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Data collection with farmers in bean pest and disease management using the Open Data Kit

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Kampala , Uganda

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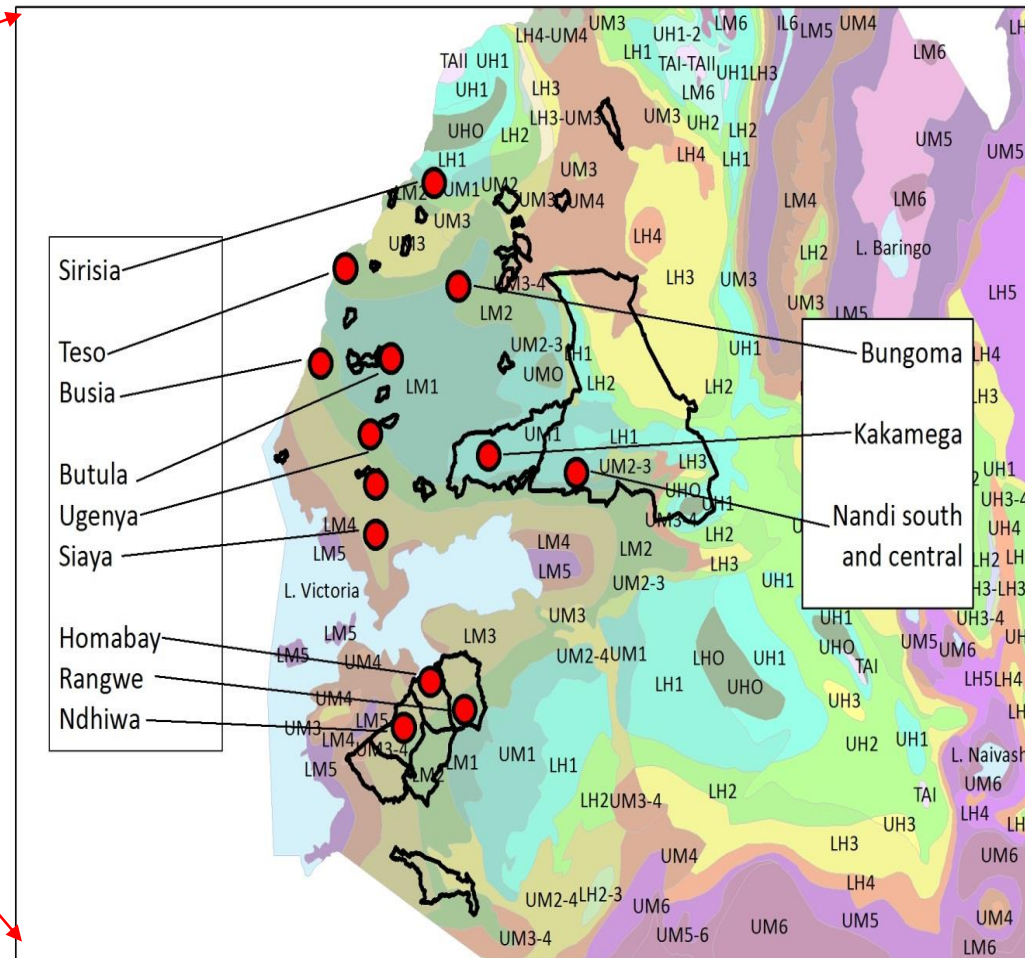
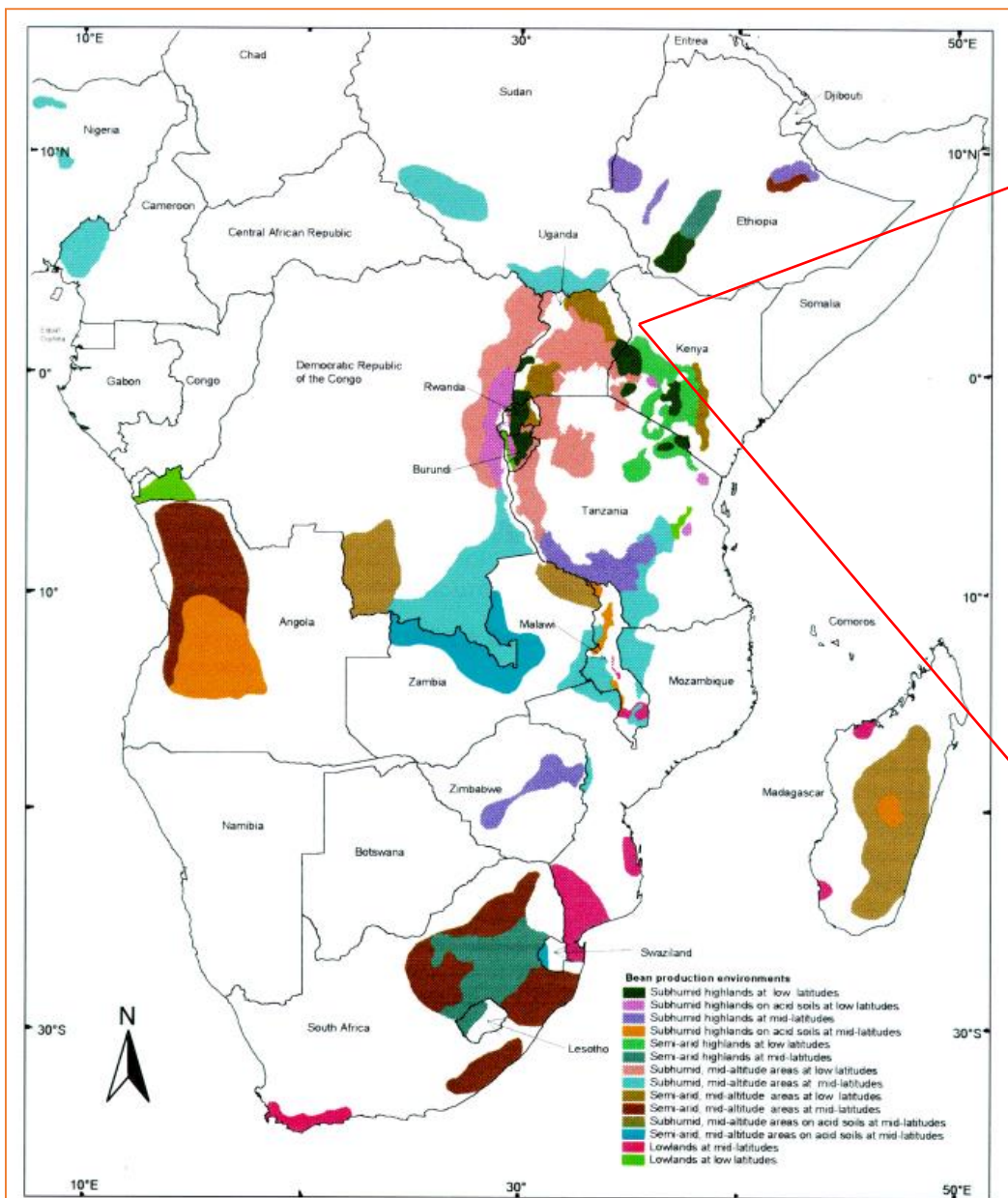
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Project background

- Data collection with ODK part of a 3 –year project aimed at Supporting investments for upscaling of grain legumes in western Kenya through assessing and modeling the threat of biotic stressors.
- Its funded by the McKnight Foundation and coordinated by CIAT- Uganda
- It's a multi- partner project with 5 Kenya based partners including 2 universities, 2 Kenya agricultural and livestock research organizations, 1 development partner and 8 farmer based research networks
- The major goal of the project is
 - ✓ to guide ongoing and future legume pest and disease management efforts,
 - ✓ improve strategic decision making, and
 - ✓ increase the likelihood of integrated pest and disease management technology adoption
- Target crops include common beans, cowpea, ground nuts and soybeans

Where we operate



Project data management plan

- The project is engaged in development of a digital data management system(DDS).
- Under DDS, the project has explored several options including;
- the traditional- Pen and paper , relational databases such as MS Access and other platforms such as ODK

A. Pen and paper- at the project inception in 2012

MIC.pdf - Adobe Acrobat Reader DC
Window Help

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Socio-economic profiling and analysis of the legume crop management system in Western Kenya

1. GENERAL INFORMATION HHID 001

1. Date of interview (DD/MM/YYYY) 14/11/2013 2. Name of enumerator LEAH

3. County MIGORI 4. District RONGAO 5. Village KODERO-BAHARA

6. Agro-ecological zone LM1

7. Name of head of household PHILEMON ONYANGO ODERO

8. Sex of head of household: Male Female

8a Household type (Select only one) Male headed and managed Male headed, female managed
 Female headed and managed Child headed (below age 18)

9. Name respondent (if not household head) N/A

10. Sex of respondent (if not household head) (Only recorded, not asked!) 1= Male 0= Female N/A

11. Age of the household head (years) 60

12. Education level of household head (tick): Primary Secondary University None
Others (specify)

13. Total number of household members 15 (Male) 7 (Female) 8

14. Number of household members working on farm on full-time basis 2

15. Latitude (+/- dd.ddddd) 000.77807 Longitude (ddd.ddddd) E034.60170
Elevation (mmmm) 1482 m

16. Names of five most important crops grown in past 2 years :
1. Maize 2. Cassava 3. Sweetpotatoes 4. Sugarcane 5. Common bean

17. Participation in legume promotion activities/project: 1=Participating 2=Non-participating

2. LAND OWNERSHIP AND USE

2.1. Household ownership, access to and allocation of land to grain legumes and other crops in 2013
Long Rain (LR) and 2013 Short Rain (SR) seasons? Note: Parcel 1 is the farm where the farmer lives

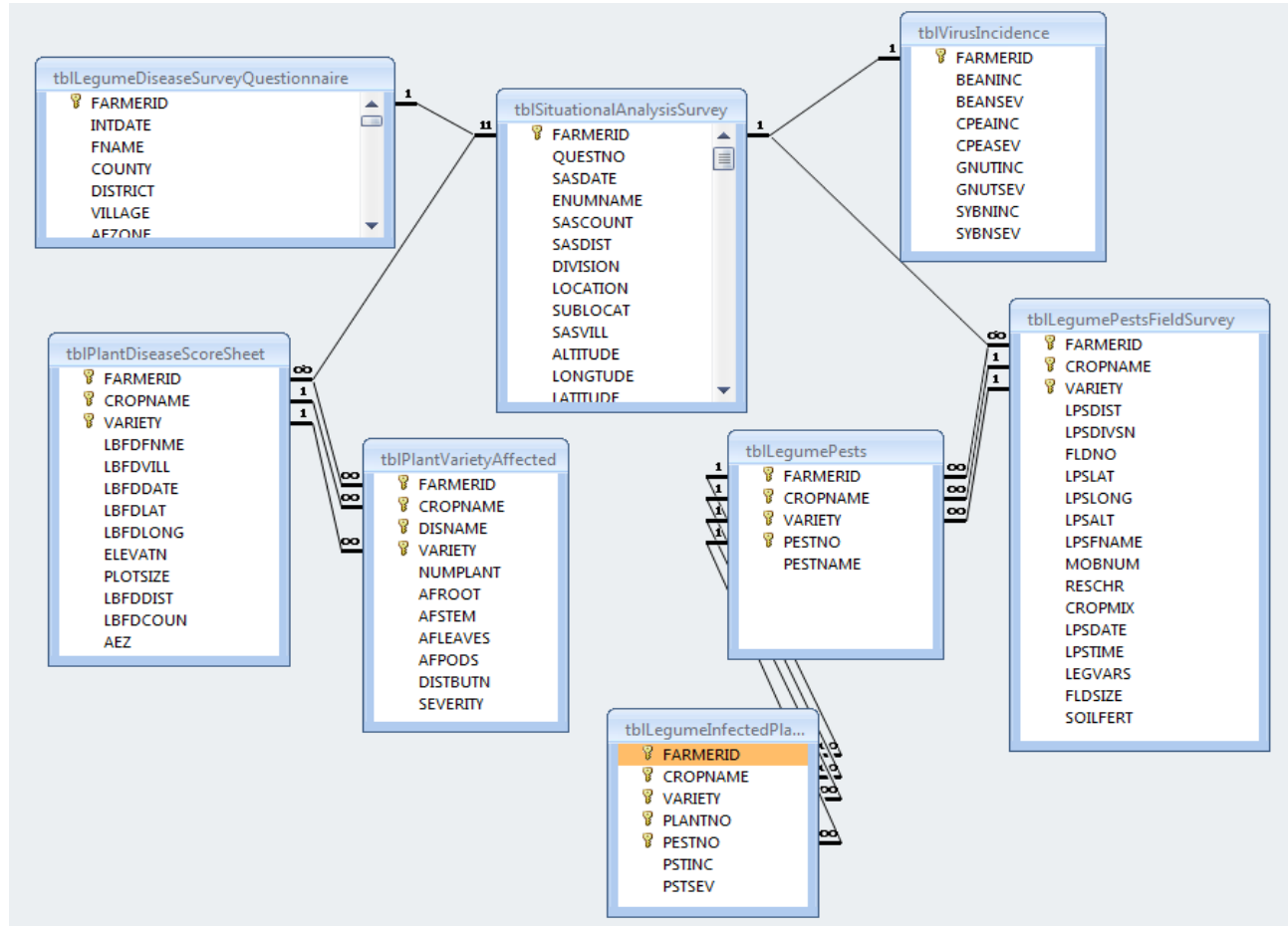
[Taskbar icons: File Explorer, Chrome, Word, VLC, Skype, Excel, PDF, Mail, PowerPoint, Internet Explorer]

Obstacles:

- Data was not centrally managed- so data sharing became difficult.
- Data collection and entry was not aggregated- so the system became costly
- Numerous post data collection errors

.....Data management Continued

B. MS access database- 2013 &2014



Obstacles:

- **Data collection and entry was not aggregated- so the system became costly**
- **Actual database developed was costly.**
- **Numerous entry errors**
- **Data processing required expertise**
- **Data sharing among partners was difficult.**

- **Moving forward, the project is piloting ODK as an alternative to the old systems**

.....Data management Continued

C. Open Data Kit(ODK):

- Its an array of open source tools to enable data collection using android based devices and data submission to an online server(cloud).
- It's a stepwise process

ODK processes

1. **Data form development** : Relevant pest and disease questions are generated by subject matter specialists and uploaded on ODK platform

Seed_quality_20052015_final_DISEASES - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW Sign in

H9

	A	B	C	D	E	F	G	H
1	type	name	label	hint	default	appearanc	constraint	constraint
2	start	start						
3	end	end						
4	today	today						
5	location	gpspoint	Get location					
6	text	enumerator	Enumerator					
7	select_one field_trial_id	field_trial_id	Field trial identifier					
8	text	farmer_name	Host					
9	text	group-name	Name of the farmer group					
10	select_one location	location	Location of the field trial					
11								
12	select_one agro_ecological_zone	agro_ecological_zone	AEZ					
13	select_one plot_history	plot_history	Name crops that were planted in the previous season on this plot?					
14	text	plot_history_others	specify others:					
15	select_multiple neighboring_crops	neighboringcrops	List crops in adjacent fields					
16	text	other_crop	Specify others					
17	select_one planting_period	plantingperiod	When did you plant this farm?					
18	select_one yes_no	weeding	Did you weed before the plots became bushy?					
19	select_one yes_no	weeding-pattern	Did you weed all plots on the same day?					
20	select_multiple weed_types	weedtypes	List common weed types observed on the plots					
21	text	weedtypes-others	Specify others:					
22	select_one crop_age_options	crop_age_options	At what stage is the crop?					
23	select_multiple unusual_occurrence_in_t	other_observations	Are there any unusual occurrences or observations on the farm(please probe the this will get gps location					
24	text	other_observations_others	Specify others:					
25	begin_group	rep_repeats	Replicate repeats					
26	begin_repeat	replicate	Replicate					
27	select_one replicate	replicate	Replicates					
28	begin_group	options_repeats	Ootions repeats					

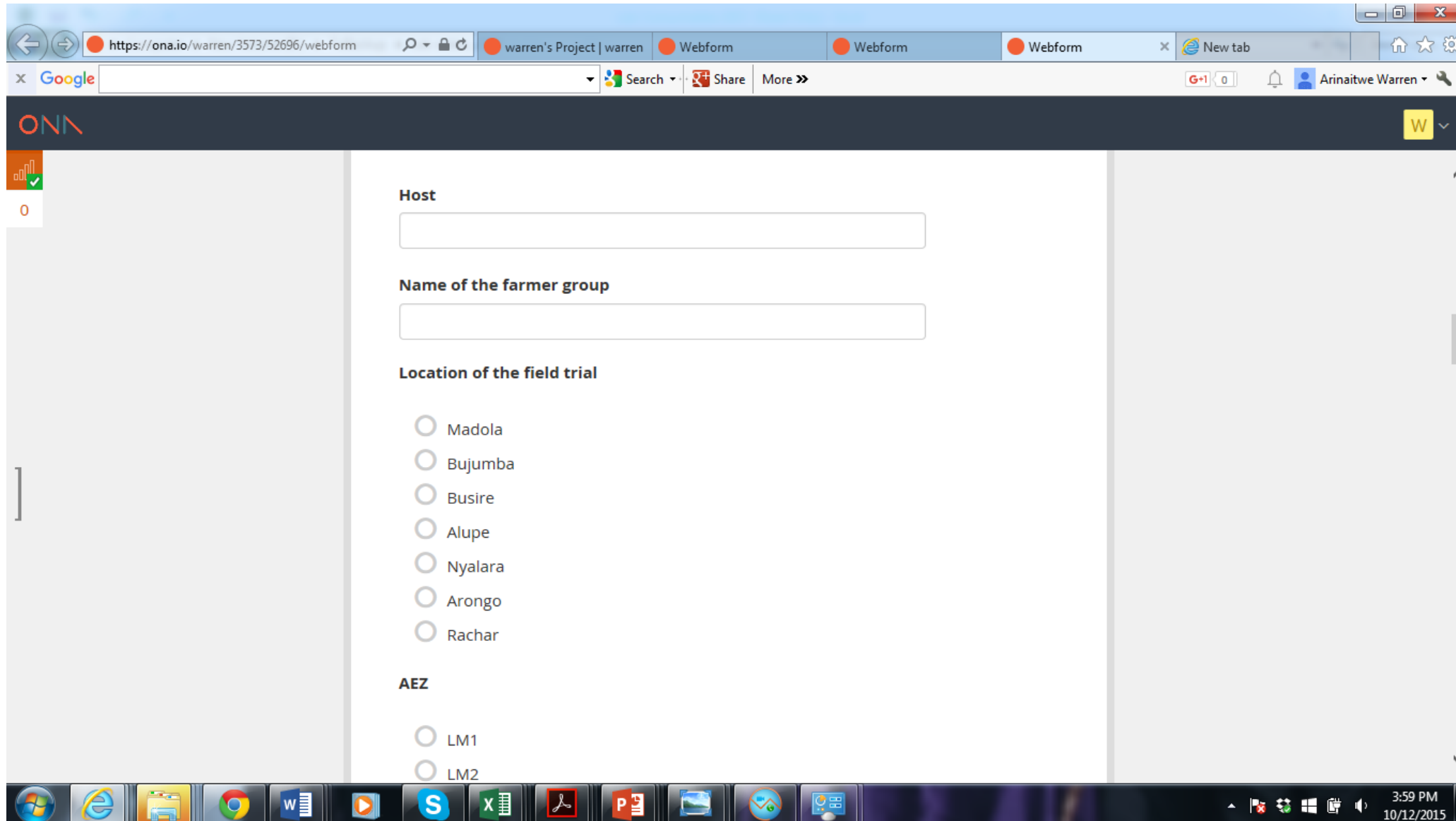
choices survey

READY 100%

11:27 AM 10/12/2015

ODK processes

2. Download forms to ODK



.....ODK processes

3. Train enumerators and pretest the tool.



ODK processes

4. View data on the server

The screenshot displays the ONA ODK workflow interface for a project named "warren's Project / Legume_diversity_20052015_final_DISEASES". The interface includes a navigation menu with "Overview", "Map", "Table", "Summary Charts", and "Settings". The "Overview" tab is active, showing 71 records and a "Webform" icon. The "Activity" section displays statistics: 71 Records, 10 days ago Last Submission, and 0 Contributors. A "Submission Time" line graph shows the number of submissions over time from May 21, 2015, to September 17, 2015. The graph shows a peak of 10 submissions in late May, a dip to 2 in early June, a rise to 10 in mid-June, and a final spike to 28 in late September. The right sidebar contains an "Export data" section with a "File type" dropdown set to "CSV" and a "Prepare csv export" button. Below this is an "XLS Reports" section showing "NO XLS REPORTS". The "Submit data" section has three radio buttons: "Using Webforms" (selected), "Using ODK Collect", and "Importing CSVs". A "Link" section is partially visible at the bottom.

Activity	Records	Last Submission	Contributors
71	10 days ago	0	

Submission Time

Date	Submissions
21 May 2015	8
19 Jun 2015	2
19 Jun 2015	10
17 Sep 2015	28

Export data

File type: CSV

Prepare csv export

XLS Reports

NO XLS REPORTS

Submit data

Using Webforms | Using ODK Collect | Importing CSVs

<https://ona.io/warren>



Results

The project has successfully piloted and adopted ODK in their data management systems

The screenshot shows a web browser window with the following details:

- Address bar: <https://ona.io/warren/3573/52698#/table>
- Page title: Legume_diversity_20052015_final_PESTS
- Navigation tabs: Overview, Map, **Table**, Summary Charts, Settings
- Record count: 44 Records
- Search bar: Search
- Table showing 19 records (rows 1-19 visible):

#	Submission Time	Get loca...	Enumera...	Field tria...	Host	Name of...	Location...	AEZ	Name cr...	specify o...	List crop...	Specify...	When di...	Did you...
1	2015-06-04T07:21:47		Janet	No Answer	Florence...	Alupe wo...	Alupe	LM1	Maize		<input checked="" type="checkbox"/> Maize...	Cassava	After mai...	No
2	2015-06-04T07:22:03		Janet	LG001	Peter Od...	Madola	Madola	LM1	Common...		<input checked="" type="checkbox"/> Comm...		After mai...	No
3	2015-06-04T07:22:05		Janet	LG003	Christoph...	Madola	Madola	LM1	Soybean		<input checked="" type="checkbox"/> Soybe...		After mai...	No
4	2015-06-04T07:22:06		Janet	LG006	Lambert...	Baraka	Madola	LM1	Others	Sugar cane	<input checked="" type="checkbox"/> Comm...	Millet	After mai...	No
5	2015-06-04T07:22:07		Janet	LG007	Humphre...	Madola	Madola	LM1	Groundnuts		<input checked="" type="checkbox"/> Comm...	Cassava	After mai...	No
6	2015-06-04T07:22:09		Janet	LG008	Nancy Ad...	Busire	Busire	LM1	Common...		<input checked="" type="checkbox"/> Comm...	Sorghum	After mai...	No
7	2015-06-04T07:22:10		Janet	LG009	Catherine...	Irana	Nyalara	LM1	Maize		<input checked="" type="checkbox"/> Maize		After mai...	No
8	2015-06-04T07:22:12		Janet	LG010	Mary Atie...	Busire vill...	Busire	LM1	Maize		<input checked="" type="checkbox"/> Maize...	Sorghum	After mai...	No
9	2015-06-04T07:22:13		Janet	LG011	Phanice...	Bujumba	Bujumba	LM1	Common...		<input checked="" type="checkbox"/> Comm...	Nappier g...	After mai...	No
10	2015-06-04T07:22:15		Janet	LG012	Caleb Odi...	Bujumba	Bujumba	LM1	Common...		<input checked="" type="checkbox"/> Maize...	Cassava	After mai...	No
11	2015-06-04T07:22:16		Janet	LG013	Caroline...	Tingale	Bujumba	LM1	Common...		<input checked="" type="checkbox"/> Maize...	Sorghum	After mai...	No
12	2015-06-04T07:22:17		Janet	LG014	Pamela A...		Bujumba	LM1	Common...		<input checked="" type="checkbox"/> Comm...		After mai...	No
13	2015-06-04T07:22:19		Janet	LG015	Alice Ama...	Tingale	Bujumba	LM1	Common...		<input checked="" type="checkbox"/> Comm...	Sorghum	After mai...	No
14	2015-06-04T07:22:20		Janet	LG016	Godiver...	Bujumba	Bujumba	LM1	Others	Sugarcane	<input checked="" type="checkbox"/> Comm...		After mai...	No
15	2015-06-04T07:22:22		Janet	LG019	Violet Wa...	Alupe wid...	Alupe	LM1	Maize		<input checked="" type="checkbox"/> Maize		After mai...	No
16	2015-06-04T07:22:23		Janet	LG020	Alice Nak...	Alupe wid...	Alupe	LM1	Common...		<input checked="" type="checkbox"/> Comm...		After mai...	No
17	2015-06-04T07:22:24		Janet	LG021	Sokovia o...	Alupe	Alupe	LM1	Maize		<input checked="" type="checkbox"/> Comm...	Cassava	After mai...	No
18	2015-06-04T07:22:26		Janet	No Answer	Bonface...	NyoroKa	Madola	LM1	Soybean		<input checked="" type="checkbox"/> Comm...		After mai...	No
19	2015-06-04T07:22:27		Janet	No Answer	Jane Ros...	Alupe	Alupe	LM1	Common...		<input checked="" type="checkbox"/> Comm...	Cassava	After mai...	No

Lessons learnt

1. **Improved data quality:** Data collection and entry error controls were embedded into the collection tool
2. **Cost reduction:** Simultaneous collection and digitization of data has been achieved which has reduced post field data processing costs
3. **Rich data set obtained:** Complementation of collected data with multi-media data such as videos, photos, audio recordings and GPS data has been achieved.
4. **The system is more interactive-** This has made data sharing and further processing by the project team members more flexible!.

Other lessons

1. Extensive training of enumerators is important
2. The tool needs to be pretested before actual data collection
3. Not every smartphone will work. A good smartphone with functional GPS and a longer battery life is important
4. The system can be complex with complex questionnaires. The instrument should be as precise as possible.

Future research

Problem: Some Project participants have held on to the use of paper and pen just in case their data is lost on the cloud.

Proposed research: The project will pursue research that demonstrates the value proposition on the use of paper and pen and the mobile device. The research will strengthen the use of ODK in research, and understand the perceptions of different project partners towards the new data capture and management system.



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Thank you



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