Isn’t there an App for that?

Smartphone Apps in (marine) resource management

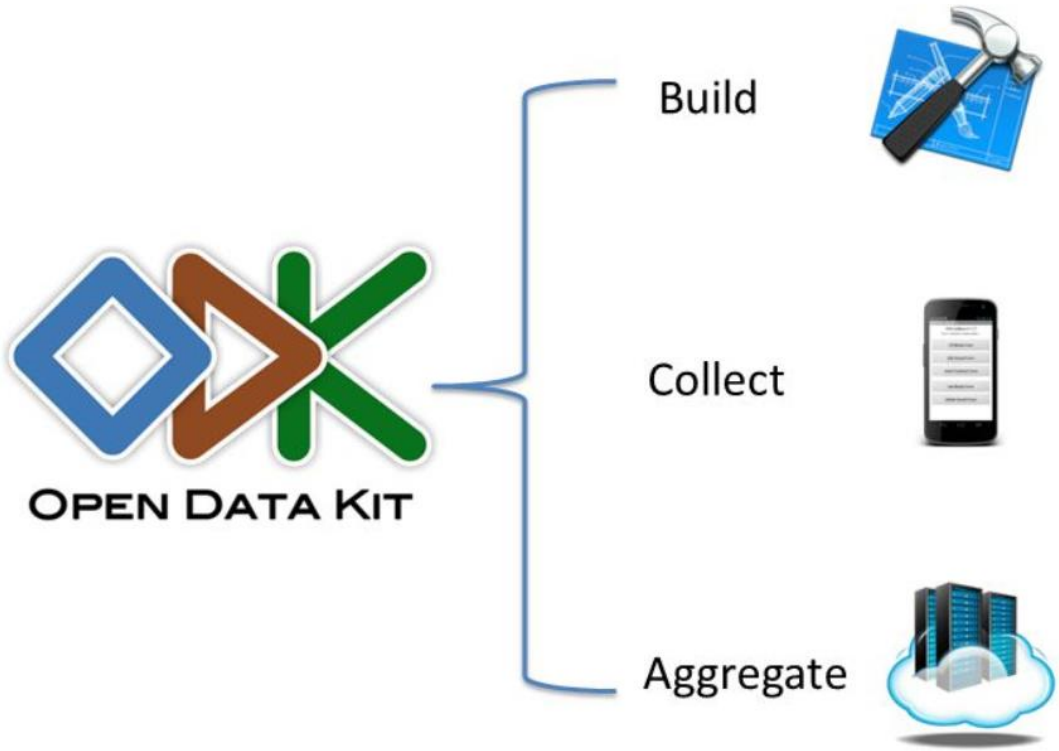
- ✓The spectrum of Smartphone Apps in (marine) resource management
- ✓A guide for App Development
- ✓Open Data Kit for data driven marine management in Fiji as example

3. Open Data Kit for data driven marine management

Further info: macbio-pacific.info/app/

Open Data Kit (ODK)

*free and **open-source** set of tools which help organizations author, field, and manage mobile **data collection** solutions. ODK provides an out-of-the-box solution for users to*



Open Data Kit (ODK)

Build a data collection form or survey (XLSForm);

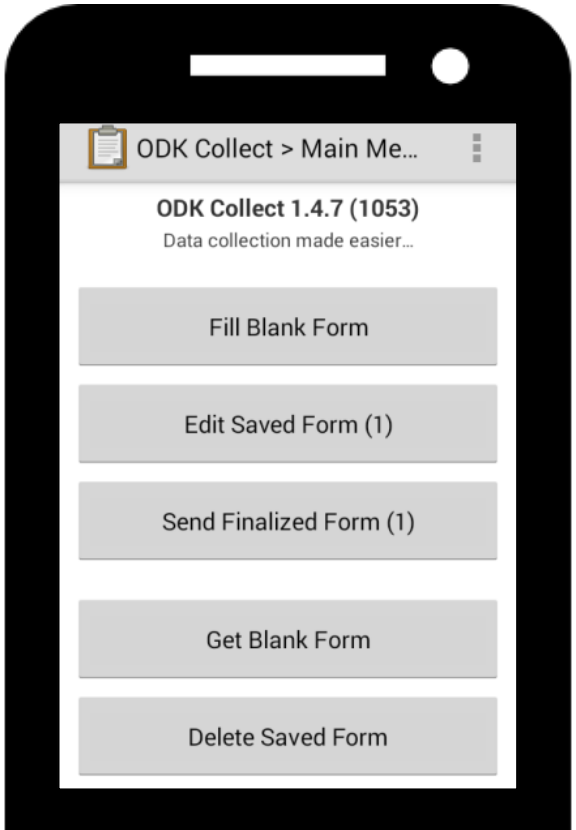
- Multiple Question types, pics, video, geo-location, multiple language
- Offline data collection
- Viewable and editable before sending

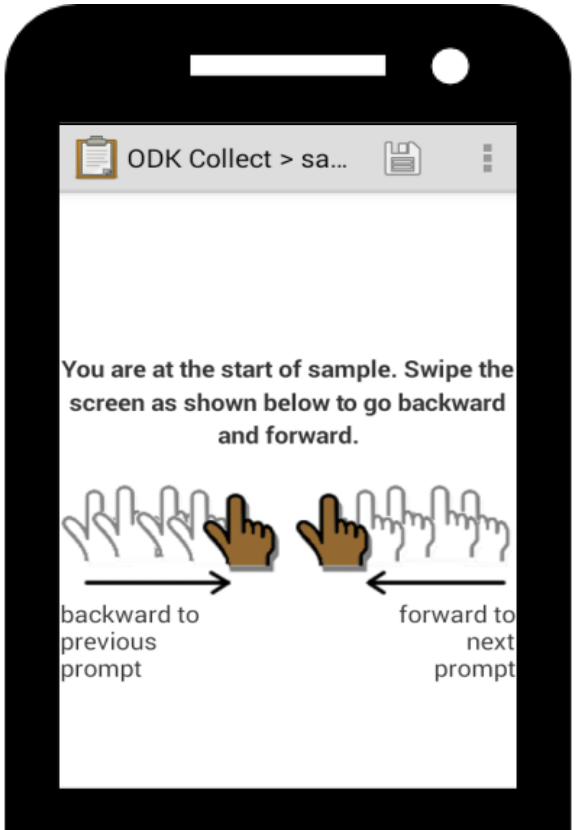
Collect the data on a mobile device and send it to a server; and

Aggregate the collected data on a server and extract it in useful formats

Open Data Kit

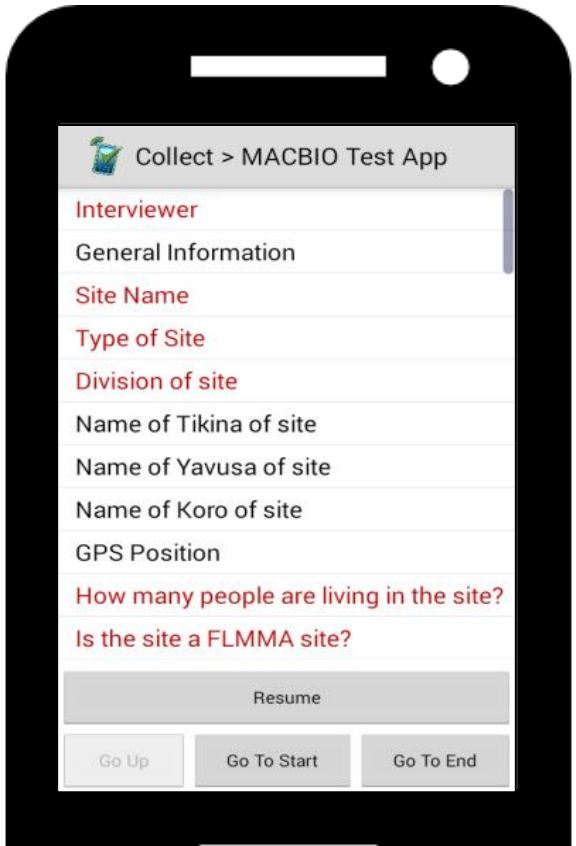
- Adjustable features, including
  - management and editing of saved surveys





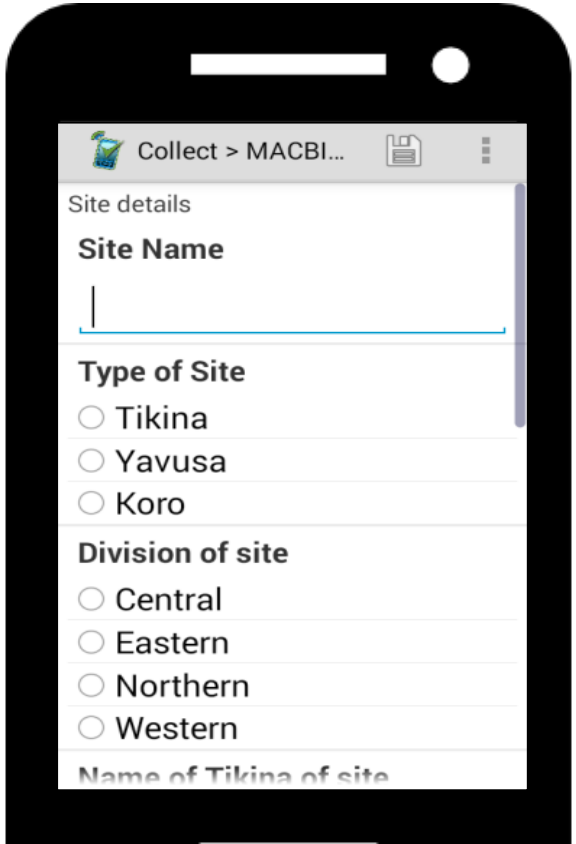
Open Data Kit

- Adjustable features, including
  - survey logic support (only relevant questions are displayed)
  - question overview menu



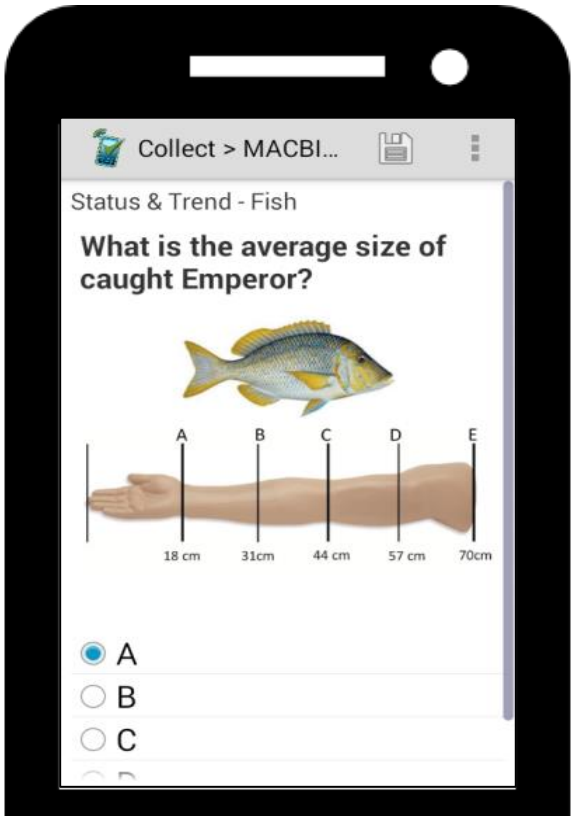
Open Data Kit

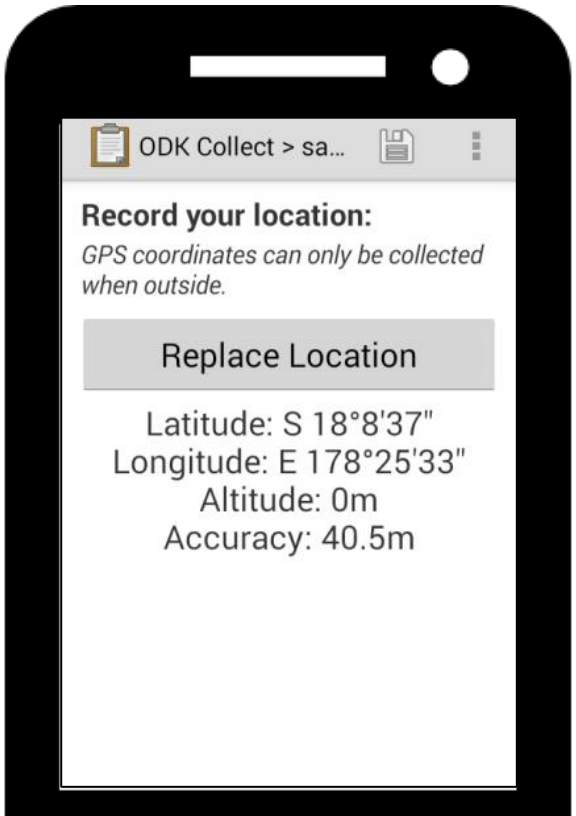
- Adjustable features, including
  - question structuring on one/multiple screens
  - Various question types

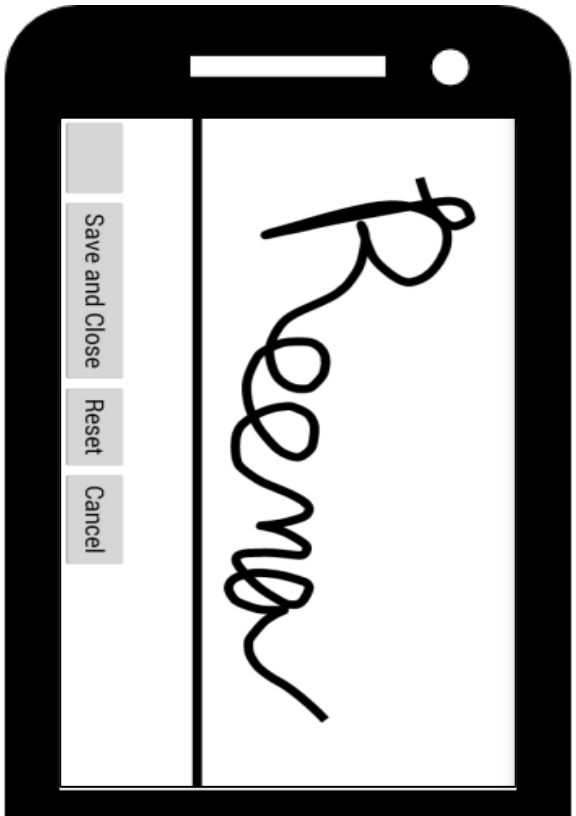


Open Data Kit

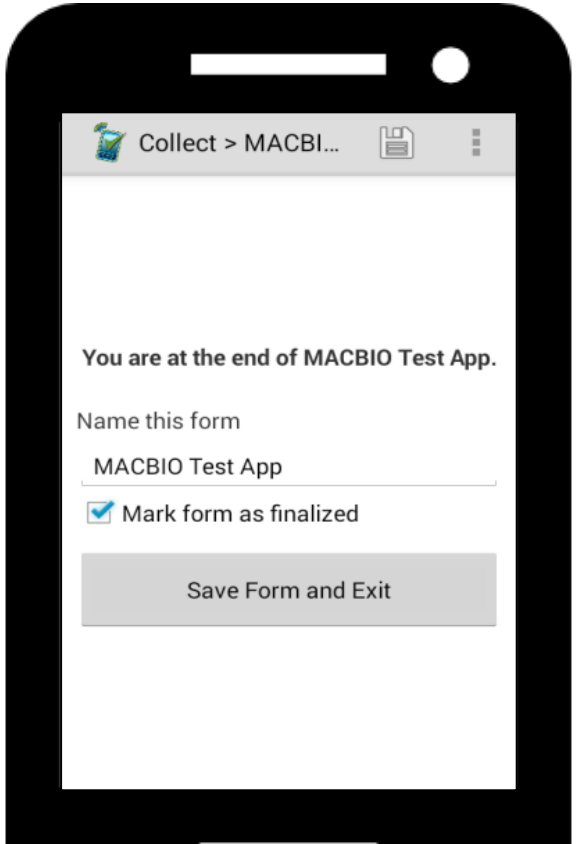
- Adjustable features, including
  - multi-media, GPS and signature support



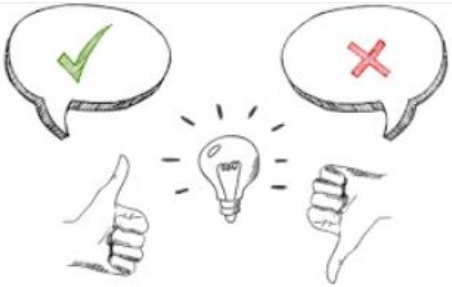




Open Data Kit



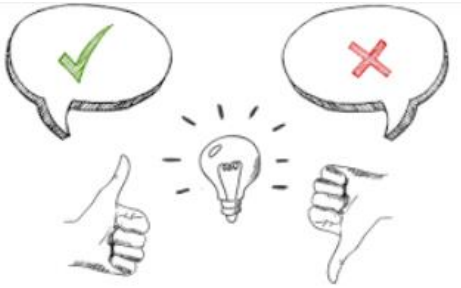
Open Data Kit - **Feedback**



(Avira 2016)

- Advantages
  - ease of use, portability, media support and quick analysis - render it superior to paper based approaches
- Drawbacks
  - Capturing of open ended questions, Water resistance of devices, Limited battery life and availability of electricity, Slow response of older devices or devices with other applications running in the background
- Novelty of the approach, led to slightly higher initial reluctance of a few participants, if not communicated well
- In general the app worked better in interviews with individuals, rather than groups

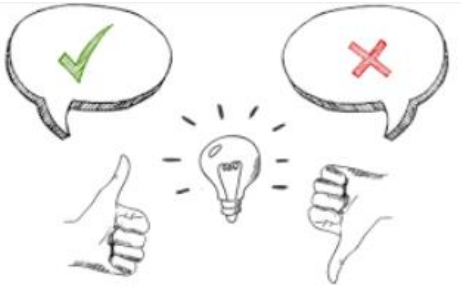
Open Data Kit – **Feedback** (2)



(Avira 2016)

- Field testing and feedback was carried out in an iterative, responsive way
  - Whenever an interview had been carried out, respective feedback was submitted to the central office via a phone call, where it was incorporated into the backend console right away
  - By refreshing the app on the phone, the survey could be continued with the updated questions and survey structure
  - → very efficient and effective, and lead to an increasingly improved app
- Training, tests and iterative improvement should not be underestimated

Open Data Kit – **Feedback** (3)



(Avira 2016)

- Estimated overall time period to implement the described app approach from first discussion to a running system is between 3 and 6 months
- Keeping the approach in house had clear advantages in terms of responsively incorporating feedback and iteratively building the approach
- Also going through the entire process, enabled a deepened understanding to inform thorough documentation of the approach
- While basically no specific IT or app development skills are required, a background and interest in this sector is advisable

Lessons learnt

- **Strategic approach:** Objective and the added value of an app
- **Don’t reinvent the wheel:** Initial market research, discussions with stakeholders and the study of lessons learned
- **Proof of concept phase is important:** Low cost building block systems
- **Devil is in the detail:** User contexts, internet and electricity availability, costs and modalities of data plans etc
- **In house, iterative** approach with quick feedback loops
  - Development step by step with users
- **Open source**, compatible and scalable approaches, to
- **Avoid duplication** of development effort, dependencies & lock in effects
- **Data sensitivity** issues are important to build trust

(Sydney Morning Herald 2016)

Outlook

- 2016 Tropical Cyclone Winston: need of cross sectoral thinking
  - Rapid damage assessment & Post-Disaster Needs Assessments:
    - Lack of available socio-economic & bio-physical data
    - Absence of quick and simple approaches of data collection and the corresponding data base infrastructure
- Country wide app infrastructure was suggested:
  - Every village or even every citizen could with standard app installed on smartphones
  - Specific surveys are uploaded on demand
  - Can speed up coordinated relief efforts dramatically & institutionalize long term data collection, e.g. on reef status.
  - Cooperation with existing networks and stakeholders crucial

Outlook

- Mobile apps can truly add value to management of natural resources, if they are strategically and participatory designed and implemented
- A common vision and standards are of paramount importance beyond sectoral approaches and narrow project foci, to avoid a jungle of overlapping, unused apps.
- More affordable and powerful hardware
- More flexible and open software standards
- Ever increasing internet and electricity coverage and growing familiarity with new technologies in Fiji, Pacific Island countries and the entire developing and industrialized world…

ODK - Further Reading

- DOHERTY, J. 2013. Open Data Kit ODK - MOBILE MEETS THE CLOUD - An Exploration of the Open Data Kit. Available at: http://opendatakit.org/wp-content/uploads/2013/04/CALGIS-Mobile-Meets-the-Cloud.pdf
- ODK. 2016a. Open Data Kit – Short explainer video Available at: https://youtu.be/HqqUdfz9Uyc?t=2m33s

MACBIO

Open Data Kit - KoBo Toolbox

KoBo Toolbox

MACBIO

KoBoToolbox

MacArthur Foundation

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TIDES
WHAT'S POSSIBLE

Conrad N. Hilton
FOUNDATION

FIDELITY FOUNDATION

CISCO

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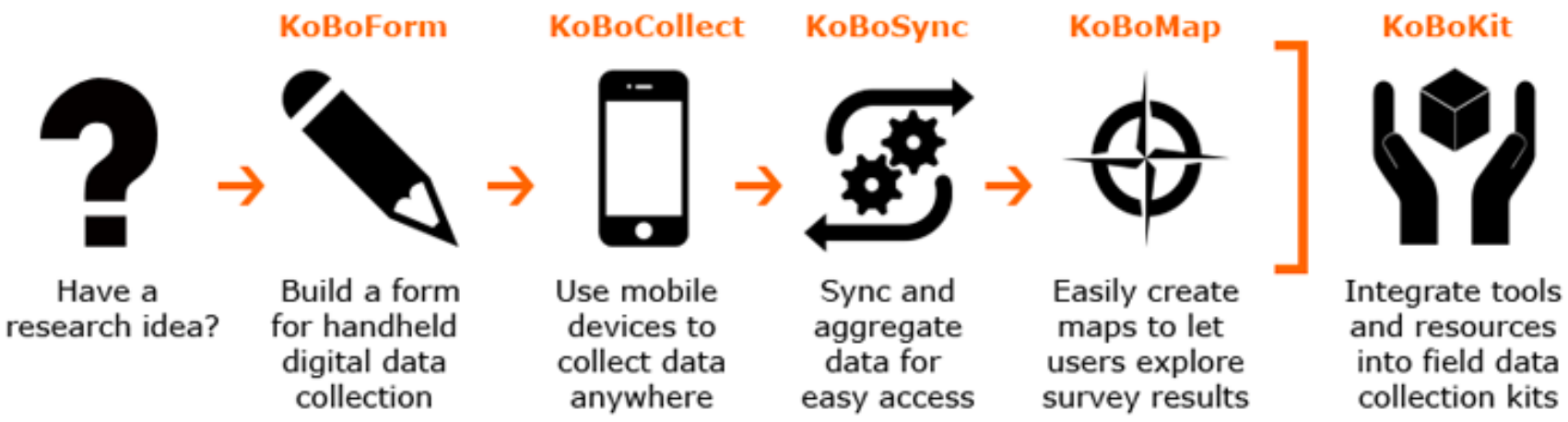
KoBoToolbox



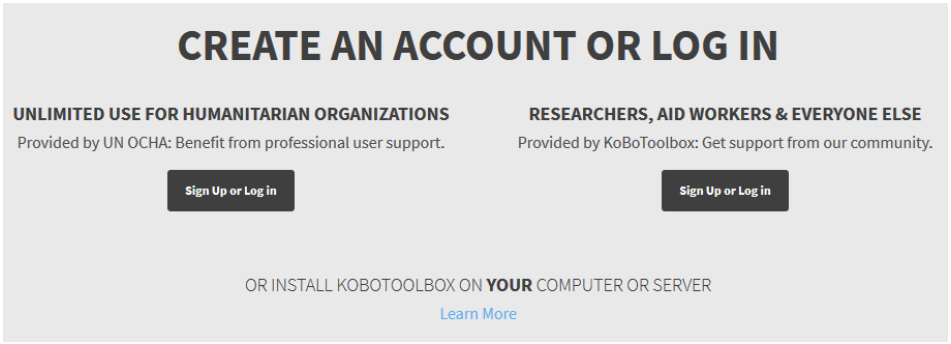
KoBoForm

Build a form for handheld digital data collection

Build a Form

- **Sign up and first login**

  - Visit https://kf.kobotoolbox.org and create a new account.
  - After activating your account through the link that was sent to you, you can log in to access your account.

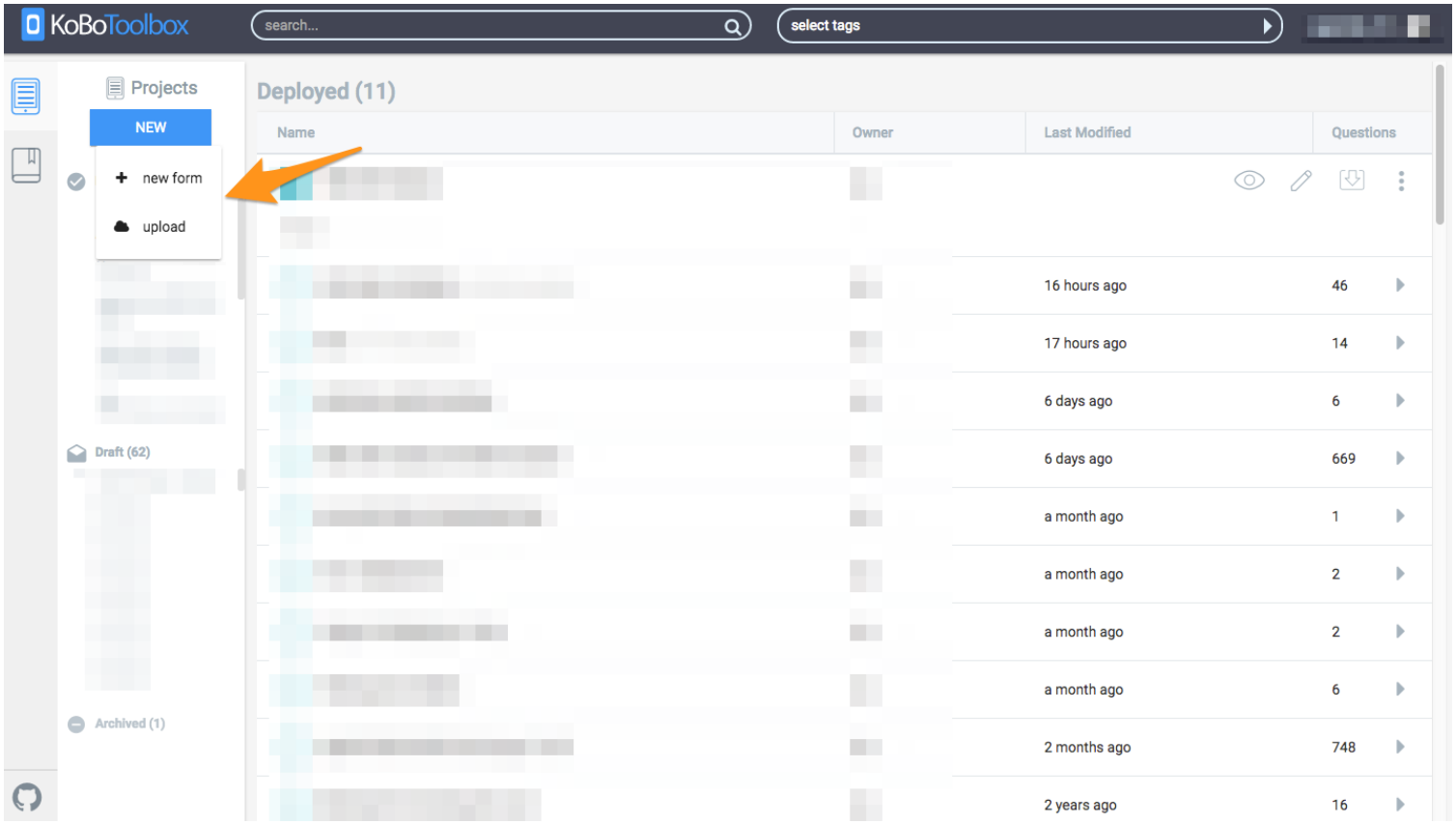


KoBoForm

MACBIO

Create your first form

- You can create your first form by clicking on New, then choose New Form.

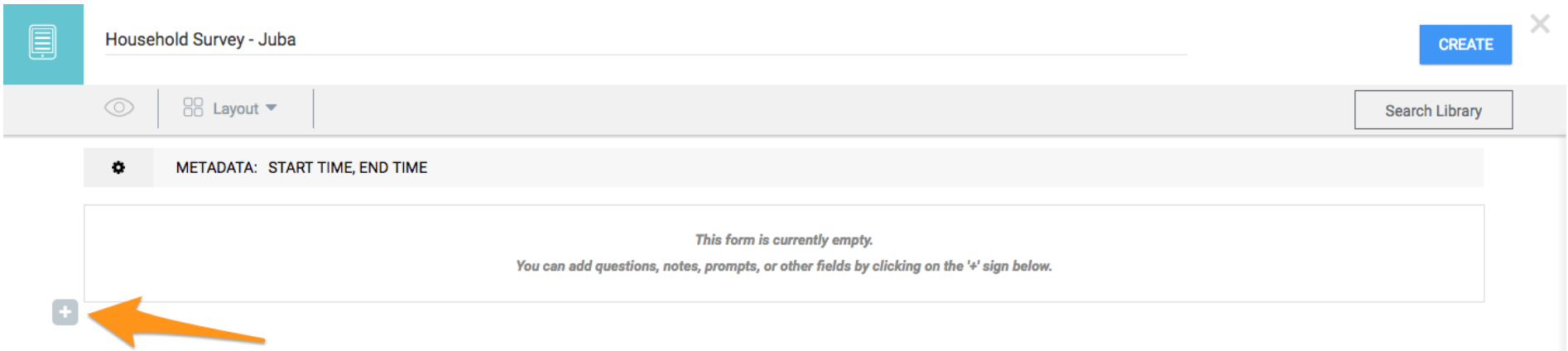


KoBoForm

MACBIO

Create your first form

- Click on the + button to add your first question.

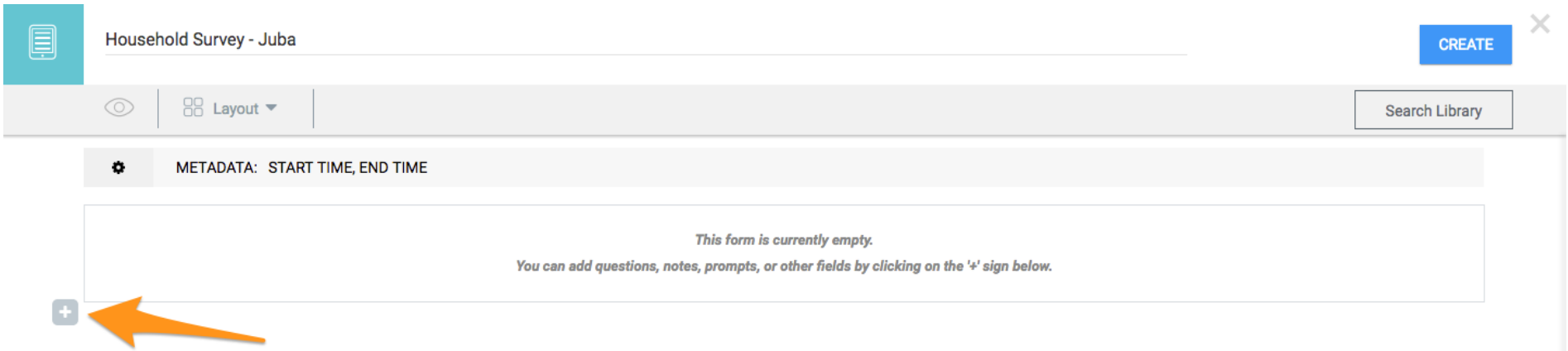


KoBoForm

MACBIO

Create your first form

After typing in the question label, click Add Question and choose a response type.



KoBoForm

MACBIO

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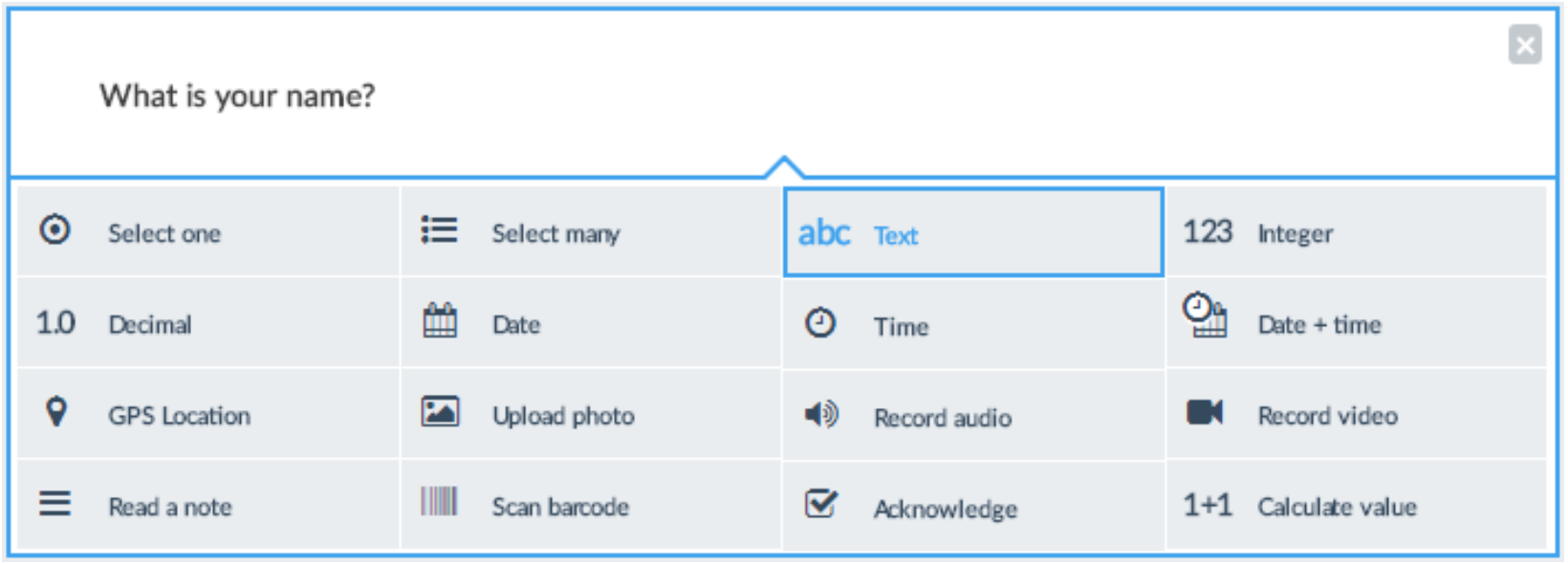
- After typing in the question label, click Add Question and choose a response type.



- You can give your form a name by changing the default 'New form' text on top.

KoBoForm

MACBIO

Create your first form

- To add skip logic to a question, click on a questions settings and go to the Skip Logic section.

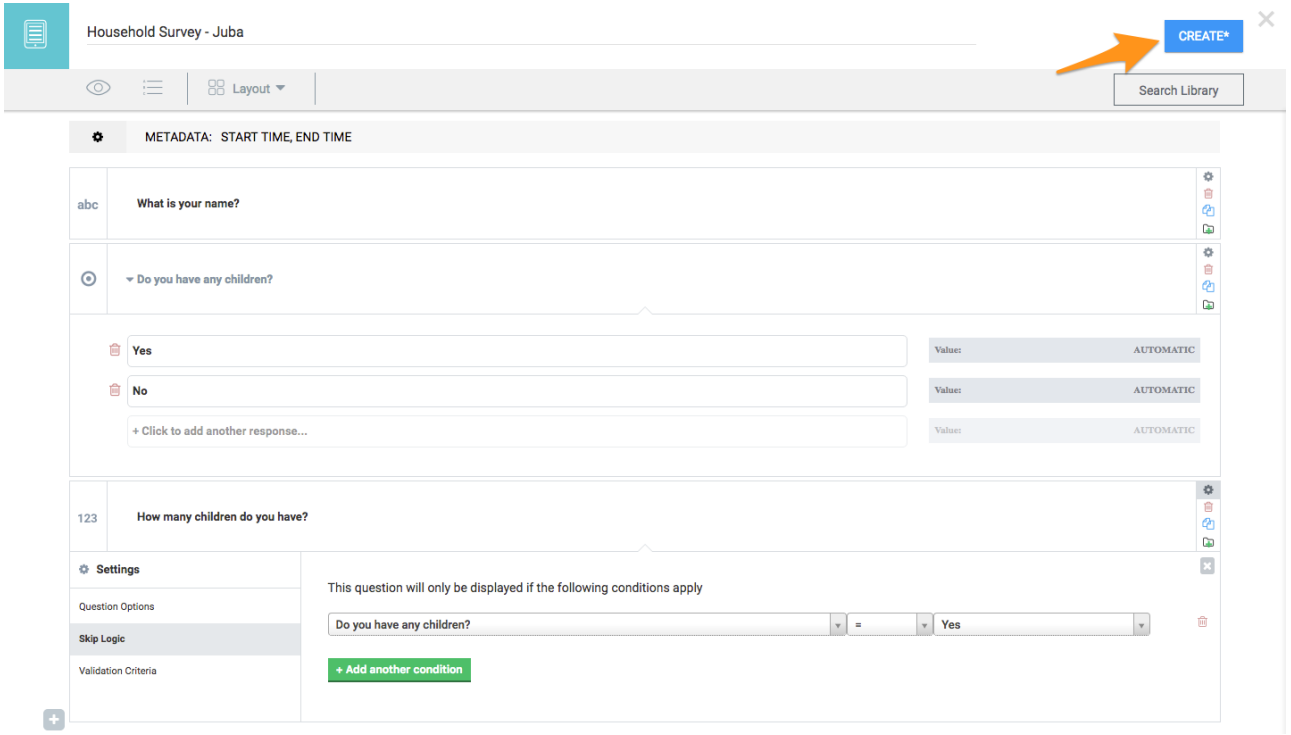
(See here for an overview of all formbuilder functions.)

KoBoForm

MACBIO

Create your first form

- Click **Preview Form** to quickly view your questions and test skip logic.
- To save the form click the Create/Save button, then 'X' to close the form.

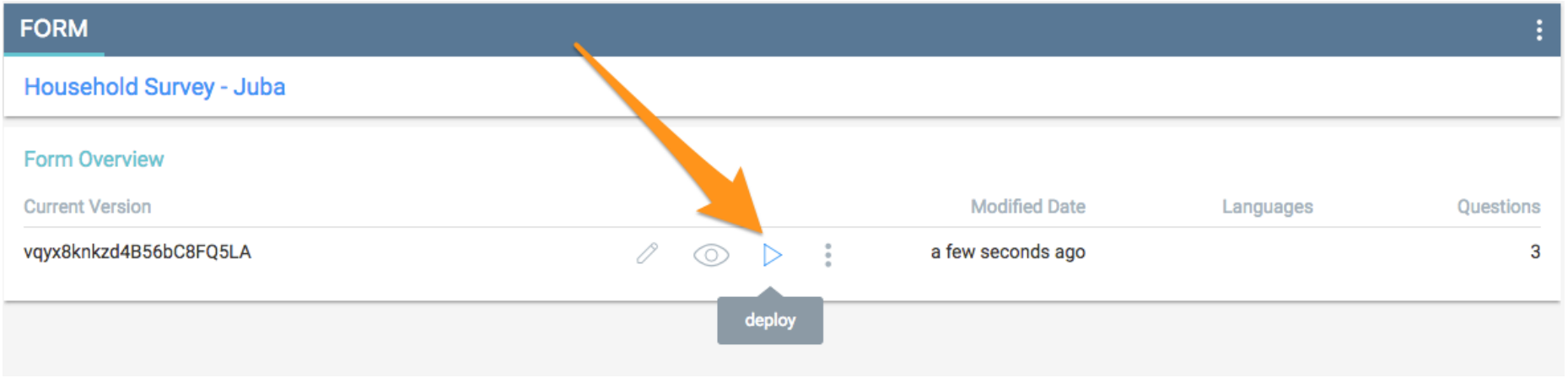


KoBoForm

MACBIO

Create your first form

- To start collecting data you need to first **deploy your draft form as a new data collection project**.



MACBIO

Create your first form

- You're ready to collect data! You can enter data in the browser on any device (computer, iPhone, Android) or use our Android application KoBoCollect.

KoBoForm

MACBIO

Forms (advanced)

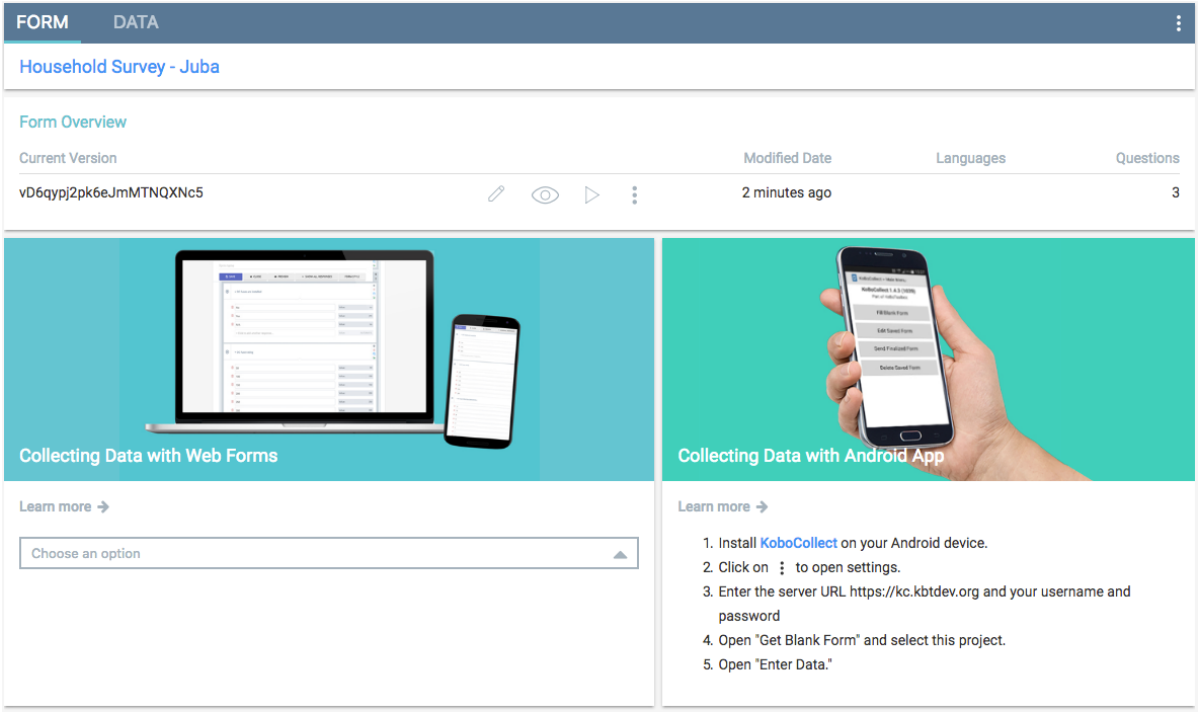
- Adding Questions from the Library
  - Questions that have previously been added to the library can be added to any other form by moving them over from the Question Library sidebar.
- Adding Another Language to Your Form
- Limiting Responses with Validation Criteria
  - To avoid accidental or invalid answers
- Grouping Questions and Repeating Groups
  - Groups are collection of one or more questions inside a form
- Include Responses Inside Another Question
  - You can include the response of one question (such as the answer "41" to the question 'How old are you?') inside the label of another question.

KoBoCollect

Use mobile devices to collect data anywhere

Overview on Data Collection Tools

- KoBoToolbox allows data collection in multiple ways.
  - KoBoCollect as the tool of choice for Android devices
  - Web Forms (Enketo) for collecting data on all other devices (including iPhones, iPads, or any laptop or computer)



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MACBIO

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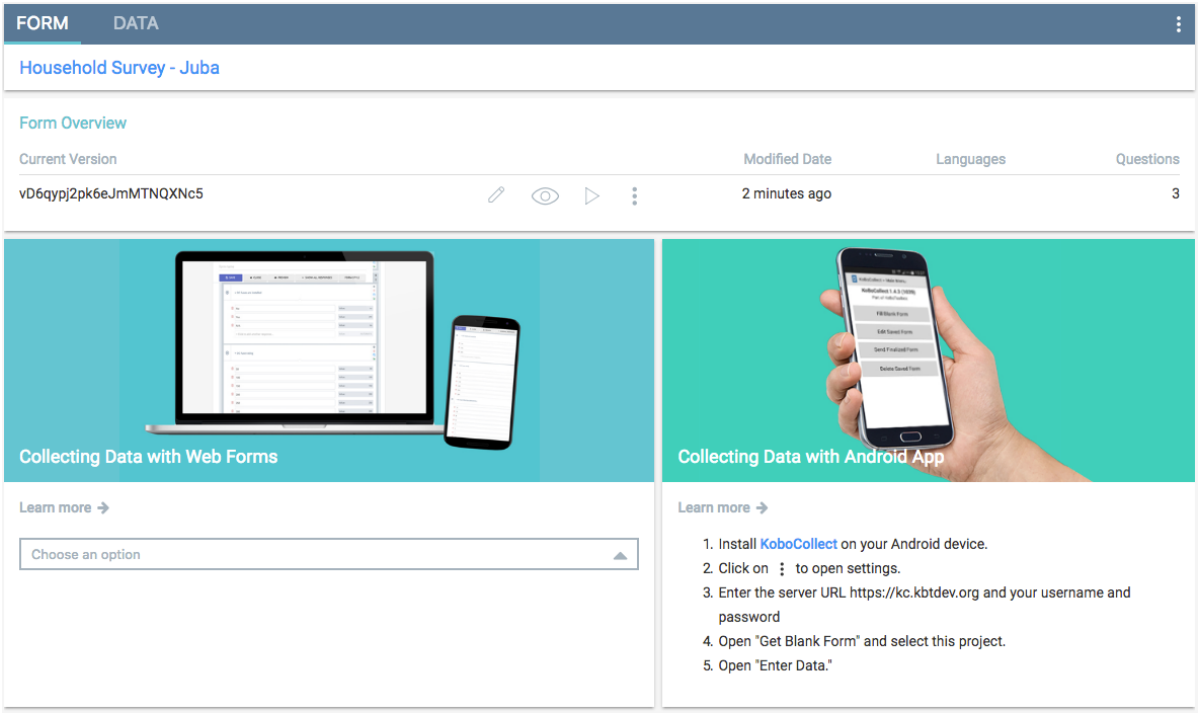
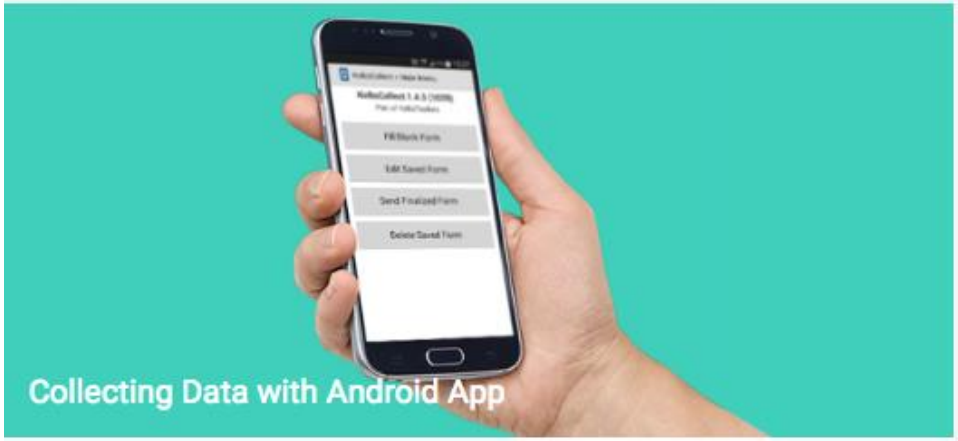


Collecting Data with KoBoCollect on Android

- KoBoCollect is an Android app that can be installed on any modern Android device.

Google play

KoBoCollect

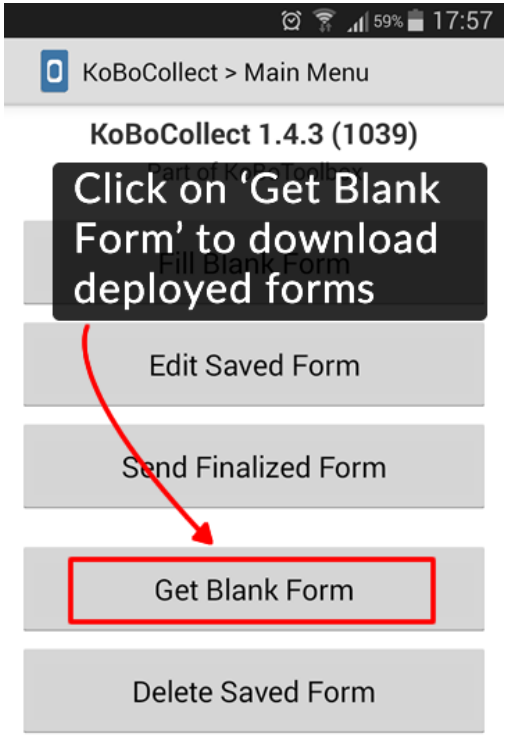


Server URL set up

- After installing KoBoCollect, configure it so that it can be used together with your KoBoToolbox account for data collection. These instructions are also listed on the Form page after you have deployed your project.
- Install KoboCollect on your Android device.
- On your Android device, open KoBoCollect and open the General Settings (this may be in the top right of your screen, the bottom right, or a button in the center bottom - depending on your Android version)
- In General Settings, under URL, enter the server URL https://kc.kobotoolbox.org
- Still in General Settings, enter your username and password

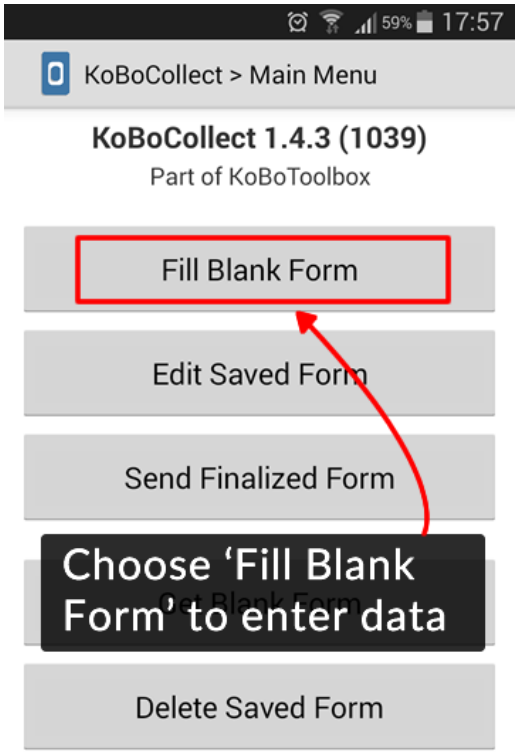
Download forms from your account

- Make sure you are connected to the Internet on your device. Also, you need to have deployed at least one project in KoBoToolbox.
- On the home menu of KoBoCollect, click Get Blank Form
- A list of all your forms from your different projects will be shown. Click Toggle All (or select the ones you wish to download), then click Get Selected.



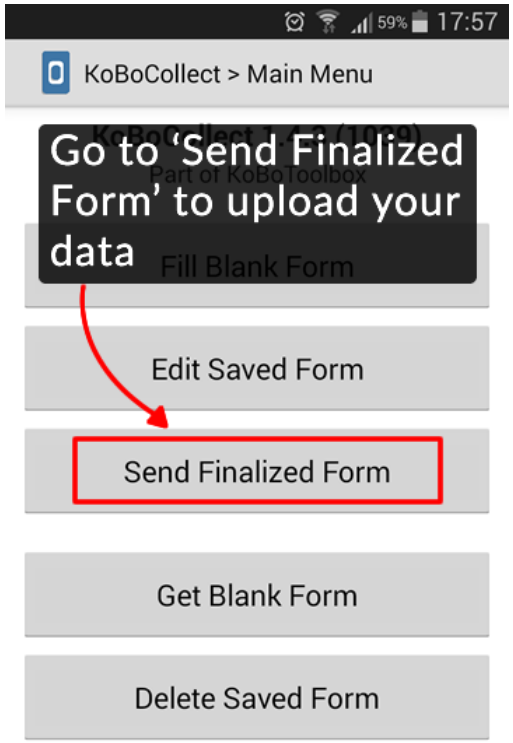
Collect data

- Click on Fill blank form
- Select the form to which you would like to enter data
- Go through all the questions (swiping your finger from right to left)
- At the end click on Save Form and Exit (making sure the form is marked as 'finalized')



Uploading finalized data

- From the home screen, click on Send Finalized Form
- A list of your most recently collected forms appears.
- Click Toggle all (or select the ones you wish to send), then click Send Selected.



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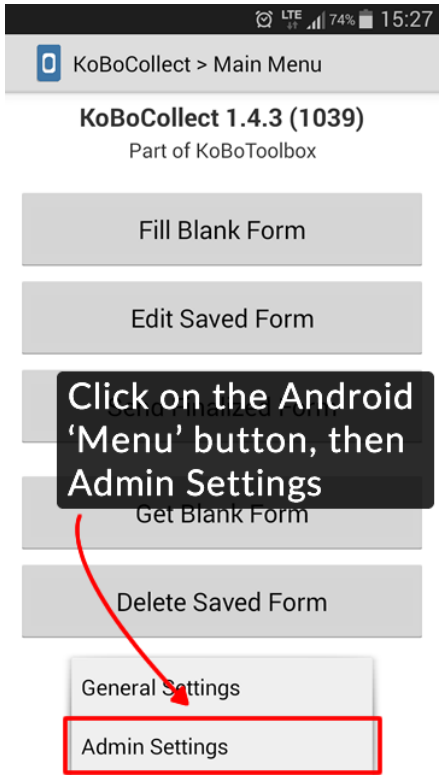
Collecting GPS Locations

- **The time it takes for a device to determine its GPS coordinates varies strongly and may depend on:**
  - The quality of the GPS sensor
  - The last time since the device had last determined its GPS location
  - Cloud cover
  - Buildings or other structures obstructing view of the sky
- **To obtain a GPS signal you should be outdoors with good visibility of the sky. To get a strong GPS signal:**
  - Stand as far from buildings, trees, or other structures as possible
  - Make sure your body isn't obstructing view of the sky
  - Get an initial GPS location at the beginning of the day before starting to collect points in the field
  - Enable A-GPS (data-network assisted) on your device

Hiding buttons and options

You are able to hide many of the buttons available in KoBoCollect.

- On the home screen click the Android menu button
- Choose Admin Settings
- Select the buttons you would like to hide from the different screens. If you set an admin password, your interviewers won't be able to access the Admin settings to ever get access to these buttons.



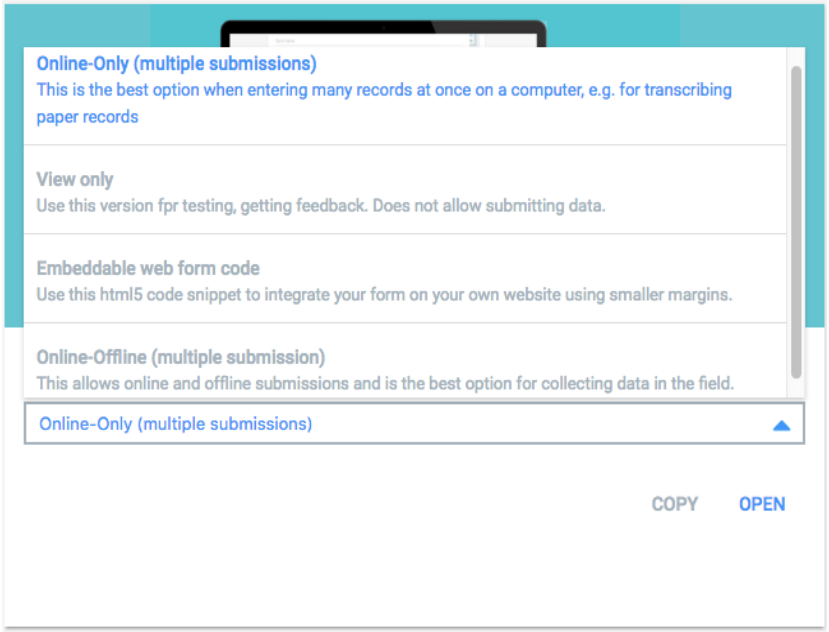
KoBoCollect

Collecting Data through Web Forms

MACBIO

Collecting Data through Web Forms

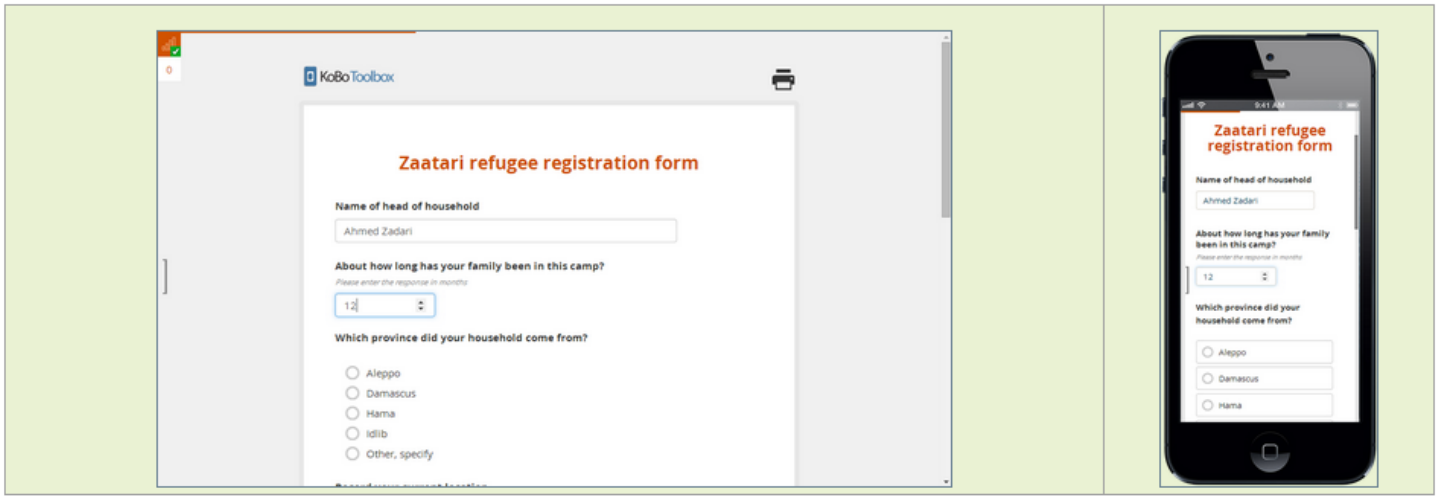
- **Online-Only**
  - using web forms on your computer
  - E.g. testing purposes or transcribing data from using paper forms.
  - Just select the item in the dropdown and then click Open to start entering data.
- **Offline-Online**
  - To collect data on a mobile device in the field or any device that will not be constantly connected to the Internet
- To send the URL by email just click Copy and paste it into an email or social media message.



MACBIO

Collecting Data through Web Forms

- To collect data using a mobile device, you need to copy the URL of your webform to your mobile device.
- You can simply send it by email or text message to any device.
- To obtain the URL of the webform, click either the 'Enter data in browser' or 'How to collect data on mobile device' buttons.

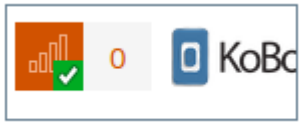


MACBIO

Collecting data offline

- also possible to collect data while you are offline. However, it is essential to visit the URL once before going offline, and then saving it on the device (for example with a bookmark on the mobile browser).

  Once your form has been fully loaded and cached, you'll see the offline availability icon (empty "signal bars" and a check mark) in the top-left corner indicating that you can access the form offline until your browser's data has been cleared:



- Enketo will display your form afterwards even without any Internet connectivity, and it will store and queue your data until you are online again.

MACBIO

KoBoToolbox on Your Computer (ADVANCED)

- If it is not possible to connect a handset to the Internet at all (the interviewers can't move into an area where a connection is available), then it is also possible to transfer survey data from KoBoCollect through an external tool (ODK Briefcase) and by connecting the mobile devices by USB cable to a local computer. For more details about how to use ODK Briefcase to transfer data, read this post. After this is it possible to upload the survey data from a centralized computer to the KoBoToolbox server, using the same tool.

- Finally, it is also possible to install KoBoToolbox on a local computer, e.g. a laptop, and then connect local mobile devices through a local WiFi to the computer. This WiFi does not need to be connected to the Internet as there would be a direct connection between the mobile devices and the local computer. See here for finding out how to install KoBoToolbox on your computer.

KoBoSync

Sync and aggregate data for easy access

MACBIO

Analyze and Manage Data

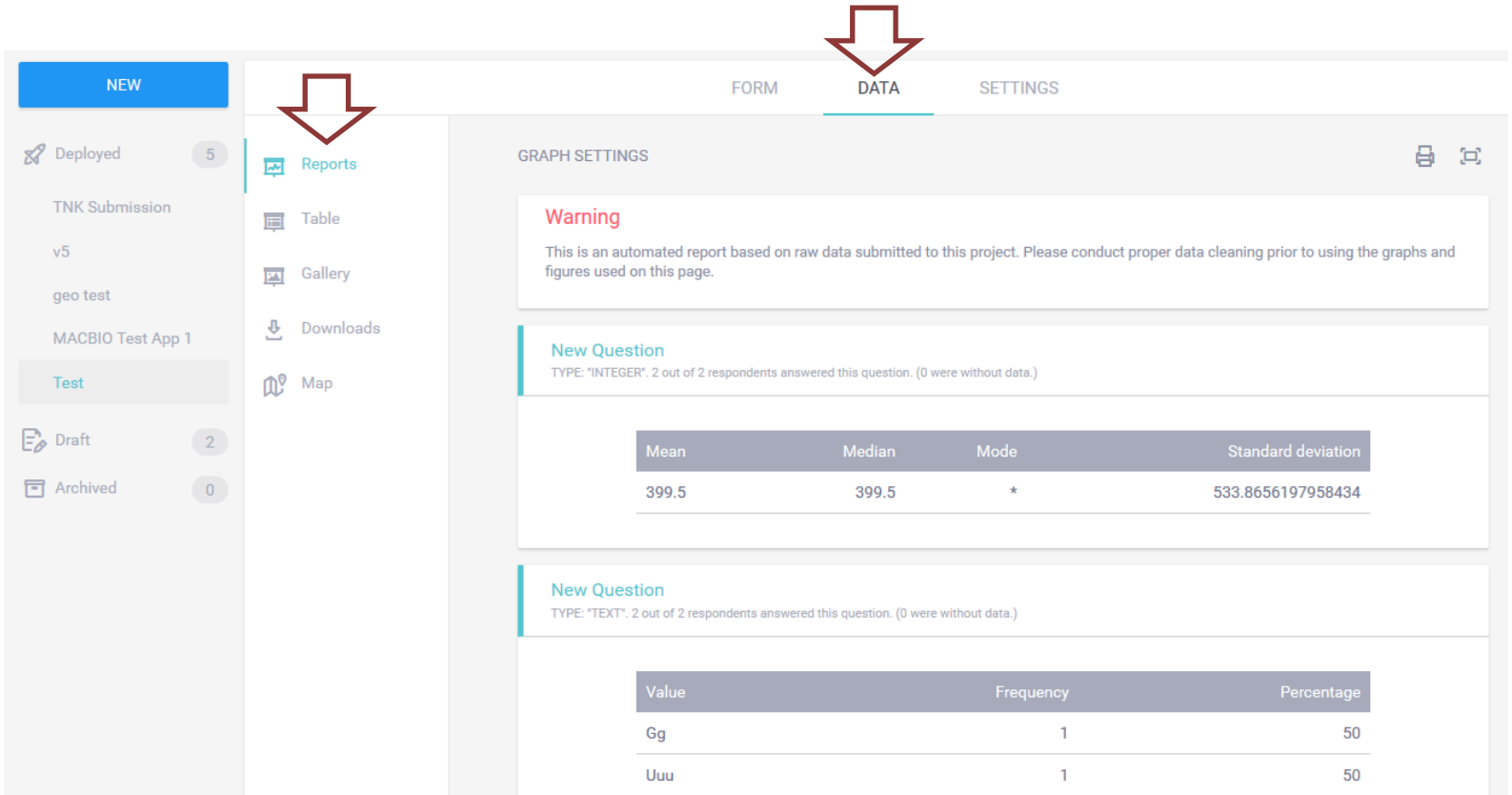
- Inspect your data moments after it was collected - or download it for advanced analysis in other software. KoBoToolbox includes simple tools for creating tables, summarizing indicators - and of course a map showing all of your collected GPS coordinates.
- **Quick Analysis**
- **Downloading data**
- **Mapping**

KoBoSync

MACBIO

Quick Analysis

- **Report**: Summarize using simple frequencies or calculating averages (mean, median, and mode)
- **Table**: Create summary tables for all indicators without having to download the data
- **Gallery**: View collected pictures and other media



KoBoSync

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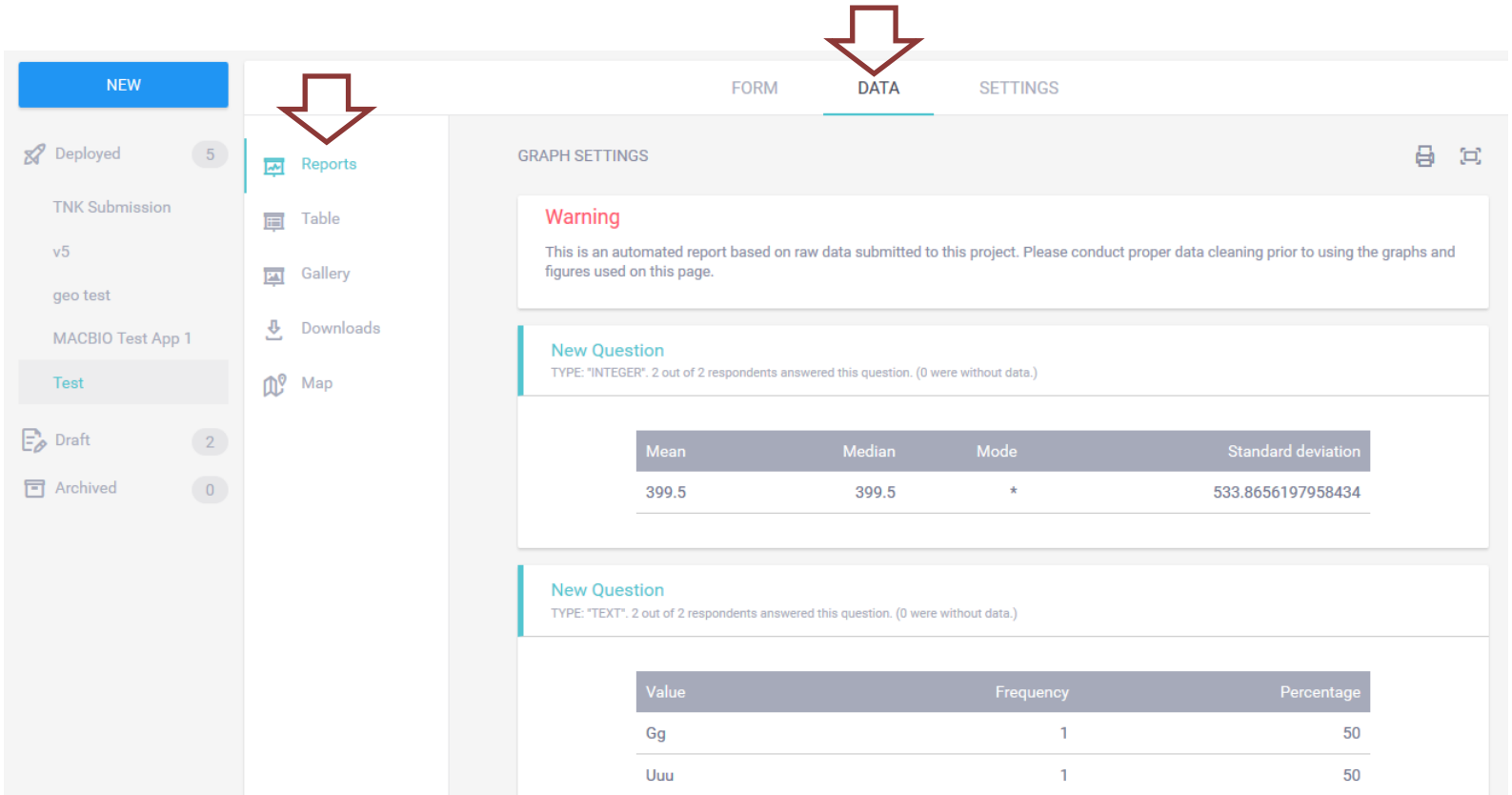


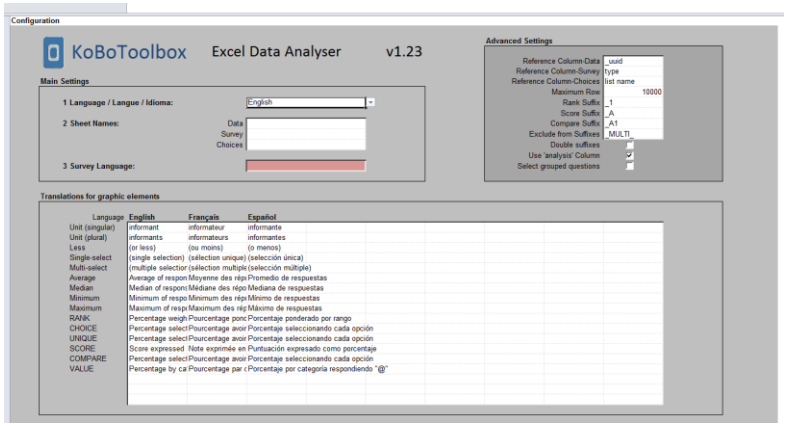
Further Analysis

Using the Excel Analyzer

The Excel Data Analyser was developed by the UN Office for the Coordination of Humanitarian Affairs (OCHA). It allows to rapidly analyze data collected through KoBoToolbox in Excel - using the labels included in the form (including multiple languages) and featuring many kinds of analysis tools for Select One, Select Multiple, Integer, Text, and other questions types.

Documentation

A full documentation of the tool is available from OCHA on the [Humanitarian Response website here](), in English or French.



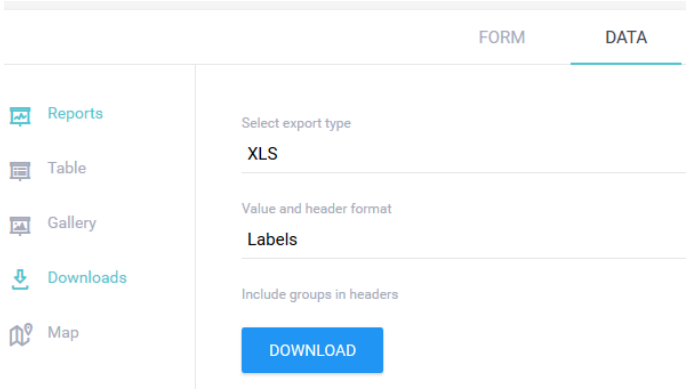
KoBoSync

MACBIO

Exporting and Downloading Your Data

You can download your data in multiple formats. As soon as any data has been collected, the following formats are available for download:

- XLS (formatted spreadsheet)
- CSV (comma separated values)
- ZIP (a zip folder of your photos, videos, or sound recordings - if applicable)
- KML (a file containing all the GPS points collected - if applicable)



- Download all collected media (images, videos, sound recordings) as a ZIP file
- Data can also be accessed by other means through a robust API

(Application programming interface)

KoBoSync

Sync and aggregate data for easy access

Exporting and Downloading Your Data

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Downloading photos and other media

If your form includes a photo, video, or sound recording question, these files will be uploaded to the server along with your other data. When exporting your dataset to XLS or CSV these files will include references to the filenames of the media attachments, but not the files themselves. To download your media files choose the ZIP option under 'Download data'.

http://support.kobotoolbox.org/customer/en/portal/articles/2477543-advanced-features

KoBoMap

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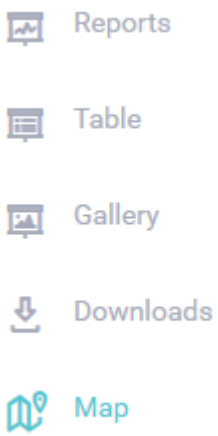
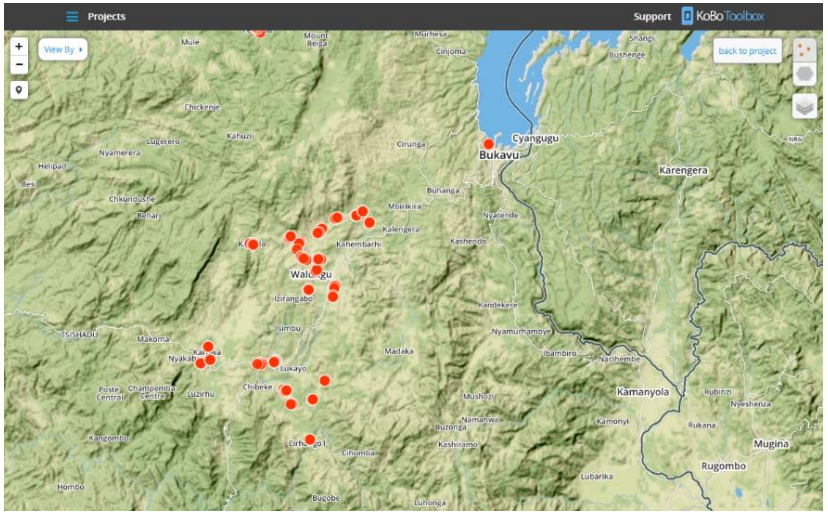
Mapping, sharing, and exporting GPS data

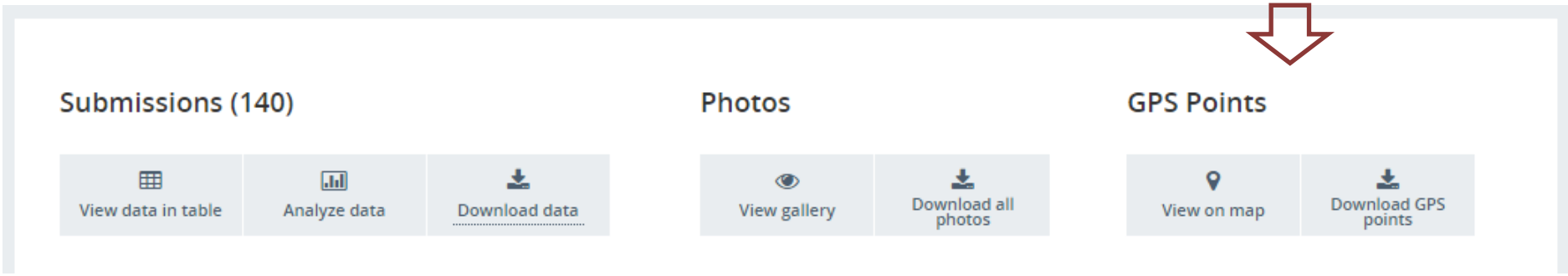
- **Mapping**
  - Immediately see colected points
  - Disaggregate data points by survey responses (such as gender or education level)
  - Download all GPS points as KML file to integrate into other software





Mapping, sharing, and exporting GPS data

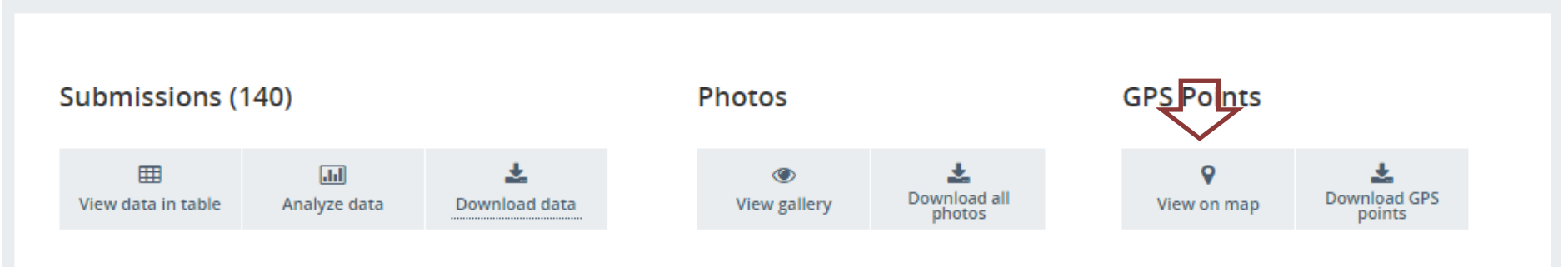
- Your project may include a one or more GPS questions in its form. KoBoToolbox will include the GPS data (latitude, longitude, altitude, precision) in the dataset that can be downloaded as XLS or CSV. It is also possible to view the GPS coordinates on an online map and to download the points as a KML file for use in other applications.
  - **Option 1 - View GPS points online**
  - **Option 2 - Download GPS**
  - Both of the following options only appear if your form has any GPS questions *and* has submissions with GPS coordinates.



KoBoMap

Mapping, sharing, and exporting GPS data

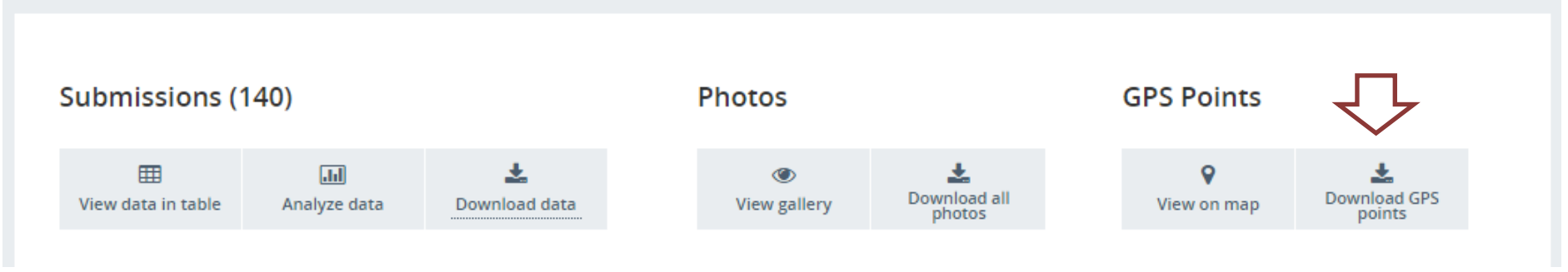
- **Viewing your GPS points**
  - **Option 1 - View GPS points online**.
    - button **View on Map**,
    - see the submissions based on certain question responses
    - you can also disaggregate by question responses, such as displaying male and female respondents, or other types of responses where a simple geographic distribution might be interesting.
    - choose between the layers on the right of the screen, such as Google Satellite or Cloudless Earth.



KoBoMap

Mapping, sharing, and exporting GPS data

- **Option 2 - Download GPS** points as KML.
  - Click on the button Download GPS Points. This will start a new export process with the latest data.
  - Previous exports will be listed by their creation date, allowing you do see snapshots of GPS coordinates at various points in time.
  - KML files can be imported in a variety of software, including Google Earth, Google Maps, or professional GIS software such as ArcMap.



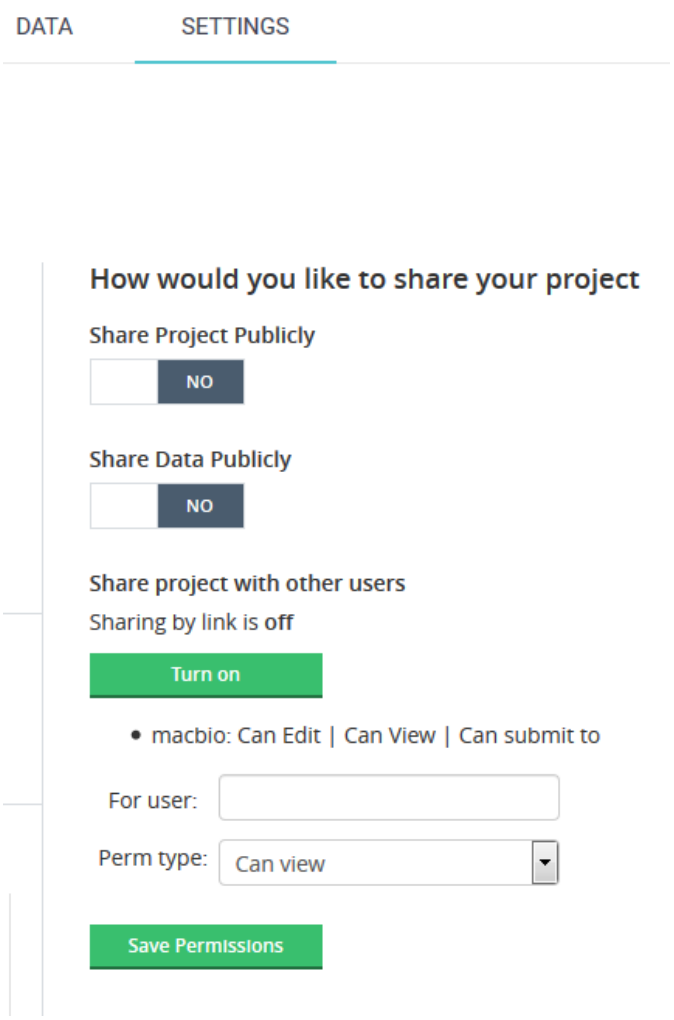
Mapping, sharing, and exporting GPS data

- **How to share map data**
  - You can share a map with others is to go into your Project's Settings and enable Share Data.
  - This means that anyone can view your data - i.e. in map, table, or file download format.
  - They won't be able to edit anything, which would require giving Can Edit permissions to a particular user.
  - After this you can send the URL of the map (see above).

KoBoKit

Managing permissions

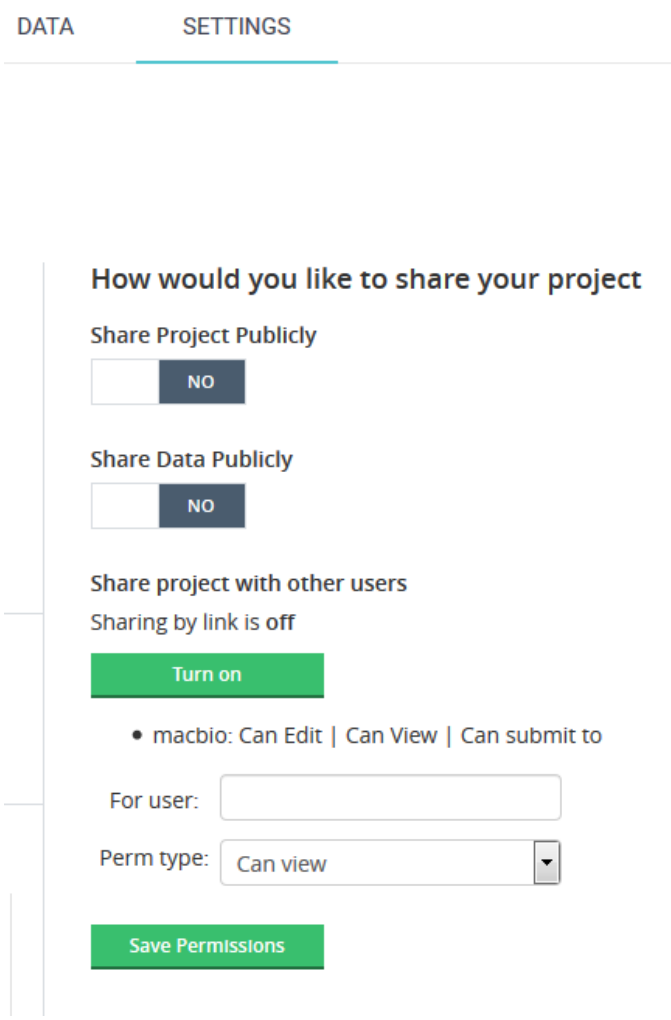
- KoBoToolbox allows giving different permission levels to a data collection project.
- While most users may only use a single user to manage, access, and enter data for a given project, sometimes more complex scenarios require different levels of access.



KoBoKit

Managing permissions

- **Setting Project-specific user permissions**
  - To control Project permissions go to the Settings box in your data collection project, enter the username of the user who should get new permissions, select the permission level, then click Save Permissions. The three available permissions are:
    - Can view (access data collected)
    - Can edit (make changes to the collected data or the project description, which includes viewing permissions), or
    - Can submit to (only collect data but not see results). Can submit to can be combined also with viewing or editing privileges.



KoBoKit

MACBIO

Managing permissions

Assigning 'Can Submit To' rights for specific users

- You might want to use one or more users other than your own account to collect data.
    - For example, you created a form and project but have three enumerators in the field, who should only be able to submit data but not access the collected information.

http://support.kobotoolbox.org/customer/en/portal/articles/2103898-managing-permissions

KoBoKit

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Data Security

- Server instances KoBoToolbox by HHI
  HHI hosts data with Amazon Web Services (AWS)
- physically located in the United States of America. AWS security information can be found on this page.
- Once your data is received on the server it is stored in accounts protected by usernames and passwords.

Hands on!

- Create a form with KoBo Toolkit that collects at least
  - a geolocation
  - a photo
  - free text
  - a multiple choice answer
- Collect at least 4 data points using the form in
  - the android app AND
  - a webform
- Quickly analyse your data
  - As a report
  - On a map
- Export your data
  - As xls
  - Zip AND
  - KML

KoBoForm

KoBoCollect

KoBoSync

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Further Info

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