EU and national regulators. Hardware vendors are engaged on firmware and network management integration. This is a serious, long-term initiative with institutional backing.

Where we are now

We are currently running pilot case studies with mobile network operators in Europe and Africa, testing the GMDI-CAP collection, archiving, and processing system. In June 2025 we are hosting our first stakeholder event—bringing together pilot operators, meteorological services, WMO, ITU, water industry representatives, and hardware vendors to review first results and shape the next phase.

If you are considering participation, the June event is the ideal moment to engage — meet the team, hear from operators already in the pilot, and help define what GMDI looks like at scale.