Measuring Agricultural Labor
A Guidebook for Designing Household Surveys

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ABOUT LSMS

The Living Standards Measurement Study (LSMS), a survey program housed within the World Bank’s Development Data Group, provides technical assistance to national statistical offices in the design and implementation of multi-topic household surveys. Since its inception in the early 1980s, the LSMS program has worked with dozens of statistical offices around the world, generating high-quality data, developing innovative technologies and improved survey methodologies, and building technical capacity. The LSMS team also provides technical support across the World Bank in the design and implementation of household surveys and in the measurement and monitoring of poverty.

ABOUT THIS SERIES

The LSMS Guidebook series offers information on best practices related to survey design and implementation. While the Guidebooks differ in scope, length, and style, they share a common objective: to provide statistical agencies, researchers, and practitioners with rigorous yet practical guidance on a range of issues related to designing and fielding high-quality household surveys. The series draws on experience accumulated from decades of LSMS survey implementation, the expertise of LSMS staff and other survey experts, and new research using LSMS data and methodological validation studies.

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ACRONYMS

FAO  Food and Agriculture Organization of the United Nations
ICLS  International Conference of Labour Statisticians
ILO  International Labour Organization
LFS  Labor Force Survey
LSMS  Living Standards Measurement Study
LSMS-ISA  Living Standards Measurement Study – Integrated Surveys on Agriculture
MFP  Multifactor Productivity
NFE  Non-Farm Household Enterprise
NSO  National Statistical Office
SDG  Sustainable Development Goal
TFP  Total Factor Productivity
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EXECUTIVE SUMMARY

In poor countries, most of the people living beneath the international poverty line of $1.90 per day live in rural areas, eking out an existence on agriculture, either directly or indirectly. Given the prevalence of subsistence agriculture among the poorest households, the agricultural labor by household members is a key asset. This is why understanding agricultural labor from survey data is critical for accounting, and policy purposes, as well as for analysis to better understand labor markets. This Guidebook sets out recommendations for designing and implementing surveys to measure agricultural labor on household farms in low-income countries.

In household surveys, agricultural labor information is usually collected as part of a general labor module, using “the last seven days” as a reference period. However, this may not capture the seasonality of agricultural labor, leading to an overall underestimation of the number of people working on farms. To gather comprehensive data on agricultural activities, we recommend that an agricultural labor module be added to the traditional labor module. The best-practice survey design choices for agricultural labor modules to measure work on household farms are summarized below.

The reference period

The reference period for collecting agricultural labor data should be aligned with the reference period for which information on agricultural outputs and non-labor inputs are collected. The reference period should cover at least one entire agricultural season.

The timing and frequency of visits

When feasible, households should be visited twice at different times of an agricultural season, once after planting and once after harvesting. If households can only be visited once, they should be visited after harvesting.

Household labor on crop production activities

It is recommended that the information on agricultural labor is collected at plot level for each member of the household that worked on any household-listed plot. Any detailed analysis related to agricultural productivity will require information on labor input to be collected separately for each plot. The total number of days worked on the plot and the typical or average number of hours worked per day by each member during the reference period should be gathered without reference to any specific activity. For any given plot, the respondent should be the plot manager.

Household labor on post-harvest activities

Information on household labor carrying out post-harvest activities should be collected at the crop level for each household member that worked on post-harvest operations for any crop harvested by the household. The respondent for these questions should be the most knowledgeable person on the crop disposition by the household or the household’s farm activities. The total number of days worked on the crop by each member during the reference period should be collected, followed by a question on the typical or average number of hours worked per day for all activities, without reference to any specific activity.
Hired, free or exchange labor

Hired, free or exchange labor information should be collected at the person-type-plot level, disaggregated by men, women and children. For any given plot, the respondent should be the plot manager. Data should be collected on the total number of people by person-type per plot, the average number of days a typical person-type worked on each plot during the reference period, and the typical or average number of hours worked per day. While wage is not collected for household labor and free or exchange labor, it should be collected for hired labor.

Conclusions and recommendations

This Guidebook offers suggestions for survey practitioners on measuring work carried out on household farms in household and agricultural surveys. The menu of available methods is diverse and varies in the seasonal timing of interviews, the frequency and mode of interviews, the selection of respondents, the reference period, and the granularity of units in which labor is reported. The selection of the appropriate method depends on multiple factors and must be tailored to the survey objectives and the country’s agricultural labor data needs, while bearing in mind other potential users of the data.

This Guidebook recommends the collection of agricultural labor hours for all household members as well as for hired, free or exchange labor. Labor data should be collected for the entire agricultural season, aligned with data collection on output and non-labor inputs. Information on household agricultural labor should be collected for each household member working on household farm operations, while data on hired, free or exchange labor should be collected by grouping men, women, and children. Information on labor for crop production activities should be collected at plot level, while information on labor for post-harvest activities should be collected at crop level. Consequently, the respondent for questions on crop production activities should be the plot manager while the respondent for questions on post-harvest activities should be the most knowledgeable person on the crop disposition by the household.

The methods and recommendations presented here are relevant for integrated and multi-topic household surveys, other smaller-scale household surveys, agricultural sample surveys, and agricultural censuses. While we have focused on crop production and post-harvest activities on household farms, future research will explore other activities that may also be considered as household agricultural labor, such as livestock production, fishing, hunting, and gathering of agricultural products.
Agriculture remains the backbone of the economies of most low-income countries around the world today. In poor countries, most of the people living below the international poverty line of $1.90 per day live in rural areas, with income either directly or indirectly linked to agriculture (World Bank, 2018). The agricultural practices of these poor households are typically labor intensive, relying primarily on family labor (FAO, 2012). The agricultural labor of household members is thus a key asset, making knowledge about labor productivity a critical component of any poverty reduction strategy, particularly given that more benefits from agricultural development accrue to the poorest segments of the population (Olinto et al., 2013). Increasing agricultural labor productivity is seen as a crucial element towards achieving the Sustainable Development Goal 2 (SDG 2) to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture, as this is the goal of SDG 2.3, which aims to “double the agricultural productivity… of small-scale food producers” by 2030.

Measuring work on household farms accurately is critical to the development of effective agricultural policies (Arthi et al., 2018). However, experts often disagree on the best-practices for capturing data on household farms’ work in household and agricultural surveys. The menu of available methods is diverse, varying in length of the reference period, the selection of respondents, the sequencing of questions, the seasonal timing of interviews, and even the appropriate granularity of units in which labor is reported. As a result, the tools and methods currently used diverge widely across surveys, both within and across countries (Bardasi et al., 2011).

This Guidebook is a reference for survey practitioners who are looking for guidance on measuring labor on farming households in household and agricultural surveys. It builds on an established set of activities performed by the Living Standards Measurement Study team of the World Bank, including previously published guidelines’ and methodological work conducted in Tanzania, Ghana, and Malawi starting in 2014. The methods and recommendations found here are designed for integrated and multi-topic household surveys, other smaller-scale household surveys, agricultural sample surveys, and agricultural censuses.

This Guidebook focuses on agricultural labor related to crop production and post-harvest activities on household farms. Future research will explore other areas of household farming labor, including livestock production, fishing, hunting, and gathering of agricultural products. As a living document, it will be updated as additional recommendations become available.

The remainder of the document is organized as follows. Section 2 presents concepts and definitions that are commonly used throughout the guidebook. Section 3 illustrates the analytical and policy relevance of measuring work on household farms. In Section 4, the methodological options for collecting household farm labor are shown, along with an explanation of the survey design tradeoffs and the requirements of each method regarding the respondent’s burden and time, as well as human and financial resources. Section 5 recommends methods for measuring agricultural labor on household farms for different survey objectives. While the primary emphasis is on measuring household labor, recommendations are also made for measuring hired, free or exchange labor used by farming households.

1 https://unstats.un.org/sdgs/metadata?Text=&Goal=2&Target=2.3

2 “Designing Household Survey Questionnaires for Developing Countries” and the LSMS Guidebooks.
2. Concept and Definitions

This section explains the concepts and definitions of frequently used terms:

**Household:** “the concept of household is based on the arrangements made by persons, individually or in groups, for providing themselves with food or other essentials for living. A household may be either (a) a one person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household, or (b) a multi-person household, that is to say, a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their resources and may have a common budget; they may be related or unrelated persons, or constitute a combination of persons both related and unrelated” …… often, the concept of a “family” is more readily understood than a “household”, but it is not the same thing; a family may include people living in other households in other places.” (UN, 2015b).

**Agricultural holding:** an “agricultural holding is an economic unit of agricultural production under single management comprising all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households, by a clan or tribe, or by a juridical person such as a corporation, cooperative or government agency. The holding’s land may consist of one or more parcels, located in one or more separate areas or in one or more territorial or administrative divisions, providing the parcels share the same production means, such as labor, farm buildings, machinery or draught animals.” This definition indicates that there are two types of agricultural holdings: (i) holdings in the household sector — that is, those operated by household members; and (ii) holdings in the non-household sector, such as corporations and government institutions. (FAO, 2017).

**Parcel:** “a parcel is any piece of land of one land tenure type entirely surrounded by other land, water, road, forest or other features not forming part of the holding or forming part of the holding under a different land tenure type. A parcel may consist of one or more fields or plots adjacent to each other. The concept of a parcel used in the agricultural census may not be consistent with that used in cadastral work.” (FAO, 2017).

**Field:** “a field is a piece of land in a parcel separated from the rest of the parcel by easily recognizable demarcation lines, such as paths, cadastral boundaries, fences, waterways or hedges. A field may consist of one or more plots.” (FAO, 2017).

**Plot:** “a plot is a part or whole of a field on which a specific crop or crop mixture is cultivated, or which is fallow or waiting to be planted.” (FAO, 2017).

**Agricultural labor:** Any work/activity performed by an individual (household or non-household members) on an agricultural holding during the reference period.

**Exchange labor:** Work performed by non-household members on a household’s agricultural holding, compensated by work performed in their agricultural holding. Generally, this is an agreement between both parties such that no monetary payments are made for labor services rendered. For instance, households A and B agree to work on each other’s farms. They go to household A’s holding one day, and then they go to household B’s holding the following day.

**Free labor:** Work performed by non-household members on an agricultural holding that is not compensated in any form. No monetary or in-kind payments are received by the parties that supplied the labor.

**Hired labor:** Work performed for pay (cash or in-kind) by non-household members on an agricultural holding.
We exclude cases of forced labor or debt bondage from hired labor, as they are context-specific and require specialized modules.

**Reference period**: The span of time within which respondents are expected to report the information solicited. Examples include the last seven days, the last 30 days, the last 12 months, the most recent agricultural season, and so on.

**Recall period**: The time lag between the reference period and the date of interview. For instance, if the reference period is the first quarter of the year and the household is interviewed in July, then the recall period is the duration between March 31 and the day of interview, which is about three to four months. The reference period and the recall period may be used interchangeably when there is no time lag between the reference period and the date of interview, such as the last seven days, the last 30 days, and so on.

**Agricultural season**: The primary time from the start of land preparation to the completion of harvesting of crops, including post-harvest activities is considered to be the agricultural season. Agricultural seasons are often determined by the production cycle of the main field crop which follows the major rainy season of the country or region. Determining an agricultural season is difficult, however, as crop-specific production cycles are often overlapping and vary by country and region. In addition, a country or a region may have more than one crop cycle.

**Plot manager**: The person who is most knowledgeable and makes decisions concerning the crops to be planted, inputs to be used, and timing of cropping activities on the plot. The plot manager may or may not be an owner of the plot in question.

**Crop production activities**: Crop production activities include land preparation (including ridging), planting, weeding, fertilizer and pesticide application, and harvesting.

**Post-harvest activities**: “Post-harvest activities encompass drying, threshing, cleaning, storage, processing, transporting, and marketing.” (Grolleaud, 2002).

**Living Standards Measurement Study – Integrated Surveys on Agriculture**: The Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA) is a household survey project established with a grant from the Bill and Melinda Gates Foundation and implemented by the LSMS team. Recognizing that existing agricultural data in the Sub-Saharan Africa Region suffers from inconsistent investment, institutional and sectoral isolation, and methodological weakness, the LSMS-ISA project collaborates with the national statistics offices of its eight partner countries in Sub-Saharan Africa to design and implement systems of multi-topic, nationally representative panel household surveys with a strong focus on agriculture. The primary objective of the project is to foster innovation and efficiency in statistical research on the links between agriculture and poverty reduction in the region. In each partner country, the LSMS-ISA project supports multiple rounds of nationally representative panel surveys with a multi-topic approach designed to improve the understanding of the links between agriculture, socio-economic status, and non-farm income activities. The frequency of data collection is determined on a country-by-country basis, depending on data demand and the availability of complementary funding.
3. Analytical Relevance of Household Agricultural Labor Data

Data on agricultural labor is vital for measuring work, employment, total productivity, and labor productivity in agriculture. The following subsections establish some of the key analytical uses of agricultural labor data.

3.1 MEASURING PEOPLE WORKING IN AGRICULTURE

If the objective of a survey is to obtain statistics for people working in agriculture and other sectors, labor data at the individual level is required. Information should be collected on the number of hours an individual worked on any activities (including agricultural) during a given reference period, for each applicable individual household member. Information on a person’s work is usually obtained from a generic household labor module with questions asking whether the individual worked on any activities (including agricultural activities) in the last seven days. The generic household labor module provides a count of all categories of agricultural work performed by all members of the household, including work on household farms, wage or salary work in large farms and plantations, as well as paid or unpaid work on other households’ farms. Efforts should be made to collect the necessary data from all household members, including men, women, and children.

3.2 ANALYZING TOTAL FACTOR PRODUCTIVITY IN AGRICULTURE

Labor is an important component of total factor productivity analysis in agriculture, which requires that the input and output data used for the analysis be available at the same level of granularity (such as plot or crop). As all labor used to produce the crop(s) must be captured, agricultural labor data for the entire agricultural season from all sources (including household, hired, and free/exchange) are required.

3.3 ANALYZING LABOR PRODUCTIVITY, TECHNOLOGY ADOPTION, AND LABOR MARKETS

Agricultural labor data are also important for estimating labor productivity, which requires more granular data relative to total factor productivity. Data should be collected on the number of hours a person worked on a given plot for the entire reference agricultural season. As with total factor productivity, measuring labor productivity requires that the input and output data used for the analysis be available at the same level of granularity (such as at plot or crop levels). In addition, the measurement of agricultural labor is a critical component to understanding technology adoption. Regardless of whether a given technology is labor intensive or not, the profitability of new technologies and the labor constraints to their adoption are fundamental issues for agricultural development. Labor productivity is crucial for the monitoring of the SDG indicator 2.3.1: “Volume of production per labor unit by classes of farming per pastoral per forestry enterprise size.” In addition, labor market analysis typically considers labor productivity for individuals, hence requiring data at the individual level. Given that the Sustainable Development Agenda also recommends that indicators be disaggregated by sex whenever possible, data should be collected at the individual level for each plot (that is, at person-plot level) for the entire reference agricultural season.
4. Methodological Considerations in Designing Surveys for Measuring Household Agricultural Labor

Survey design decisions are always driven by the intended purpose of the data. As agricultural labor data can serve a number of purposes, the design of a module and the structure of questions must be tailored accordingly. It is particularly difficult to measure farm labor on smallholder farms because of its non-salient and non-regular nature, due to its dependency on crop demands and weather patterns (Arthi et al., 2018). When approaching survey design, designers must consider the objectives and type of survey: the data needs of the implementing country; the intended users of the data; and the consistency of methods for any cross-country comparisons. Survey designers must also decide on the timing and frequency of interviews, the mode of data collection, the potential respondents, and the reference period along with a host of other decisions. This section presents various options available for survey practitioners and NSO officials when designing surveys to collect data on household agricultural labor.

4.1 DECIDING FREQUENCY AND TIMING OF INTERVIEWS

As agriculture faces higher seasonality than other sectors, practitioners designing surveys to measure agricultural labor must consider the timing of the year in which the survey will be implemented.

Presumably, collecting data by diary or daily interviews throughout the agricultural season would most accurately capture agricultural labor data. In practice, however, this is difficult to implement, given the financial costs and logistical burden it would entail. Generally, agricultural data are either collected weekly or a few times or once at the end of an agricultural season.

Collecting agricultural labor data on a weekly basis implies a lower cognitive burden for respondents but has higher cost implications. Phone surveys are one option for lowering the costs of surveys with high frequency interviews (Section 4.2). Alternatively, household agricultural labor data can be collected less frequently, by visiting households twice at different times of an agricultural season, typically after planting and after harvesting. During the first visit, they are asked to provide their agricultural labor information for activities that occurred earlier in the agricultural season such as land preparation and planting, while information on activities that are undertaken later are asked during the second visit (such as weeding, input application, harvesting and so on). Finally, practitioners may also wait until the end of the agricultural season (that is, after the harvest) to collect the household agricultural labor information for the entire season. This visit can take place either immediately after the end of the season, or in the following months. In Section 4.4, we discuss some concerns with a one-visit survey where labor is reported for the entire season.

To overcome the cost implications of frequent interviews and bias in data quality introduced by longer recall periods, as found by Beegle et al. (2012), recent meth-
odological studies have combined traditional multi-topic household survey implementation with supplementary frequent data collection (including phone and face-to-face interviews) to obtain certain information that requires higher frequency of interviews, such as labor.

4.2 DECIDING ON THE MODE OF INTERVIEWS

Depending on the frequency and timing of the interviews, either phone or face-to-face interviews can be used when collecting agricultural labor data. Traditionally, multi-topic household surveys are conducted with face-to-face interviews. However, this method of data collection can be expensive, particularly in the context of high frequency surveys. Alternatively, data can be collected through phone interviewing. Recent studies have shown that estimates of labor inputs collected through face-to-face interviews are similar to those collected through phone interviews, assuming both interviews are implemented correctly (Arthi et al., 2018).

High frequency phone interviews can be a cheaper alternative to high frequency face-to-face interviews. However, levels of phone ownership and infrastructure needs, such as network, airtime credit, and electricity requirements, must be considered while planning the survey (Dillon, 2012). Non-universal phone ownership in the survey implementation context can introduce a number of challenges and tradeoffs arising from the requisite methodological solutions, which include selection issues (if the survey only collects data via phone), systematic measurement bias (if the survey collects data differently from phone owners and phone non-owners), or costs/endowment effects (if the survey calls for the provision of phones to respondents who do not own them) (McCullough et al., 2020).

Answering complex questions over the phone may also impose a higher cognitive burden on the respondent, potentially leading to lower response rates. Furthermore, only one person may be able to answer the phone, possibly implying higher rates of proxy respondents as well as complications in ensuring confidentiality, given that interviewers have less control over the environment in which interviews are conducted.

It may be necessary to implement one baseline face-to-face interview to establish a relationship with a household, explain how the high frequency phone interviews will work, and ensure the person who needs to provide responses has constant access to a working phone throughout the duration of the interviews. This may reduce the attrition rate and increase compliance with phone interviews.

Despite these challenges, high frequency phone surveys are a viable option to produce reliable data, while being considerably less expensive than high frequency in-person visits. However, further research is needed to provide guidelines on operationalizing and integrating them into nationally representative surveys. Several issues remain unexplored, including the ideal number of phone calls, the appropriate period between phone calls, the minimum required sample size, respondent selection and incentives, and the integration of high frequency phone data with recall data collected in in-person interviews.

Box 1. Cost comparison of data collection modes

Compared to a survey with face-to-face interviews, the cost of implementing a survey comprising of phone interviews may be much lower, thanks to significantly lower transportation costs and interviewer living expenses. Arthi et al. (2018) presents a costing exercise in which it calculates the increase in the variable costs of conducting 1, 10, 20, 25, or 30 interviews face-to-face or by phone, while assuming all fixed costs are subsumed under an LSMS-type baseline survey. The variable costs include the cost of the phones and staffing a call center in comparison to enumerator allowances and transport costs. The results show that phone interviews are much less expensive compared to those conducted face-to-face: while the cost of a single round of phone interviews is 6 percent of the cost of the baseline survey, the cost of a single round of face-to-face interviews is 14 percent of the cost of the baseline survey.

4.3 SELECTING RESPONDENTS

Determining the appropriate respondent for the agricultural labor module is critically important and must be given careful attention in the survey design and implementation process. The respondent can be each member who worked on a given plot, the individual who is most knowledgeable and makes the decision regarding the activities on the plot (that is, the plot manager), or the adult household member who is most knowledgeable about the household’s agricultural labor activities.5

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3 The methodological studies were conducted in Ghana, Malawi and Tanzania. See Appendix C for more details.
4 This Guidebook focuses on phone interviews implemented as a part of multi-topic household surveys.
5 Note: that this is not necessarily the head of the household
The most common practice is to interview the manager of each plot.

Interviewing each member of the household who worked on a given plot may yield the most accurate data of the person’s work on the plot (Bardasi et al., 2012). However, it will likely complicate or prolong the field operations, as enumerators must locate and contact each member that worked on the household’s plot (Schaffner, 2000). Additionally, some studies have shown that proxy responses may not differ significantly from self-responses when it comes to child labor (Dillon et al., 2012). As a final option, if the plot manager is not available, a household member that is knowledgeable about the household’s farming operations may be asked the survey questions, and can be assisted by other members of the household.

4.4 SELECTING REFERENCE PERIODS

Choosing the appropriate reference period is a key component of designing surveys to measure agricultural labor. Longer recall periods have the potential of introducing recall bias into the collected data, irrespective of the cognitive requirements of the questions. For instance, Arthi et al. (2018) found that even seemingly straightforward questions are affected by the recall period, such as questions about the number of plots cultivated by the farmer and the names of the people who worked on them. Similarly, Gaddis et al. (2018) indicate that “household members’ work on the farm are neither regular (rate-based estimates are impossible) nor salient (recalling and counting each time that the person works on the farm is challenging), thus the accuracy of labor measurement depends both on memory and the ability to mentally scale labor to fit standard question formats.” In the absence of salient or regular events, respondents infer their labor inputs based on their general assumptions about their farm activities or what they believe should have occurred, which may lead to the omission of individuals that occasionally work on the farm, for example (Arthi et al., 2018).

Longer recall periods can also lead to “telescoping” and “recall decay” (Sudman et al., 1973; Beegle et al., 2012). With telescoping, respondents remember a distant event as if it occurred more recently, and consequently include the information outside the given reference period. With recall decay, respondents may forget having performed certain activities or may forget details of events (Beegle et al., 2012). It must be noted, however that, shorter reference periods do not necessarily yield better data, as they can result in incomplete information (Section 4.4.1). Nonetheless, a reference period that may not be suitable in one situation may yield reliable data in others, depending on the frequency and timing of interviews. When choosing a reference period, survey practitioners should consider the empirical advantages and disadvantages of each reference period and the resulting recall period, as well as other aspects of the survey field operations.

4.4.1 The last seven days

The labor modules of multi-topic household surveys often rely on a seven-day reference period to collect the labor information of all household members. Globally, the seven-day reference period is also used in most Labor Force Surveys (LFS) to collect data on employment, unemployment, and labor force participation (ILO, 2013; Schaffner, 2000). In these labor modules, information is collected on each member of the household above a specified age who worked on any activities, including agriculture, during the seven days preceding the date of the interview. Schaffner (2000) notes that “questions that use shorter reference periods tend to elicit more accurate responses than questions that use longer reference periods for two reasons: first, because they do not stretch respondents’ memories and second, because it is easier to design brief sequences of questions.”

While the seven-day reference period is recommended for LFS, it fails to capture the total labor for the entire agricultural season, which is necessary for conducting a farm productivity analysis. In addition, if the interview is conducted only once, the seven-day reference period captures only partial information on labor market characteristics, due to the high seasonality of farming activities. For instance, Reardon et al. (2000) indicate that “there is a 50-60 percent chance for the seven days to fall outside a crop production season in areas with one rainy season and roughly a 20-30 percent chance for it to do so in areas with more than one rainy season.” Moreover, households might report little or no agricultural labor activities when the interview occurs in low season, even though they spend the majority of their time on agriculture over the course of a year (Schaffner, 2000; Reardon et al., 2000). Surveys conducted over 12 months or that include two visits in different seasons will be able to mitigate the seasonality issue and provide labor force indicators.

6 The farm labor information should be collected for all individual members above the minimum age for labor data collected in the country. Information for minors should be requested from the most knowledgeable adult.

7 Depending on the crop variety and cultural practices, the agricultural season may last between 3 to 7 months.
High frequency surveys such as weekly interviews where households are interviewed every week throughout the agricultural season can use a seven-day reference period every week to cover the entire agricultural season.\textsuperscript{8} Figure 1 shows an example of questions with a seven-day reference period.

### 4.4.2 Specific agricultural season

Agricultural seasons vary across countries and even regions within countries, with some countries experiencing more than one agricultural season in a year. Information from respondents on a specific agricultural season can be linked to information on inputs and outputs collected for the same reference season in order to conduct productivity analysis. In cases where countries have more than one agricultural season, data would ideally be collected separately for each agricultural season, according to the survey objectives.

Although the reference agricultural season is often referred to as “the last completed agricultural season”, careful consideration must be given to countries that have multiple agricultural seasons as well as to extended surveys, as the timing of the interviews may result in different reference seasons from household to household. Figure 2 illustrates how an extended survey collects information from different agricultural seasons, depending on the month of interviews when the reference period of “last completed agricultural season” is used. For example, households interviewed between November 2018 and July 2019 will provide information on the main agricultural season 2018, while households interviewed between August 2019 to October 2019 will provide information on the main agricultural season 2019. Annex A illustrates other cases.

Thus, the reference agricultural season should be clearly defined, preferably using the local name. It should also be documented and emphasized during all phases of the survey, so that it is clear to everyone involved in the design and the implementation of the survey, as well as to the users of the resulting data.

The following are the example questions:\textsuperscript{10}

- During the (main/rainy) agricultural season [YEAR], how many days did [NAME] spend on the following activities on this plot?
- During the last completed (main/rainy) agricultural season [YEAR], how many days did [NAME] spend on the following activities on this farm?
- In the last 7 days, did [NAME] run a non-farm business of any size for themselves or the household or help in any kind of non-farm business run by this household, even if for one hour?
- In the last 7 days, did [NAME] work on household agricultural activities (including farming, raising livestock, or fishing; whether for sale or for household food) even if just for one hour?
- In the last 7 days, did [NAME] work on household agricultural activities (including farming, raising livestock, or fishing; whether for sale or for household food) even if for one hour?
- How many hours in the last 7 days did [NAME] work on household agricultural activities (including farming, raising livestock, or fishing; whether for sale or for household food) even if just for one hour?

### 4.4.3 The last 12 months

While the “last 12 months” can be used to collect data over a longer duration, the accuracy, reliability, and usability of the agricultural labor data collected with a “last 12 month” reference period may create challenges for productivity analysis. For one, the duration might start and end in the middle of an agricultural season and hence not refer to a particular agricultural season (Reardon et al., 2000). The last 12 months can even be more confusing, potentially leading

\textsuperscript{8} It is important to keep in mind that high frequency surveys have implementation challenges, including but not limited to respondent and enumerator fatigue, along with increasing costs.

\textsuperscript{9} For example, in Ethiopia, two seasons are called Mehir and Belg; in Tanzania, Masika and Vuli; in Sri Lanka, Maha and Yala; and in India, Kharif and Rabi.

\textsuperscript{10} When an agricultural season spans over two years, it is important to reference both years. For example, if the planting is done at the end of year 2018 and the harvest is done at the beginning of year 2019, the agricultural season should be referred as “agricultural season 2018-19.”
4. METHODOLOGICAL CONSIDERATIONS IN DESIGNING SURVEYS FOR MEASURING HOUSEHOLD AGRICULTURAL LABOR

4.4.4 Other periods

Aside from the reference period discussed above, there are other periods that might be useful for survey practitioners, such as a month, a quarter, or a calendar year, depending on the objectives of the survey. As discussed above, however, decisions about the appropriate reference period must take into account the specific agricultural seasons in the regions to be surveyed, the timing of the interviews, and the types of intended analysis.

4.5 SELECTING REPORTING UNITS

The reporting unit – such as household, person, plot, crop, activity, and time – will determine the granularity of the information collected. A more granular reporting unit such as individual, plot, or activity levels will expand the scope of possible data analysis. Two or more reporting units can also be combined to increase granularity. However, this may increase the interviewing time and the burden on the respondents. Data can also be collected at an aggregated level; however, it then becomes impossible to disaggregate if such a data analysis need should arise. It is therefore important that the objectives of the survey are clear, and that the questionnaire design and data collection protocol enable the achievement of those objectives. Survey practitioners should carefully weigh the advantages and disadvantages of the degree of granularity and select the reporting unit (or combination of units) most appropriate for answering the analytical questions of interest.

4.5.1 Person

Farm labor can be grouped into three main categories: 1) household members who engage in household farming activities; 2) persons who are non-household members, but are hired to work on the farm for either cash or in-kind payment (such as tenants and permanent or casual laborers); and 3) free or exchange labor, that is, non-household members working for free or in exchange.
for services rendered by the household. Classifying farm labor in this manner facilitates the respondents’ ability to recall information, because of the distinct characteristics of the three groups. For example, it requires households to make payments for hired labor, making it easier to keep track of them while comparing to household or free or exchange labor.

Data for all labor for each plot should be collected. Following the standard definition of a household, information on all household members should be collected, regardless of whether a given individual worked on the farm in general or in each specific plot. Additionally, some workers may not be listed as household members following the standard definition of a household, such as children or other relatives who may live and work elsewhere, but temporarily visit the household to assist during the peak agricultural season. These workers, who are excluded from the list of household members and thus from “family workers”, should be captured as free or exchange labor.

When data are collected at the individual level, it assures that future data analysis will not be limited by data constraints, allowing for linkages between an individual’s labor with other topics such as their health or education, for example. Aggregate labor characteristics are collected when questions do not refer to any specific person or category of worker, such as “Did anyone work on the farm?” or “How many days in total did people work on this plot?” Questions like these can create ambiguity in the data collection process as well as in the resulting usability of the data and should thus be discouraged.

Survey designers can also choose to categorize people and ask questions by category. Categorization often follows demographic characteristics such as age or gender, maintaining some limited disaggregation of the data. While this method is recommended for collecting information on hired and free or exchange labor, it should be avoided for collecting household labor information to the greatest extent possible.

### 4.5.2 Plot

The lowest level of land disaggregation varies by country. Depending on the country, it may be a plot, a parcel, or even a farm in some cases. At the highest level of granularity, agricultural labor data can be collected separately for each plot, or for all plots combined at the lowest level of granularity (Reardon et al., 2000). For productivity and other related analysis, however, information on labor inputs must be collected separately for each plot. Using the highest level of granularity also facilitates a natural flow to the interview and reduces bias in the collected data (Reardon et al., 2000). Therefore, practitioners should ideally design their surveys for collecting agricultural labor data at the highest level of granularity for the land reporting unit.

During field operations, respondents must clearly understand the level at which they are reporting, be it at the plot, parcel, or farm level. It is critical that all plots cultivated by a household are reported if data are collected at plot level. Forgotten or missed plots will be omitted from the conversations between interviewers and respondents and will thus be excluded from the data. A plot roster is usually created at the beginning of the agricultural module. To obtain a comprehensive list of plots, interviewers may sketch a rough map with respondents that locates all plots, including fallow and pasture plots.

### 4.5.3 Crop

To reduce the cognitive burden of respondents and ensure a natural flow to interviews, it is best for certain information to be collected at the crop level. This is particularly true for post-harvest activities, including crop processing, storage, and packaging for sale. After crops have been harvested, farmers tend to pool their harvest from different plots by crop in order to perform post-harvest activities. Decisions on the disposition of the harvest are also often made by crop, making it easier for respondents to recall information at the crop level. Collecting information on post-harvest activities at the crop level is particularly important in countries where there is a high level of land fragmentation.

### 4.5.4 Activity

During the agricultural season, farmers perform different activities such as land preparation, planting, weeding, ridging, harvesting, and so on. Survey questionnaires can be structured to capture labor input at the disaggregated activity level (that is, for each specific activity) or

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11 This Guidebook excludes cases of forced labor or debt bondage from hired labor, as they are context-specific and require specialized modules.

12 Farm refers to all land use wholly or partly for agricultural production purposes, without regard to title, legal form, or size. See Section 2 for definitions of plot, parcel, and farm.
at the aggregated activity level (that is, for all activities combined). While collecting information at the disaggregated activity level expands the analytical possibilities of the data, high levels of disaggregation can introduce bias into the data. For example, some activities are done in parallel, making it difficult for the respondents to disaggregate by each activity. In some cases, respondents might indicate working two hours on a given plot for planting and report the same number of hours for weeding, even though in actuality they spent two hours doing both activities simultaneously. To avoid the risk of double counting, therefore, data should be collected at the aggregated activity level. For instance, the questionnaire can be structured to ask for the total number of hours worked over a given reference period without referencing any particular activities, followed by questions on the specific activities performed.

4.5.5 Time

The choice of time unit for estimating person-days or person-hours is equally important when designing survey questionnaires for measuring agricultural labor. Simply asking a yes or no question on whether an individual participated in household agricultural labor activities is insufficient. Identifying the length of time in days or hours an individual performed those activities allows for quantifying the intensity of their participation (Schaffner, 2000).

There are several ways to estimate the length of time worked during the chosen reference period. Interviewers can ask respondents directly for the number of hours they worked on a given plot during the reference period. While this is recommended for a short reference period, asking for the total number of hours with a longer reference period will put excessive cognitive burden on the respondents, likely resulting in erroneous data.

Alternatively, interviewers can ask respondents a set of questions to construct rough estimates of the hours worked by an individual during the reference period. One possible set of questions would ask respondents for the number of days worked during the reference period, followed by the typical or average number of hours worked per day during those days, as shown in the example below.

Another option is to ask for the number of weeks worked during the reference period, the typical or average number of days per week worked during those weeks, and the typical or average number of hours worked per day during those days, as shown in the example below.
5. Recommendations for Measuring Household Agricultural Labor

This section presents recommended modules for implementing surveys to measure agricultural labor. Emphasis is placed on the objectives of the survey and potential data needs, while reflecting findings from recent methodological studies. While adhering to the contents of these modules, survey designers should adapt them to fit the relevant country context and survey objectives, taking into account various tradeoffs in survey design choices.

5.1 Capturing all household members, land holdings and crops

Accurate information on household agricultural labor requires respondents to provide an accurate listing of all cultivated plots as well as all household members working on those plots. Recent studies have found that one of the primary sources of bias in agricultural labor data concerns the omission of household members and cultivated plots (Arthi et al., 2018; Gaddis et al., 2019).

5.1.1 Counting all household members

A complete list of household members is needed in order to have a comprehensive list of farm workers. Every individual who falls within the definition of a household member should be listed. The definition of household should be carefully considered, as different definitions of households will have implications for household size, composition, welfare, and production as highlighted by Beaman et al., (2012). The household listing is normally done at the beginning of the interview in the Household Roster section, where demographic information such as sex and age are collected. As mentioned previously, some workers who do not fall within the standard definition of a household would not be listed as “family workers.” For example, children or relatives who live elsewhere but temporarily visit the household to help during the peak season should be counted as free or exchange labor.

5.1.2 Capturing all land holdings

In order to establish a comprehensive list of cultivated plots, a complete list of plots to which the household has access is required, regardless of ownership status, title, legal form, cultivation status, or size. This listing is done at the beginning of the agricultural questionnaire in the Plot Roster section. To ensure that no plots are forgotten, enumerators should reread the plot roster to the respondent after its completion, and then ask, “Do you have any other plots, even smaller ones which you or any member of the household had access to?” If any plots were omitted, they should be added at this time. Another option is for the enumerator to draw a sketch map of all land holdings with their respective plot managers. This sketch map will facilitate data collection at plot level and potentially reduce the omission of plots. For surveys that include multiple visits, the plot roster (and the sketch map) from the previous visit should be read in each subsequent visit to ensure that farmers identify each plot and add any plots that were omitted. After all relevant plots are listed, questions should be asked to identify the plots under cultivation.
5.1.3 Counting all crops

A complete list of cultivated crops is needed in order to have a comprehensive list of harvested crops. All crops cultivated by the household (including tree and permanent crops) during the reference season must be listed, whether or not the household intends to harvest them. This listing is typically done when detailed plot information is collected.

5.2 SURVEYS INTENDED TO MEASURE WORK AND EMPLOYMENT IN AGRICULTURE

If the primary objective of the survey is to measure work and employment in agriculture, data should be collected as part of the household questionnaire and at the individual level, where information is obtained for every individual member of the household beyond a specified age threshold. Given that the information is collected at the individual level, the respondent must be either the relevant individual or the adult household member most knowledgeable about the household’s labor activities. It is equally important to ensure that the questionnaire captures information on work in different income-generating activities, including, wage or salary work, and household farming and non-farming activities.13 The labor module should be designed and tested to ensure that it captures all forms of work-related activities for all men, women, and children in the household.

The survey should capture the number of hours that an individual has worked in each activity, their payments received, and other relevant details, such as the characteristics of the job and benefits received. The number of hours worked will determine the primary activity or occupation of the individual, especially for those that have multiple occupations. Questions related to the intended destination of outputs should be asked to determine whether individuals are employed or working for their own use. The 19th International Conference of Labor Statisticians (ICLS) agreed that the main intended destination of production is the major determinant of employment among farmers. If the main intended destination of the output of the work done by a farmer is for sale or barter, that individual will be classified as employed, whereas if the main intended destination is for own or family use, the individual will be classified as an own use production worker. To classify workers as employed, at least one question regarding the intended use of own production goods must be asked, such as: “Thinking about all the [farming products or animals or fish] [NAME] worked on, are they intended: a) mainly for sale; b) mainly for family use; or c) mixed destination?”

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13 In countries where the provision of free or exchange labor to households is common, specific questions should be asked to capture this type of work.
In general, a seven-day reference period is used in this type of module. However, this method may not capture the seasonality of agricultural work if the survey is conducted solely during a specific season of the year. In these cases, the survey should register both the current employment status of the individual as well as their usual employment. For instance, a seven-day reference period can be used to find out the current employment status, while a 12-month period can be used to establish the individual’s employment over a longer duration. In cases where the survey spans an entire year and has been designed to be seasonally representative, using a seven-day reference period should be sufficient to capture the seasonality in employment, as different households and individuals will be interviewed at different times during the interview period.

5.3 SURVEYS INTENDED TO ANALYZE AGRICULTURAL OR LABOR PRODUCTIVITY

If the objective of the survey is to analyze agricultural or labor productivity, the timing and the frequency of interviews as well as the reference period should be chosen in such a way that the data collected will cover an entire agricultural season. While weekly interviews during an entire agricultural season would collect the most reliable data, this method has high cost implications. To lower costs, agricultural labor data could be collected less frequently. When feasible, households should be visited twice at different times of an agricultural season — once after planting and once after harvest. If households are visited only once, they should be visited after the harvest.

If households will be visited after planting and after harvesting, data can be collected in two modalities. The first is to use specific reference periods: 1) collect the time spent on the farm from the start of the agricultural season up to the day of the interview during the first visit, and 2) collect the time spent on the farm from the day of the first interview to the end of the agricultural season during the second visit. The second is to use specific activities, regardless of when they occur within the agricultural season: 1) collect the time spent on land preparation and planting during the first visit, and 2) collect the time spent on post-planting, harvesting, and post-harvest activities during the second visit. If the interviews are aligned and occur immediately after planting and harvest, the data collection should be bound to specific reference periods, as in the first modality.

If households are visited only once after harvest, the reference period should be “the last completed (main or rainy) agricultural season” or “the (main) agricultural season [YEAR]”. Efforts must be made to prevent extending the interviews into another agricultural season, as households may then combine information from both seasons.

5.3.1 Household labor

It is recommended that the information on agricultural labor is collected at plot level for each household member who worked on any plot cultivated by the household. Typically, decisions on the use of inputs, including labor, are made at plot level. In addition, crop production is captured at plot level. Collecting data on agricultural labor at plot level will allow for linking labor to output and other inputs for productivity analysis. This method is also used to reduce the cognitive burden on respondents by ensuring a natural flow to the interview, as well as allowing for other individual-level analysis and aggregation, as needed (Reardon et al., 2000).

For any given plot, the plot manager should be the respondent. Alternatively, the person most knowledgeable about the household’s farm operations or each member of the household can be interviewed.

The total number of days worked on the plot by each household member during the reference period should be collected, followed by a question on the typical or average number of hours worked per day. If the subsequent analysis is not intended to examine labor allocation across activities, then the number of days and hours worked per plot should be solicited for all activities, without reference to any specific activity. While the disaggregated activity level may seem preferable, respondents may not be able to apportion the actual number of hours to each specific activity, and instead may report the same number of hours across activities and plots, leading to an overestimation of hours worked. A preferable approach is to ask respondents how many days or hours an individual worked on a given plot, and then request information on the activities performed by the individual on the plot.

As mentioned previously, phone interviews are cheaper than in-person interviews, but the high frequency approach still has higher cost implications relative to traditional surveys with one or two visits. Appendix B illustrates the impact of the timing of interviews on data collection. It includes an example of data collection using the first modality with unaligned interviews (that is, interviews that do not occur immediately after planting and harvesting).
5.3.2 Post-harvest activities by household labor

When feasible, information on household labor for post-harvest activities should be collected. These activities are labor-intensive and lack of labor input towards them may increase the probability of post-harvest losses, thus reducing the consumption of and income from the crop.

To collect information on post-harvest activities, households should be visited after the harvest. When possible, interviews should be conducted after all post-harvest activities are finalized for the reference agricultural season. If this is not feasible, the information can be collected any time after the harvest. Regardless of the timing, the reference agricultural season period for capturing the post-harvest activities should be the same as for crop production. Therefore, if the interview occurs before all the post-harvest activities are completed, the respondents should be asked to give an estimate for the remainder of time to be spent on these activities.

Information on household labor for post-harvest activities should be collected at the crop level for each member of the household who was involved in the post-harvest operations of any crop harvested by the household. Collecting this information at the crop level will reduce the cognitive burden for respondents, as farmers tend to pool their harvests from different plots by crop in order to perform the relevant post-harvest activities. This is especially important in countries with high levels of land fragmentation.

The household member most knowledgeable about household crop disposition or farm operations should be interviewed. Alternatively, each member of the household can be interviewed.

The total number of days worked on the crop by each household member during the reference period should be solicited, followed by a question on the typical or average number of hours worked per day. Ideally, the number of days and hours worked per crop for all activities should be captured, without reference to any specific activity. Respondents can first be asked how many days and hours an individual worked on a given crop, and then asked to indicate all activities performed by the individual.

5.3.3 Hired, free or exchange labor

Given the critical role that hired, free or exchange labor play in labor market operations in low-income countries, agricultural labor modules implemented in these contexts must count both hired, free or exchange labor information. The design and implementation of this section is similar (but not identical) to the section on household labor information.

5.3.3.1 Plot-level activities

Information should be captured at plot level for all hired, free or exchange labor. The respondent should either be the plot manager or the household member most knowledgeable about the household’s farm operations.

Unlike in the household labor section, people who worked as hired or free or exchange labor can be grouped by demographic characteristics such as age or sex, but this choice must be driven by the survey objectives and intended analysis. Typically, hired, free or exchange labor information should be collected at plot level, disaggregated by men, women, and children (person-type). While no wage information is collected for household or free or exchange labor, it is important to collect this data for hired labor. Special attention should also be paid to gather any information on machinery services that may be hired jointly with labor. Collecting the wage rate for hired labor allows for imputing the cost of household and free or exchange labor.

5.3.3.2 Post-harvest activities

If information on post-harvest activities by hired, free or exchange labor is desired, a similar approach to the above can be taken, and the data should be collected at the person-type-crop level.

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16 If households process their crops as part of the household enterprise activities, then labor information may be collected either in the agricultural module or in the household enterprise module (if one is included in the survey). If a survey includes both agricultural and household enterprise modules, caution must be exercised to avoid gathering this information twice.

17 Labor supplied to other household(s) is captured in the labor module with a seven-day reference period (Section 5.1).
5.4 HOW TO IMPLEMENT THE RECOMMENDATIONS

5.4.1 Surveys intended to measure work and employment in agriculture

First, every individual member of the household should be listed, and all those above a specified age threshold should be identified (Section 5.1.1). The interview should then proceed person by person, ensuring that information on all eligible members are collected. Each should answer for themselves. If this is not feasible, a person who is knowledgeable about the individual should answer on their behalf (a proxy respondent).

5.4.2 Surveys intended to analyze agricultural or labor productivity

For surveys intended for analyzing agricultural or labor productivity, two modalities are possible. The most common way is to interview either the plot manager or the household member with most knowledge about the household’s farm operations. The alternative is to interview each member of the household above a specified age threshold.

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Box 2. Recommendations by type of agricultural labor for productivity analysis

<table>
<thead>
<tr>
<th>LABOR TYPE</th>
<th>INFORMATION COLLECTED</th>
</tr>
</thead>
</table>
| Household (excluding post-harvest activities) | • Questions should be asked at person-plot level.  
• For each member of the household who worked on cultivated plots, information should be collected on the total number of days worked on a given plot during the reference agricultural season as well as the typical or average number of hours worked per day during those days that were worked, irrespective of the activity performed by the person.  
• If possible, indicate all the activities performed on the plot. |
| Post-harvest household | • Questions should be asked at person-crop level.  
• For each household member who worked on the harvested crops, information should be collected on the total number of days worked on a given crop on post-harvest activities during the reference agricultural season as well as the typical or average number of hours worked per day during those days, irrespective of the activity performed by the person.  
• If possible, indicate all post-harvest activities performed on the crop. |
| Hired | • Questions should be asked at plot level for each person-type that is men, women, and children.  
• The total number of each person-type hired for each plot throughout the reference agricultural season should be collected.  
• Number of days and typical or average number of hours per day that each person-type worked on a given plot should be collected.  
• If possible, the activities performed by each person-type on a given plot should be collected.  
• Payments in the form of wage paid per day to each person-type should be collected and should include the value of in-kind compensation.  
• Information on machinery services that may be hired jointly with labor should be collected.  
• If information on post-harvest activities by hired labor is collected, questions should be asked at the crop level for person-type. |
| Free or exchange | • The design of this section is similar to that for the hired labor, except no wage information is captured. |

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18 Age thresholds normally follow countries’ practices. Alternatively, the International Labor Organization’s definition of child labor can be used.

19 For more detailed information on the reasoning behind each question in the sample module, a flow of the questions, and how to implement the module, refer to the Employment and Own-Use Production in Household Surveys: A Practical Guide for Measuring Labor (Forthcoming).
5.4.2.1 Household labor

5.4.2.1.1 Surveys with one respondent per plot
For surveys with one respondent per plot (that is, the plot manager), the first step is to list all land holdings and identify all plots cultivated by the household (Section 5.1.2). The interview should proceed plot by plot, ensuring that all cultivated plots are included. For each plot, the interviewer should ask if each household member has worked on the plot, ensuring that all members above a specified age threshold are included (Section 5.1.1). For example, if a household has two cultivated plots (plots 1 and 2) and three household members (persons A, B and C) above the specified age threshold, the interview should be conducted as follows: “During the agricultural season 2018, did A work on plot 1 for any activity?”. If yes, the number of days, the typical or average number of hours per day, and activities performed are collected. This should then be repeated for persons B and C on plot 1. After all information on plot 1 has been collected, the same should be repeated for plot 2, again asking about persons A, B and C.

Appendix C.2 presents the recommended set of questions to be included in the agricultural labor module.

5.4.2.1.2 Surveys that interview all household members
In specialized surveys where it is feasible to interview each member of the household, the first step is to list all the members of the household and identify those who are above a specified age threshold (Section 5.1.1). The interview should proceed person by person, ensuring that information on all eligible household members are collected. Ideally, this would be done by interviewing each relevant individual. However, if the person is not available, a knowledgeable household member (a proxy respondent) may answer on their behalf. Each person should be asked if they have worked on each cultivated plot, ensuring all the cultivated plots are accounted for (Section 5.1.2). For example, if a household has two cultivated plots (plots 1 and 2) and three eligible household members (persons A, B and C), the interview should be conducted as follows: “During agricultural season 2018, did A work on plot 1 for any activity?”. If the answer is yes, the number of days, the typical or average number of hours per day, and activities performed are also collected. This should be repeated for person A on plot 2. After all the information on person A is collected, the same process should be repeated for persons B and C, respectively.

Appendix C.3 shows the recommended set of questions for specialized surveys.

5.4.2.2 Post-harvest activities by household labor

5.4.2.2.1 Surveys with one respondent
For surveys with one respondent, a listing should be done of all crops harvested by the household in the reference agricultural season (Section 5.1.3). The interview should proceed crop by crop, ensuring that all harvested crops are included. For each crop, the interviewer should ask if each household member has worked on the crop, ensuring that all members above a specified age threshold are included (Section 5.1.1). For example, if a household has two harvested crops (crops 1 and 2) and three household members (persons A, B and C) above the specified age threshold, the interview should be conducted as follows: “During the agricultural season 2018, did A work on crop 1 for any post-harvest activity?”. If yes, the number of days, the typical or average number of hours per day, and activities performed are collected. This should be repeated for persons B and C on crop 1. After all information on crop 1 has been collected, the same process should be repeated for crop 2, asking about persons A, B and C respectively.

Appendix C.4 shows the recommended set of questions to be included in the agricultural labor module.

5.4.2.2.2 Surveys that interview all household members
In specialized surveys where it is feasible to interview each member of the household, the first step is to conduct a listing of all individual household members, identifying all those above a specified age threshold (Section 5.1.1). The interview should then proceed person by person, ensuring that information on all the eligible members are collected. Ideally, each should be personally interviewed. However, if the person is not available, a knowledgeable household member can answer as a proxy respondent on their behalf. Each person should be asked if they have worked on each harvested crop, ensuring that all harvested crops are accounted for (Section 5.1.3). For example, if a household has two harvested crops (crops 1 and 2) and three eligible household members (persons A, B and C), the interview should be conducted as follows: “During agricultural season 2018, did A work on crop 1 for any post-harvest activity?”. If yes, the number of days, the typical or average number of hours per day, and activities performed are collected. This should be repeated for person A on crop 2. After all information on person A has been collected, the same should be repeated for persons B and C respectively.

Appendix C.5 shows the recommended set of questions to include in specialized surveys.
5.4.2.3 Plot level activities by hired, free or exchange labor

First, all land holdings should be listed, and all plots cultivated by the household should be identified (Section 5.1.2). The interview should proceed plot by plot, ensuring that all cultivated plots are included. For each cultivated plot, the interviewer should ask if each person-type has worked on the plot, ensuring that all person-types are included. For example, if a household has two cultivated plots (plots 1 and 2) and hired two adult women and one adult man during the agricultural season, the interview should be conducted as follows: “During the agricultural season 2018, did you or anyone in your household hire any women to work on plot 1?”. If the answer is yes, the number of women, the number of days, the typical or average number of hours per day, wage, and activities performed are also collected. This should be repeated for men and children on plot 1. After all information on plot 1 has been collected, the same process should be repeated for plot 2, asking about women, men and children.

Appendix C.6 shows the recommended set of questions to capture information on labor provided by hired, free or exchange labor for plot level activities.

5.4.2.4 Post-harvest activities by hired, free or exchange labor

First, a listing should be done of all crops harvested by the household in the reference agricultural season (Section 5.1.3). The interview should then proceed crop by crop, ensuring that all the harvested crops are included. For each crop, the interviewer should ask if each person-type has worked on the crop, ensuring that all person-types are included. For example, if a household has two harvested crops (crops 1 and 2) and hired two adult women and one adult man during the agricultural season to perform post-harvest activities, the interview should be conducted as follows: “During the agricultural season 2018, did you or anyone in your household hire any women to work on crop 1 for any post-harvest activity?”. If yes, the number of women, the number of days, the typical or average number of hours per day, wage, and activities performed are collected. This should be repeated for men and children on crop 1. After all information on crop 1 has been collected, the same process should be repeated for crop 2, asking about women, men and children.

Appendix C.7 shows the recommended set of questions to capture information on labor provided by hired, free or exchange labor for post-harvest activities.
Agriculture continues to be the mainstay of the economies of most low-income countries. Most of the extreme poor in low-income countries reside in rural areas and participate in labor-intensive agricultural practices. Given that the labor of household members in agriculture is a key asset for poor households, understanding agricultural and labor productivity is a critical component of any poverty reduction strategy.

This Guidebook has offered suggestions for survey practitioners on measuring work carried out on household farms in household and agricultural surveys. As we have seen, the menu of available methods is diverse and varies in the seasonal timing of interviews, the frequency and mode of interviews, the selection of respondents, the reference period, and the granularity of units in which labor is reported. Selection of the appropriate method depends on multiple factors and must be tailored to the survey objectives and the country’s agricultural labor data needs, while bearing in mind other potential users of the data.

The methods and recommendations presented here are relevant for integrated and multi-topic household surveys, other smaller-scale household surveys, agricultural sample surveys, and agricultural censuses. While we have focused on crop production and post-harvest activities on household farms, future research will explore other activities that may also be considered as household agricultural labor, such as livestock production, fishing, hunting, and gathering of agricultural products.

Additionally, recent studies by the LSMS team have shown that high frequency mobile phone surveys hold promise to produce reliable data, while being considerably less expensive than high frequency in-person visits, however further research is also needed to provide guidelines on operationalizing and integrating them into nationally representative surveys. Several issues remain unexplored, including the ideal number of phone calls, the appropriate period between phone calls, the minimum required sample size, respondent selection and incentives, and the integration of high frequency phone data with recall data.

This Guidebook is a living document and will be updated as additional recommendations become available. See the Appendixes for more information on timing and reference periods, sample questionnaire modules and their corresponding manuals, along with details onmethodological studies.
REFERENCES


ANNEX A.
EXAMPLES OF TIMING OF INTERVIEWS AND REFERENCE PERIODS

The figures in this section present illustrative examples of the timing of interviews and reference periods, demonstrating the impact of the timing of interviews on data collection when a non-specific reference period such as “last completed agricultural season” is used.

Figure A.1 illustrates a survey structured to collect information on two main agricultural seasons with two visits to each household (one visit to collect information per each agricultural season). When the reference period of “last completed agricultural season” is used, households interviewed between September 2018 and December 2018 will provide information on the first agricultural season 2018, while households interviewed between January 2019 and April 2019 will provide information on the second agricultural season 2018 during the first visit interviews. During the second visit interviews, households interviewed between May 2019 and June 2019 will provide information on the second agricultural season 2018 while households interviewed between July 2019 and December 2019 will provide information on the first agricultural season 2019.

Figure A.1. Two agricultural seasons with two visits
Figure A.2 illustrates a survey structured to collect information on one main agricultural season with two visits to each household (that is, a post-planting visit to collect information from the start of the agricultural season up to the day of the interview, and a post-harvest visit to collect information from the day of the first interview to the end of the agricultural season). This is a traditional timing of visits commonly used in many countries. To reduce the cognitive burden of respondents and recall bias, the interviews should be aligned with the agricultural cycles, with post-planting visits beginning in June and post-harvest visits beginning in January.

Figure A.2. One agricultural season with post-planting and post-harvest visits
ANNEX B.
SAMPLE QUESTIONNAIRE MODULES

The sample modules provided include:

**B.1. Module to collect work and employment of household members**

**B.2. Module to collect agricultural labor input provided by household members (excluding post-harvest activities)**

  B.2.1. Module for surveys with one respondent per plot

  B.2.2. Module for specialized surveys that interview all household members

**B.3. Module to collect agricultural labor input provided by household members for post-harvest activities**

  B.3.1. Module for surveys with one respondent per crop

  B.3.2. Module for specialized surveys that interview all household members

**B.4. Module to collect agricultural labor input provided by hired, free or exchange labor (excluding post-harvest activities)**

**B.5. Module to collect agricultural labor input provided by hired, free or exchange labor for post-harvest activities**

*Note*: these are simply sample modules and should be customized to fit each country context.
### ANNEX B.1.
### MODULE TO COLLECT WORK AND EMPLOYMENT OF HOUSEHOLD MEMBERS

**MODULE: EMPLOYMENT**

This section is asked for household members N+ years or older.

(The reference age N should be based on the minimum age for labor data collection in the country)

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<td><strong>INTERVIEWER:</strong> IS THE RESPONDENT N+ YEARS OR OLDER?</td>
<td><strong>INTERVIEWER:</strong> IS [NAME] REPORTING FOR HIM/HERSELF?</td>
<td><strong>INTERVIEWER:</strong> WHO IS RESPONDING ON BEHALF OF [NAME]?</td>
<td>Last week, that is from Monday [DATE] up to Sunday [DATE], did [NAME] do any work for someone else for pay for one or more hours? INCLUDES PAID APPRENTICESHIPS AND PAID INTERNSHIPS.</td>
<td>How many hours did [NAME] do this work last week?</td>
<td>Last week, did [NAME] work in a non-farm household business that [NAME] operates, for one or more hours?</td>
<td>How many hours did [NAME] do this work last week?</td>
<td>Last week, did [NAME] help in a non-farm household business that is operated by another HH member for one or more hours?</td>
<td>How many hours did [NAME] do this work last week?</td>
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**ANNEX B. SAMPLE QUESTIONNAIRE MODULES**

**MODULE: EMPLOYMENT**

**THIS SECTION IS ASKED FOR HOUSEHOLD MEMBERS N YEARS OLD OR OLDER**

(the reference age N should be based on the minimum age for labor data collection in the country)

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<tr>
<th>4a</th>
<th>4aa</th>
<th>4b</th>
<th>5</th>
<th>E2</th>
<th>Recovery question</th>
<th>Intended destination</th>
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<tbody>
<tr>
<td>Last week, did [NAME] work on household farming, livestock, fishing or forestry activities, even if only for one hour?</td>
<td>How many hours did [NAME] work last week?</td>
<td>Thinking about all the products [NAME] worked on, are they intended...?</td>
<td><strong>READ OPTIONS</strong> Only for sale...</td>
<td><strong>REVIEW QUESTIONS</strong> Q1a, Q2a, Q3a, Q4a [AND Q4aa]: IS THERE ANY YES?</td>
<td>Last week, did [NAME] run or do any kind of business, farming or other activity to generate income?</td>
<td><strong>READ ONLY IF NEEDED:</strong> For example: making things for sale, buying or reselling things, providing paid services, growing products, raising animals, catching fish, hunting or foraging for sale.</td>
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<td><strong>YES... 1</strong></td>
<td><strong>NO... 2</strong></td>
<td><strong>Q4b</strong></td>
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**INTERVIEWER:** REVIEW QUESTIONS Q1a, Q2a, Q3a, Q4a [AND Q4aa]: IS THERE ANY YES?

**HOURS**

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### ANNEX B.2.
**MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HOUSEHOLD MEMBERS (EXCLUDING POST-HARVEST ACTIVITIES)**

**B.2.1. For surveys with one respondent per plot**

Questions 5 and 6 are optional and should be included when relevant.

**MODULE: LABOR INPUTS (HOUSEHOLD)**

This section is asked for household members N years old or older (the reference age N should be based on the minimum age for labor data collection in the country)

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<th>INDIVIDUAL ID</th>
<th>INTERVIEWER: RECORD THE ID OF THE RESPONDENT.</th>
<th>DAYS (TOTAL)</th>
<th>TYPICAL HOURS PER DAY</th>
<th>LAND PREPARATION</th>
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<th>RIDING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES</th>
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<th>YES...</th>
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<th>NEXT PERSON-PLOT</th>
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</table>

During those days that [NAME] worked on [PLOT] during [REFERENCE AGRICULTURAL SEASON], did [NAME] work on [PLOT] for any activity? On how many days did [NAME] work on [PLOT] during [REFERENCE AGRICULTURAL SEASON]? During those days that [NAME] worked on [PLOT], how many hours per day did [NAME] work on [PLOT] typically? What activities did [NAME] perform on [PLOT] during [REFERENCE AGRICULTURAL SEASON]? Select all that apply. Do not read out the list of activities to the respondent. During those days that [NAME] worked on [PLOT], did [NAME] use a tractor or mechanical unit to work on [PLOT]? How many hours in total did [NAME] work on [PLOT] using a tractor or mechanical unit during [REFERENCE AGRICULTURAL SEASON]?
B.2.2. For specialized surveys that interview all household members

Questions 5 and 6 are optional and should be included when relevant.

### MODULE. LABOR INPUTS (HOUSEHOLD)

THIS SECTION IS ASKED FOR HOUSEHOLD MEMBERS N YEARS OLD OR OLDER

(the reference age N should be based on the minimum age for labor data collection in the country)


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<th>TYPICAL HOURS PER DAY</th>
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<th>RIDING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES</th>
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For specialized surveys that interview all household members, questions 5 and 6 are optional and should be included when relevant.
ANNEX B.3.
MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HOUSEHOLD MEMBERS FOR POST-HARVEST ACTIVITIES

B.3.1. For surveys with one respondent per crop

<table>
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<th>PID</th>
<th>DAYS (TOTAL)</th>
<th>TYPICAL HOURS PER DAY</th>
<th>SHELLING/THRESHING/PEELING</th>
<th>SORTING</th>
<th>DRYING</th>
<th>CLEANING</th>
<th>PROCESSING (MILLING, GRINDING, GRATING, ETC)</th>
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Since [CROP] was harvested, has [NAME] worked on any post-harvest activities for [CROP], beginning with shelling, threshing, etc.? YES... 1 NO... 2 NEXT PERSON-CROP

Since [CROP] was harvested, on how many days has [NAME] worked on any post-harvest activities for [CROP]?

What activities has [NAME] performed on [CROP] since your household harvested it? SELECT ALL THAT APPLY

DO NOT READ OUT THE LIST OF ACTIVITIES TO THE RESPONDENT

How many more days is [NAME] expected to work on [CROP] for post-harvest activities? IF NONE, RECORD '0'.

This section is asked for household members N years old or older (the reference age N should be based on the minimum age for labor data collection in the country)
### MODULE: POST-HARVEST LABOR (HOUSEHOLD)

**THIS SECTION IS ASKED FOR HOUSEHOLD MEMBERS N YEARS OLD OR OLDER**

*the reference age N should be based on the minimum age for labor data collection in the country*

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<th>INDIVIDUAL ID</th>
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<td>YES…</td>
<td>YES…</td>
<td>YES…</td>
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</tbody>
</table>

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**Q1**

INTERVIEWER: WAS [CROP] HARVESTED DURING THE [REFERENCE AGRICULTURAL SEASON]?

INTERVIEWER: RECORD THE ID OF THE RESPONDENT.

1. Since [CROP] was harvested, has [NAME] worked on any post-harvest activities for [CROP], beginning with shelling, threshing, etc.?
2. Since [CROP] was harvested, how many days has [NAME] worked on any post-harvest activities for [CROP]?
3. What activities has [NAME] performed on [CROP] since your household harvested it?

**Q2**

DO NOT READ OUT THE LIST OF ACTIVITIES TO THE RESPONDENT

**Q3**

How many more days is [NAME] expected to work on [CROP] for post-harvest activities?

IF NONE, RECORD '0'.

**Q4**

**Q5**

**TABLE: POST-HARVEST LABOR (HOUSEHOLD) DETAILS**

<table>
<thead>
<tr>
<th>DAYS (TOTAL)</th>
<th>TYPICAL HOURS PER DAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELLING/THRESHING/PEELING</td>
<td>SORTING</td>
</tr>
<tr>
<td>DRYING</td>
<td>CLEANING</td>
</tr>
<tr>
<td>PROCESSING (MILLING, GRINDING, GRATING, ETC)</td>
<td>PROTECTION FROM LOSSES</td>
</tr>
<tr>
<td>SUPERVISION</td>
<td>DAYS</td>
</tr>
</tbody>
</table>

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**ANNEX B. SAMPLE QUESTIONNAIRE MODULES** 29
ANNEX B.4.

MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HIRED, FREE OR EXCHANGE LABOR FOR PLOT LEVEL ACTIVITIES (EXCLUDING POST-HARVEST ACTIVITIES)

Questions 7-9 and questions 15-17 are optional and should be included when relevant.

<table>
<thead>
<tr>
<th>PERSON TYPE</th>
<th>Hired labor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.</td>
</tr>
<tr>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Children (under 15)</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Children (under 15)</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td></td>
</tr>
<tr>
<td>Children (under 15)</td>
<td></td>
</tr>
</tbody>
</table>

...
## Module: Labor Inputs (Hired & Exchange)

### Optional 1
Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], were hired [PERSON TYPE] supervised by you or anyone in your household when working on [PLOT]?

- YES... 1
- NO... 2

### Optional 2
Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did hired [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?

- YES... 1
- NO... 2

### Optional 3
Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], for how many hours in total did hired [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?

### Exchange Labor
Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did any [PERSON TYPE] from other households work on this [PLOT] free of charge, as exchange laborers or to assist for nothing in return?

- YES... 1
- NO... 2

### Table

<table>
<thead>
<tr>
<th>PLOT ID</th>
<th>PERSON TYPE</th>
<th>Optional 1</th>
<th>Optional 2</th>
<th>Optional 3</th>
<th>Exchange Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>YES... 1</td>
<td>NO... 2</td>
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<td></td>
<td></td>
<td>YES... 1</td>
<td>NO... 2</td>
<td>YES... 1</td>
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<td></td>
<td></td>
<td>YES... 1</td>
<td>NO... 2</td>
<td>YES... 1</td>
<td></td>
</tr>
</tbody>
</table>

### Additional Questions
During those days that [PERSON TYPE] worked on [PLOT] without pay, how many hours per day did a typical [PERSON TYPE] work on [PLOT]?
### Module: Labor Inputs (Hired & Exchange)

<table>
<thead>
<tr>
<th>Exchange Labor</th>
<th>Optional</th>
<th>Optional</th>
<th>Optional</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>15.</td>
<td>16.</td>
<td>17.</td>
</tr>
</tbody>
</table>

**PLOT ID**

**PERSON TYPE**

<table>
<thead>
<tr>
<th>LAND PREPARATION</th>
<th>PLANTING</th>
<th>WEEDING</th>
<th>RIDGING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES</th>
<th>HARVESTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES... 1</td>
<td>NO... 2</td>
<td></td>
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<td>YES... I</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HIS... 2</td>
</tr>
</tbody>
</table>

Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], were [PERSON TYPE] supervised by you or anyone in your household when working on [PLOT] without pay?

Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?

Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], for how many hours in total did [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?

<table>
<thead>
<tr>
<th>HOURS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

---

1 Men
1 Women
1 Children (under 15)
2 Men
2 Women
2 Children (under 15)
3 Men
3 Women
3 Children (under 15)
... ...
ANNEX B.5.

MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HIRED, FREE OR EXCHANGE LABOR FOR POST-HARVEST ACTIVITIES

Questions 7 and 13 are optional and should be included when relevant.

| CROP CODE | PERSON TYPE | INTERVIEWER (CAPI): WAS [CROP] HARVESTED DURING THE [REFERENCE AGRICULTURAL SEASON]? | YES... 1 NO... 2 | NEXT CROP | 1. Since [CROP] was harvested, has your household hired any [PERSON TYPE] to work on post-harvest activities on [CROP]?
|           |             | YES... 1 NO... 2 | Q8         |          | 2. Since [CROP] was harvested, how many [PERSON TYPE] did your household hire to work on post-harvest activities on [CROP]?
|           |             |                   |            |          | 3. Since [CROP] was harvested, how many days did a typical hired [PERSON] work on post-harvest activities on [CROP]?
|           |             |                   |            |          | 4. During those days when hired [PERSON TYPE] worked on [CROP], how many hours per day did a typical [PERSON] work?
|           |             |                   |            |          | 5. Normally, how much did your household pay per day to the hired [PERSON] to work on post-harvest activities on [CROP]?
|           |             |                   |            |          | INDICATE THE AMOUNT PAID PER PERSON PER DAY
|           |             | NUMBER | DAYS | HOURS PER DAY | AMOUNT PER DAY |
| 1 | Men |          |      |             |               |
| 1 | Women |         |      |             |               |
| 1 | Children (under 15) |       |      |             |               |
| 2 | Men |         |      |             |               |
| 2 | Women |          |      |             |               |
| 2 | Children (under 15) |       |      |             |               |
| 3 | Men |         |      |             |               |
| 3 | Women |          |      |             |               |
| 3 | Children (under 15) |       |      |             |               |
| ... | ... | ... | ... | ... | ... |
**MODULE. POST-HARVEST LABOR (HIRED & EXCHANGE)**

<table>
<thead>
<tr>
<th>Hired labor</th>
<th>Optional</th>
<th>Exchange labor</th>
</tr>
</thead>
</table>
| **6.** Since [CROP] was harvested, what post-harvest activities did [PERSON TYPE] perform on [CROP]?
SELECT ALL THAT APPLY
DO NOT READ OUT THE LIST OF ACTIVITIES TO THE RESPONDENT |
| **7.** Since [CROP] was harvested, were hired [PERSON TYPE] supervised by you or anyone in your household when working on post-harvest activities on [CROP]?
YES... 1
NO... 2 |
| **8.** Since the [CROP] was harvested, have any [PERSON TYPE] from other households worked on post-harvest activities on [CROP] free of charge, as exchange laborers or to assist for nothing in return?
YES... 1
NO... 2 |
| **9.** Since [CROP] was harvested, how many [PERSON TYPE] from other households worked on post-harvest activities on [CROP] free of charge, as exchange labourers or to assist for nothing in return? |

**CROP CODE**

<table>
<thead>
<tr>
<th>PERSON TYPE</th>
<th>SHELLING/THRESHING/PEELING</th>
<th>SORTING</th>
<th>DRYING</th>
<th>CLEANING</th>
<th>PROCESSING (MILLING, GRINDING, GRATING, ETC)</th>
<th>PROTECTING FROM LOSSES</th>
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<th>NUMBER</th>
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<tbody>
<tr>
<td>1 Men</td>
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<td>1 Women</td>
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## Module: Post-Harvest Labor (Hired & Exchange)

### Annex B. Sample Questionnaire Modules

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<th>PERSON TYPE</th>
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</thead>
<tbody>
<tr>
<td>10.</td>
<td></td>
<td>11.</td>
<td>12.</td>
</tr>
<tr>
<td>Since [CROP] was harvested, how many days did a typical [PERSON] work without pay on post-harvest activities on [CROP]?:</td>
<td>During those days when [PERSON TYPE] worked without pay on post-harvest activities on [CROP], how many hours per day did a typical [PERSON] work?:</td>
<td>Since [CROP] was harvested, what post-harvest activities did [PERSON TYPE] perform on [CROP] without pay?: SELECT ALL THAT APPLY</td>
<td>DO NOT READ OUT THE LIST OF ACTIVITIES TO THE RESPONDENT</td>
</tr>
<tr>
<td>DAYS</td>
<td>HOURS PER DAY</td>
<td>SHELLING/THRESHING/PEELING</td>
<td>SORTING</td>
</tr>
<tr>
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<tr>
<td>1 Men</td>
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<td>1 Women</td>
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<td>3 Women</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3 Children (under 15)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since [CROP] was harvested, were hired [PERSON TYPE] supervised by you or anyone in your household when working on post-harvest activities on [CROP] without pay?:

YES... 1

NO... 2

---

Primary respondent for module:
ANNEX C.
SAMPLE QUESTIONNAIRE MANUALS

ANNEX C.1.
MODULE TO COLLECT WORK AND EMPLOYMENT OF HOUSEHOLD MEMBERS

Description: This section asks about the income-generating activities of all household members that are N years or older (as determined by a minimum age for collecting labor statistics in the country).

Respondent: Household members should answer for themselves. When this is not possible, a proxy respondent can be used.

Reference period: As per international standards, the reference period is “last week” — being the last full/completed week prior to the date of the interview. For example, if the interview is conducted on Tuesday, September 15th, the reference period is from the Monday of the week prior through last Sunday, which is Monday, September 7th to Sunday, September 13th.

General conventions for implementing the labor module by the interviewers:
- Regular text: Indicates text to be read by the interviewer
- CAPS: Indicates response categories and filters not to be read out loud
- [Parenthesis]: Indicates that a choice or a substitution must be made
- Bold text: Highlighted for emphasis

Definitions:
- Work is any paid or unpaid activity to produce goods and services (that is any productive activity). This includes employment (see below) as well as time spent providing or creating services and goods for own use. This “own-use production” includes both goods (for example farming, fishing, preserving foods for storage, or sewing your own clothes) and services (for example childcare, eldercare, food and meal preparation for immediate consumption, or other household chores).
- Employment is a specific subset of work, defined as work performed for pay or profit. The questions in this section will help you work with the respondent to determine which activities qualify as employment.

Instructions: If some household members are absent, proceed with the interview for all those present and make the necessary arrangements for a call back (either face-to-face or via the phone). Continue the interview with absent members after ascertaining the appropriate time of their availability. A proxy response should be obtained only if it is not possible to interview a household member directly.

Household Member
There is one subsection for all current household members that are N years or older.

ID. INTERVIEWER: COPY THE PID OF ALL INDIVIDUALS

E0. INTERVIEWER: IS [NAME] N+ YEARS OR OLDER?

0a. INTERVIEWER: IS [NAME] REPORTING FOR HIM/HERSELF?
Every effort should be made to collect information directly from each eligible household member regarding their own labor activities. A proxy response should be obtained only if it is not possible to interview a household member directly.

0b. INTERVIEWER: WHO IS RESPONDING ON BEHALF OF [NAME]?
Do NOT read out the question. If response is given by proxy, record the PID of the respondent who is answering on behalf of [NAME].
1a. Last week, that is from Monday [DATE] up to Sunday [DATE], did [NAME] do any work for someone else for pay for one or more hours?

Select YES if the person did any form of paid work last week that was not for a household member, for one hour or more. The question is asked of everyone and intended to include people working for pay for someone else, such as employees or paid apprentices, including casual, informal, and part-time employees. Paid agricultural work for others (not the respondent’s own household) is included. Payment includes all forms of remuneration — wage, salary, tips, commissions, and so on — either paid in cash, in-kind payments, or under a commitment of deferred payment. Exclude people who were self-employed, for example in a business or market-oriented activity with the intention of earning a profit, or those helping in a family business or family farm. These people will be accounted for in subsequent questions.

1b. How many hours did [NAME] do this work last week?

Record the total number of hours the person worked for a wage, salary, or any other pay during last week. Record the hours actually worked, not the number of hours they normally or usually would have worked. Include break times but exclude commute time (the time going to and from work).

2a. Last week, did [NAME] work in a non-farm household business that [NAME] operates, for one or more hours?

Select YES if last week the person worked for themselves or in a non-farm household enterprise (NFE) that they manage or operate, for one hour or more. NFEs are also commonly referred to as family businesses and include any kind of business activity to earn an income in the form of profits (in cash or in kind) such as craftsman, hairdresser, shopkeeper, making and selling food, medical practice, and so on. Only include here business activities in which the person manages or operates the NFE, meaning they make decisions about running the business; these persons should have been accounted for in question 1a.

2b. How many hours did [NAME] do this work last week?

Record the total number of hours the person worked last week in any non-farm enterprise or household business that they manage or operate. Record the hours actually worked, not the number of hours they usually or normally would have worked. Include break times but exclude commute time (the time going to and from work).

3a. Last week, did [NAME] help in a non-farm household business that is operated by another HH member for one or more hours?

Select YES if the person has helped in a non-farm business operated by another household member last week, for one hour or more. Exclude business activities/enterprises in which the person makes decisions about running the business; these persons should have been accounted for in question 2a.

3b. How many hours did [NAME] do this work last week?

Record the total number of hours the person helped last week in any non-farm household business operated by another family member. Record the hours actually worked, not the number of hours they usually or normally would have worked. Include break times but exclude commute time (the time going to and from work).

4a. Last week, did [NAME] work on household farming, livestock, fishing, or forestry activities, even if only for one hour?

Select YES if the person did any of the following work last week, for one hour or more:

• Any farming-related work on land owned, rented, or otherwise used by members of this household. Exclude work on land cultivated by others (for example, helping the neighbor harvest).

• Any livestock-related work with animals owned or rented by members of this household. This includes breeding, raising, or caring for livestock (such as cattle, sheep, goats and so on) as well as any other animals raised for meat, goods, or services (for instance donkeys, poultry, rabbits and bees and so on). Exclude work looking after another household’s animals (such as work for payment as a herder), which should be captured in 1a.

• Any fisheries-related work, such as fishing, aquaculture, shellfish collection and so on. Exclude employment in fishing and aquaculture activities (for example work for a non-household member...
for payment as a fisherman), which should be captured in 1a.

- Any forestry-related work, such as collecting wood or plants, foraging for food or other goods, and hunting in forests or other uncultivated areas (grasslands and seashores and so on). Exclude employment in forestry activities (for example working for a non-household member for payment in any of these areas, receiving payments for forest services), which should be captured in 1a.

4aa. Last week, did [NAME] help on household farming, raising livestock, fishing, or foraging/hunting for one or more hours?
Select YES if the person helped last week in any of the farming, livestock, fishing, or forestry activities listed above, for one hour or more. This question is asked when the answer to Q4a is “No”. Some respondents may spend time contributing to these activities but may not consider their input to qualify as work. The question intentionally does not include the word “work”, yet such activities do qualify as such.

4b. How many hours did [NAME] do this work last week?
Record the total number of hours the person worked (or helped) in any of these household agricultural and related activities last week. Include break times but exclude commute time (the time going to and from work).

5. Thinking about all the products [NAME] worked on, are they intended...
This question seeks to capture the main intended destination of the products obtained from the person’s work in household farming, fishing, livestock, or forestry activities. This relates specifically to the output of each person’s own farming, fishing, livestock, or forestry activity, not the total output of the household. Ask the respondent to select the answer that applies best. ONLY FOR SALE means that all the output from this person’s activities will be consumed by the household.

E2. INTERVIEWER:
REVIEW QUESTIONS Q1a, Q2a, Q3a, Q4a [AND Q4aa]: IS THERE ANY YES?

6a. Last week, did [NAME] run or do any kind of business, farming, or other activity to generate income?
Record YES if the person ran/operated any sort of activity meant to generate income. This includes all activities explained above in Q2a, Q3a, and Q4a. The words “work”, “job”, or “employment” MUST NOT be used, as the intent is to count activities that meet the definition of work or employment even when individuals themselves do not consider the activities to do so.

6aa. Or, did [NAME] help with the business, farm, or paid job of a household member?
Record YES if the person helped any household member with their activities in any sort of work or employment listed in Q2a, Q3a, Q4a, and also Q1a. Examples of Q1a include a son who helps his mother with grading exams as part of her job as a teacher or helps his father cut vegetables as part of his paid employment as a cook at a restaurant (not owned by the household). As in the previous question, the words “work”, “job”, or “employment” MUST NOT be used; again, the intent is to capture activities that meet the definition of work or employment even when individuals themselves do not consider the activities to do so.

6b. How many hours did [NAME] do this work in the last week?
Record the total number of hours the person worked or helped in any of these activities last week. Record the hours actually worked, not the number of hours they usually or normally would have worked. Include break times but exclude commute time (the time going to and from work).

6c. Was [NAME]’s work in household farming, livestock, fishing, or forestry activities?
Record YES for any of the activities indicated above in Q4a.

7. Thinking about all the products [NAME] worked on, are they intended?
See Q5 above for guidance.
ANNEX C.2.

MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HOUSEHOLD MEMBERS

This manual applies to the two versions of the sample questionnaires presented in Annex B.2.

Description: This section asks about the work household members have done on the cultivated plot since the beginning of the reference agricultural season.

Respondent: The manager of each plot should be the respondent for their respective plot. In the absence of the manager of the respective plot, an adult member that is most familiar and knowledgeable about the household’s agricultural labor activities should respond.

Plot
There is one sub section for every plot cultivated by the household since the beginning of the reference agricultural season.

Household Member
In each plot, there is a subsection for all current household members aged N years or older. Ask the questions member by member for each plot.

1. During [REFERENCE AGRICULTURAL SEASON], did [NAME] work on [PLOT] for any activity? Record YES if [NAME] has worked on [PLOT] since the household started preparing the [PLOT] for the REFERENCE AGRICULTURAL SEASON, independent of the agricultural activity performed, and even if it was only for one hour.

Note: this question and follow-up questions are asking about [PLOT] ONLY – IGNORE work on any other plot.

2. On how many days did [NAME] work on [PLOT] during [REFERENCE AGRICULTURAL SEASON]? Record the TOTAL number of days ON which [NAME] worked on [PLOT] since the household started preparing [PLOT] for the REFERENCE AGRICULTURAL SEASON, independent of the agricultural activity performed, and even if it was only for one hour.

3. During those days that [NAME] worked on [PLOT], how many hours per day did [NAME] work on [PLOT] typically? Record the typical number of hours [NAME] worked PER DAY on [PLOT]. EXAMPLE: In our example above, John worked 1 hour on Tuesday and 3 hours on Wednesday. The answer is either 1 or 3 hours.

4. What activities did [NAME] perform on [PLOT] during [REFERENCE AGRICULTURAL SEASON]? Select ALL activities that [NAME] has performed on [PLOT] during the days recorded in question 2. Select LAND PREPARATION AND PLANTING for any activity related to land preparation and planting, WEEDING for weeding, HARVESTING for any harvesting-related activity, SUPERVISION if [NAME] did not work themselves but supervised other household members or non-household workers, and RIDGING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES for any other non-harvesting, non-planting activity, such as ridging or fertilizing.

5. (OPTIONAL) During those days that [NAME] worked on [PLOT], did [NAME] use a tractor or mechanical unit to work on [PLOT]? Record YES if [NAME] has worked on [PLOT] using a tractor or mechanical unit, independent of the agricultural activity performed, and even if it was only for one hour.

6. (OPTIONAL) How many hours in total did [NAME] work on [PLOT] using a tractor or mechanical unit during [REFERENCE AGRICULTURAL SEASON]? Record the total number of hours [NAME] worked on [PLOT] using a tractor or mechanical unit.
ANNEX C.3.
MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HOUSEHOLD MEMBERS FOR POST-HARVEST ACTIVITIES

This manual applies to the two versions of the sample questionnaires presented in Annex B.3.

Description: This section asks about household post-harvest labor. For each crop harvested, information is sought about each member’s post-harvest activities and time spent. Hence, there are two subsections, with one roster nested in the second roster. The first roster is for crops harvested by the household, while the second roster is for household members who did post-harvest work on crops harvested.

Respondent: The respondent should be the most knowledgeable household member regarding the crop’s disposition by the household or the household post-harvest farm operations, who may be assisted by other farm managers and laborers within the household.

Crops Harvested
There is one subsection for every crop harvested by the household during the reference agricultural season.

Household Members
In each crop harvested, there is a subsection for all current household members aged N+ years or older. Ask the questions member by member for each [CROP].

1. Since [CROP] was harvested, has [NAME] worked on any post-harvest activities for [CROP], beginning with shelling, threshing, and so on?
Select YES if [NAME] has worked or performed any post-harvest activity for [CROP] even if for one hour since [CROP] was harvested during the REFERENCE AGRICULTURAL SEASON. Post-harvest activities include shelling, threshing, cleaning, drying, milling, grinding, and so on.

Note: this question and follow-up questions are asking about current [CROP] in roster ONLY – IGNORE work on any other [CROP].

2. Since [CROP] was harvested, on how many days has [NAME] worked on any post-harvest activities for [CROP]?
Record the TOTAL number of days in which [NAME] has worked on [CROP] post-harvest activities since [CROP] was harvested. CONSIDER ALL days on which [NAME] worked, even if it was only for a short time. EXAMPLE: John worked on maize drying for 2 hours on Tuesday afternoon, 3 hours on Wednesday, and for 3 hours on Thursday. The answer is 3 days (Tuesday, Wednesday, and Thursday).

3. Since [CROP] was harvested, how many hours per day did [NAME] work on [CROP] for post-harvest activities typically?
Record the typical number of hours [NAME] worked PER DAY on [CROP] post-harvest activities since [CROP] was harvested. EXAMPLE: In our example above, John typically worked for 3 hours PER DAY.

4. What activities has [NAME] performed on [CROP] since your household harvested it?
Select ALL post-harvest activities that [NAME] has performed on [CROP] since [CROP] was harvested by the household. Select any of SHELLING/THRESHING/PEELING; SORTING; DRYING; CLEANING; PROCESSING (milling, grinding, grating, cooking oil production, and so on); PROTECTION FROM LOSSES; or SUPERVISION.

5. How many more days is [NAME] expected to work on [CROP] for post-harvest activities?
Record the ADDITIONAL number of days that [NAME] expects to work on [CROP] post-harvest activities from the interview date. If none, record zero.
ANNEX C.4.
MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HIRED, FREE OR EXCHANGE LABOR FOR PLOT LEVEL ACTIVITIES

**Description:** This section asks about the labor the household hired or received for free to cultivate their plots during the reference agricultural season.

**Respondent:** The manager of each plot or an adult member that is the most knowledgeable about the household's farm operations should respond.

1. Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did you or anyone else in the household hire any [PERSON TYPE] to work on [PLOT]?
   Read out the question text for each person-type and record YES or NO. Record YES if any individual from [PERSON-TYPE] has been HIRED to work on [PLOT] since the household started preparing land for the reference agricultural season, independent of the agricultural activity performed, and even if it was only for one hour.

   By hired, we mean the person-type worked for PAYMENT in cash or in-kind. Do NOT consider person-types that have worked for free. It does NOT matter who in the household hired the people. Do NOT consider as payment the food given during the day of work.

   **Note:** this question and follow-up questions are asking about [PLOT] ONLY – IGNORE work on any other plot.

   **Men** – all MALE persons, not household members and aged 15 years or older

   **Women** - all FEMALE persons, not household members and aged 15 years or older

   **Children** - all persons under 15 years independent of sex, not household members

2. Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], how many [PERSON TYPE] did you or anyone else in the household hire to work on [PLOT]?
   Record the TOTAL number of [PERSON TYPE] (that is men, women, or children) that have been HIRED to work on [PLOT] since the beginning of the REFERENCE AGRICULTURAL SEASON.

   **Note:** that the people did not have to work on [PLOT] at the same time. **EXAMPLE:** if one woman was hired in February, and two other women were hired in April, record the total as 3.

3. Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], how many days did a typical hired [PERSON TYPE] work on [PLOT]?
   Record the number of days ON which a TYPICAL [PERSON-TYPE] worked on [PLOT] since the household started preparing land for the REFERENCE AGRICULTURAL SEASON.

   **Note:** that the question is asking for ONE (typical) [PERSON-TYPE] ONLY, not the total. If persons were hired for different lengths of time, record the number of hours each [PERSON-TYPE] normally work on [PLOT] per day. **CONSIDER ALL days on which a typical person worked, even if it was only for a short time.** **EXAMPLE:** In the above example, if the woman in February was hired for 6 days and the two women in April for 3 days, record either 6 or 3.

4. During those days that hired [PERSON TYPE] worked on [PLOT], how many hours per day did a typical hired [PERSON TYPE] work on [PLOT]?
   Record the typical number of hours ONE [PERSON TYPE] worked PER DAY on [PLOT] on the days [PERSON TYPE] worked. **EXAMPLE:** In our example above, if each woman worked around 6 hrs per day, record 6.
5. Normally, how much did your household pay per day to the hired [PERSON TYPE] to work on [PLOT]?
Record the TOTAL AMOUNT paid on average to EACH [PERSON TYPE] PER DAY. Estimate the amount for in-kind payments.

Note: that the question asks for the amount per person. If the payment was paid to a group, calculate how much was paid for one individual.

6. What activities did [PERSON TYPE] perform on [PLOT]?
Select ALL activities that all individuals from [PERSON TYPE] have performed on [PLOT].
Select LAND PREPARATION for any land preparation, PLANTING for any planting-related activity, WEEDING for weeding, HARVESTING for any harvesting-related activity, RIDGING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES for any other non-harvesting, non-planting activity, such as ridging or fertilizing, and SUPERVISION for any supervising activity on PLOT.

7. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], were hired [PERSON TYPE] supervised by you or anyone in your household when working on [PLOT]?
Select YES if the respondent or any member(s) of the household supervised hired [PERSON TYPE] when they were working on [PLOT]. This question should be asked if relevant.

8. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did hired [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?
Record YES if hired [PERSON TYPE] has worked on [PLOT] using a tractor or mechanical unit independent of the agricultural activity performed, and even if it was only for one hour.

9. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], for how many hours in total did hired [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?
Record the total number of hours that hired [PERSON TYPE] worked on [PLOT] using a tractor or mechanical unit.

10. Since your household started preparing this [PLOT] for [REFERENCE AGRICULTURAL SEASON], did any [PERSON TYPE] from other households work on this [PLOT] free of charge, as exchange laborers or to assist for nothing in return?
This question is asked for every [PLOT]. Read out the question text for each [PERSON TYPE] and record YES or NO. Record YES if any individual from [PERSON TYPE] has worked on [PLOT] WITHOUT PAYMENT since the household started preparing [PLOT] for the REFERENCE AGRICULTURAL SEASON, independent of the agricultural activity performed, and even if it was only for one hour.

Working without payment includes working as an exchange laborer (e.g., if neighbours help each other harvesting) or for nothing in return (e.g., if a relative who is not a household member helps with the harvest but gets nothing in return). Do NOT consider as payment the food given during the day of work.

Note: this question and follow-up questions are asking about [PLOT] ONLY – IGNORE work on any other plot.

Men – all MALE persons, not household members and aged 15 years or older
Women - all FEMALE persons, not household members and aged 15 years or older
Children - all persons under 15 years independent of sex, not household members

Exchange/Free Labor
These questions are asked for every [PERSON TYPE] with a YES response in Q10.

11. Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], how many [PERSON TYPE] worked on [PLOT] without pay?
Record the TOTAL number of [PERSON TYPE] (that is men, women, or children) that have worked WITHOUT PAYMENT on [PLOT] since the beginning of the REFERENCE AGRICULTURAL SEASON.

Note: the people did not have to work on [PLOT] at the same time. EXAMPLE: If the father of the household head (who lives in another household) helped with
12. Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], on how many days did a typical [PERSON TYPE] work without pay on [PLOT]?
Record the number of days on which a TYPICAL [PERSON TYPE] worked on [PLOT] since the household started preparing land for the REFERENCE AGRICULTURAL SEASON.

Note: the question is asking for ONE (typical) [PERSON-TYPE] ONLY, not the total. If persons worked for different lengths of time, record the average. CONSIDER ALL days on which a typical person worked, even if it was only for a short time. EXAMPLE: In the above example, if the father helped in February for 7 days and the five neighbours in May for half a day, record either one or 7 days. Even though the neighbours only worked half a day, they have worked ON that day, so we count it as one.

13. During those days that [PERSON TYPE] worked on [PLOT] without pay, how many hours per day did a typical [PERSON TYPE] work on [PLOT]?
Record the number of hours that ONE [PERSON TYPE] normally works PER DAY on [PLOT] on the days [PERSON TYPE] worked. EXAMPLE: In our example above, if the father worked 6 hours per day and the neighbours worked 3 hours per day, record either 6 or 3 hours.

Select ALL activities that all individuals from [PERSON TYPE] have performed on [PLOT]. Select LAND PREPARATION for any land preparation, PLANTING for any planting-related activity, WEEDING for weeding, HARVESTING for any harvesting-related activity, and RIDGING, FERTILIZING, OTHER NON-HARVEST ACTIVITIES for any other non-harvesting, non-planting activity, such as ridging or fertilizing.

15. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], were [PERSON TYPE] supervised by you or anyone in your household when working on [PLOT] without pay?
Select YES if the respondent or any member(s) of the household supervised [PERSON TYPE] when they were working on [PLOT] without pay.

16. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], did [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?
Record YES if [PERSON TYPE] has worked on [PLOT] using a tractor or mechanical unit independent of the agricultural activity performed, and even if it was only for one hour when they were working on [PLOT] without pay.

17. (OPTIONAL) Since your household started preparing [PLOT] for [REFERENCE AGRICULTURAL SEASON], for how many hours in total did [PERSON TYPE] use a tractor or mechanical unit to work on [PLOT]?
Record the total number of hours that [PERSON TYPE] worked on [PLOT] using a tractor or mechanical unit when they were working on [PLOT] without pay.
ANNEX C.5.
MODULE TO COLLECT AGRICULTURAL LABOR INPUT PROVIDED BY HIRED, FREE OR EXCHANGE LABOR FOR POST-HARVEST ACTIVITIES

Description: This section asks about the post-harvest labor the household hired or received for free to perform post-harvest activities such as shelling, threshing, drying, cleaning, or processing crops after crop harvest during the reference agricultural season.

Respondent: The respondent should be the most knowledgeable household member regarding the crop’s disposition by the household or the household post-harvest farm operations, who may be assisted by other farm managers and laborers within the household.

Crops Harvested
There is one subsection for every [CROP] harvested by the household during the reference agricultural season.

Hired Labor
In each CROP HARVESTED roster, there is a sub-section for each [PERSON TYPE] (men, women, and children) hired to do post-harvest work/activities on [CROP]. Answer the questions by [PERSON TYPE] for each [CROP].

1. Since [CROP] was harvested, has your household hired any [PERSON TYPE] to work on post-harvest activities on [CROP]?
   Read out the question text for each [PERSON TYPE] (men, women, and children) and select YES or NO. Select YES if any individual from [PERSON TYPE] has been HIRED to work on [CROP] post-harvest activities since [CROP] was harvested.

   By hired, we mean the [PERSON-TYPE] worked for payment in cash or in-kind. Do NOT consider any [PERSON-TYPE] that worked for free. It does NOT matter who in the household hired the people. Do NOT consider as payment the food given during the day of work.

   Note: for each CROP HARVESTED roster, this and subsequent questions are asking about crops harvested ONLY – IGNORE work on any other crop not in this roster.

   Men - all MALE persons, not household members and aged 15 years or older

   Women - all FEMALE persons, not household members and aged 15 years or older

   Children - all persons under 15 years independent of sex, but not household members

   The next set of questions are asked for every [PERSON TYPE] with a YES response in Q1.

2. Since [CROP] was harvested, how many [PERSON TYPE] did your household hire to work on post-harvest activities on [CROP]?
   Record the TOTAL number of [PERSON TYPE] (that is men, women or children) that have been HIRED to work on post-harvest activities on [CROP] since [CROP] was harvested.

   Note: that the people did not have to work on [CROP] post-harvest activities at the same time. EXAMPLE: if two women were hired to peel cassava in the first week in December, three other women were hired in January to do the same activities, and an additional three women were hired to fry cassava flour, record the total as 8 (2+3+3).

3. Since [CROP] was harvested, how many days did a typical hired [PERSON TYPE] work on post-harvest activities on [CROP]?
   Record the TOTAL number of days that a typical hired [PERSON TYPE] worked on post-harvest activities on [CROP] since [CROP] was harvested.

   Note: the question is asking for ONE (typical) [PERSON TYPE] ONLY, not the total. CONSIDER ALL days on which a typical [PERSON TYPE] worked, even if it was only for a short time.
4. During those days when hired [PERSON TYPE] worked on [CROP], how many hours per day did a typical [PERSON TYPE] work?
Record the typical number of hours ONE hired [PERSON TYPE] worked PER DAY WORKED on [CROP] during the days of hire. If people were hired for different lengths of time, record the number of hours ONE [PERSON TYPE] normally worked on [CROP] per day. EXAMPLE: In our example above, if each woman typically worked for about 6 hours per day, record the answer as 6.

5. Normally, how much did your household pay per day to the hired [PERSON TYPE] to work on post-harvest activities on [CROP]?
Record the TOTAL AMOUNT normally paid to EACH HIRED [PERSON TYPE] PER DAY to work on post-harvest activities on [CROP]. Estimate the cash equivalent for in-kind payments.

Note: the question asks PER [PERSON TYPE] for the typical number of hours reported in Q4 (e.g., per man). If the payment was paid to a group, calculate how much was paid for ONE individual in the group.

6. Since [CROP] was harvested, what post-harvest activities did [PERSON TYPE] perform on [CROP]?
Select ALL post-harvest activities that each selected [PERSON-TYPE] has performed on [CROP] since the [CROP] was harvested. These activities include shelling/threshing/peeling; drying; sorting; drying; cleaning; processing (milling, grinding, grating, cooking oil production, etc); protecting from losses; and supervising.

7. (OPTIONAL) Since [CROP] was harvested, were hired [PERSON TYPE] supervised by you or anyone in your household when working on post-harvest activities on [CROP]?
Select YES if the respondent or any member(s) of the household supervised hired [PERSON TYPE] when they were working on post-harvest activities on [CROP]. This question should be asked if relevant.

Exchange/Free Labor
8. Since the [CROP] was harvested, have any [PERSON TYPE] from other households worked on post-harvest activities on [CROP] free of charge, as exchange laborers or to assist for nothing in return?
This question asks if any [PERSON TYPE] from other households has worked on post-harvest activities on [CROP] free of charge, as an exchange laborer, or to assist for nothing in return? Select YES for any [PERSON TYPE] that has worked for free or exchange labor on post-harvest activities on [CROP].

9. Since [CROP] was harvested, how many [PERSON TYPE] from other households worked on post-harvest activities on [CROP] free of charge, as exchange laborers or to assist for nothing in return?
Record the TOTAL number of [PERSON-TYPE] (that is men, women, or children) that has worked on post-harvest activities WITHOUT PAYMENT on [CROP] since [CROP] was harvested.

Note: the persons did not have to work on [CROP] at the same time.

10. Since [CROP] was harvested, how many days did a typical [PERSON] work without pay on post-harvest activities on [CROP]?
Record the number of days that a typical [PERSON-TYPE] worked WITHOUT PAY on post-harvest activities on [CROP] since [CROP] was harvested.

Note: the question is asking for ONE (typical) [PERSON-TYPE] only, NOT the total. If people worked for different lengths of time, record the number of days that ONE [PERSON-TYPE] normally spend working on [CROP]. CONSIDER ALL days on which a typical person worked, even if it was only for a short time.

11. During those days when [PERSON TYPE] worked without pay on post-harvest activities on [CROP], how many hours per day did a typical [PERSON] work?
Record the number of hours PER DAY that ONE (typical) [PERSON-TYPE] normally worked on post-harvest activities on [CROP] without pay on the days [PERSON TYPE] worked.
12. Since [CROP] was harvested, what post-harvest activities did [PERSON TYPE] perform on [CROP] without pay?
Select ALL post-harvest activities that each selected PERSON TYPE has performed on [CROP] without pay since the [CROP] was harvested. These activities include shelling/threshing/peeling; sorting; drying; cleaning; processing (milling, grinding, grating, cooking oil production, etc); and protecting from losses.

13. (OPTIONAL) Since [CROP] was harvested, were hired [PERSON TYPE] supervised by you or anyone in your household when working on post-harvest activities on [CROP] without pay?
Select YES if the respondent or any member(s) of the household supervised [PERSON TYPE] when they were working on post-harvest activities on [CROP] without pay. This question should be asked if relevant.
ANNEX D.  METHODOLOGICAL STUDIES

Methodological studies on agricultural labor were conducted in three countries in Sub-Saharan Africa – Ghana, Malawi, and Tanzania – to examine some of the considerations discussed above. The broad objectives of the studies were: 1) to assess the accuracy of traditional LSMS-type recall surveys and 2) to explore mobile phone surveys as an intermediate alternative approach. Additionally, the Malawi study incorporated different approaches to operationalize the 19th ICLS definition of work and employment for smallholder farmers. In this section, the study design and variation across countries are presented and cross-country results are discussed.

ANNEX D.1.  STUDY DESIGNS

The study designs were similar across the three countries. However, as the studies were implemented sequentially – first Tanzania, followed by Ghana and then Malawi – each study benefited from lessons learned in the studies that preceded it. The following paragraphs and Table D.1 summarize the differences in study design across countries.

In Tanzania, the study was conducted among 854 farming households from 18 rural enumeration areas in the Mara Region, located in the northern part of the country. Information on agricultural production, labor, and other inputs were collected for the 2014 main long rainy season. Households were randomly assigned to one of the four survey designs within each of the 18 enumeration areas, and interviews were conducted between January and September 2014. For more details on the study in Tanzania, see Arthi et al., (2018).

In Ghana, the study was conducted among 720 farming households from 20 enumeration areas in Mampong Municipal, Ejura Sekyedumase, Nkoranza South, and Pru districts. Information on agricultural production, labor, and other inputs were collected on the main rainy season in 2015. Households were randomly assigned to one of three survey designs within each of the 20 enumeration areas, and interviews were conducted between March 2015 and February 2016. For more details on the study in Ghana, see Gaddis et al. (2019).

Finally, in Malawi, the study was conducted among 960 farming households from 20 rural enumeration areas in Ntcheu and Zomba districts. Information on agricultural production, labor, and other inputs were collected for the 2016/2017 main rainy season. Households were randomly assigned to one of the six survey designs within each of the 20 enumeration areas, and interviews were conducted between September 2016 and August 2017. The different study arms adopted in the three countries are as follows.

- **Control type 1**: Households assigned to this group had only one in-person interview soon after the end of the agricultural season (an endline survey), representing the traditional method for collecting agricultural labor data in household surveys. In this visit, detailed information was collected on the households and their agricultural practices. For each plot cultivated by the household, each household member was asked to report the total number of days worked over the season, and the typical number of hours worked per day. In Tanzania and Malawi, households were further randomly sub-divided into two groups. One group was asked to report the days and hours worked for each specific activity such as land preparation and planting, weeding, and harvesting (that is a disaggregated labor activity module), while the other group was asked to report the days and hours for all activities combined (that is an aggregated labor activity module). The household member roster, listing all members of the household according to the definition of the household in the country, was constructed during this endline survey, along with a plot roster, constructed by listing all plots owned/cultivated by the household.
• Control type 2: Households assigned to this group had in-person interviews at the beginning of the agricultural season to collect basic information on the households (a baseline survey) in addition to the endline survey. A critical task undertaken during the baseline survey was the construction of the household member roster and the plot roster. Like the households in control group type one, the households in this group were revisited for in-person interviews soon after the end of the agricultural season, to collect detailed information on the households and their agricultural practices (an endline survey). During the endline survey, the households were asked to report new plots that they might have acquired/cultivated as well as new members that might have joined the household since the baseline survey. For each plot cultivated by the household, each household member was asked to report the total number of days worked over the season and the typical number of hours worked per day. In Tanzania and Malawi, households were further randomly sub-divided into two groups to report days and hours worked in an aggregated and disaggregated manner.

• Treatment type 1: Households assigned to treatment group type one were interviewed in baseline and endline surveys, similar to those assigned to control group type two. Additionally, these households had weekly in-person interviews that were conducted throughout the agricultural season, between the baseline and endline surveys. During the weekly interviews, the number of hours worked by each household member on each listed plot was asked for each day of the previous week. The number of hours worked was requested for all activities combined, with respondents then specifying the activities they had performed. During these visits, households were also asked to report any new plots acquired/cultivated by the household after the baseline interview, as well as any new members that might have joined the household.

• Treatment type 2: Households assigned to the treatment group type two followed the same survey schedule as the households in treatment group type one, except that their weekly interviews were conducted over the phone.

Table D.1. Summary of study designs

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<th>Weekly in-person survey</th>
<th>Weekly phone survey</th>
<th>Endline survey</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1-a</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2-d</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2-a</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) C – Control, T – Treatment, a – aggregated labor activity module, d – disaggregated labor activity module

Figure D.1. Timeline of interviews during the agricultural season

Source: authors own analysis

20 For this group, for each plot, each household member was asked to report the total number of weeks worked over the season, the approximate number of days per week worked, and the approximate number of hours per day worked irrespective of activity.
ANNEX D.2.

RESULTS

The following presents analytical results from the methodological studies in the three countries, comparing data collected through weekly in-person surveys (weekly interviews) with data collected by the endline surveys (recall). While the method used to collect weekly-interview data remains the same across the three countries, the recall data collection methods vary. For instance, in the control group in Ghana and for one control group in Malawi, both the baseline and endline surveys were conducted, while the control group in Tanzania and one control group in Malawi had no baseline survey. These disparities are taken into consideration when interpreting the results. In Ghana and Malawi, we compare data from weekly in-person surveys with data from control group type 2 (that is recall-with-baseline), while for Tanzania, the comparison is made with data from its control group which only had endline surveys (that is recall-without-baseline).

Margin of Misreporting – Household farm labor hours, conditional on any farm labor

From Table D.2., we see the variation in recall bias (that is the difference between recall data collected from endline surveys and data collected through weekly in-person surveys) in the person-plot hours across the three countries. The recall bias is highest in Tanzania, followed by Malawi and then Ghana. The results indicate that households tend to overestimate the cumulative number of hours each household member spent on a plot during the agricultural season when asked at the end of the season. The results here include only those individuals that reported working on any cultivated plots of the household. For the weekly interviews in Tanzania, the person-plot average of the total season hours was 39.5. However, this number jumped to 121.3 in the end of season recall, indicating a recall bias of 207 percent. For Ghana and Malawi, the recall bias was 18 and 47 percent, respectively.

Table D.2. Household agricultural labor over the season per person-plot hours

<table>
<thead>
<tr>
<th></th>
<th>Weekly Interview</th>
<th>Recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>39.5</td>
<td>121.3***</td>
</tr>
<tr>
<td>Ghana</td>
<td>106.4</td>
<td>125.7***</td>
</tr>
<tr>
<td>Malawi</td>
<td>61.4</td>
<td>90.5***</td>
</tr>
</tbody>
</table>

Note: Not adjusted for plot size. T-test on difference in means with *** indicating the difference is significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

D.2.1. Effect of people and plot listings

Accurate household agricultural labor information requires respondents to provide an accurate listing of cultivated plots as well as an accurate listing of household members working on those plots. This section examines the results for numbers of household farm workers and plots cultivated by the households, comparing weekly-interview, recall-with-baseline, and recall-without-baseline groups. Households in the weekly-interview group were asked to list their household members and their cultivated plots during the baseline survey. During each weekly interview, they were asked to add any new household members and plots cultivated within the past week. Finally, during the endline survey, households were asked to add any new household members and plots cultivated since the last weekly interview. For the recall-with-baseline group, households were asked to list household members as well as plots cultivated during the baseline survey. At the endline survey, they were asked to add any new members that joined the household since the baseline survey, as well as any additional plots cultivated. For the recall-without-baseline group, households were asked during the endline survey to list all plots cultivated during the entire agricultural season and all household members that worked on any plot.

21 Statistical tests to explore differences between the weekly phone surveys and weekly in-person surveys were conducted. No statistical differences were found for most indicators of interest across the two groups. Thus, the results of the phone survey group are not presented in this Guidebook.
Figures D.2., D.3., and D.4. show the cumulative number of household farm workers (aged 10 years or older) across different groups in the three countries, calculated as the cumulative total of people aged 10 and older listed as having worked on at least one of the household’s cultivated plots. The cumulative number of household farm workers is higher in the weekly-interview group than in the recall groups in all three countries, similar to the pattern for listed household members.

Figure D.2. Cumulative workers per household over the duration of the season in Malawi (by week)

Source: Authors own elaboration

Figure D.3. Cumulative workers per household over the duration of the season in Tanzania (by week)

Source: Authors own elaboration

Figure D.4. Cumulative workers per household over the duration of the season in Ghana (by week)

Source: Gaddis et al. 2019
Figures D.5, D.6, and D.7 show the cumulative number of cultivated plots for different groups in the three countries, calculated as the cumulative total of plots cultivated by the households over the duration of the agricultural season. The cumulative number of cultivated plots is again higher in the weekly-interview group than in the recall groups in all three countries, similar to the pattern of listed household farm workers presented above.

**Figure D.5. Cumulative Plots Cultivated per household over the duration of the season in Malawi (per week)**

![Cumulative Plots Cultivated per household over the duration of the season in Malawi (per week)](source: Authors own elaboration)

**Figure D.6. Cumulative Plots Cultivated per household over the duration of the season in Tanzania (per week)**

![Cumulative Plots Cultivated per household over the duration of the season in Tanzania (per week)](source: Authors own elaboration)

**Figure D.7. Cumulative Plots Cultivated per household over the duration of the season in Ghana (per week)**

![Cumulative Plots Cultivated per household over the duration of the season in Ghana (per week)](source: Gaddis et al. 2019)
In Table D.3., we examine the effect of listing plots and household farm workers on the reported hours of agricultural labor over the season in Ghana. The regression includes a variable that equals unity if the plot was listed by the household at baseline (Plot listed at baseline) and the interaction of this variable and the recall variable (Recall* plot listed at baseline). It also includes a variable that equals unity if the person was listed as having worked on at least one of the household’s cultivated plots at baseline (Person listed as worker at baseline) and the interaction between the variable and the recall variable (Recall* person listed as worker at baseline).

The results in Table D.3. show that reported hours per person-plot over season are significantly higher for plots and household workers listed at baseline than for plots and household workers added later. They also show that the recall variable becomes insignificant when regressions control for this characteristic. In addition, recall bias does not differ between plots (people) listed at baseline and those that were added later, as the relevant interaction effects are insignificant. These results indicate that reported hours of agricultural labor per person-plot over season are higher for the recall households, likely because these households forget to list several plots and people when information is collected only at the end of the season without frequent interviews. These forgotten plots and workers have, on average, less farm labor than the plots and workers that were listed at baseline. When these ‘marginal’ plots and workers are forgotten and omitted, the total average hours per person-plot increases. On the other hand, the weekly-interview households list more ‘marginal’ plots and farm workers during the frequent interviews, reducing their total average hours per person-plot.

D.2.2. Effect of education level of the respondent

In Table D.4., we examine the cognitive burden of respondents in constructing responses to a given question. It is anticipated that individuals with higher cognitive skills will be better at constructing responses to questions, and therefore subject to less recall bias. The regression includes a variable that equals unity if the worker has education above primary (Respondent education) and the interaction between the variable and the recall variable (Recall* respondent education). The results in Table D.4. indicate that educated survey respondents are less likely to overestimate the number of hours that an individual worked on a given plot of the household

### Table D.3. Listing of plots and household workers and recall bias in hours of agricultural labor reported over season in Ghana

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td>10.32 **</td>
<td>4.35</td>
<td>4.84</td>
<td>5.02</td>
</tr>
<tr>
<td></td>
<td>(5.20)</td>
<td>(12.91)</td>
<td>(8.22)</td>
<td>(13.54)</td>
</tr>
<tr>
<td>Plot listed at baseline</td>
<td>76.25 ***</td>
<td>69.61 ***</td>
<td>7.91</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.15)</td>
<td>(7.91)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recall * plot listed at baseline</td>
<td>1.70</td>
<td>-4.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(13.99)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person listed as worker at baseline</td>
<td>91.24 ***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.20)</td>
<td>87.08 ***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recall * Person listed as worker at baseline</td>
<td>-2.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(10.32)</td>
<td>-2.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>4462</td>
<td>4462</td>
<td>4462</td>
<td>4462</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.024</td>
<td>0.052</td>
<td>0.090</td>
<td>0.112</td>
</tr>
</tbody>
</table>

Note: The sample is those individual members of the household 10 years or older who reported having worked on the household's cultivated plot at any time during the season. Regressions control for household size and number of plots, and the average distance between the household’s residence and the plots (all at baseline). Standard errors are shown in parentheses. *** denotes significance at the 1 percent level; ** at the 5 percent level; * at the 10 percent level.

Source: Gaddis et al. 2019

### Table D.4. Education interaction: recall bias in hours of agricultural labor reported over season

<table>
<thead>
<tr>
<th></th>
<th>Malawi</th>
<th>Tanzania</th>
<th>Ghana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td>33.66</td>
<td>95.82 ***</td>
<td>13.93</td>
</tr>
<tr>
<td></td>
<td>(2.16)</td>
<td>(2.27)</td>
<td>(6.06)</td>
</tr>
<tr>
<td>Respondent education (more than primary school)</td>
<td>-15.46 ***</td>
<td>-3.14</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.45)</td>
<td>(7.51)</td>
<td></td>
</tr>
<tr>
<td>Recall * respondent education</td>
<td>-22.64 ***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.50)</td>
<td>(12.10)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>8,055</td>
<td>11,542</td>
<td>4,335</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.42</td>
<td>0.15</td>
<td>0.02</td>
</tr>
<tr>
<td>Total recall bias for educated workers</td>
<td>11.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(8.23)</td>
<td>(10.55)</td>
<td></td>
</tr>
</tbody>
</table>

Note: The sample is those individual members of the household 10 years or older who reported having worked on the household’s cultivated plot at any time during the season. Standard errors are shown in parentheses. *** denotes significance at the 1 percent level; ** at the 5 percent level; * at the 10 percent level.

Source: authors own analysis
over the entire season. Specifically, the reduction in recall bias with respondents having above primary level of education is about 23 for the number of hours in Malawi, 23 in Tanzania and 22 in Ghana. These findings support the notion that recall bias (in this case, overestimation of hours worked on plot) stems in part from the cognitive burden associated with calculating hours worked at plot level where irregularity in the working schedule prevents easy rate-based calculations (Arthi et al., 2018). Furthermore, according to Arthi et al. (2018), in studies with labor data based on recall, the gains in labor productivity associated with higher human capital may be partly derived from an artefact of education-based differences in labor data accuracy.

The evidence presented above corroborates the conclusions of Arthi et al. (2018), who explain the reasons why recall leads to the type of misreporting described above, and why the elements of farm labor calculations are particularly vulnerable to recall bias. They argue that that the need to infer past labor leads to the overstatement of hours worked, and that a lack of salience leads marginal plots and individuals to be under-reported.

### D.2.3. Effect of gender

In Table D.5. and D.6., we examine the gender effect of household workers in constructing responses to a given question. It is anticipated that since women often carry out different agricultural roles and activities simultaneously rather than sequentially (Blackden et al., 2006), constructing responses to questions is more difficult for women relative to men, subjecting female workers to higher levels of recall bias.

**Table D.5.** compares average hours per person per plot between the weekly-interview group and the recall-with-baseline group in Ghana for male and female workers. Male farmers work almost 50 percent more hours per plot than female farmers during the season, but the recall bias appears to be greater for males than for females.

**Table D.6.** includes an indicator variable that equals unity if the worker is female (Female) and the interaction between the variable and the recall variable (Recall* Female). The results in **Table D.6.** show that there is statistically significant recall bias in season-wide hours per plot for males (overestimated by 17 hours), while there is no significant recall bias for females.

The results in **Table D.5.** and **Table D.6.** suggest that, contrary to our expectations, it is more difficult for male workers than for female workers to recall the number of hours worked per plot.

**Table D.6.** Estimation of recall bias in farm labor by gender in Ghana, heterogeneity

<table>
<thead>
<tr>
<th></th>
<th>HOURS PER PERSON-PLOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall</td>
<td>17.33 **</td>
</tr>
<tr>
<td></td>
<td>(7.09)</td>
</tr>
<tr>
<td>Female</td>
<td>-39.7 ***</td>
</tr>
<tr>
<td></td>
<td>(6.20)</td>
</tr>
<tr>
<td>Recall * Female</td>
<td>-16.38</td>
</tr>
<tr>
<td></td>
<td>(10.14)</td>
</tr>
<tr>
<td>Observations</td>
<td>4,462</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.04</td>
</tr>
<tr>
<td>Total recall bias for females</td>
<td>0.95 (7.37)</td>
</tr>
</tbody>
</table>

Note: The sample is those individual members of the household 10 years or older who reported having worked on the household’s cultivated plot at any time during the season. Regressions control for the household numbers of workers and plots, and the average distance between the household’s residence and the plots (all at baseline). Standard errors are shown in parentheses. *** denotes significance at the 1 percent level; ** at the 5 percent level; * at the 10 percent level.

Source: Gaddis et al. 2019

---

**Table D.5.** Heterogeneity in recall bias by gender, descriptive estimate in Ghana

<table>
<thead>
<tr>
<th></th>
<th>Weekly interviews</th>
<th>Recall with baseline</th>
<th>Difference</th>
<th>Weekly interviews</th>
<th>Recall with baseline</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male workers</td>
<td></td>
<td></td>
<td>Female workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>B-A</td>
<td>C</td>
<td>D</td>
<td>D-C</td>
</tr>
<tr>
<td>Hours per person-plot</td>
<td>126.49</td>
<td>151.94</td>
<td>25.45 ***</td>
<td>85.84</td>
<td>96.71</td>
<td>10.87 *</td>
</tr>
<tr>
<td></td>
<td>(4.56)</td>
<td>(7.34)</td>
<td>(8.18)</td>
<td>(3.14)</td>
<td>(5.68)</td>
<td>(5.97)</td>
</tr>
<tr>
<td>Observations</td>
<td>1,410</td>
<td>880</td>
<td>1,337</td>
<td>795</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The sample is those individual members of the household 10 years or older who reported having worked on the household’s cultivated plot at any time during the season. Reported hours worked have been winsorized at the top 1 percent of the distribution. Standard errors are shown in parentheses. T-test on difference in means with *** indicating the difference is significant at the 1 percent level and * at the 10 percent level.

Source: authors own analysis
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