Guideline for Using the Standard Agricultural Ground Reference Data Collection ODK Form

Background

As the applications of artificial intelligence (AI) and machine learning (ML) in crop analytics become more readily accessible to public and private sector actors, the need for a core set of standardized ground reference data is growing. While a number of organizations have developed effective tools for the collection of in field ground reference data, no generic and standardized tools exist on common mobile data collection platforms. Mobile data collection tools are commonly used by agricultural development projects supporting millions of smallholder farmers around the world. The opportunity exists to leverage these tools to rapidly expand the collection of core ground reference data and to dramatically improve the availability of this data for crop analytics. At the same time, data collection and sharing hubs offer platforms for aggregation, sharing and use of ground reference data in ways that multiple actors can easily access. These factors create an exciting opportunity to accelerate innovation and scale up of crop analytics applications for smallholders across a range of use cases.

Goal

This test is designed as part of the Enabling Crop Analytics at Scale (ECAAS) project of the Bill & Melinda Gates Foundation. The goal is to create a standard ODK form for collecting core agricultural ground reference data for advanced crop analytics.

Partners

Tetra Tech was awarded a contract by the Bill & Melinda Gates Foundation to implement the first phase of ECAAS initiative. ODK, Radiant Earth Foundation, and D4DInsights, are working with Tetra Tech to design the standard ODK form and post-processing data, Q&A and ingestion of the data catalog to enable development of analytics for agricultural monitoring.

Access the Form

Data Model

You can see the full list of form questions in [this document](#).

Form Overview

You can watch this [short video](#) to see the form in action.

Download the Form

This form requires Android 5.1 or later and ODK Collect v2021.2.4 or later. If you do not have these versions, please upgrade first.

1. Go to the Play Store and download or upgrade to the [latest version of ODK Collect](#) (currently v2021.2.4).

2. Your next steps depend on your install type.

   - New install: Tap the Configure with QR code button on the first launch screen.
   - Existing install: Tap the Project icon on the upper right of the main screen, then tap Add project.

3. Scan the following QR code to the right of this text.

4. Press Fill Blank Form and you should see the form named "ECAAS Field Mapper". The current form version is 2022070501. Form updates are automatic.

Language Options

By default, ODK Collect matches the device language. This only sets the language for the Collect user interface and not for the form. This can be manually changed in the app.

1. On the main screen, tap the Project icon in the upper right corner.

2. Select Settings, and tap User interface under Project settings. Tap Language and choose the desired language.

The default form language is English. As of March 2022, a French version of the form is available.

1. When you have opened the "ECAAS Field Mapper" form (step 4 above), select the three dots in the upper right corner of your screen.

2. Select Change Language and choose the language most appropriate for your use.

Set Your Username

By default, ODK Collect does not provide each user a username and they must manually set it.

1. On the main screen, tap the Project icon in the upper right corner.

2. Select Settings, and tap Server under Project settings. Tap Username and type your chosen username into the provided textbox. Usernames can be used to identify specific form entries or sort entries based on users. A new username must be set for every project you open in the ODK Collect app.

How to Collect Data

The goal of this data collection is to capture polygons on the ground and their corresponding crop properties. With that in mind, you can collect a geo-boundary that is smaller than the actual field boundary if:

a) The whole perimeter of the field is not accessible.
b) The perimeter of the field is very large and not walkable.
c) There are multiple crops within the same field, and you can distinguish their boundaries. In this case, it is requested that you collect separate entries for each crop rather than using the intercropping option.

Follow these steps to record an entry in the form:

- The first two questions ask for the name of the organization and project. These will be used to easily identify and catalog your data for publication and analysis. Answers to these questions will default to your last saved value so you do not need to enter them each time.

- Next, you are asked how the consent of the farmer was collected to record his/her field's data. This question will guide how the data can be shared later on. Therefore, you need to inform the farmer about the intended use or publication of data and then record that in the form. The actual consent doesn't need to be recorded for each entry, and can be shared with the whole dataset at the end. If no consent is given by the farmer or village head/chief, or you do not have institutional consent, you cannot collect data. The answer to this question will default to your last saved value so you do not need to enter them each time.

- The next question will ask whether you are allowed to walk around the field and collect the GPS coordinates of the boundary. If you are not allowed to do so, you will collect one point in the center of the field. The answer to this question will default to your last saved value so you do not need to enter them each time.

- Next, you are asked if the field is fallow (and then the questions regarding crop type, etc are skipped). The answer to this question will default to your last saved value so you do not need to enter them each time.

- Next, you will be asked whether this form is being recorded post harvest. (This option can be used to record data such as crop type, water source, etc for the field during the previous growing season). The answer to this question will default to your last saved value so you do not need to enter them each time.

- The next question is about the class of the primary crop type. This form supports data collection for Food crops planted every year, Food crops planted every few years and Tree crops. Depending on your response, the rest of the questions will be customized.

  For Food crops (both planted every year and every few years):

  - Crop type(s) is the next set of questions. First, you are asked if this is an intercropped field. If the field is intercropped, you will be asked to enter the percentage of the field that is intercropped. Then, the primary crop type is asked, and if it is intercropped, the secondary crop(s) are recorded. The list contains some existing crops (most common), and there is an "Other" option if the crop you want to enter is not among the pre-populated ones. You can one select one crop as the Primary. Please use a consistent naming convention to enter any new crops. We recommend using FAO AGROVAC ensure cross-domain specificity. The list/taxonomy of the crop names should be provided to surveyors in advance.

  - [for cereal crops only] The next question will be about the crop development stage.

  - Crop cut measurements can be entered next. This question is for projects that collect yield information through crop cuts. The answer to this question will default to your last saved value so you do not need to enter them each time.

    If you opt-in to enter these measurements, you will be asked to enter the area of sampling and the dry weight of the produce for each sampling site. You have the option to select different measurement units for the area and the weight, and add as many sites as you want. Area and weight units will default to the last entered value.

  - Planting and Harvest Date are the next two questions. For both of them you can either enter a full date or a Month and Year. If the dates are not known, you can select "Date not known". It's recommended to capture the full date for both of these if they are known. This will support developing better in-season forecasting models.

  For Tree Crops the questions will be

- The primary crop will be asked first. If it's coffee, the next question will be about the variety of the coffee.

- Next question will record the number of trees in the field.

- Then the year that the majority of the trees have been planted is asked.

- Crop yield measurements can be entered next. This question is for projects that collect yield information. The answer to this question will default to your last saved value so you do not need to enter them each time.

  If you opt-in to enter these measurements, you will be asked to enter the dry weight of the produce for each sampling tree. You have the option to select different measurement units for the weight, and add as many trees as you want. Measurement units will default to the last entered value.

- Finally the Harvest Date is recorded. You can either enter a full date or a Month and Year. If the dates are not known, you can select "Date not known". It's recommended to capture the full date if it's known. This will support developing better in-season forecasting models.

- Next, the water source is recorded.

- The next questions will depend on your response about the possibility of recording the field boundary. First, you will be asked to collect a point in the center of the field. Then, if you are able to capture the field boundary coordinates, you will be shown the "GeoShape" module to collect a polygon. You can use either of the three methods to capture the field boundary. Ideally, using the "Automatic location recording" and walking around the boundary is preferred. This method will record a point every 10 sec (default but can be changed) as you walk around the boundary, and the resulting polygon is the optimal data for developing labeled data on satellite imagery and generating improved analytics.

- Next, you will enter the area of the field. You can select the appropriate unit and enter your estimation/measurement of the field area.

- Lastly, you will have the option to take pictures from the field and upload it as part of your data submission.

Questions?

We want to ensure you have a seamless experience. If you have any questions, please reach out to info.ecaas@tetratech.com.