

Training Course on Mobile Data Collection Using Open Data Kits (ODK)



Venue: The University of Nairobi Dates: 11th - 13th September 2019

Training organised jointly by the University of Nairobi's Institute for Climate Change and Adaptation and the African Conservation Centre.

Report prepared by the DCP Kenya team, Institute for Climate Change and Adaptation and the African Conservation Centre, Nairobi, 23rd September 2019 The Development Corridors Partnership is a research and capacity building collaboration among institutions from China, Kenya, Tanzania, and the UK. Its main purpose is to deliver effective research and build capacity so development corridor decision-making can be based on sound scientific evidence and effective use of available planning tools and procedures.



Funders



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Introduction

Mobile data collection improves the efficiency, accuracy and consistency of data collection. Open Data Kits (ODK) is a modular and simple to use framework that supports structured questionnaire design, data collection, real-time data transfer, and database management. Although the ODK application (App) has been extensively adopted in research it was noted that Development Corridors Partnership (DCP) team in Kenya was yet to adopt ODK and this meant reliance on paper-based data collection processes which proved to be tedious, inefficient, and with increased margins of error. Based on these gaps, DCP Kenya team organized a three-day training workshop on mobile data collection using ODK with the key aim of building the capacity of project partners and researchers to design and use mobile-based data collection tools to facilitate proper data collection and management. The training course was organized as part of the ongoing capacity building initiatives for postdoctoral research fellows and research assistants in Kenya. This course was held at the Institute for Climate Change and Adaptation (ICCA), University of Nairobi, on 11th to 13th September 2019.

Rationale for ODK Course

The ODK training was organised following successful piloting of a paper-based household survey in May-June 2019 and an analysis of the data in July and August 2019. The paper-based data collection process proved to be time-consuming, involved carrying around bulk volumes of papers, risking damage from weather conditions and requiring huge spaces for storage, both in the field and back in the office. Furthermore, the data handling process post-piloting was tedious and exposed several errors in data collection and data entry process. The data required intensive cleaning and consultations with enumerators in cases where handwritten forms were illegible thereby extending the data handling process unnecessarily.

Following earlier consultations with DCP partners from the UK and Tanzania which begun in December 2018 during the DCP annual conference in Dar es Salaam Tanzania, the Kenya team felt the urgent need to be trained on the use of alternative, quicker, cleaner, reliable and efficient means of data collection to aid the envisioned large scale data collection between September and December 2019. Consequently, the Open Data Kits (ODK) was identified as the most appropriate application for the DCP team.

Course Objectives

- 1. To build capacity to formulate structured survey tools in ODK
- 2. To increase the efficiency of data collection by using ODK

Expected Outcome

- 1. Improved capacity in the design, and use of ODK
- 2. Increased response rates for surveys and logical consistency of responses

- 3. Reduced time for data collection and data entry
- 4. Increased overall accuracy of datasets

Course Organisation and Delivery

Although the ODK application (App) has been used widely in research and humanitarian action in Sub-Saharan Africa, in which some of the DCP partners have conducted different projects, there was not enough expertise within the Kenyan team to conduct the training prompting the team to outsource these services.

Based on the recommendations from the DCP partners based in the UK, particularly the University of Cambridge, the DCP team in Kenya sought training services from GeoPsy Multidisciplinary Research (GeoPsy Research), an organization that offers research and training consultancy services in Kenya. Together with the GeoPsy Research team, the DCP Kenya developed a tailor-made ODK training curriculum to meet the identified training capacity gaps and needs (*see Annex A*). In addition, the DCP team also felt it necessary to expand the training to the wider university fraternity and hence the announcement for the training was extended to students and researchers outside the DCP team.

Announcement and Applications

The course was developed (*see Annex B*) and announced through the Institute for Climate Change and Adaptation (ICCA) mailing list and the African Conservation Centre (ACC) staff communication channels. In the announcement, interested applicants were to express their interest by calling or texting a specified number or sending an email to an address that was provided.

Course Attendance

Originally, the projected number of participants was 30, unfortunately, the announcement to the University students did not go out in time, and therefore did not reach a wider catchment of students from other departments. Similarly, the participants from ACC and other partners were unable to attend as the dates coincided with earlier planned events. In total, 14 participants, attended the training with most of them been DCP researchers (n=10), while others were from the Stockholm Environment Institute (SEI) (n=2), PhD student at the ICCA (n=1) and projects officer from ACC (1). Note that the DCP researchers are primarily from ACC and ICCA. The course was run for three days and all the participants attended the training on all the three days translating to 100% attendance rate (see annexe C). During the training, we had several students and partners express the desire to have the course organised again to give them an opportunity for advanced training.

Cost of Training

The training was charged at Ksh15,000 per person. Non-DCP course participants paid their course fees attendance. The DCP met the costs of their researchers and covered costs of meals, training venue, training materials and certificates for all participants. The course costs were heavily subsidised compared to between Ksh75,000 and Ksh80,000 per person charged by other competing trainers for the same duration. Therefore, the DCP through its partners' saved 80-82% in course fees. Organisers and trainers donated their time and travel costs. Direct costs were covered by the Development Corridors Partnership.

Course Delivery

Course Programme

The trainers comprised two GeoPsy staff: Dr Francis Oloo and Mr Isaac Fadamullah. The course content was adapted after day one to lay emphasis on what appeared to be the most immediate needs and gaps. The overall programme for the course (as delivered) is shown below.

Table 1: Course Programme			
Day	Time	Торіс	Facilitator
	08:30 – 9:00	Registration & Introductions	Dr Tobias Nyumba Prof. Daniel Olago
	08:30-10:00	Introduction to Mobile Data Collection	Dr Francis Oloo
	10:00-10:30	Break	
Wednesday 11 th September 2019	10:30-11:30	Basic ODK questionnaire design and validation	Dr Francis Oloo
	11:30-1:00	Intermediate ODK Questionnaire Design	Isaac Fadamullah
	1:00 -2:00	Lunch Break	
	2:00 – 3:30	Practical exercise on ODK Questionnaire design	Francis & Isaac
Thursday	08:30-10:00	Advanced ODK questionnaire design	Dr Francis Oloo
12 th September	10:00-10:30	Break	
2019	10:30-12:00	Setting up ODK Aggregate	Isaac Fadamullah

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		Servers/Google App Engine	
	12:00-1:00	ODK Data Collection	Dr Francis Oloo
	1:00 - 2:00	Lunch Break	
	2:00 – 3:30	Practical skills on ODK data management/ ODK Server systems	Isaac Fadamullah
	08:30 – 10:00	Exploratory analysis of ODK data	Dr Francis Oloo
	10:00 - 10:30	Break	
Friday 13 th September 2019	10:30 – 12:30	Practical exercise: Design, validation and implementation of ODK sample surveys	Dr Francis Oloo
	12:30 – 1:00	Evaluation & Wrap	Dr. Tobias Nyumba

Mode of Training

The main tools for the training were PowerPoint presentations, and ODK XLSform, ODK Collect, KoboToolbox and Google App Engine. The training adopted a hands-on approach with stepwise discussions and presentations to ensure that no participant was left behind. The trainers alternated in providing one-on-one support and presenting, sometimes providing IT support for slower computers, phones and network failures. However, the programme was kept on schedule with very minimal disruptions despite the discussions and presentations getting lively and eliciting questions, which took longer than the time allocated in the original programme.





Plate 1: Prof. Olago presiding over the opening of the training course (top left) and participants at the training (top right and bottom).

Follow up

Certificates of Attendance will be produced and circulated to all registered participants later. However, all course materials were circulated to the participants during the training, including training data.

Course Evaluation

Pre-course Evaluation and Expectations

Participants were asked to indicate their level of knowledge and use of paper-based and mobile data collection tools prior to the training course using paper stickers on a whiteboard (Plate 2).



Plate 2: Participant during the course evaluation

Overall, most participants (57.1%, n=8) had not used mobile-based data collection tools at all, followed by 28.6% (n=4) who had used it a bit. Only one participant had used the platform a lot (Plate 3). In contrast, paper-based data collection tools were the most widely used with 64.3% (n=9) and 28.6% (n=4) having used it a bit and a lot in their work, respectively (Plate 3). With this result, the trainers had their work cut out.



Plate 3: Participants response to course evaluation questions

Post-course Evaluation Results

At the end of the training, participants were asked to evaluate the course on various aspects and to make suggestions on areas of improvement and potential topics for future training. Overall the course was very well received with 72.7% (n = 8) of the participants rating the course as very good or excellent with a mean score of 4.09 (Figure 1) based on a score from **0 (poor) to 5 (excellent)**. There were different comments ranging from positive to negative regarding different aspects of the course. Positive comments on the cordial and professional interactions between the trainers and participants were dominant. However, the negative sentiments revolved around the duration of the course. Three days seemed insufficient and participants recommended longer or graduated course timelines to ensure the course content is adequately covered and understood. Although the participants felt the use of ODK was invaluable, as it enhanced their IT skills such as programming, they recommended training on other mobile data collection tools to supplement the skills in ODK. A more detailed analysis of feedback is provided below for each question.





Figure 1: Course rating by participants

2. How much has the course improved your understanding of the use of mobile data collection tools such as ODK?

Participants indicated the contribution of the training to their understanding of mobile data collection by scoring from 0 (hardly at all) to 5 (a lot) (Figure 2)



Figure 2: Level of improvement of participants understanding

3. How much can you apply what you learned in your professional work?

On whether participants were ready to deploy ODK in their work, participants were asked to score from 0 (hardly at all) to 5 (a lot) to indicate their preparedness. A majority still felt they needed additional time and practice before deploying the ODK (Figure 3).



Figure 3: Ability to apply the tools immediately

4. In your own words, what are the things that you liked most about the course?

Although participants acknowledged the difficulties in learning new techniques over a short period of time, they appreciated the professional manner the course was delivered and the level of patience and understanding the trainers displayed throughout the course. Comments by participants are presented in Table 2.

The trainers were very clear on the subject and were patient with learners to ensure
they understood the concepts progressively.
The training was hands-on with trainers clearly addressing issues as necessary.
The trainers were very patient and ensured everyone was on board. The training
covered the whole course outline. The trainers took time in answering and making
people understand ODK Build, Collect and Aggregate
Generation of excel datasheet. It saves on a lot of time and minimises error
Practical skills in Programming ODK questionnaires, developing a cloud server and
practically linking the tool in android phones.
Building of Survey forms using ODK kit
How to conduct mobile-based questionnaires
Easy to understand. Trainers were very patient even for new users. New age
technology.
Practical sessions which included hands-on support and stepwise approach to training
The practical aspect and the professionalism of the trainers
It's interesting and amazing

5. What did you not like about the course?

Although the course was great, the majority of the participants felt the duration of the course was too short and hence they did not learn much. This was complicated by the general lack of advanced/sharp IT skills among the participants (Table 3). This observation is consistent with the sentiments in question number 3 above where majority of participants felt they were not yet entirely ready to deploy ODK in their work. However, this can be addressed through practice and continuous engagement with the application. The trainers provided additional data for practice and we hope that the participants' confidence levels will improve over time. Furthermore, the DCP is immediately deploying the use of ODK and will be having regular sessions to sharpen skills on the use of ODK.

Table 3: Comments by course participants
Short duration for the course
Wish on the topics we had more time to train
On day 3 - the training was more of programming and requires a lot of IT skills
Setting up and administration of Survey using ODK
Time limitation
No takeaway exercises and tests/quiz to evaluate one's knowledge
The technical scripting was confusing

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6. What was the single most valuable thing you learned in the course?

Table 4: Valuable skills

The accuracy of the survey and choices sheets in Excel is very important in coming up with valid questions in ODK How to create servers and install ODK aggregate Database management- Coding and linking the Mobile phones with the server Real-time information. Providing for a place and accompanied description including photographs. It is also the location accurate ODK programming. Developing a cloud server Kobo Toolbox, ODK-Kit, Geo-referencing Google AppEngine integration The app development using Google App engine Practical application of the mobile data collection tools how to create and use the ODK forms and how to aggregate so I can manage my data collection

The coding aspect

7. How can we do better next time - or any other comments you would like to share?

Create a quiz/test that trainees can try later in their own time
More time be allocated for several practical sessions
make the training longer
It came at the right time; it has been helpful
By improving on what we have learned through practice
Spread the training to about five days to allow internalization of concepts
You need to moderate the training so that learners can digest and practice
Have more days for the training
Create a quiz/test that trainees can try later in their own time.
Extend the training over a longer period
The coding aspect

8. What other mobile data collection tools would you like to learn about?

Table 6: Potential areas for future training

Conclusion and Recommendations

The training on mobile-based data collection using ODK provided the participants with invaluable skills for designing, fielding, collecting and managing research data using mobile-based applications. Apart from ODK, the participants were introduced to other similar and relevant applications like KoboToolBox and Google App Engine. The interactive mode of training ensured that all the participants moved together during the three days of training. From the post-training evaluation, a majority of the participants felt that the training was relevant and the skills learnt are applicable to the ongoing tasks within the DCP project. The participants were also happy with the skills of the trainers, patience and mutual respect that was there between the facilitators and the participants. One limitation that was highlighted by the participants was on the short duration of the training. The participants also pointed out that in future other aspects that could be captured include GIS-related tools, data analysis and an exploration of other alternative data collection tools.

Annex A. ODK training plan

GEOPSY		GE@PSY RESEARCH		
www.geopsy-research.org office@geopsy-research.org Tel: +2	254722173755	www.geopsy-research.org	office@geopsy-research.org	Tel: +254722173755
ODK Training Plan		- Step-by-step introduct	ion in designing ODK questionnaires	

Introduction

Mobile data collection improves the efficiency, accuracy and consistency of data collection. Open Data Kits (ODK) is a modular and simple to use framework that supports structured questionnaire design, data collection, real-time data transfer, and database management. Building the capacity of project partners and researchers to design and use ODK is a critical step for proper data collection and management.

Objectives

- 1. To build capacity to formulate structured survey tools in ODK
- 2. To increase efficiency of data collection by using ODK

Expected Outcome

- 1. Improved capacity in the design, and use of ODK
- 2. Increased response rates for surveys and logical consistency of responses
- 3. Reduced time and for data entry
- 4. Increased overall accuracy of datasets

Mode of Training

The main tools for the training are training module in PowerPoint presentations, ODK xlsform, ODK Collect /Kobo Toolbox apps

Training Concept

Duration: 3 days

Requirements: Each participant should come with a smartphone or tablet running on android (version 5 upwards) operating system.

DAY 1

- Introduction to mobile data collection
- ODK architecture Build, Collect, Aggregate
- Practical: Hands-on exploration of ODK build, ODK collect and ODK aggregate

DAY 2

- Special data types: geolocation, barcodes, time, images, video, audio
- Practical introduction to ODK software app and data management on Google App Engine

DAY 3

- Settings, data controls and validation
- Collating, exploratory analysis and visualization of ODK data
- Practical implementation based on existing questionnaires in ODK

Participants

We will work with a minimum number of 10 participants per training session. This is
desirable to ensure effective interactions between the trainers and the participants.

Training Costs

For each participant, a training fee of 5,000/- will be charged per day. This charge is
exclusive of costs of the venue, meals, transport and internet (these costs will be catered
for by your institution)

Francis OLOO, PhD

24th July, 2019

Annex B. Course announcement

Training Opportunity on Mobile Data Collection using ODK

The Development Corridors Partnership is pleased to invite Target Participants you to a three-day training course on The use of mobile data collection tools to be delivered at the Institute for This course is aimed at organizational staff and students who 11th -13th September 2019.

About the Training

Advances in information technology have opened exciting new avenues for how academic and applied research is conducted and data collected. One of these advances is the use of Mobile Data Collection (MDC). Instead of collecting data on paper using a pen, and manually entering into a database for analysis, data is input into a device that is What You Will Learn capable of exporting directly into a centralized database for processing and analysis. Open Data Kit (ODK) is a suite of tools that allows data collection using Android mobile devices and data submission to an online server. This training will equip the participants with skills to author, fill in and manage mobile data collection platform using ODK



Climate Change and Adaptation, University of Nairobi on are conducting field data collection management and reporting activities.



At the end of the training the participants will be able to:

- Create survey forms using Build or XLS Forms
- ii Set up ODK Build, Collect and Aggregate
- iii Upload forms to an Aggregate server
- Load forms into Collect on an Android device iv Use ODK Collect to fill out forms with field participants v
- vi Upload survey data from Collect to Aggregate vii Export and Analyze data from Aggregate

Training Approach

This course is delivered by seasoned trainers who have vast experience as expert professionals in the use of MDCs within a developing country context. The course is taught through a mix of practical activities, theory, group works and case studies. Please Carry your LAPTOPS and any questionnaires for training.

Certification

At the end of this course, all participants will be issued with a certificate of participation.





UK Research and Innovation

Fees and Payment

The total costs for this training is Ksh15, 000 (Ksh 5,000 per day). The DCP will cover costs of meals, teas, learning materials and training venue. Due to limited spaces, we are happy to accept participants on a first come basis and upon full payment of training fees. Please contact Dr Nyumba on tnyumba@uonbi.ac.ke or 0720114221 and Ms. Yvonne on y.githiora@gmail.com or 0726825649 for further clarification and to advice on payments.

Who is Development Corridors Partnership?

The DCP is a research and capacity building collaboration among institutions from China. Kenya, Tanzania, and the UK. Its main purpose is to deliver effective research and build capacity so development corridor decision-making can be based on sound scientific evidence and effective use of available planning tools and procedures. The project is led by UN-World Conservation Monitoring Centre (UN-WCMC) with funding from the UK Research and Innovation Global Challenges Research Fund (UKRI GCRF). In Kenya the DCP is led by the African Conservation Centre and University of Nairobi's Institute for Climate Change and Adaptation. Further details about the DCP can be found here.









Annex C. List of Participants

Name	Position/Designation	Institution
1. Dr Catherine Sang	PDRA	ICCA and ACC
2. Dr Tobias Nyumba	PDRA	ACC and ICCA
3. Ms Yvonne Githiora	RA/Project Officer	ICCA
4. George Owira	RA	ICCA
5. Viviane Njogu	RA	ICCA
6. Steve Okoth	RA	ICCA
7. Tom Randa	RA	ICCA
8. Ben Mwangi	RA	ICCA
9. Francis Kago	RA	ACC
10. Mary Mwangi	RA	ACC
11. Eunice Odek	PhD Student	ICCA
12. Faith Saalu	Project Officer	SEI-Africa
13. Felix Akumu	Project Officer	SEI-Africa
14. Julius Muriuki	Programme Officer	ACC
Trainers		

- 1. Dr Francis Oloo
- 2. Mr Isaac Fadamullah

Note:

ACC: African Conservation Centre ICCA: Institute for Climate Change and Adaptation SEI-Africa: Stockholm Environment Institute, Africa