

IMPACTS AND SUSTAINABILITY OF IRRIGATION IMPACT EVALUATION

ENUMERATOR HANDBOOK & TRAINING MANUAL

OCTOBER 2017

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PURPOSE OF THE IRRIGATION IMPACT EVALUATION HOUSEHOLD SURVEY

This follow up survey will be conducted from May - June 2017 in Karongi and Nyanza Districts in Rwanda. This survey is part of an impact evaluation of the Land Husbandry, Water Harvesting and Hillside Irrigation (LWH) Project in Rwanda. The Ministry of Agriculture in Rwanda (MinAgri) is implementing the LWH project with technical assistance from the World Bank. The LWH project has been active since July 2010.

The questionnaire being used for the survey is divided into different modules. As the main objective of the LWH project is to increase the productivity and commercialization of hillside agriculture through irrigation and other land husbandry interventions, the agricultural modules are the most detailed. The survey module contains several sections related to irrigation, since the objective of the study is to better understand the impacts of irrigation on plot and household-level outcomes. In addition, the questionnaire contains modules on housing, labor, income/expenditures, shocks, agricultural extension, social networks and cooperation, farmer groups, financial access, household assets and food security. There is also a module dedicated to two interventions related to experiential learning and water fee payment/subsidies.

The data collected as part of the impact evaluation will be critical to improving future rounds of this program. The results from the study will help clarify what the exact outcomes of the program are for the participants, which parts of the program are most important, and which parts could most be strengthened. In collecting this data, you will be helping to improve the livelihoods of future participating farmers of Rwanda.

SURVEY ETIQUETTE

Many respondents may have low education and literacy levels. If some questions are difficult for them to understand, be patient in explaining the questions. Do not rush through the survey, as that may cause result in inaccurate data.

When you arrive at a household, you must introduce yourself and explain briefly the purpose of your visit before starting the interview. It is very important to make a good first impression! Explain that all information collected will be completely confidential. Respondents' names and personal responses will **NEVER** be revealed to anyone. If they seem uncomfortable, then reassure them of this fact. It is **essential** that you do your best to make the respondents feel comfortable as they give you their answers. However, if they refuse to answer a certain question, you should not force them to respond.

You will need to ask respondents for their consent (See Appendix A). If a respondent does not consent to the survey, do not pressure them to take the survey. Report their response to your Supervisor. The survey asks you to interview the Main Agricultural Decision Maker in the household. The determination of the main agricultural decision maker should be made by the household.

Each interview should take roughly two hours to complete. Please advise the respondent ahead of time to make sure that he/she will be available for the duration of the interview. Make sure that both you and the respondent are sitting in a position or location that is private, free of distraction and is comfortable for both of you. You will be expected to complete 3 surveys per day on average.

When you arrive at someone's house for an interview, you should immediately identify yourself and explain why you are there. See an example introduction in Appendix B.

ENUMERATOR RESPONSIBILITIES

- Cooperate with other survey team members during the training and fieldwork to ensure that the survey is carried out in a timely and professional manner
- Complete 3 household interviews per day. If you have to miss a day of work for any reason you must tell ask your supervisor or a manager for approval at least one day in advance. Your specific household assignments will be given in the form of daily assignment sheet.
- During the interview: Be polite and respectful at all times. You must turn off your cell phone! Do not change the wording or sequence of questions. Never suggest answers to a respondent.
- Ask the supervisor if you have any questions or doubts during an interview or need clarification on any section of the questionnaire.
- Complete all questionnaires in the household; check each questionnaire thoroughly for completeness and accuracy at the end of each interview. Be sure responses were carefully selected, and you did not accidentally select the wrong button (ex: a Harvest of 50 metric tons of beans! Meant to be kg).
- Don't rely on the tablet to catch every error! If something doesn't make sense, ask the HH for clarification.
- Submit the survey on tablet after you finish it
- Revisit households for clarifications or corrections as instructed by the supervisor
- Participate in regular review sessions with supervisors and advise them of any problems as they arise
- Write comments at the end of survey if you have anything important regarding that particular survey before submitting it.

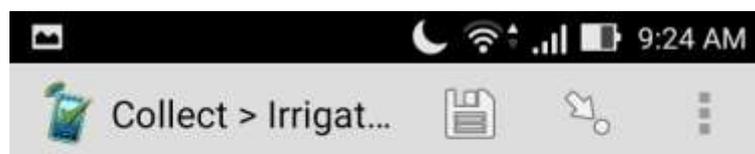
Training Protocols

1. All trainees are expected to be ready to start by 8:30 AM each day, to return on time from breaks, and to stay through 5:00 PM each day. Attendance will be taken. More enumerators are at the training that will be needed. Anyone not attending all training days, for the full day, will not be eligible for an Enumerator position.
2. The training will cover, one by one, all modules in the questionnaire.
3. Each module will be discussed in-depth, with the questionnaire and the survey manual side-by-side.

4. For each question, the English will be read aloud, followed by the Kinyarwanda. Translation issues will be fixed in real time by the Research Associate.
5. Answers to any questions or clarifications will be recorded in the training manual by the Research Associate in “track changes”, and by all trainees in their notebooks. An updated training manual will be distributed at the end of training.
6. Each set of modules will be followed by mock interview sessions, allowing the enumerators to practice the questions themselves and report and questions or concerns that arise.
7. The training includes classroom pilots of the paper questionnaire, classroom pilots of the tablet questionnaire, and a field pilot of the tablet questionnaire. All participants are expected to submit their paper and tablet surveys.
8. When working on the tablet template, everyone will carefully compare to the paper questionnaire. Any problems found with the template, and any suggestions, will be compiled by the Research Associate each day.
9. Several of the training days will begin with a quiz on the previous day’s material. The final day of training will include a Final Exam. These scores, along with performance on the Pilot Survey, participation and attendance at training will determine who is offered an Enumerator position.

QUESTIONNAIRE FORMAT

Example 1: Question with single response:



all_survey

All Survey Group

id_10_confirm

According to our record, your HH is in village [Kambogo], cell [Nyarugenge], sector [Rubengera], and district [Karongi] . Is this information correct?

Yes

No

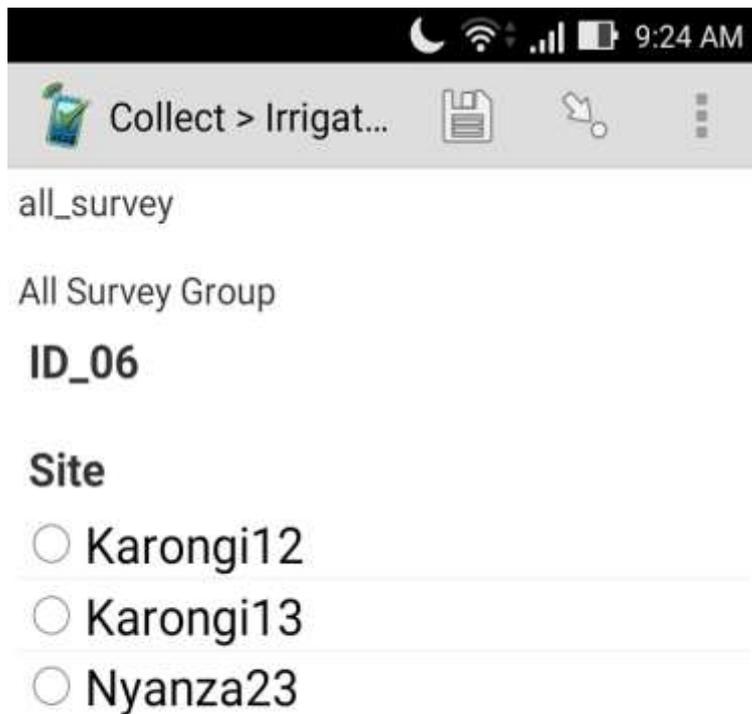
“All Survey Group” indicates which group of questions this one belong to. A group is a set of questions for the same topic.

“id_10_confirm” is the name of the question.

“According to... correct?” is the question that will be read to the respondents.

We have two options in this example – Yes and No. When you see a circle next to the options, it means that you can select only one among all options (two in this case).

Example 2: Questions with multiple choices but one response



The screenshot shows a mobile application interface. At the top, there is a status bar with a moon icon, signal strength, battery, and the time 9:24 AM. Below the status bar is a navigation bar with a folder icon, the text 'Collect > Irrigat...', a floppy disk icon, a hand icon, and a three-dot menu icon. The main content area displays 'all_survey' and 'All Survey Group' in a light grey font. Below that is the question ID 'ID_06' in a bold black font. The question title 'Site' is also in bold black font. The question body contains three radio button options: 'Karongi12', 'Karongi13', and 'Nyanza23', each on a new line with a horizontal separator line below it.

Here, you can choose only one answer among three options.

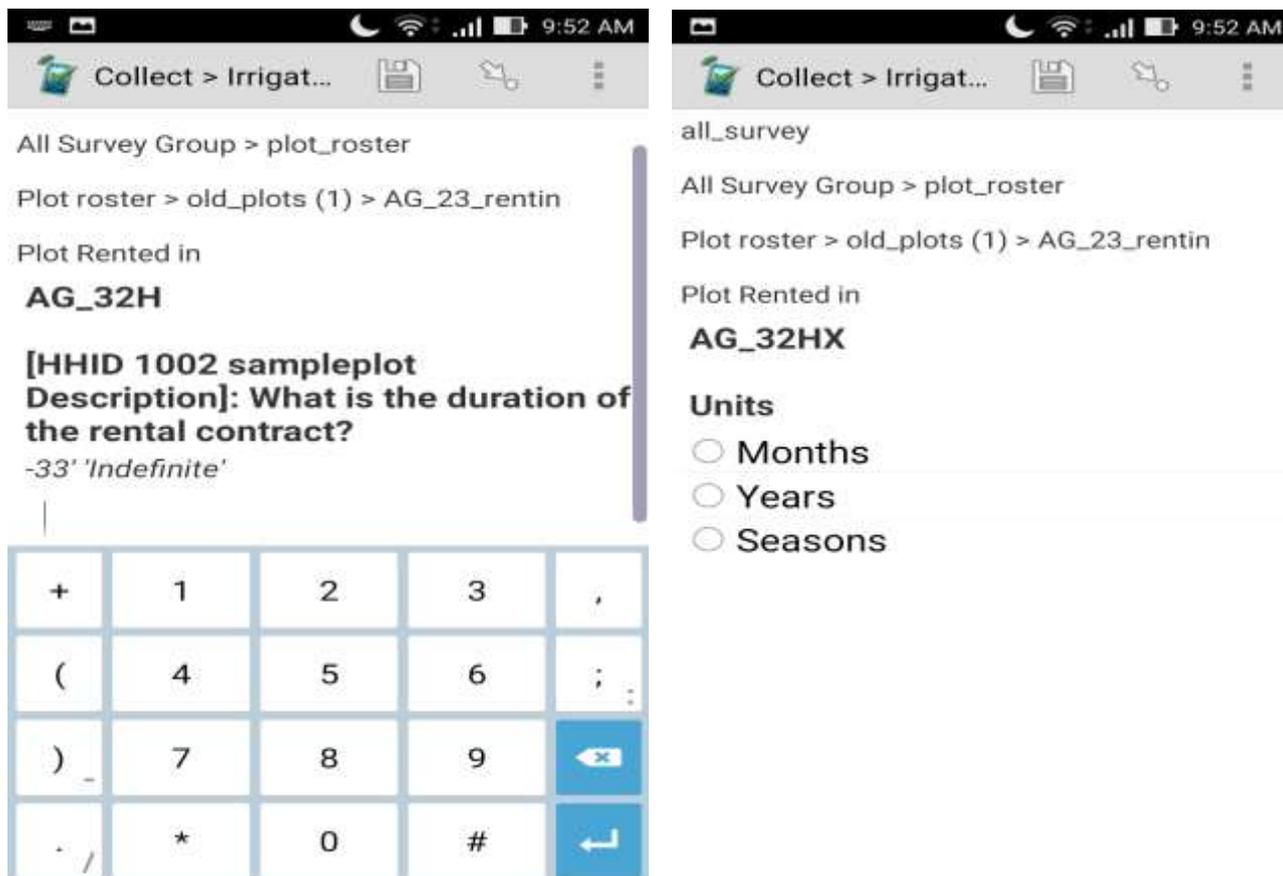
Example 3: Questions with multiple responses



The screenshot shows a mobile application interface. At the top, there is a status bar with a moon icon, signal strength, battery, and the time 9:27 AM. Below the status bar is a navigation bar with a folder icon, the text 'Collect > Irrigat...', a floppy disk icon, a hand icon, and a three-dot menu icon. The main content area displays 'all_survey' and 'All Survey Group' in a light grey font. Below that is the question ID 'AG_15' in a bold black font. The question body contains the text 'According to our records, these are all the parcels you owned when we visited you. Which ones do you still own?' in bold black font. The question body contains two checkbox options: 'HHID 1002 parcel 1' and 'HHID 1002 parcel 2', each followed by 'Description' on a new line with a horizontal separator line below it.

Here, the options have squares and not circles. This means that the respondent can choose multiple answers.

Example 4: Questions with number and unit



If you ask a respondent the duration of the rental contract, they might say something like “four seasons.” In that case, you would enter “4” for AG_32H and you would enter the code for “Seasons” for AG_32HX (in this case, the unit code happens to be 3). Unit questions should never appear in your interview. If a respondent doesn’t know the answer to a question with a number and a unit, or refuses to tell you, the tablet will skip the unit question.

On the tablet, these questions show one at a time. Once you have entered the quantity and pressed the “forward” arrow, it will ask you the unit.

INSTRUCTIONS FOR FILLING QUESTIONNAIRE

- The survey will be conducted completely using tablets. There is no option to fill a paper form and then enter it to the tablet later on, so it is important that you become comfortable using the tablet while performing the interview.
- Ask all questions to the respondent even if you think that the answer is obvious.
- The tablet will automatically skip to the correct question based on the respondent’s answer to previous questions (for example, if the respondent says they did not sell any of their crops yet, the tablet will not show the rest of the questions regarding crop sales).
- Use the answer codes presented by the tablet. All answer codes are pre-loaded.

- Mark decimal points clearly using a period (full stop), not a comma. Always use a zero if the answer is less than 1.

Example: *Incorrect: “.5” “0,5”* *Correct: “0.5”*

- In some cases, when writing OTHER as the answer, you must specify what it stands for. The tablet will prompt you to do so. Write the answer in the answer space provided. Writing in Kinyarwanda is fine, you do not need to write in English. **MAKE SURE THE ANSWER IS NOT REFLECTED IN THE PREDEFINED OPTIONS.**
- When asking the number of minutes to reach any place, record the time taken for **ONE WAY** only.
- When asking the cost to reach any place, record the total cost to travel **BOTH WAYS**

Below is the list of **SPECIAL CODES** when respondent is unable to answer your question. Do your best to help them answer, but if they can truly not respond, use the following codes. For questions where you select an answer on the tablet, “Don’t Know” and “Refuse to answer” will appear for you to select. Please do your best to probe, to avoid the use of these codes.

-99 – Missing – use if respondent cannot answer because the appropriate documents are missing.

Example: Respondent can’t find his/her government ID. However, National ID numbers are very important! Please do your best to get them.

-88 – Do not Know – Use if the respondent cannot give an answer because they do not know, even after probing. Example: Age of husband.

-77: Other: If you select other among a choice list, you will be prompted to specify which other response. You have to make sure you do not include a response which is already in the choice options just because the farmer’s response is not exactly the same. They may be synonyms.

-66 – Refuse to Answer – If a respondent refuses to answer, even after probing.

-33 – Indefinite – For instance, if the rental period is not defined.

Selecting the Correct Respondents

1. When appointments are arranged for interviews, they will be told about 2 hours of the agricultural decision maker’s time is needed.
2. The respondent for the study is the main agricultural decision maker for the household and the one most knowledgeable about household agriculture.

The main agricultural decision maker may be different from the person who knows much about farming.

For example, suppose you are at household with three adult members. The husband, wife and elder daughter. The wife spends the most time working on the farm, the daughter goes to the market to buy inputs, pays labor, and she is the one in charge of selling harvest. The husband typically decides what type of crop to grow, what type of inputs to use. In this case, the husband would be the decision-maker.

Then, suppose the HH says both husband and wife are equally involved in decision making or they tell you some decisions made by husband, others by wife?

Have the HH make the decision about who the respondent is based on the following:

- Decision maker + more knowledgeable about farming (cultivation, inputs usage and cost, labor, harvest sales)

SPECIFIC INSTRUCTIONS FOR EACH MODULE

SECTION A (ID): HOUSEHOLD IDENTIFICATION

PLEASE FILL OUT THIS SECTION OF the SURVEY CAREFULLY.

ID_05: The HH Code will be assigned to enumerators by their supervisors, on a daily assignment sheet.

ID_07 – ID_10: Here you should collect information on the address of the respondent's primary residence not the location of their plot. These questions come up only if the farmer does not confirm the address provided in the baseline. The locations of the plot will be recorded separately.

ID_23: Some farmers might be employed as irrigators. Since we have their names, in this question we ask them to confirm that they actually are irrigators. If they do not confirm, we will follow up asking why. *Note: this question comes up only if one person from the HH is recorded as irrigator. If nobody from the HH is an irrigator, this question will not be asked.*

SECTION B: Old HOUSEHOLD ROSTER

In this section, information (number, name, age, sex,...) about the household members from the baseline will be preloaded.

HH_10A: These are earnings from the past 12 months. For instance, if we are in the household in November, the earnings should be from November 2016 through October 2017. In cases where the household is engaged in an activity jointly with another member of the household, ask them for their share. We want to avoid a situation where we are double counting a contribution from multiple members of the household.

HH_10B,C and D: These are earning in each season (17B and 17C).

SECTION B1: New HOUSEHOLD ROSTER

B1HH_14: *Be sure to only record the number of **additional people** who joined the household after June 2017 and are now regularly living in the household. Write HH members in the following order:*

FIRST: *List Head of HH followed by spouse and children. If several wives, record in order of marriage.*

SECOND: *List other HH members related to the head of household or his spouse(s).*

THIRD: *List other HH members NOT related to the head of household or his spouse.*

FOURTH: *List any people absent currently but who are HH members, for example persons temporarily absent for less than six months due to school, seasonal work, holiday, hospital/clinic, but are part of household's economic activities (income and expenditures). For example, members who seasonally migrate to work in Kigali, but sends money to the household, students at secondary schools whose school fees and other costs are paid by the household.*

*Sequence: Ask questions **B1HH_03 - B1HH_12B** in the HH roster for one person before proceeding to the next person. The tablet will automatically proceed in this order. After you finish asking questions about the first person, the tablet will automatically start showing you questions about the second person and so on. The enumerator should pose the very last questions in the roster (ROS_19-ROS_24) to the head of household.*

B1HH_14A: Be careful of the members that you include in the HH roster. If you have any questions, call your Supervisor.

B1HH_07: Fill in an age for all family members. Record only *completed years*. If they are 2.5 years old, then you should record “2”. If a baby has not completed its first year, record “0”.

B1HH_05A: You should do your best to get the national ID number of every adult individual in the HH (age>18). If the individual does not know their national ID number, even after probing, you may write -99 or -88 or -66” in the tablet. This should be very rare. Please do check that the ID number you inserted is correct.

HH_10A: These are earnings from the past 12 months. For instance, if we are in the household in November, the earnings should be from November 2016 through October 2017. In cases where the household is engaged in an activity jointly with another member of the household, ask them for their share. We want to avoid a situation where we are double counting a contribution from multiple members of the household.

B1HH_10B, B1HH_10C and B1HH_10D: Record individual earnings from the activity by season (17B and 17C).

ROS_13: You should probe to see whether the individual had a secondary activity, other than the activity that you recorded in the previous question (ROS_12). If they did not contribute in any other way economically, then record a “15” here.

HH_15A: The respondent should be the **primary agricultural decision-maker** for the household (the person recorded in **HH_15**). The household should identify the person whom they deem to be the main agricultural decision maker. Typically, the main agricultural decision maker will be the household head.

SECTION C: Old Plot Roster

Information (descriptions and maps) collected on parcels and plots from the baseline will be preloaded. You will need to confirm if the descriptions match the plots the household told us they owned/cultivated at the baseline.

The sample plot is a plot that has been previously identified and described as part of the household listing. The sample plot is a plot that is particularly of interest to the study, although households should not necessarily be made aware of its importance. Hence, it is essential for us that if the sample plot was sold, not rented in anymore, or rented out, we collect all the information about the (new) owner. We are interested in all the information that can help us track the owner, in order to visit him in the future to ask questions about this plot.

After the sample plot, we have the most important plot, which is a plot, any way in the irrigated area or above irrigated area, identified by the household at the baseline, because the household considers it more valuable than others (apart from the sample plot).

If the household has more than one plot, the sample plot is listed first, followed by the most important plot, then other plots.

The maximum number of parcels is 5 while its 4 for plots.

A tertiary valve is a metallic, terrace-level water outlet, connected to a secondary pipe, intended to be used by households to irrigate.

SECTION C1: New Plot Roster

This question focuses on new plots cultivated by the household but also asks about parcels which the HH has acquired after June 2017. The definition of these two land-related entities can be confusing so please see the definition below.

A parcel is a unit of land ownership. We can define a parcel as a contiguous piece of land that is owned by a household. Sometimes the household will have a land title for this unit of land. In other cases, the household may have customary or no title. Please note that a parcel can have multiple plots or a dwelling plus an agricultural plot.

A plot is a contiguous area of **cultivated or cultivatable land**. You must probe very carefully to get all plots cultivated by the HH during the recall period. Include any plots that were cultivated on – this includes plots that were rented by the HH. In some cases, the plot will correspond exactly to a Parcel (this is rare) but typically, it is a cultivated section within a Parcel.

New Parcel Recording Protocols: We record the five largest parcels owned by the household starting with the most important and recording them in decreasing order of importance (i.e. most to least important). Please include parcels newly acquired, i.e. after June 2017.

New Plot Recording Protocols: For the new plots, proceed with the household's largest until you have captured the smallest plot. Please note that there is a limit of 4 plots that can be recorded, but for the number, you should record all the plots the household tells you they cultivated.

C1AG_10a- C1AG_10f – Please prompt for information on previous owner.

C1AG_11: We are interested in the self-reported size of the parcel even if the parcel size is indicated on the respondent's land title. If the respondent does not know the size of their Parcel, ask them for the length and width in meters and do the multiplication (i.e. 4 meters long, 2 meters across = $4*2=8$).

C1AG_23: Plot descriptions must be detailed (ex: Plot near the Old Mango tree, begins 20m beneath the primary canal) Use landmarks that will not change from season to season (like crops), so that we are able to identify the plot when we come back to survey next time. This determines the plots that the tablet will ask about in the rest of the survey.

C1AG_28: If the respondent does not know the size of their plot, ask them to estimate the length and width in meters and do the multiplication. Please use the calculator app that you can find in your tablet. If the respondent has a land title, do make an estimate based on what the land title says and what you see. For example, if the plot is only half of the parcel, divide the size from the land title by two.

C1AG_30A: Radical terraces should always be LWH/RSSP terraces. LWH/RSSP is a government/MinAgri project.

SECTION T: TREATMENT

In this section we collect information on two interventions (Water fee subsidies and crop demonstration kits) that happened in the field during Seasons B 2017 and C 2017 respectively.

Mini-kits: it consisted in the distribution of horticultural mini-kits (seeds and compost) to farmers.

Water fees subsidy: it consisted in subsidies on water fees that farmers are supposed to pay at the end of each season. It could be obtained for Season A only, Season A and B, or for no seasons. Assignment to any of these groups was done through a public lottery.

For both interventions we ask to confirm the information we have. If they do confirm, we ask follow up questions. If they do not confirm, we ask the reason why our information is not correct. These questions will be asked only if the respondent took part in the intervention program.

ID_20: After the lottery, each farmer received a lottery card stating the subsidy received and the total amount of water fees to be paid at the end of Season 17A and 17B. You should take a picture of this card. Keep in mind that different members of the same HH might have joined different lotteries and, as a consequence, have more than one lottery card. Please take a picture of each of them.

ID_22: After paying the fees, farmers received a receipt. Ask the farmer to collect all the receipt he got (if he paid the fees) and take one picture of all of them (NOT one for each receipt).

SECTION D1: CROP

Notes on Seasons: This survey covers Seasons 2017 B and 2017. The standard months are listed below. Be sure to capture all of the crops the HH grew. Consider a crop to belong to the season if it was planted within these months, regardless of when it was harvested. If you are not sure which season a crop falls in, please ask your Supervisor for clarification.

For some crops (horticultural crops, beans, potatoes), it may happen that the HH did not plant seeds but they had harvest. In this case the quantity of seeds will be 0 but we are still interested in recording the harvest.

Season B 2017: February 2017 – May/June 2017

Season C 2017: June 2017 – August 2017.

Season A 2018: September 2017 – January/February 2018

Notes on Plots: We ask questions on crops only for three cultivated plots. Ideally, we ask about the sample plot and the most important plot from baseline. However, farmers might have sold one of them, or both, or never cultivated (owned or rented in) two. Given that we want to get the information for three plots, this is the protocol to be followed if sample plot or the most important plot, or both, were not cultivated.

- i. *In the Baseline we asked questions about 4 plots. If a farmer doesn't cultivate anymore the sample plot, or the most important, we replace it with the 3rd plot of the baseline. If they were both sold (or not rented in then gave them to the owner, or rented out), we replace them with the 3rd and 4th plot of the baseline, plus one other plot until we get 3 cultivated plots.*
- ii. *If the 4th plot can't be used for replacement (e.g. they were sold or the farmer had only 3 plots at the baseline), then we use new plots for replacement. We ask information about 4 new plots, and the most important should be picked for replacement, then the second most important and so on, until we get 3 cultivated plots.*
- iii. *If after the replacement process, we have only 1 cultivated plot we ask questions about crops only for this cultivated plot. If no plot was cultivated, we don't ask this section.*

Again, we are capturing both seasonal crops and permanent crops.

For permanent crops, we are interested in recording information for crops that were harvested during the season. In other words, the crops could have been planted before the start of the Season but as long as they are harvested within the season, they should be recorded in that season.

PC_01: Here, we are trying to gauge the percentage of the plot used for cultivation during this season. The plot may be larger than the area cultivated this season.

CRP_17b_b: List all the crops cultivated on this plot.

CRP_17b1,2,3_s: List three primary crops cultivated on each plot in the command area, command area catchment and on the most significant agricultural plot cultivated outside of these areas. The following questions in this section collect details for each of these crops (e.g. quantity of seeds, harvesting, etc).

PC1_04: If the hh reports that they cultivated 50% of the plot at PC1_01, and they report that maize was 60% and beans were 40%, take the cultivated area of the plot as 100% (not 50%).

PC_05: Seed here is used in a broad sense. Covers anything from which a plant can grow and includes cutting for sweet potatoes and cassava.

PC_07: If they did not spend any money on it i.e. they either saved seed or received it from the Government or NGO for free, record 0.

Note that the sum of the amount the HH sells, eats, or loses post-harvest cannot be greater than the harvest.

Quantity Harvested >= Quantity Sold + Quantity Eaten + Post-Harvest Losses

Therefore: PC_09 >= PC_10 + PC_11 + PC_12

PC_11: Captures amount **already eaten**

PC_10: Captures amount of crop **sold already**

PC_10E: Make sure this is the total amount earned. If the HH had multiple sales, you must ask them the amount earned at each sale and record the sum.

PC_12: Refers to only post-harvest losses **NOT** losses that occurred in the field.

PC_12: This question asks for the all possible reason the HH grew this crop and allows multiple responses. Select “1” if the household grew this particular crop, based on the advice of the LWH project or a project agronomist. Select “2” if the household grew this crop as part of an arrangement with an external investor. It is possible that the household grew the crop based on the advice of the LWH agronomist and because the crop was chosen as part of the investor’s arrangement. In this case, the respondent can choose both.

PC_16 and PC_17: These questions refer to all the plots that were cultivated during Season A that have not already been asked about as part of the earlier crop questions. For this section, we are interested in the total combined production on these plots **NOT** the amount produced by plot. Therefore, you will have to sum the total production from multiple plots if the respondent has cultivated the same crop on multiple plots. For example, if the respondent has cultivated onions on two different plots (Plot 1 and Plot 2). The response for PC_16 should be as follows:

Amount of onions Harvested on Plot 1 + Amount of onions Harvested on Plot 2

SECTION D2: Plot-specific Irrigation

PI_2: Select only the main reason the household did not irrigate their plot

PI3_04: Asks about how the water gets to the plot from the irrigation source (mainly Secondary Pipe)

PI_5: Asks about irrigation method. That is, once the water is near the plot, which methods do they use to irrigate their plot.

Transverse furrows are small ditches on a plot that run perpendicular to the embankment.

Longitudinal furrows are small ditches on a plot that run parallel to the embankment.

SECTION D3: HH Farm Labor

General Note on this Section:

Person-days: person-days are the total number of days worked by all members of the household combined. If one person worked for one day on a task, that counts as one person-day. If two people both worked for one day, that counts as two person-days.

If one person worked in the morning, or in the afternoon, that counts as half day. Here, it does not matter whether the people are men, women or children.

Examples:

- 1) The head of household works for 10 days on a task: 10 person-days
- 2) The head of household and his wife both work for 10 days: 20 person-days
- 3) The head of household works for 10 days, and the wife and three children each work for 5 days: 25 person-days
- 4) The head of household works for 10 days, 6 of them during the morning and 4 all day: 7 person-days

HL_03:

In this section, we record total labor payments made per activity.

Examples:

- 1) HH pays 2,000 Rwf each to two workers for harvesting (one male and one female).
TOTAL PAYMENT: 2,000Rwf + 2,000Rwf = 4,000Rwf
RECORD ONLY THE TOTAL (Rwf 4,000)

- 2) \geq TOTAL PAYMENT: 1,000Rwf + 3,000Rwf
RECORD ONLY THE TOTAL: Rwf 4,000 Rwf

- 1) and 2) give the same answer. That is ok. We are concerned only with Total Payment. We are not concerned with how many laborers are paid or how much each laborer gets paid.

SECTION D4: Inputs

This section asks questions about inputs used on all of the plots the HH cultivates in the command area, command area catchment and their most significant agricultural plot outside this area. There is also a question that asks about the use of and amount spent on a given input on the rest of the plots combined.

PN_01: Here, we ask if the input was used in any of respondent's plots. If the answer is no, we proceed with the next input. If the answer is yes, we ask plot specific questions regarding the use of this input.

PN_02: Here, we would like to know how much of the input was used on this plot. The amount of input used on each of these plots and the amount of inputs summed together should not be greater than the amount of input recorded in PN_08. In other words, they should not have used more input on these plots than they said they used in total.

$$PN_{08} \geq PN_{02_plot1} + PN_{02_plot2} + PN_{02_plotx}$$

PN_04: We are interested in the amount of this input used on all other plots combined (all plots other than the ones asked about in PN_02. For example, if the HH has two plots other than the ones we asked about in PN_02, and if they used a particular input on these plots, you will need to sum up the amount of input used on each of these plots and record that number here.

SECTION D0: General Irrigation

IG_51: For maintenance tasks, we are trying to measure the level of irrigation knowledge. So, you should not read the tasks to the respondents.

IG_51 – An irrigator or operator is someone who is paid by the LWH project to engage in operations and maintenance tasks for the LWH project. A monitor is the elected member (farmer) of a WUG who is responsible for coordinating and troubleshooting problems related to water usage.

SECTION E (EX): EXTENSION

This section asks many questions that repeat for each type of extension provider (for example, TUBURA agent, LWH agronomist, lead farmer, etc). The tablet will automatically ask each question about the first provider and then skip to the second one and so on.

SECTION I: HOUSING

In this sections, we only capture changes in the housing after June 2017.

SECTION J: FARMER GROUPS

GR_06: A water user group (WUG) is an organization created at the level of the secondary pipe by the LWH project for the purposes of managing irrigation infrastructure and ensuring adequate operations and maintenance of the above infrastructure.

GR_20: A Water User Association is an organization that was created at the site-level to manage irrigation infrastructure and ensure adequate operations and maintenance of that infrastructure (water use).

SECTION J: SOCIAL NETWORKS and COOPERATION

General note: These questions should be asked with respect to the sample plot. A neighbor is defined as someone who cultivates on the same bench but on either side of the respondent's plot. Other members of your Water User Group (WUG) is meant to signify all those in the terrace benches besides the neighbor. Questions about other members of your WUG will only be asked to households who have sample plots in the command area.

I2_21: Sharing hiring labor is defined as either hiring labor jointly with neighbors or other members of your block or alternatively, using the labor that has been hired by your neighbors or other members of your block on your plot.

SECTION K (INC & EXP): INCOME & EXPENDITURES

Income and expenditure section – Make sure that there is consistency. Probe and make sure that they are reporting all their income. We should be capturing income and expenditure for the entire household and not for individual respondents.

For this section, enumerators should interview the member of the household present who knows the most about household finances.

Record “0” if a household did not spend or get income for a particular category.

PART 1: Income

NOTE: Record **household** income, **not** personal income. Record 0 if the HH did not earn any money from a category (do not leave any question blank).

INC_01: Include all livestock products: butter, milk, yogurt, cheese, eggs, meat. Does not include selling of livestock, which is captured in the assets section.

INC_02: Record only non-monetary gifts and transfers here from anyone outside the HH and monetary transfers in INC_03.

INC_04-INC_06: Occasionally, the LWH project has paid farmers to carry out these activities in project sites.

INC_07: An irrigator or operator is an individual employed/paid by the LWH project to help irrigate at the secondary and tertiary levels and to conduct operations and maintenance work on the infrastructure. Record any income the household earned from this occupation here (note: this should be relatively rare among the households that you interview).

PART 2: Expenditures

*Note that this section is divided into **frequent and infrequent expenditures**. Make sure that for EXP_01 to EXP_07 you want to know how much the household spent in the **past 1 week** and for EXP_08 to EXP_18b you want to know how much the household spent **from 1st November 2016 to October 31th, 2017**. For both types, we do not need to know about specific purchases but the total amount they spent on all purchases of that item.*

NOTE: Record **household** expenditures, **not** personal expenditures. Record 0 if the HH did not spend any money on a category (do not leave any question blank).

Frequent purchases: Capture expenditure for the **PAST ONE WEEK**.

EXP_02: Include all money spent on airtime (by all HH members) and any money spent on internet (for example, at internet café)

EXP_04: Leisure here refers to activities such as going to bar, watching sports and watching movies. Include all money spent on alcoholic beverages here.

Infrequent purchases: Capture expenditure **from 1st November 2016 to October 31th, 2017**.

Note: For this section, enumerators must first record whether the purchase was made by cash or in-kind. If the latter, we want the respondent's estimate of the value of the payment in the questions labeled b). For example, if school fees were paid in-kind then, the respondent should code the response to EXP_08 as 2 and the approximate value of these payments over the course of the last year in EXP_08b.

EXP_08: School fees covers all expenditures including tuition, costs of books/notebooks and uniform.

EXP_13: Excluding fees accounted for in the Farmer Groups section (for Water User Groups/Water User Association). Include only fees charged by the financial institution, not amounts deposited.

EXP_14: Include all expenditures on medicines and any payments to doctors, nurses or other medical providers. If the HH has health insurance, only include additional payments for health care.

EXP_17: include animal feed, medicines, any veterinary care, fees for vaccinations.

SECTION K: ASSETS

Note: Please be sure that when you speak about "other livestock" you exclude cows.

SECTION L: RURAL FINANCE

IMPORTANT: Respondents may feel uncomfortable telling you the details about the money they keep in different places. At the beginning of this section, remind them that all answers they give are confidential and will not be shared with anyone. If they refuse to answer any questions, re-state that this information is confidential but be polite and never pressure them to give you information they do not wish to share. If they still do not answer, indicate "-66" and move to the next one.

RF_2: Here, you should record the total amount of formal savings the household holds across all accounts. For example, if the household has two formal savings accounts and Account 1 has a balance of 2,000 RWF and Account 2 has a balance of 3,000 RWF, you should sum the amount in each formal account and record 5,000 RWF for this response.

A formal saving organization is a registered institution, where members have accounts and their transactions are formally recorded.

RF_3: Record the most recent deposit in any formal account.

RF_4: A Rotating Savings and Credit Association is a group that meets regularly to engage in savings and borrowing together. Typically, households contribute savings regularly and then are able to withdraw from the group pooled savings when it is their turn.

RF_5: If there are multiple forms of informal savings, sum up the amounts saved across all of these sources and record that number here.

SECTION M (CRD): CREDIT

All questions here apply to all loans, no matter the amount.

CRD_2: Consider all requests for loans, regardless of whether or not the respondent eventually received the loan.

CRD_5: Record the main purpose of the loan here (i.e. the use for which the HH intends to spend the majority of the money).

CRD_8: A group loan is one that an individual takes through a larger group (i.e. a cooperative, SHG, etc.)

SECTION N: SHOCKS

In this section we capture information on unpredictable events that caused a loss to farmers. We are only interested in shocks related to drought or lack of rainfall.

SECTION O: FUTURE EXPECTATIONS

Scenarios: These scenarios before X_11 and X_14 should be read dispassionately and without much emotion. This should not sound like a marketing pitch or as if we have an interest in the investment arrangement. The household should not come away with the sense that we are working for the investor.

X_11 – Site refers to LWH project site.

X_13 – Site refers to LWH project site.

Module P: FOOD SECURITY (WDDS)

The respondent for this module should be an adult female. If an adult female is unavailable, the second choice should be the person most knowledgeable about food consumption in the HH.

EXP_28: This question asks about the number of days not the number of times a HH has consumed a given food item. Therefore, the response should always be out of 7 (5 days out of 7). We do not care whether the household consumed the food item twice per day during those 5 days.

Taking GPS coordinates:

MP_01: Save waypoint at the entrance of the house. Please remember to switch on the Bluetooth Receiver and pair it with the GPS of your tablet. Take the GPS coordinates, then switch of the Bluetooth Receiver to save its battery.