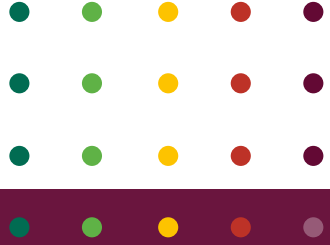




EXTENSION DOCUMENT
TECHNICAL GUIDELINES

HOW TO MEASURE RAINFALL MANUALLY?





ABOUT THE PROJECT

The Project *“Agroforestry: potential for sustainable development in the uplands”* aims to contribute to sustainable development in sloping upland areas, with focus on evaluating agroforestry practices and systems addressing production and productivity, soil conservation, management practices such as nutrient application and weeding, and competitive effects between trees, crops and forage grass in young and mature agroforestry systems, study fruit value chains and market links, and assess opportunities and bottle-necks for wider agroforestry adoption and increasing of scale.

The Project (formally two projects) is funded by Formas, a Swedish Research Council for Sustainable Development and Vetenskapsrådet / Swedish Research Council, respectively. It is carried out between January 2020 and December 2023 (Formas), and December 2024 (VR), by SLU - Swedish University of Agricultural Sciences and the International Centre for Research in Agroforestry (ICRAF - also known as World Agroforestry) in Viet Nam, the Soil and Fertilizers Research Institute (SFRI) and the Departments of Agriculture and Rural Development from provinces of Dien Bien, Son La and Yen Bai.

WHY FARMERS AND EXTENSION OFFICERS SHOULD KNOW ABOUT ACTUAL RAINFALL?

In rainfed farming conditions, the Food and Agriculture Organization of the United Nations (FAO) recommends that farmers sow only when the rainfall is appropriate, i.e. exceeds 30 mm (FAO, 1979). While weather reports are now more reliable and frequently updated, the increasing unpredictability as result of climate change poses challenges to hydro-meteorological forecasts, especially those for an entire season. Hence, farmers need to ascertain actual rainfall in their living and farming area to plan a successful crop season effectively. Implementing a straightforward measurement method can verify actual rainfall, supplementing the estimates based on the field experience of farmers and local agricultural extension officers.



Photo: Nguyen Anh Minh | ICRAF Viet Nam

MANUAL RAINFALL MEASUREMENT



Material:

Funnel, a big storage bottle (1.5-liter bottle can be reused), wire, measuring jar, a straight bamboo pole.

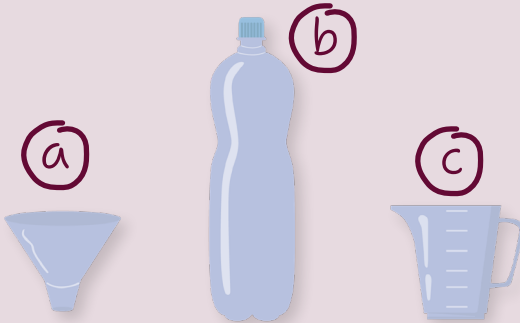


Figure 1. Material to measure rainfall:

- (a) funnel;
- (b) big storage bottle;
- (c) measuring jar.

Installation and measurement:

Use wire to connect and secure the funnel to the storage bottle. Attach them on a vertical bamboo pole. Ensure the funnel surface is on a flat contour and positioned higher than the surrounding tree/crop canopy (Fig. 2).



Photo: Pham Huu Thuong | ICRAF Viet Nam

Figure 2. Manual rain measuring device in the fields

Measure the volume of water in the storage bottle after rain events, or daily.

Calculate the rainfall using the equation:
$$\frac{A \times 10}{B}$$

Where A is the volume of water in the storage bottle (ml);

B is the area of the funnel (cm²) calculated from the diameter as presented in Table 1.

Rainfall is measured in millimetres (mm)

Table 1: The funnel diameter and area

Diameter (unit: cm)	Area - B (unit: cm ²)
5	20
6	28
7	38
8	50
9	64
10	79
11	95
12	113
13	133
14	154
15	177

For example: if A = 500 ml, B = 15 cm, the rainfall is approximately $(500 \times 10) / 177 \approx 28$ mm:

$$\frac{500 \times 10}{177} \approx 28 \text{ (mm)}$$

CHECKING ACTUAL RAINFALL ON YOUR SMARTPHONE



Currently, some meteorological organizations have installed weather stations in various localities, offering free applications on smartphones for users to check actual rainfall in the nearest area. One such app is Vrain.

Instructions:

Download and install the Vrain app on your smartphone.

Check the rainfall: Open the Vrain app, search for your province, and find the closest weather station to your field. If the station is not available in your commune, search for a nearby location. However, note that data may vary due to fragmented topography effects.

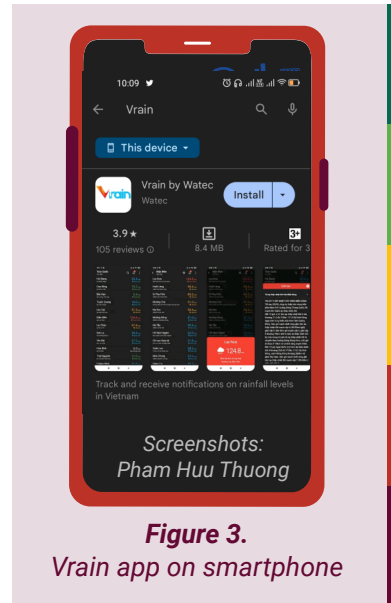


Figure 3.
Vrain app on smartphone

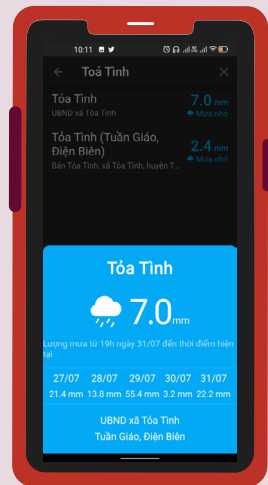
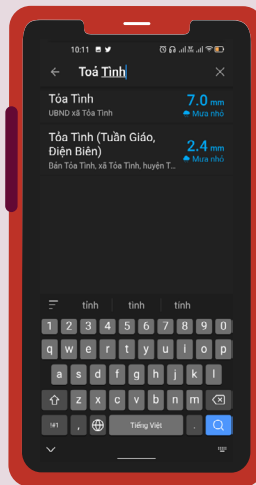
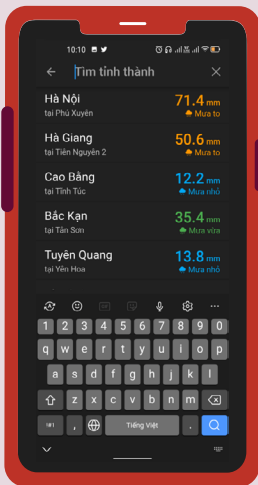


Figure 4.
Search for weather stations and see actual rainfall on your smartphone

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