openforis

Open Foris Collect Mobile

USER'S MANUAL

VER. MARCH 2017

TABLE OF CONTENTS

1 KEY FEATURES

Field data collection via Open Foris Collect Mobile offers a number of advantages compared to recording data using paper field forms. Collect Mobile runs on Android OS and the market offers a variety of tablet devices varying in performance, ruggedness and price. A few considerations on selecting a device are listed under "Considerations for buying equipment".

1.1 Advantages of using OF Collect Mobile

- On the fly measurement validation
- Use of device in-built accessories (camera, etc.)
- Integrated code and species lists
- Easy backups
- No transcription of handwritten forms
- Export data via email or cloud storage system

1.2 Guidelines for data collection with Collect Mobile

- **Crew roles and workflow:** All field crews should be assigned unique IDs, so it is easier for data managers to contact the right crew in case data needs to be clarified. It is recommended to set this ID as soon as the crew starts working. Regular and clear intervals for data backup and transfer should also be set (e.g. after every cluster or every hour). Rules for systematic cluster and plot naming should be set prior to starting data collection.
- **Making changes to collected data:** The easiest way to change data already collected is through the entity table. See "Moving in a survey" for more details.

2 INSTALLATION

Collect Mobile is freely available from the Google Play store.
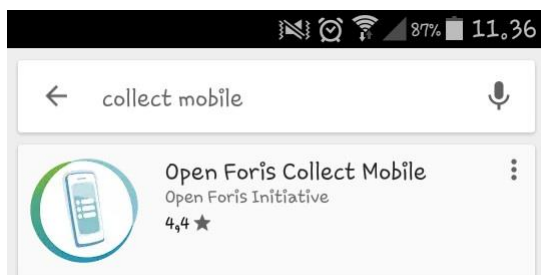
Select "Install" on the store page and approve the use of your device's location, media, file directories and camera. These are needed to use all the features of Collect Mobile. By default, updates are automatically installed upon release.

OF Collect Mobile is also available as an APK-file at:

https://drive.google.com/drive/folders/0ByMwEaY7tf1bfnYtcGNaUHJKWHAwcmplX1VzazJ3VmNuTEJyTjFpdmpLNmJMLXNwVU9LSzQ

This allows you to install older versions of Collect Mobile for survey compatibility reasons for example. You need to enable the installation of Apps from unknown sources. This is usually done through the Apps directory of device settings. To see which version is currently installed, see the App page of Collect Mobile on your device.
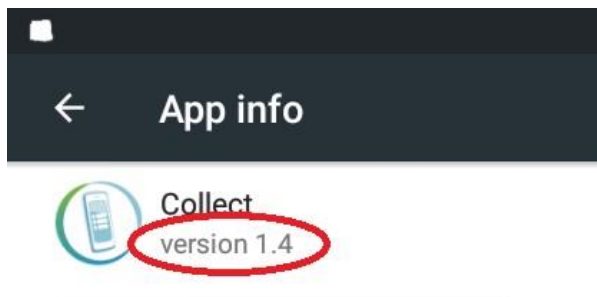
When you first start OF Collect Mobile, the program will automatically download a demo survey. This should not take more than a few seconds.

2.1 Managing surveys

To import a published survey, select "Surveys" on the drop down menu. You will then see a list of all surveys in your device's memory. Select the one you want to use. If the survey you want to use isn't there, select "Import" from the upper right hand corner. Browse to a location where you have saved the wanted survey and select it. Notice that any entered data on the current survey will be deleted if you import a new one.

If you wish to delete surveys, tick the box next to their names in the survey menu and select "Delete". Notice that a survey has to be in the .collect-mobile format to work.

2.2 Uninstallation

To uninstall Collect, follow the general uninstallation workflow for you device. Often this is somewhat as follows:

Settings/Device/Apps/Collect

Make sure Collect Mobile is not running before uninstalling. If you do not intend to install Collect again, you should select "Clear data" on the app screen. After this, click "Uninstall".

2   USING OPEN FORIS COLLECT MOBILE
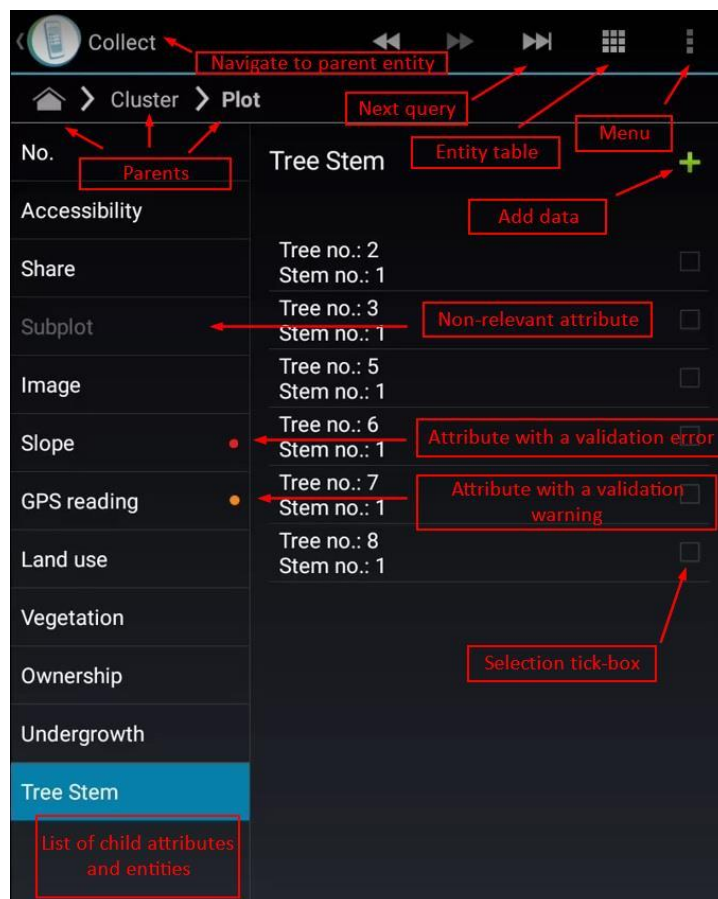
3.1 The user interface

Shown in the image on the left is a typical screenshot from a Collect Mobile survey. Annotated are the most important features, which will be explained in this section.

Non-relevant attribute: You can set criteria for an attribute's relevance in Survey designer. If an attribute is irrelevant, you can't input data for it.

Validation error/warning: Criteria can also be set to check if a value is right or simply impossible. A red dot represents an error, which means that the attribute is wrong or missing, thus preventing its use in analyses. A warning prompts you to double check the value, but doesn't prevent its use.

**Parent/child:** Descriptions of data structure, mostly relevant for survey design.

3.2 Entering and deleting data

To add a new data entry, tap on the green plus sign. Depending on the type of the attribute, you can select one or multiple options by either selecting their tick-box, typing their code or selecting from a dropdown menu. For more information on different types of attributes, see the Open Foris Collect manual: http://www.openforis.org/tools/collect.html

To save screen space, code list explanations are often stowed away. If you need to check the definition of a specific code, click on the "Show code descriptions" link. A pop up containing explanations for that code list appears. To exit the pop up, tap outside it on the screen.
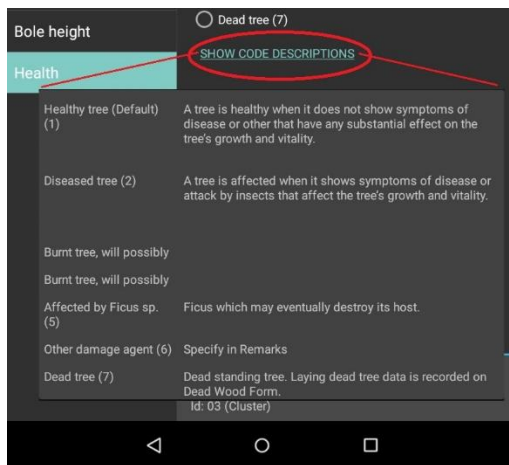
To delete data, tick the box next to it. You can select multiple files at the same time. To deselect a choice, tap again on the tick box. **Note that the only way to get back deleted data is through backups!** Data can also be modified easily, so only clearly redundant or accidentally created data should be deleted.
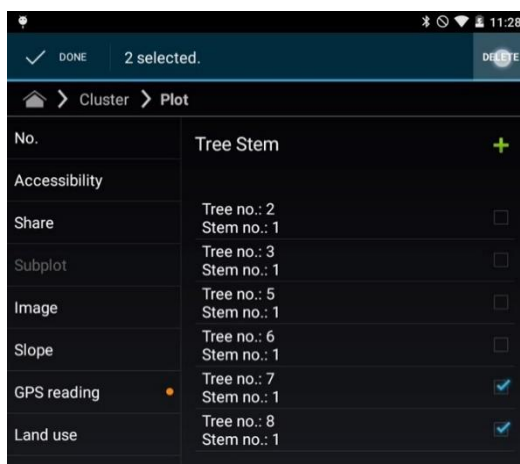
3.3 Use of in-built device accessories

Camera: The device should have a back camera. If an image attribute is added into the survey design, you can take images by selecting Capture image where appropriate. Images can also be attached to the survey as files by selecting Select image. Image files can be quite big, so images should only be taken when they are necessary for validating or differentiating the data.

Date: You can use the device's inbuilt calendar to set a date for your data collection in a uniform format (dd.mm.yyyy).

Location: Your device's location can be used to locate plots instead of inputting the coordinates manually. The plot's location can be used to check that it is in the right place in relation to other plots in a cluster, for example. Turn on location on your device (usually found by swiping down on the upper edge of the device's screen). Select a spatial reference system and then "Start GPS". Depending on the availability of GPS satellites, this takes some time. Trees, buildings, clouds and time of day affect the visibility and availability of GPS satellites. Best signal is usually found on top of hills and in unobstructed terrain.

See also tools for predicting satellite availability, such as:

 http://satpredictor2.deere.com/homePost

Compass: Your device's compass can be used for navigating to a feasible plot location. When in an attribute that uses the device's location, select "Navigate to expected location". A compass screen will appear showing a red dot that indicates where you should go to find a predesignated plot location or come within acceptable range of another plot.

3.4 Moving in a survey

There are multiple ways to move between objects in a survey. Using the devices back=-key is not recommended.

Next query button*:* ▶▶|

This button moves you directly to the next object that needs to be filled. It skips over objects that have been set as irrelevant in relation to the current data in survey designer. For example, OF Collect Mobile can be programmed to skip tree data attributes if there are no trees on a plot. The fast forward button would then skip over the irrelevant attributes to save time and avoid confusion. We recommend you to use the fast forward button when progressing in data collection. Notice that you might be moved to another node or tab if you started backtracking while in the middle of a survey.

Forward button*:* ▶▶

Moves you to the next object in the survey, be it relevant or not. Can be used to check previously saved data when you don't want to immediately return to the next unfilled object. Swiping from *right to left* does the same thing.

Back button*:* ◀◀

Moves you back to the previous object, be it relevant or not. Useful if you notice you mistyped or didn't input a required value. Swiping from *left to right* does the same thing.
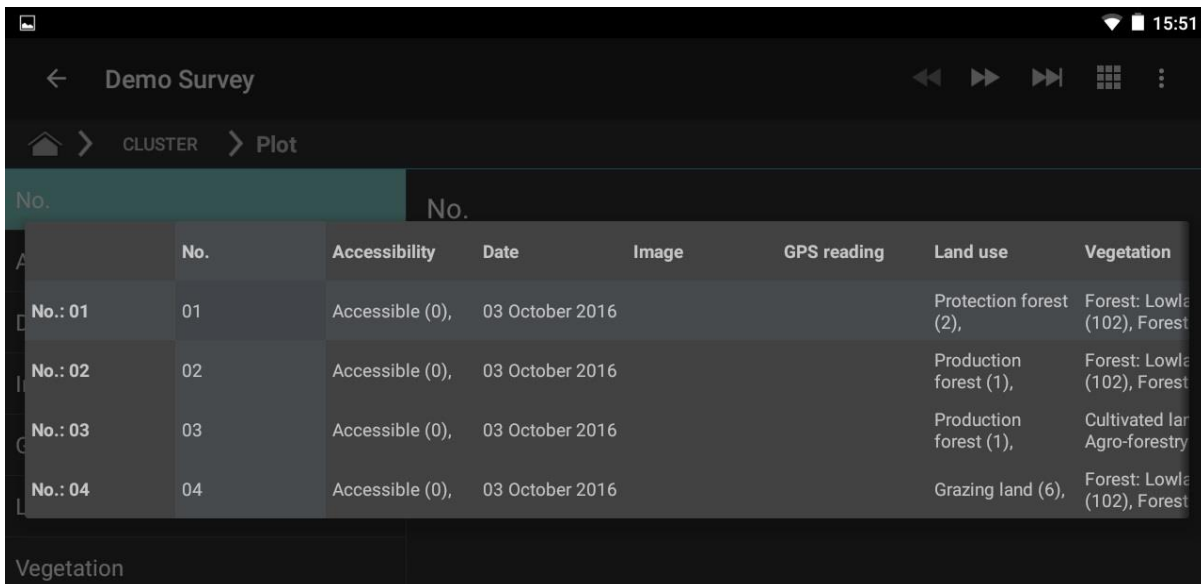
Entity table:
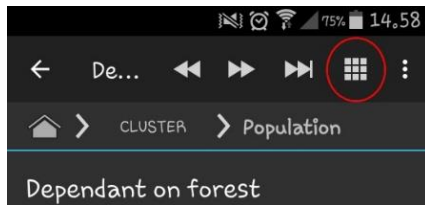
You can view a summary of the survey by clicking on the entity table symbol in the upper right hand corner of your screen. The entity table allows you to quickly see all the input data in the survey and check if something is missing or gives out errors (indicated by the red dot next to the attribute's name). You can move to any part of the survey by clicking on it in the entity table.

The entity table for your current node (child list) is shown on the left hand side of your screen when you hold your device sideways. You can quickly navigate through parents by clicking on them in the upper part of the screen.

3.5 Settings

Click on the menu button and choose settings. Here you can change your working directory (i.e. where data is saved by default), the crew ID (should be done before any data is submitted) and choose whether to use the devices compass. You can also choose between a light and a dark background for your interface. You can also select if you want the system keyboard to appear onto the screen by default, or only when you select an object that supports typing.

3.6 Backups

Once data is recorded in the field, it should be **backed-up** and **exported**.

Throughout the data collection work in the field it is imperative to periodically back up the data. Field crews should be instructed to perform data back up on a regular basis, ideally at the end of each working day.

By default, Collect Mobile stores data on the SD-card. By selecting **Backup**, Collect Mobile automatically transfers the content from the SD-card to the device itself. When prompted to '*Please insert SD card to store backup on*' a second SD card should be inserted in the device, then click 'OK'.

The backup SD card should then be kept safely (in a ziploc bag) and should be used to restore data only in the event of a damage to the original SD card or to the device itself.
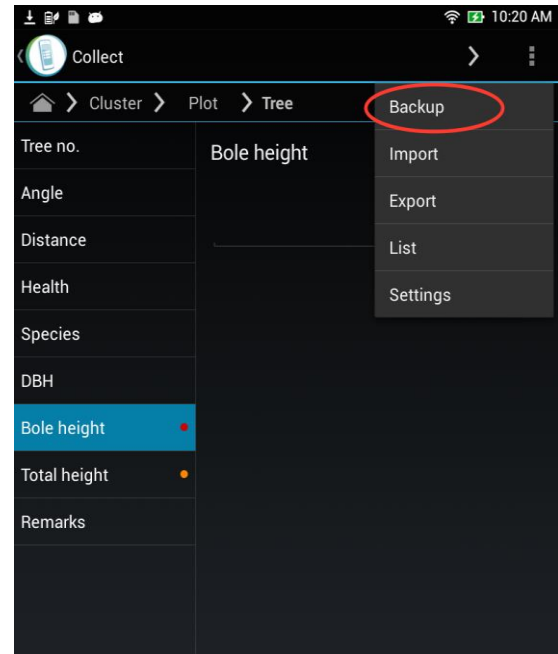

At each backup a new backup file is created containing all data entered up to that moment in time, so each consecutive file will contain additional info and will be bigger. If size becomes an issue, old back-up files can be deleted from the SD card (making sure to keep the most recent one(s)!).

3.7 Exporting data

Collecting Data with OF *Collect Mobile* allows the field crews to transfer data both on-line and off-line. If the logistic is set up in a way that field crew leaders periodically visit the main office or a district office with IT facilities, off-line data transfer can be done by connecting the tablet via cable to a PC or by extracting the SD card from the tablet and inserting it into a PC or via Bluetooth. Of course, one of the advantages of OF *Collect Mobile* is its ability to transfer data to the main office directly from the field, thus saving time and money.

Whichever transfer method is chosen, data export is done by selecting the **Export** button which creates a file named: *surveyname.collect-data(*)*. Collect Mobile will then present a number of options to where the data should be exported to. One way is to export the data file via email as an attachment. Alternatively, the data files can be sent to a cloud storage system (eg. Dropbox, Google Drive). If the latter method is chosen, the archiving system at the central office could be set up in a way that multiple folders are created and each crew is given a link to specific folder.

When you select Export, you are given two optional choices. You can select one or both:
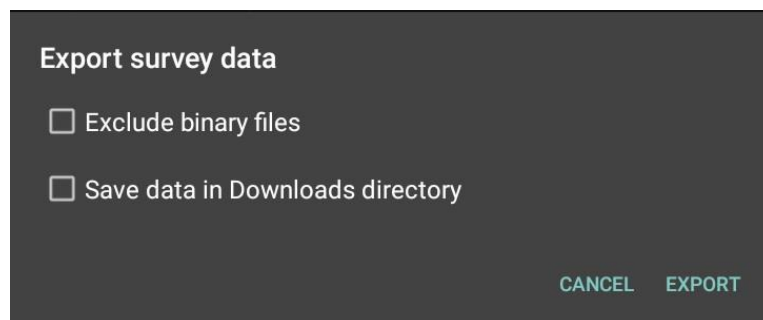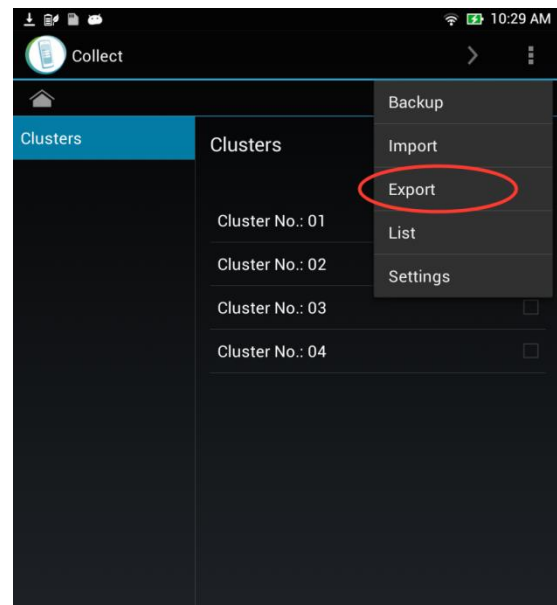
Exclude binary files: Leaves out all non-text files like images. A good idea if connections are slow or storage space limited.

Save data in Downloads directory: Saves the data locally in your device's Downloads directory. A good idea if connections are unavailable. You can also export normally and select a "Save to file.." option, but selecting Downloads saves you the trouble of browsing to the right directory.

A few points to consider:

- Ensure that a **constant contact** is kept between the field crews and the data manager via email or phone.

- Although incomplete records can be sent, it is preferable to remind the field crew leader to **export complete records.** This would facilitate the work of the data manager and minimize the instances in which existing records need to be updated.
- **Photos**: In the majority of the inventories it is requested to take photos to illustrate, for example, reference points and as a support for Land Use classification. The transfer of photos can pose a problem as files size can quickly become unmanageable. According to the logistical arrangement, alternative solutions should be found. Data can also be exported without photos, by selecting "Exclude binary files" when exporting.
- Data files can be exported even if they contain **error** or **warnings**, however field crews should be encouraged to resolve all errors prior to sending data files.

(*) If requested, Collect Mobile can be customized to include other information in the name of the export data files (eg. date stamp, device ID, etc).

4 CONSIDERATIONS FOR BUYING EQUIPMENT

- **Android version -** Make sure the device run an up-to-date android version. The newer, the better. Android 4+ is required.
- **Micro SD card -** Make sure the device has a Micro SD card slot. Open Foris Collect Mobile will by default try to store its data on a Micro SD card. This allows for quick and easy backup while in the field.
- **Screen Size -** A small screen uses less battery and is lighter. On the other hand, there is less screen space, making it harder to collect data. Our recommendation is to use a 7 or 8 inch tablet.
- **Ruggedness -** Using a device with a proper rugged design is of course more durable. The downsides are that they're heavier and significantly more expensive. An option is to use a budget model with a waterproof rugged case (http://ebookfriendly.com/waterproof-tablet-ereader-cases/). The field crews could optionally even bring a backup device. If one breaks, the SD card can simply be moved to the backup device, and data collection can immediately be continued, without any data loss. A third option is to use an already waterproof consumer model with a simpler rugged case.
- **Batteries -** The batteries need to last a full day of data collection. Since Collect Mobile works completely offline and isn't demanding on either the CPU or GPU, the actual battery life will probably be at least as long as specified by the device vendor. This assumes that the device GPS is not used for navigation, only for data collection. Please note that cold weather can significantly cut down battery life. In cases where the field crew doesn't have daily access to the electric grid or a generator, spare batteries need to be brought. We recommend against investing in extra device-specific batteries, and instead use generic power banks. We unfortunately have no experience on how these power banks operate under harsh conditions, so some testing would be advised. Below are some potential options:
  - ✓ http://www.amazon.co.uk/Simian-10400mAh-Resistant-Tablets-Smartphones/dp/B00SR6J7BC/ref=sr_1_11?s=telephone&ie=UTF8&qid=1437468048&sr=1-11&keywords=waterproof
  - ✓ http://www.amazon.co.uk/Amanda-King-Waterproof-External-Battery/dp/B00OB5VF22/ref=sr_1_71?s=telephone&ie=UTF8&qid=1437468114&sr=1-71&keywords=waterproof
  - ✓ http://www.amazon.co.uk/INNORI-22400mAh-Universal-External-Portable/dp/B00HB170VS/ref=sr_1_95?s=telephone&ie=UTF8&qid=1437467815&sr=1-95
  - ✓ http://luxa2.com/Power_Bank_Solution/113/P_MEGA_41_600mAh_World_s_Largest_Power_Station/product.htm

- **Performance** - You can get an idea of the device performance from http://www.androidbenchmark.net/device_list.php. To provide some reference points, here are our experiences with two devices. *Panasonic Toughpad FZ-A1* was usable, but slow enough to impact the user experience. We would suggest using a faster device. *Asus ME173X* provides a good user experience. Any device faster than this will probably be fine. In essence, any newer devices will perform well.
- **Examples of devices** (as of December 2015) **-** Here are three devices in different price tiers, which work fine with Collect Mobile.
    - **Panasonic Toughpad FZ-B2**; ~USD1,300 - A rugged 7-inch tablet http://business.panasonic.com/toughpad/us/rugged-b2-android-tablet-overview.html
    - **Xperia Z3 Tablet Compact**; ~USD500 A waterproof 8-inch consumer tablet http://eshop.sonymobile.com/us/buy/de-xperia-z3-tablet-compact-16gb-wifi
    - **ASUS MeMO Pad 7 (ME176C)**; ~USD200 A 7-inch budget tablet https://www.asus.com/Tablets/ASUS_MeMO_Pad_7_ME176C/specifications/
- **Additional equipment -** You might want to invest in touch screen styluses, especially in colder climates, as most touch screen cannot be operated while wearing gloves.