

Crop Cycle Tracking for SAI cropping systems

Specification for mobile application

Project: InnovAfrica

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1. Overview

This document details the requirements for the digital tool used for documenting SAI crop cycles on selected farms in all implementation countries of the InnovAfrica project.

Data will be entered by technicians or extension workers. Selected data will first be entered into paper questionnaires, and then transferred into KIPUS on a regular basis whilst the frequency will depend on the nature of the specific data.

2. General Aspects

2.1. Access rights & roles

The system can only be used with a login name/password combination. Users have to be defined for each participating country and will be able to enter data only for their respective country.

It is possible to define different user rights for data collectors and farmers, e.g. data collectors could be allowed to enter the base data while farmers could enter data for daily and monthly documentation.

These user roles have to be defined before the tool will be delivered to the users.

2.2. Time horizon

The tool will be used to track multiple crop cycles over the entire tenure of the InnovAfrica project until 2021.

2.3. Connection to household questionnaire

The entries in the household questionnaire are being made anonymously in accordance with data protection guidelines. To be able to connect data from the household questionnaire with the SAI crop cycle data, a solution using anonymous IDs is suggested:

- A field "ID" is added to the household questionnaire
- A choice "ID from household questionnaire" is added to the "Base data" section of the SAI questionnaire and shows all available IDs
- The data collector selects the corresponding ID for the current farmer
- Common data like location/address are copied into the new questionnaire

3. Questionnaires

3.1. Glossary

Terms and abbreviations used in the specification of questionnaires

HHQ	Abbreviation for Household Questionnaire
Sync	Transferring the collected data to the central server and receiving data from the server, e.g. updates for the tool
M	Mandatory: If set to Yes (Y), this has to be answered before questionnaire can be saved. If set to No (N), an answer is optional
R/W	Read/Write: Defines if entries can be made only once or can be edited later. See the following entries for details
WO	Write Once: Can only be entered once and not be edited after saving
RO	Read Only: Cannot be edited by the user. E.g. to display a result of a calculation derived from other entries
Widget	Type of entry, defines which kind of data can be entered. See the following entries
Group	A set of questions visually grouped together. Groups can be collapsed to save space on-screen
Text	Text field where free text can be entered
Choicelist	User can select one option from a predefined set of choices (e.g. Yes/No)
Selectlist	User can select 1 or more options from a predefined set of choices (or none, if the question is not mandatory). Used e.g. for questions like "tick all that apply"
GPS	GPS position. If possible, this is determined by using the GPS chip of the mobile device. Use degrees and decimals for min and sec
integer	Natural number without decimals. Range (min-max) can and should be defined
num	Numerical field. Number of decimal places and range (min-max) can and should be defined
TableRows	Set of questions that can be added multiple times. Can be used either for questions where there is no fixed number of entries (e.g. add an entry for each cow on the farm), or for a predefined list of entries.

Tabelle 1: Glossary

3.2. Base data (single entry)

This questionnaire combines all questions that are entered only once per farm. The questions are grouped thematically.

Text to be displayed	Widget	M	R/W	Comments
General Information	Group			
ID from Household Questionnaire	Choicelist			Select the ID from the List of entries in the household questionnaire
Name of Farm	Text	Y	WO	
Name of Farmer	Text	Y	WO	
Country/Region	Choicelist	Y	WO	List as in HH questionnaire (6 InnovAfrica countries plus subregions).
District/County	Text	Y	WO	as in HH questionnaire
County/Division/TA	Text	Y	WO	as in HH questionnaire
Sub-county/sub-location/Ward/EPA	Text	Y	WO	as in HH questionnaire
Village	Text	Y	WO	as in HH questionnaire
Address/Street	Text	Y	WO	as in HH questionnaire
GPS Location	GPS	Y	WO	GPS automatically captured in background
Elevation	integer	Y	WO	in m, filled automatically when GPS is used
Household Characteristics	Group			
Name of HH head	Text	Y	WO	as in HH questionnaire
Sex of the HH head	Choicelist	Y	WO	as in HH questionnaire
Age of the household head in years	Num	Y	WO	as in HH questionnaire
Household size (total number of persons)	Num	Y	WO	Range: 1-100
Number of persons working full-time in farming activities	Num	Y	WO	Range: 1-100
How many of these persons belong to the following groups?	Number picker	Y	WO	Choices: women (>25), men (>25), youth and young adults (aged between 15-25) Match total number with previous question

Text to be displayed	Widget	M	R/W	Comments
Total number living at homestead	Num	Y	WO	Range: 1-100
Years of experience of HH head in crop farming	Num	Y	WO	Range 1-100
Years of experience of HH head in conservation farming	Num	Y	WO	Range 1-100
Occupation of HH head	Choicelist	Y	WO	as in HH questionnaire
Educational level of HH head	Choicelist	Y	WO	as in HH questionnaire
Construction material of household main dwelling	Choicelist	Y	WO	Choices/IDs: 1=Pole and dagga, 2=Unburnt brick and thatch, 3=Burnt brick and thatch, 4=Burnt brick and Iron sheets, 5=Burnt bricks/Plastered and asbestos, 6=Other
Other construction material	Text	Y	WO	Show only when „Others“ is selected in previous question
Main Crop and Household Asset Ownership	Group			
Main crop grown	Choicelist	Y	WO	Choices/IDs: 1=Maize, 2=Sorghum, 3=Millet, 4=Pigeon Pea, 5=Bambara Nut, 6=Groundnut 7=Other
Other main crop grown	Text	Y	WO	Only show if “Other” was selected in previous question
Number of livestock owned	Selectlist	Y	WO	Choices/IDs: 1=Cattle, 2=Goat, 3=Chicken, 4=Turkey, 5=Geanea fowl, 6=Duck, 7=Donkey, 8=Sheep If chosen, number owned needs to be indicated
Number of agricultural equipment owned	Selectlist	Y	WO	Choices/IDs: 1=Scotch cart, 2=Ox plough, 3=Bicycle, 4=Ploughing oxen, 5=Cars, 6=Private water well, 7=Generator, 8=Radio, 9=Donkey cart, 10=Wheel barrow, 11=Mobile phones, 12=Peanut butter machine, 13=Motorbike, 14=Solar Panel, 15=Grain mill, 16Television (working) If chosen, number owned needs to be indicated
Means of production	Group			

Text to be displayed	Widget	M	R/W	Comments
Topography	Choicelist	Y	WO	Choices/IDs: 1=Plain; 2=Gentle slope; 3=Steep slope
Soil type	Choicelist	Y	WO	Choices/IDs: 1=Sand, 2=Silt, 3=Clay, 4=Loam Helptext: Indicate general soil texture
Soil colour	Choicelist	Y	WO	Choices/IDs: 1=Red, 2=Black, 3=Yellow What colour is the soil?
Soil quality	Choicelist	Y	WO	Choices/IDs: 1=Good workability, 2=bad workability, 3=good fertility, 4=bad fertility
Soil depth	Choicelist	Y	WO	Choices/IDs: 1=Deep (>1.2m), 2=Shallow<60cm, 3=very shallow <30cm Helptext: How deep or shallow is the soil?
Local soil name	Text	Y	WO	Helptext: If there is a local soil name, please provide it
Did you take a soil sample at the beginning?	Choicelist	Y	WO	Choices/IDs: 1=Yes, 2=No
Total size of land owned by head of household	num	Y	WO	in m ² , ha and acre (3 fields with automatic conversion). Range: 100m ² - 100ha
Total size of land cropped by head of household this season	num	Y	WO	in m ² , ha and acre (3 fields with automatic conversion). Range: 100m ² - 100ha
Total land size for SAI plots cropped by head of household this season	num	Y	WO	in m ² , ha and acre (3 fields with automatic conversion). Range: 100m ² - 100ha
Land size for other crops, if any	num	Y	WO	in m ² , ha and acre (3 fields with automatic conversion). Helptext: „Enter 0 if no other crops other are grown“ Range: 100m ² - 100ha
What types of irrigation are used, if any ?	Selectlist	Y	WO	Helptext: „Tick all that apply“. Choices/IDs: 1=None; 2=Natural source (Spring/river/creek); 3=Well; 4=Borehole; 5=Dam; 6=Water pan
Other irrigation	text	Y	WO	Show only when „Others“ is selected in previous question
Input purchases	Group			
Inputs purchases	TableRows	Y	WO	All the following questions (marked grey) are asked separately for Fertilizer, Pesticides, Herbicides and Seeds

Text to be displayed	Widget	M	R/W	Comments
Generally how far do you have to travel to make a purchase of farming inputs	integer	Y	WO	in km
Where do you get your farming inputs from?	Selectlist	Y	WO	Choices/IDs (same as HHQ): 1=Government, 2=Association/cooperative, 3=Traders, 4=Own farm, 5=Other farmers, 6=NGO, 7=Research, 8=Government extension officers, 9=Other (please specify)
Other sources of ...	Text	Y	WO	Shown when "Others" is selected in previous question
In which month(s) did you make most of your ... purchases in the last season?	Selectlist	Y	WO	Choices: January-December
Where do you get your manure from?	Selectlist	Y	WO	Choices/IDs: 1=Self-made, 2=bought from nearby farmers, 3=market, 4=wholesaler
Do you sell manure?	ChoiceList	Y	WO	Choices/IDs: 1=Yes, 2=No
How much money do you earn by selling your manure?	integer	Y	WO	in local currency (currency is displayed depending on country choice in "general information" section). Shown only when "Do you sell" is answered with "Yes"
How much manure do you sell per year?	integer	Y	WO	in kg/t (2 fields with automatic conversion). Shown only when "Do you sell" is answered with "Yes" Range 0-100t
How much manure do you produce?	integer	Y	WO	Per month (average), in kg/t (2 fields with automatic conversion). Range 0-100t
Please specify the name of the organization from which you purchase most of your inputs (fertilizer, herbicides, pesticides, seeds)	Text	Y	WO	

Text to be displayed	Widget	M	R/W	Comments
Please specify the village/town where you make most of your inputs purchases (fertilizer, herbicides, pesticides, seeds)	Text	Y	WO	GPS position can be automatically applied using Google Maps
<i>Historical Data</i>	<i>Group</i>			<i>For a better comparison to the data collected about the current crop cycles, farmers are encouraged to enter historical data about their staple crop production during the last 5 years.</i>
What was your main staple food grown in the last five years?	Choicelist	Y	WO	Choices/IDs: 1=Maize, 2=Sorghum, 3=Millet, 4=none of the above
Year	TableRows	N	RO	All the following questions (marked grey) are asked separately for each year (2013-2017) only ask for main staple food, skip all questions if "none of the above" was selected in previous question
What was the amount of [main staple food] you have harvested in the last 5 years if any	num	N	WO	in kg
How much money have you invested in total for [main staple food] production in each of the last five years?	integer	N	WO	in local currency Helptext: Accumulate your expenditures for fertilizer, herbicides, seeds and hired labour in the respective year
In which unit do you usually sell your [main staple food]?	Choicelist	N	WO	Choices/IDs: 1=20kg bucket, 2=50kg bag, 3=per kg
Please trace the average local [main staple food] sales price within the last five years?	Integer	N	WO	Only show main marketing channel selected in previous question

Tabelle 2: Base data

3.3. Crop cycle data

This data is collected on a regular basis, either related to the entire farm or with regard to each of the different plots of a SAI Cropping System. For plot-related data, the different plots are selected from a pre-determined list of crop combinations as promoted by InnovAfrica.

3.3.1. Number of crop cycles

The tool will be used to track multiple crop cycles over the entire tenure of the InnovAfrica program until 2021. As there may be multiple crop cycles during a calendar year, every crop cycle will be labelled according to its starting year and month:

- Upon each entry of a new crop cycle, the user has to enter the "starting year and month of the crop cycle" and "ending year and month of the crop cycle" which will be asked for under the section 3.3.3. *Plot-related data - "Crop Management and Farm Productivity"*
- Based on the selection, the crop cycle is labelled accordingly, e.g. "Maize/Pigeon Peas 2019" whereas 2019 refers to the year the cycle has started
- If a second entry for the same crop cycle in the same start year is made, a suffix is added to the label, in this case "Maize/Pigeon Peas 2019-2"

Each crop cycle has corresponding periodic farm and household data. Every time a crop cycle is finished by entering "Details of crop cycle (end of season)", we will set a reminder for the user that she/he should enter all the data listed under 3.3.2. *Action-related data* as well.

3.3.2. Action-related data

All the following questions are asked for the entire farm (not plot-related). These questions are filled once after the end of the crop cycle.

Text to be displayed	Widget	M	R/W	Comments
<i>Trainings and Field Days</i>	<i>Group</i>			
Have you attended any of the following trainings in the last 12 months?	Selectlist	Y	WO	Choices/IDs: 1=Pre-season planning meetings, 2=Field day, 3=Farmer field tours, 4=Technical SAI training, 5=Assessment of SAI trials; 6= Pre-harvest training
Which of the following stakeholders were present during these	Selectlist	Y	WO	Choices/IDs: 1=Input market suppliers, 2=Output market service providers, 3=Information service providers, 4=Farmer organization representatives, 5=Financial institutions, 6=Any other you consider useful

meetings?				Only ask if any of the meetings was attended
Other stakeholders at meetings	Text	Y	WO	Show only when „Others“ is selected in previous question
Farm activities and labour	Group			
List of Actions	TableRows	Y	WO	All the following questions (marked grey) are asked separately for each of the actions. List of actions: 1=land preparation, 2=planting, 3=fertilization, 4=weeding, 5=plant protection, 6=irrigation – if any –, 7=harvesting, 8=post-harvest activities
Date	DatePicker	Y	WO	Date the action was done
Number of workers (male)	Person picker	Y	WO	Male workers involved in the action. Range 1-10 (special picker displaying persons)
Number of workers (female)	Person picker	Y	WO	Female workers involved in the action. Range 1-10 (special picker displaying persons)
Age range of workers	Selectlist	Y	WO	Helptext: "Select all age ranges that apply". Choices: 12-18, 19-40, 41-60, over 60
Time worked by family workers	Time picker	Y	WO	Total time worked on this action (add time of all workers). Selectable in 15min-increments.
Hired workers involved?	Choicelist	Y	WO	Choices/IDs: 1=Yes, 2=No
Time worked by hired workers	Time picker	Y	WO	Total time worked on this action (add time of all workers). Selectable in 15min-increments. Only shown when "Hired workers involved" = "Yes"
Hired worker cost	integer	Y	WO	in local currency (currency is displayed depending on country choice in "general information" section). Only shown when "Hired workers involved" = "Yes"
Market prices and income	Group			
Current market price per kg of [main crop grown] in local currency	Integer	Y	WO	in local currency (currency is displayed depending on country choice in "general information" section). Main crop grown displayed based on choice in "Main Crop and Household Asset Ownership" section
What is the yearly income of household head from on-farm sources?	Integer	Y	WO	in local currency (currency is displayed depending on country choice in "general information" section).
What is the yearly income of household head	Integer	Y	WO	in local currency (currency is displayed depending on country choice in "general information" section).

from off-farm sources?				
Food and Nutrition Status	Group			
During the last 12 months, did you worry that your household would not have enough food?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any household member eat just a few kinds of food day after day due to a lack of resources?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any household member eat food that you preferred not to eat because of a lack of resources to obtain other types of food?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any household member eat a smaller meal than you felt you needed because there was not enough food?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any other household member eat fewer meals in a day because there was not enough food?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Was there ever	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two

no food at all in your household because there were no resources to get more?				months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any household member go to sleep at night hungry because there was not enough food?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
Did you or any household member go a whole day without eating anything because there was not enough food in the past 12 months?	Selectlist	Y	WO	Choices/IDs: 1=Never, 2=Rarely (in one or two months during the last year), 3=Sometimes (in 3 to 10 months during the last year), 4=Often (in more than 10 months during the last year)
What is your own assessment of the adequacy of your family's food consumption over the past 12 months?	Selectlist	Y	WO	Choices/IDs: 1=It was less than adequate for your family's needs, 2=It was just adequate for your family's needs, 3=It was more than adequate for your family's needs, 4=Not applicable Helptext: "Adequate" means no more nor less than what the respondent considers to be the minimum consumption needs of the family
Taking into consideration ALL food sources (own food production + food purchase + help from different sources + food hunted from forest and lakes, etc.), how would you assess your family's food consumption in the past 12 months	Selectlist	Y	WO	Choices/IDs: 1=Food shortage through the year, 2=Occasional food shortage, 3=No food shortage but no surplus, 4=Food surplus.

Tabelle 3: Farming activities

3.3.3. Plot-related data

This data is collected at different frequencies, based on paper questionnaires, and will be entered into KIPUS by extension workers in different intervals when the crop cycle is finished.

All the following questions are asked separately for each SAI plot, and will be entered for each single plot which the farmer is operating on his farm.

Crop Management and Farm Productivity	Group			
Plot selection	Choicelist	Y	WO	Choices/IDs: 1=Maize sole, 2=Maize/Pigeon Peas, 3=Maize/Bambara Nuts, 4=Maize/Ground Nuts, 5=Sorghum sole, 6=Sorghum/Pigeon Peas, 7=Sorghum/Bambara Nuts, 8=Sorghum/Ground Nuts, 9=Millet sole, 10=Millet/Pigeon Peas, 11=Millet/Bambara Nuts, 12=Millet/Ground Nuts, 13=CA Maize sole, 14=CA Maize/Pigeon Peas intercrop, 15=CA Maize/Ground Nuts intercrop, 16=CA Maize/Bambara Nuts intercrop
Crop cycle starting year and month	Year and Date Picker	Y	WO	
Crop cycle ending year and month	Year and Date Picker	Y	WO	
Variety 1	Text	Y	WO	
Variety 2	Text	Y	WO	
Variety 3	Text	Y	WO	
Growing system	Choicelist	Y	WO	Choices/IDs: 1=Rotation, 2=Intercropped, 3=Sole, 4=Continuous
Row spacing	Num	Y	WO	In cm Range 1-100
Plant (station) spacing	Num	Y	WO	In cm Range 1-100
Tillage method	Choicelist	Y	WO	Choices/IDs: 1=no till, 2=conventional plough, 3>manual hoe tillage
Were any residues applied?	Choicelist	Y	WO	Choices/IDs: 1=Yes, 2=No
Which type of residues was used?	Selectlist	Y	WO	Choices/IDs: 1=maize residues, 2=weeds Only ask if previous questions was answered with "Yes"
Date when first planting rains were received in area?	Datepicker	Y	WO	
Seeding Date	Datepicker	Y	WO	
Harvest Date	Datepicker	Y	WO	
Basal type	Text	Y	WO	
Manure type	Selectlist	Y	WO	Choices/IDs: 1=compost, 2=cattle manure, 3=chicken manure, 4=leaf litter, 5=Other

Other manure type	Text	Y	WO	Only show if "Other" was selected in previous question
Manure rate	Num	Y	WO	In kg/ha
Basal rate	Num	Y	WO	In kg/ha
Date of basal application	Datepicker	Y	WO	
Top dressing type	Text	Y	WO	
Top dressing application rate	Num	Y	WO	In kg/ha
Estimated germination	Num	Y	WO	In %
Date of first weeding	Datepicker	Y	WO	
Date of second weeding	Datepicker	Y	WO	
Date of third weeding	Datepicker	Y	WO	
Input usage	Group			
Input usage	TableRows	Y	WO	All the following questions (marked grey) are asked separately for Fertilizer, Pesticides, Herbicides and Seeds
Name of input used	Text	Y	WO	
Quantity used	Num	Y	WO	1-1000
Units in which input is sold	Num	Y	WO	1-1000
Price per unit	Num	Y	WO	In local currency
Total cost of input	Num	Y	WO	In local currency
Pest and diseases	Group	Y	WO	Documentation of incidence of pest and plant damage
Weed density level	Choicelist	Y	WO	Choices/IDs: 1=<10%, 2=10-30%, 3=31-50%, 4=>50%
Fall Army Worm damage	Choicelist	Y	WO	Choices/IDs: 1=<10%, 2=10-30%, 3=31-50%, 4=>50%
Termite damage	Choicelist	Y	WO	Choices/IDs: 1=<10%, 2=10-30%, 3=31-50%, 4=>50%
Productivity on-farm	Group			Details about harvested amounts of the different SAI cropping systems These metrics refers to Maize, Sorghum and/or Millet
Number of [crop name] plants	integer	Y	WO	

Number of [crop name] cobs	integer	Y	WO	
Weight of total [crop name] stalks and leaves without cobs	integer	Y	WO	in kg
Distance between four rows	integer	Y	WO	in cm
Weight of all [crop name] cobs from each sample	integer	Y	WO	in kg
Initial Weight of 6 random [crop name] cobs from each sub-sample	integer	Y	WO	in kg
Air dried weight of [crop name] cob sub-sample	integer	Y	WO	in kg
Weight of grain of [crop name] cob sub-sample	integer	Y	WO	in kg
Weight of cores of [crop name] cob sub-sample	integer	Y	WO	in kg
Moisture of grain of [crop name] cob sub-sample	integer	Y	WO	In % Helptext: To be measured by grain moisture meter
Weight of [crop name] stalk sub-sample from all three samples	integer	Y	WO	in kg
Air dried weight of [crop name] stalk sub-sample	Integer	Y	WO	in kg
<i>Productivity on-farm</i>	<i>Group</i>			<i>Details about harvested amounts of the different SAI cropping systems</i> <i>This refers to legumes, i.e. Pigeon peas, Groundnut, Bambara nuts and/or Drybean</i>
Number of [crop name] plants	integer	Y	WO	

Distance between four rows	Integer	Y	WO	in cm
Weight of all [crop name] plants including pods	Integer	Y	WO	in kg
Weight of all [crop name] pods from plot	Integer	Y	WO	in kg
Weight of pod sub-sample	Integer	Y	WO	in kg
Weight of two stems [crop name] from sub-sample	Integer	Y	WO	in kg
Air dried weight of [crop name] pods from sub-sample	Integer	Y	WO	in kg
Air dried weight of [crop name] stems from sub-sample	Integer	Y	WO	in kg
Weight of threshed [crop name] grain from sub-sample	Integer	Y	WO	in kg
Moisture of [crop name] grain	Integer	Y	WO	
Weight of [crop name] stalk sub-sample	Integer	Y	WO	in kg
<i>Quality assessment (early season)</i>	<i>Group</i>			
Plant stand (establishment)	choicelist	Y	WO	1 (poor) - 10 (very good). "Smileys" are used to illustrate value
Weed control	choicelist	Y	WO	
Crop growth and vigour	choicelist	Y	WO	
Crop colour	choicelist	Y	WO	
Other 1	choicelist	N	WO	
Other 2	choicelist	N	WO	

Other 3	choicelist	N	WO	
Qualitative comments by farmers I	Text256	N	WO	
Qualitative comments by farmers II	Text256	N	WO	
Quality assessment (mid season)	Group			
Crop growth (height)	choicelist	Y	WO	1 (poor) - 10 (very good). "Smileys" are used to illustrate value
Crop colour (vigour)	choicelist	Y	WO	
Crop uniformity	choicelist	Y	WO	
Weed control	choicelist	Y	WO	
Other 1	choicelist	N	WO	
Other 2	choicelist	N	WO	
Other 3	choicelist	N	WO	
Qualitative comments by farmers I	Text256	N	WO	
Qualitative comments by farmers II	Text256	N	WO	
Quality assessment (end of season)	Group			
Cob number	choicelist	Y	WO	1 (poor) - 10 (very good). "Smileys" are used to illustrate value
Cob size	choicelist	Y	WO	
Cob filling (proportion of the cob with grain)	choicelist	Y	WO	
Weed control	choicelist	Y	WO	
Other 1	choicelist	N	WO	
Other 2	choicelist	N	WO	
Other 3	choicelist	N	WO	
Qualitative comments by farmers I	Text256	N	WO	
Qualitative comments by farmers II	Text256	N	WO	

Tabelle 4: Post-harvest data

3.4. Daily documentation

In this section, data is documented over a period of time. Entries should be done daily, if possible.

Text to be displayed	Widget	M	R/W	Comments
Rainfall	num	Y	WO	(per day) in mm . Range 0-50 with 1 decimal
Rainfall from sensor	Infotext	N	RO	If possible in the project context, data from an online weather service or an electronic sensor on-site should be included. Details need to be discussed

Tabelle 5: Daily entries

4. Data export and reporting

The administration platform for the tool offers a reporting section, which can offer customized dynamic reports as well as aggregated data for downloading and use in other systems.

4.1. Data export

On the administration platform in the "Reports" section, there will be an option to download the collected data in an aggregated form. This data will be in the same format as the data export of the household questionnaire:

- One file in CSV format which can be opened with MS Excel
- The first line (table header) will contain the column names (names of the fields)
- For multiple choice questions, a column will be added for each choice available (choice text will be appended to column name)
- For each entry saved in the tool there will be one line in the CSV. Recurring entries (e.g. monthly entries) will be identified by the entry date
- The entries will contain the IDs specified in this document

4.2. Dynamic reports

If required, the platform can be configured to generate live reports using all the data synced to the server at any time. These can be simple data tables as well as graphical representations like bar graphs or pie charts. Currently, no such reporting is foreseen (except for 2-3 simple analyses) in the project. The configuration of further reports is subject to additional costs and will need to be agreed between InnovAfrica and KIAG.

If additional reports are needed for this project, they will need to be defined (which data should be analysed, what kind of results should be displayed etc.). For example, the data specified above could be used to calculate the total cost of a single crop cycle for various cropping systems of individual farmers or their profitability or the respective averages for the entirety of the surveyed farmer population. At the same time, filters can be applied to generate data for a variety of sub-categories.

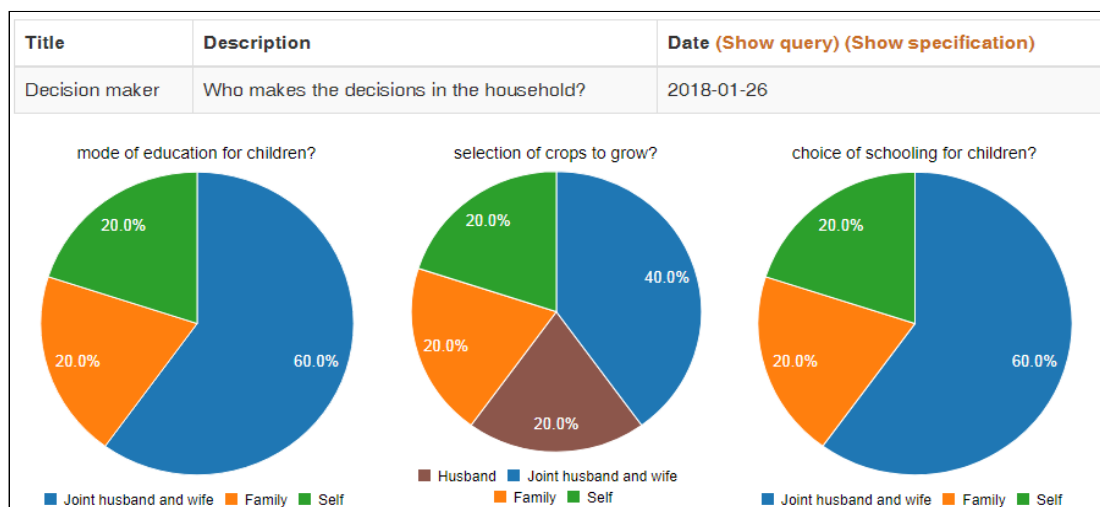


Figure 1: Example for dynamic report: Who makes decisions in household?