

Field boundary delineation and cropped area measurement

SOP ID: 002

Version: 1

Crop: Not applicable

Relevant KPI: Productivity — yield; Resource use efficiency — nutrient use efficiency, water productivity and labor productivity

R&D stage (example of activities):

- Discovery stage (yield decomposition)
- Pilot stage (on-farm participatory trials, randomized control trial)
- Scaling stage (panel studies, ex-post impact assessment)

Module description

Accurate measurement of crop cultivated area and corresponding field boundary is essential for assessing various agronomic key performance indicators (KPIs), including yield, profitability and resource use efficiency. In the past, household surveys have relied heavily on farmer-reported plot areas. However, it has been frequently noted that farmer-reported plot area is often inaccurate for various reasons. In addition, field boundary information — which is crucial for various agronomic analytics purposes — is rarely available. Here, we describe the procedure for a global positioning system (GPS)–based field area measurement using a smartphone/tablet application. We describe [GPS Fields Area Measure](#),¹ an Android application freely downloadable from Google Play Store, as an example. The module describes the procedures for downloading and performing the measurements using this app. Many other apps with similar functions can also be used to measure field/plot area. Users need to refer to the corresponding user guides when using other Android applications. GPS Fields Area Measure is also available on the [Apple App Store](#),² but the description below is only for the Android system.

This GPS Fields Area Measure user guide was created using a smartphone running Android version 13, with which the app is compatible. Please check the compatibility of the GPS Fields Area Measure app with the smartphone/tablet you will be using before going to the field.

Module 1: Use of application software for field area measurement

1.1 Required equipment/materials

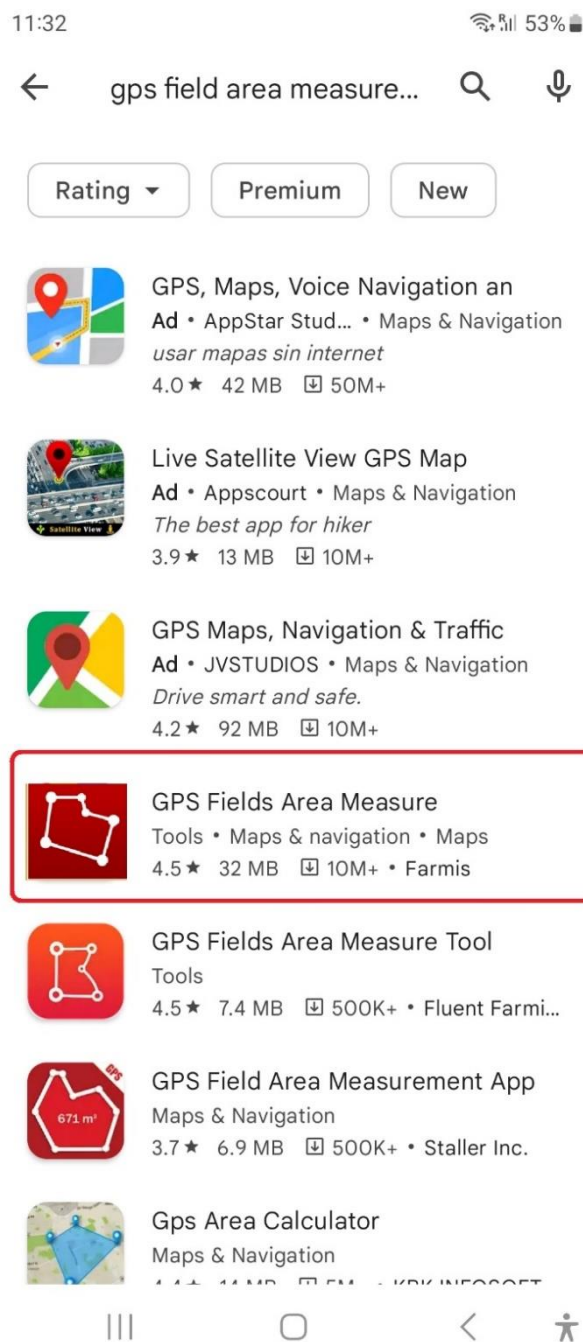
- Android-based device (e.g. smartphone or tablet).

¹ Available from: <https://play.google.com/store/apps/details?id=it.noframe.fieldsareameasure&hl=en&gl=US&pli=1>

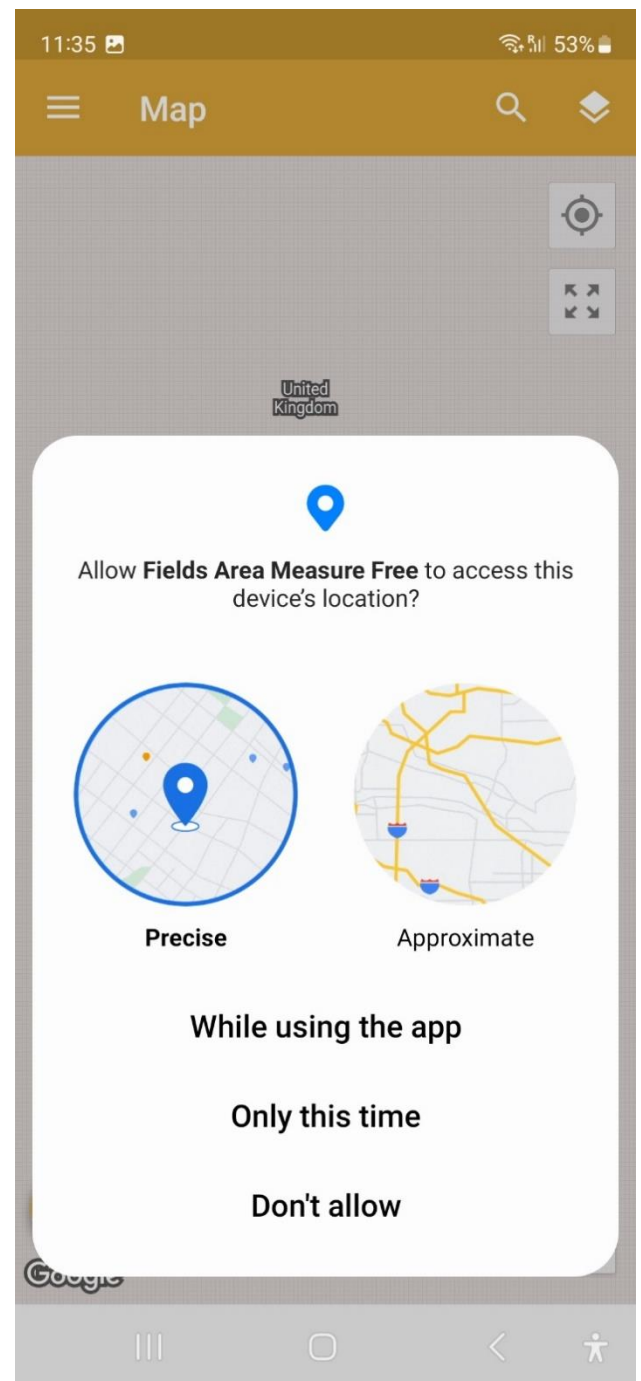
² <https://apps.apple.com/us/app/gps-fields-area-measure/id1123033235>

1.2 Procedure for downloading and installing GPS Fields Area Measure app

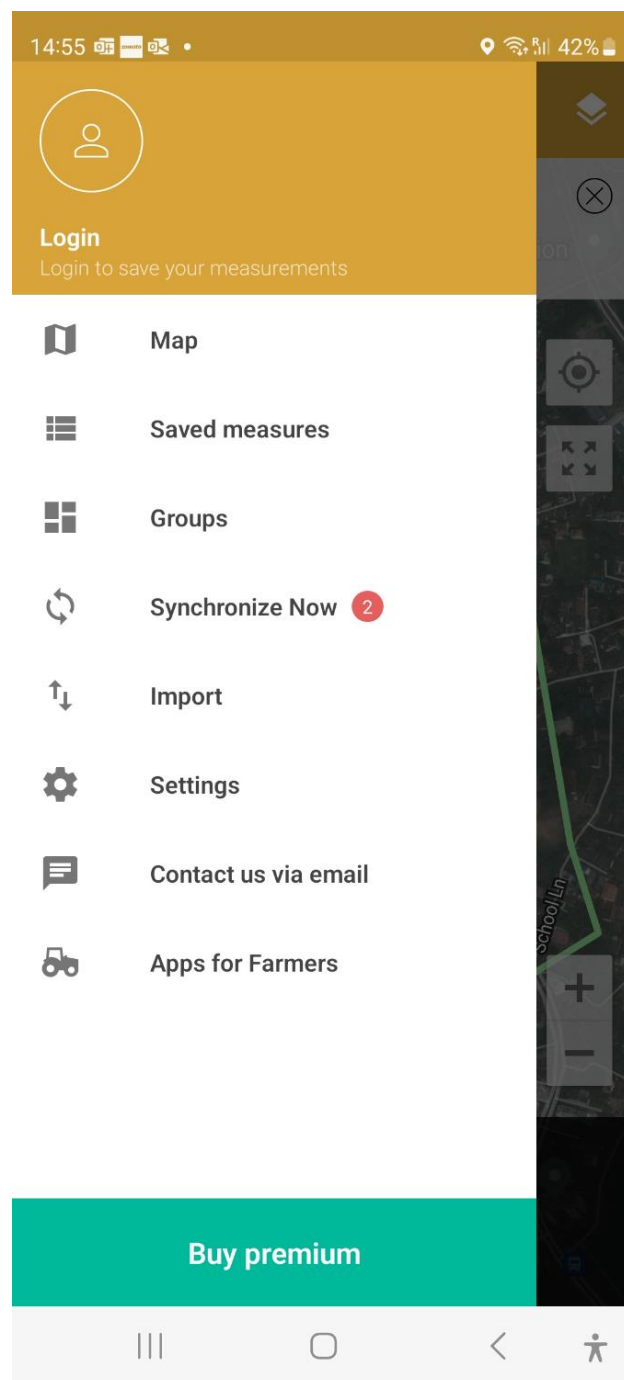
Step 1: Search for “GPS Fields Area Measure” in the Google Play Store and install it on your device.



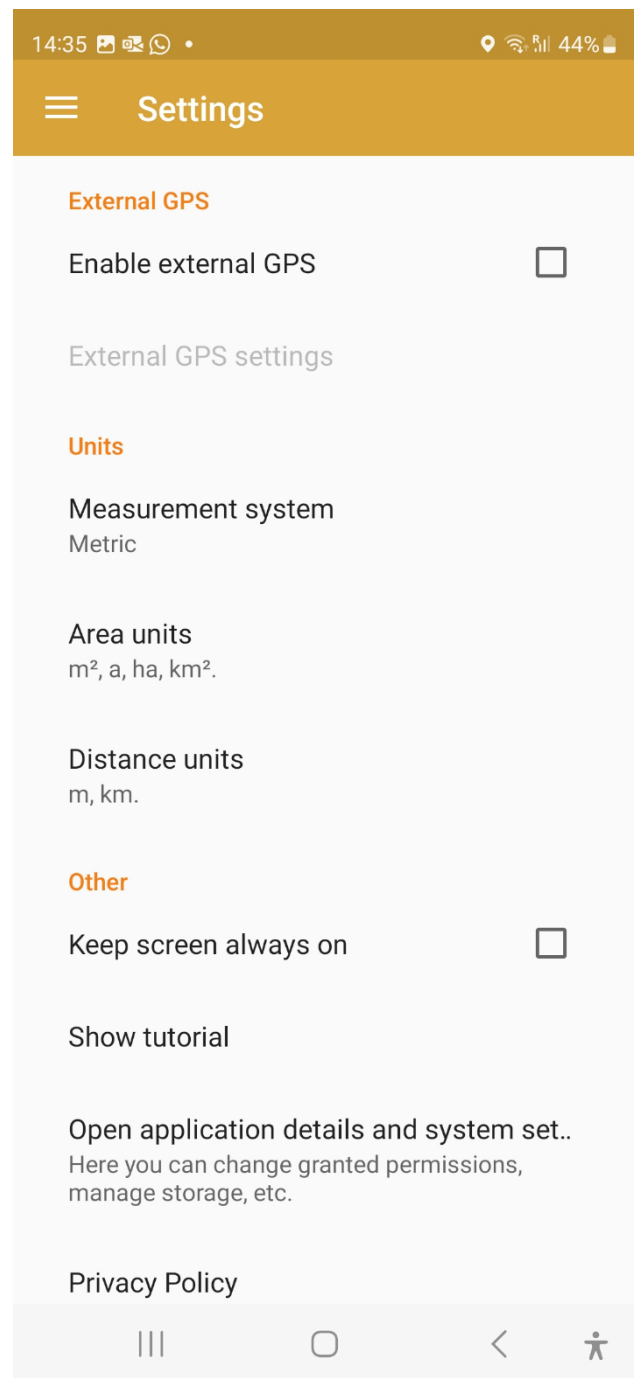
Step 2: Open the app and allow it to access your device's location.



Step 3: Settings can be accessed by pressing the menu icon at the top left (triple bar). Press the **“Settings”** options to change default measurement units.



Step 4: The default measurement units are in “Metric” system, but can be changed to “Imperial” if needed. To ensure consistency, users are requested to use the “Metric” system. The unit for area measurements can be in the form of m², ha and km².

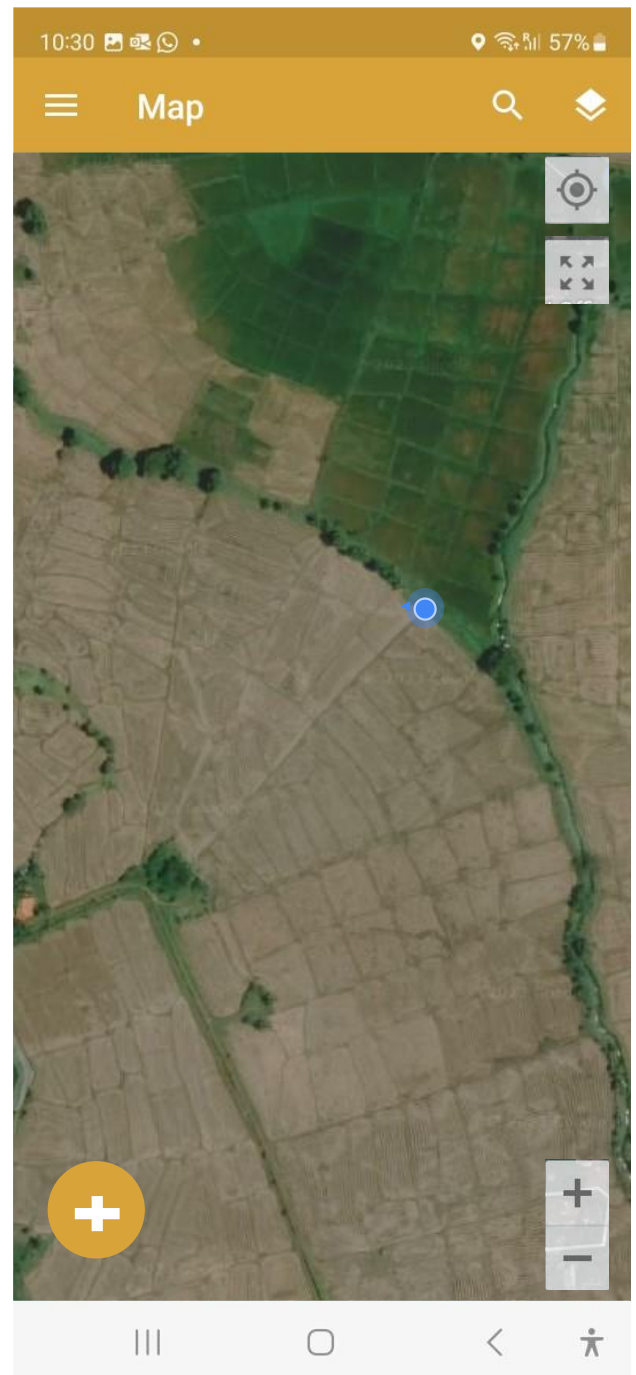


1.3 Measurement procedure

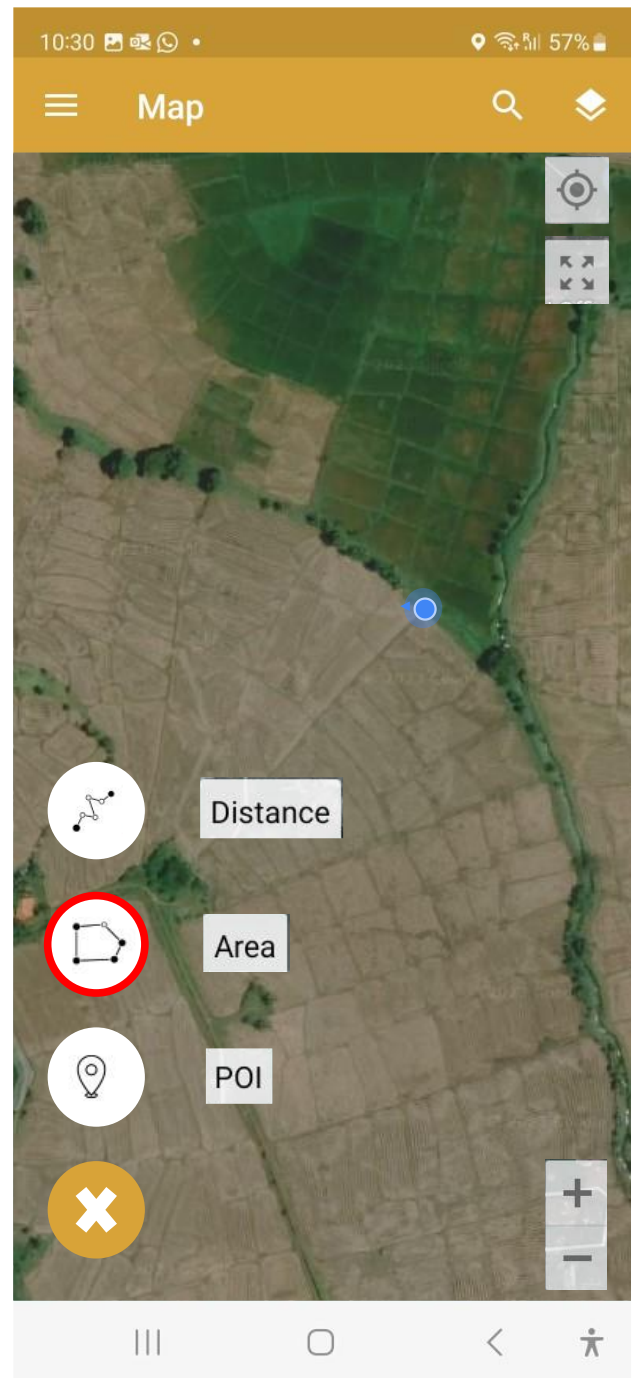
Step 1: Go to one corner of the field to be measured. Mark your starting point with a range pole so you can identify the point when you return.



Step 2: Open GPS Fields Area Measure and click on the 'Plus' (+) icon at the bottom left corner.



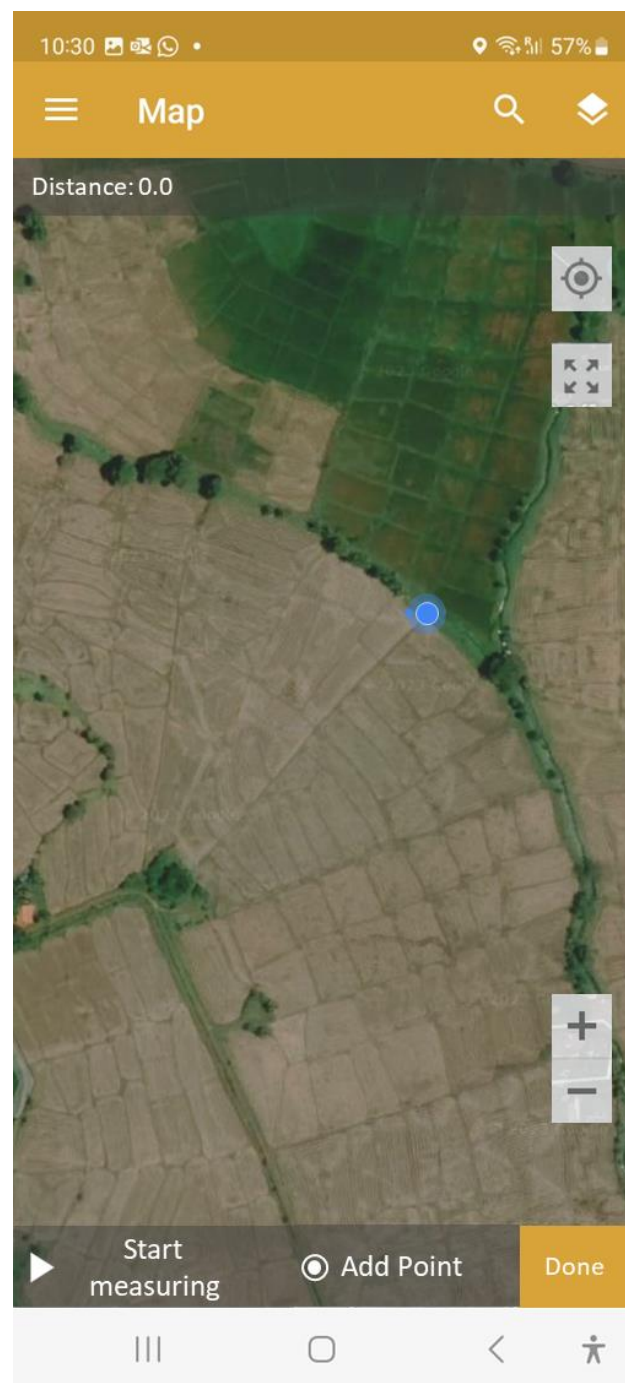
Step 3: From the three popup options, select the “Area” icon (highlighted in the red).



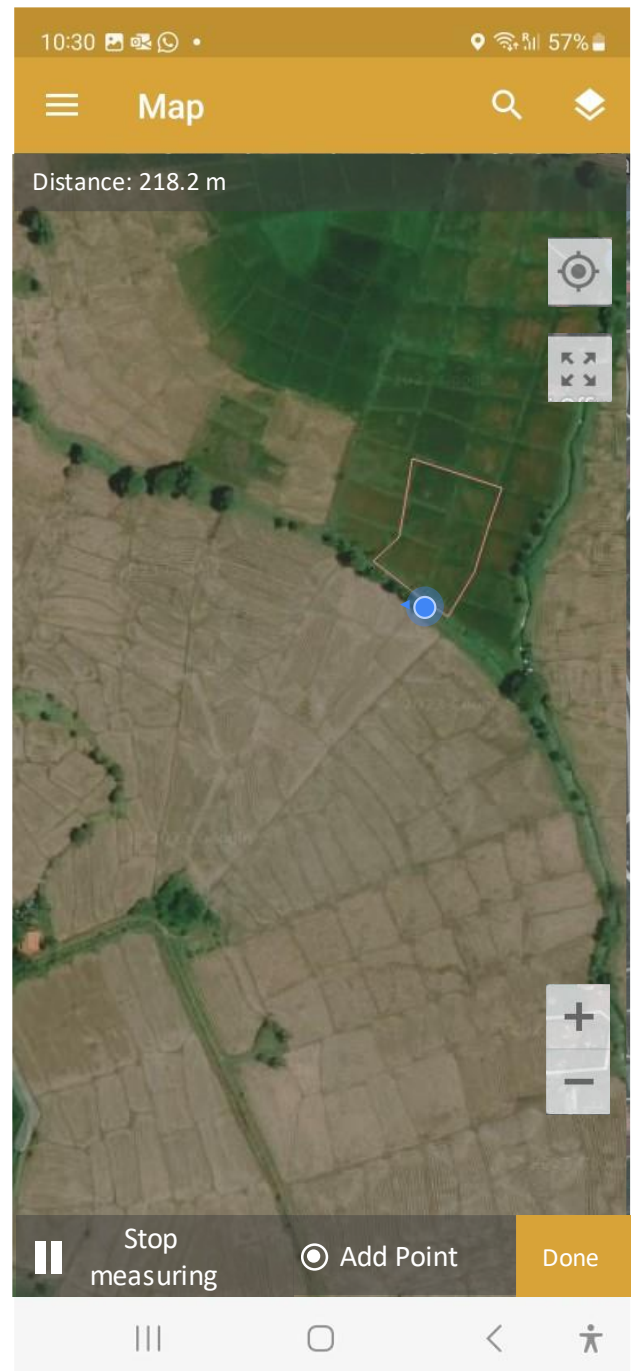
Step 4: Select the “GPS measuring” option from the following page.



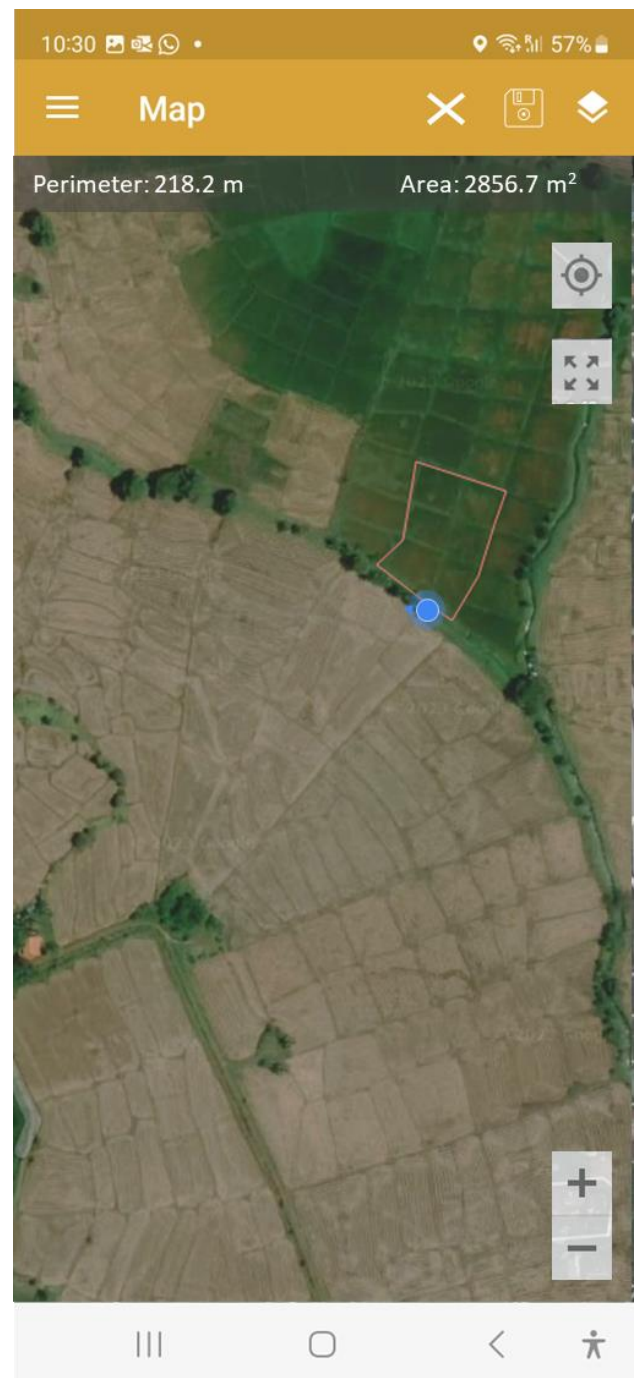
Step 5: The corner of the field where the range pole is located should coincide with the GPS location on the smartphone/tablet. Press the **“Start measuring”** button at the bottom left, then walk around the perimeter of the field.



Step 6: The surveyor must walk on the edge of the field (not a meter outside or inside the plot). At every corner, you must stop for 5 seconds (counting slowly 1, 2, 3, 4, 5) and then continue walking. You must walk all the way around the field until you return to the location of the range pole. You should be able to see the boundaries of the field marked as you walk along. Now press **“Stop measuring”** and click **“Done”**.



Step 7: The next popup option will show perimeter and area estimates of the surveyed field. Press **“Save”** (disk) icon located second from top right to save the surveyed field on the device.



Step 8: Provide a unique **“Measure name”** such as the Field ID used in Excellence in Agronomy for Sustainable Intensification and Climate Change Adaptation Initiative (EiA) and an appropriate description.

You can take a photograph of the field using the **“Camera”** option to ensure a pictorial reference for later use. (This is optional.)

Press the **“Save”** (disk) icon at the top right corner.

10:31 57%

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MEASURE INFORMATION

Measure name

Description

Group

No group

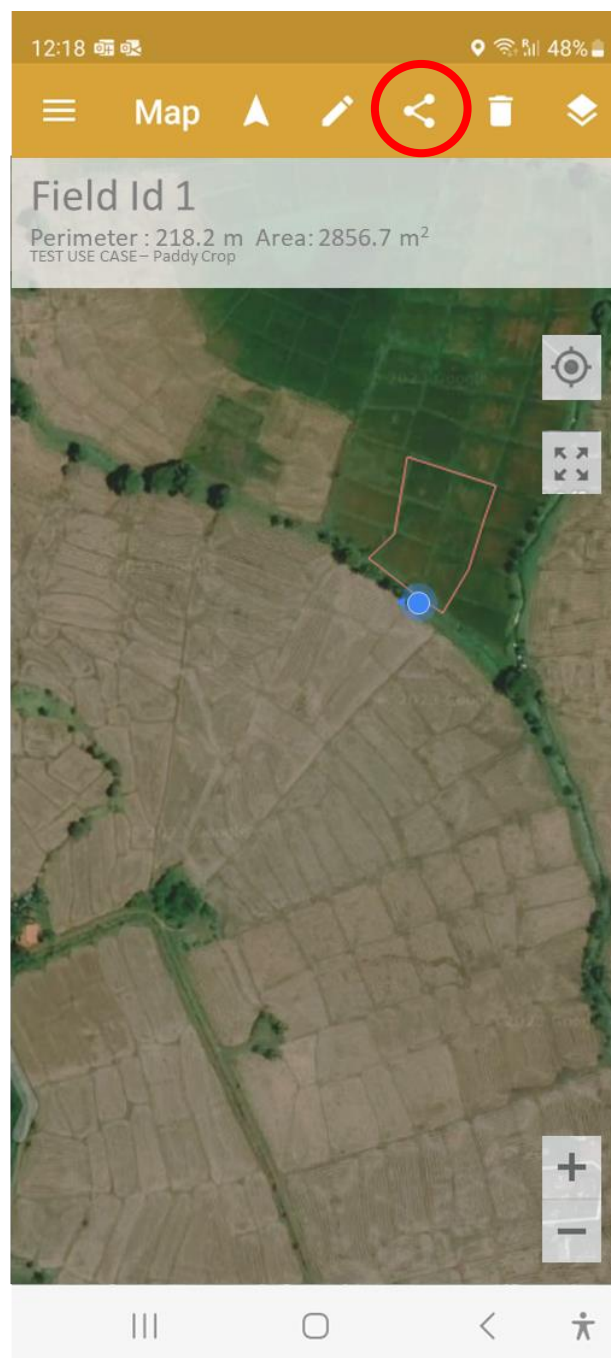
Photo

CAMERA

GALLERY

Step 9: Now the surveyed field populated with relevant information can be seen on the screen. Press the **“Share”** icon located third from the top right and in the resultant window select **“Save to device”** to export the surveyed field to KML, KMZ, shape file, etc. Provide a unique name such as the Field ID used in EiA and an appropriate description.

The data can now be opened in any GIS software.



GPS Fields Area Measure will also work offline (but with no background map layers). The procedure is exactly the same as described above.

Contributors

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