

Accurate, affordable weather forecasting

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Credit: AI-generated image ([disclaimer](#))

The first known rainfall records were kept by the Ancient Greeks, in about 500 B.C. Some 100 years later, people in India used bowls to record the rainfall. The readings were used as a basis for land taxes.

Today, not much has changed. The most common [rain](#) gauge currently used by official forecasters and airports consists of a large funnelled cylinder with a smaller measuring tube inside it. The 50 centimetre-high

cylinder collects water in the measuring tube, which has exactly one-tenth the cross sectional area of the top of the funnel. The reason for the smaller measuring tube is so that more precise rainfall measurements can be made.

Rain gauges estimate the amount of rain fall within a given period of time, and in a localised area. The estimation and quality of recorded rainfall plays a vital role in the performance of sewer systems, [water treatment plants](#), irrigation requirements and advanced recognition of a developing flood threat. Heavy rain can frequently overwhelm [urban sewage](#) systems, causing rapid flooding in cities. Unnecessary use of water for irrigation on farms can significantly increase costs. As rain gauges measure precipitation in one single point, a network of gauges is necessary to keep deviation at less than 5 %.

Furthermore, owning and operating an individual rain gauge can be expensive. [Rain gauge](#) networks are often poorly designed and sited, resulting in unreliable data that cannot be used. Long range [weather](#) radars work as very densely situated rain gauges, but the cost of long range weather radars is not affordable for many end-users, such as farmers or SMEs. Clearly then, there is a need for a cheaper and more innovative measuring device. The MARG project is offering just that.

This FP7-funded two year project, launched in November 2012 and led by a Hungarian engineering company, falls under FP7 Research for SMES. Participating SMEs of the MARG project aim to develop an innovative, accurate, real time user friendly [measurement system](#) that can monitor spatial distribution and the intensity of rain in rural and urban situations. It is envisaged that this system will be used to collect commercial weather data. The project partners decided to first identify rain type events using doppler spectrum data, and then identify rain type events using morphological information from radar rainfall maps. They then developed high grade clutter cancellation algorithms in order to

eliminate scattering data on stationary objects in the area. Commercialisation of the device will be done at a later stage of the project, as SMEs will first have to be trained on the functionality, operability and maintenance of the new system.

Sensing the weather has been important to man for millennia, and significant weather events continue to affect our lives. Establishing an effective network of weather stations is an important tool to studying and analysing weather data, to produce both a truly global weather picture and more accurate local and regional forecasts. Furthermore, this project aims to make such an innovation affordable.

More information: MARG - marg-project.eu/

Provided by CORDIS

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