

Guidance on calculating household income

Version 1.

Prepared for the Living Income Community of Practice

The Committee on Sustainability Assessment (COSA) and KIT Royal Tropical Institute

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***Note – This document will be updated as conversations progress around income measurement, and to include relevant links to more up to date guidance as it becomes available.**

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Introduction to income and income gaps

This document provides guidance on how to measure and calculate actual incomes for smallholder households in agricultural contexts. This guidance is provided for the purpose of assessing the income gap – the gap between a living incomes and actual incomes. Furthermore, this guidance focuses on smallholder agriculture contexts where crops are the primary source of income. In this sense, the guidance is intended to answer two questions:

- What components of household income do we need to consider and measure in order to assess the income gap?
- How can we effectively collect the information on these components of household income in a survey context?

A model household survey accompanies this guide for use in developing an income survey in the context of smallholder farmers. It proposes how to approach the survey structure and questions. It captures most of the critical elements for the calculation of actual income, and is organized in modules focused on different components of household income. It provides a general framework that the user can adapt depending on the study population and the research approach.¹

While recognizing the contextual importance of all income sources, this guide considers that there should be a reasonable balance between data collection precision and comprehensiveness. In this sense, we offer guidance on decisions about which elements to include, for some calculations are highly dependent on the context and characteristics of the population being studied and on the available resources.

Measuring household income for the purpose of assessing the income gap is different in some important ways from other common uses of farm household surveys. For example, household surveys are often used to assess the profitability of a particular crop. The information needed for that specific calculation differs in some important respects from the information needed to assess the income of farming households. This document is focused on measuring the income gap, and thus it provides guidance on how to capture the information needed for this purpose. While rigor is important, this guidance attempts to strike a balance also with pragmatism so as to enable broad use and applications.

What this guidance note does not cover

It is important to note that the approach presented in this guidance for surveying households about their income is not the only way to assess household economic well-being. Capturing information that includes household expenditure is a common alternative approach. Similarly, tracking food security and assets are also well-established approaches for generally assessing household well-being.

Household surveys that capture information on household incomes are neither the only way, nor are they always the best way, to estimate household income. It is not always feasible to do a full household survey, due to cost or time considerations and in some contexts, there may be other reliable ways to capture this information. The use of focus groups, rapid rural approaches, and existing secondary data can complement or substitute for surveys. Other guidance notes, produced

¹ We distill into the guidance many years of COSA experience with thousands of surveys and collaborations with a range of expert institutions in the field including The International Initiative for Impact Evaluation and CGIAR members such as the International Food Policy Research Institute.

for the Living Income Community of Practice, address alternative approaches to measuring household income, when a full survey is not feasible or desirable.

Box 1: Other guidance documents

The Living Income Community of Practice has developed a variety of resources that provide further guidance and justification for the advice given in this document. The most notable for reference are:

- [Guiding steps towards living income in the supply chain](#)
- [From Living Wage to Living Income Considerations for the use of the Anker methodology for calculating living wages to inform living income estimates.](#)
- [Applying the Household Economy Analysis to Measure and Address Income Gaps in Agriculture Supply Chains](#)
- Guidance manual on calculating and visualizing income gap to a living income benchmark (**coming soon**)

All of these documents and more can be found at www.living-income.com/papersandreports

Understanding the contribution of different components of household income to overall household economic status is important for the work of the Living Income Community of Practice because it opens the door to inquiry about the strategies and levers that can be used to raise household incomes. For example, understanding the contribution of different agricultural products to household income can help in modeling how alternative farm diversification strategies might affect farmer incomes and reduce risk. This guide explains how information on these different components of income can be captured via a survey. For those interested in measuring changes in asset, expenditure, or food security approaches, there are a number of institutions such as WHO, WFP, IFPRI, Oxfam and research references to consult such as: De Janvry *et al*, 2005; Falkingham & Namazie, 2002; Smith & Subandoro, 2007.

This guidance note does not cover survey research design – for example, what sample size to use in a farmer survey or how to select which households to interview. There is ample literature on those basic methods. The focus is only on the content of the survey, i.e., what information do you need to capture, and what would a model survey look like.

What is a living income gap?

The living income gap is defined as *the difference between the living income and smallholders' actual income*.²

Living income is further defined as *the net income required to afford a decent standard of living for all household members; and a decent standard of living means being able to afford food, water, decent housing, education, healthcare, transportation, clothing, and other essential needs including provision for unexpected events*.³

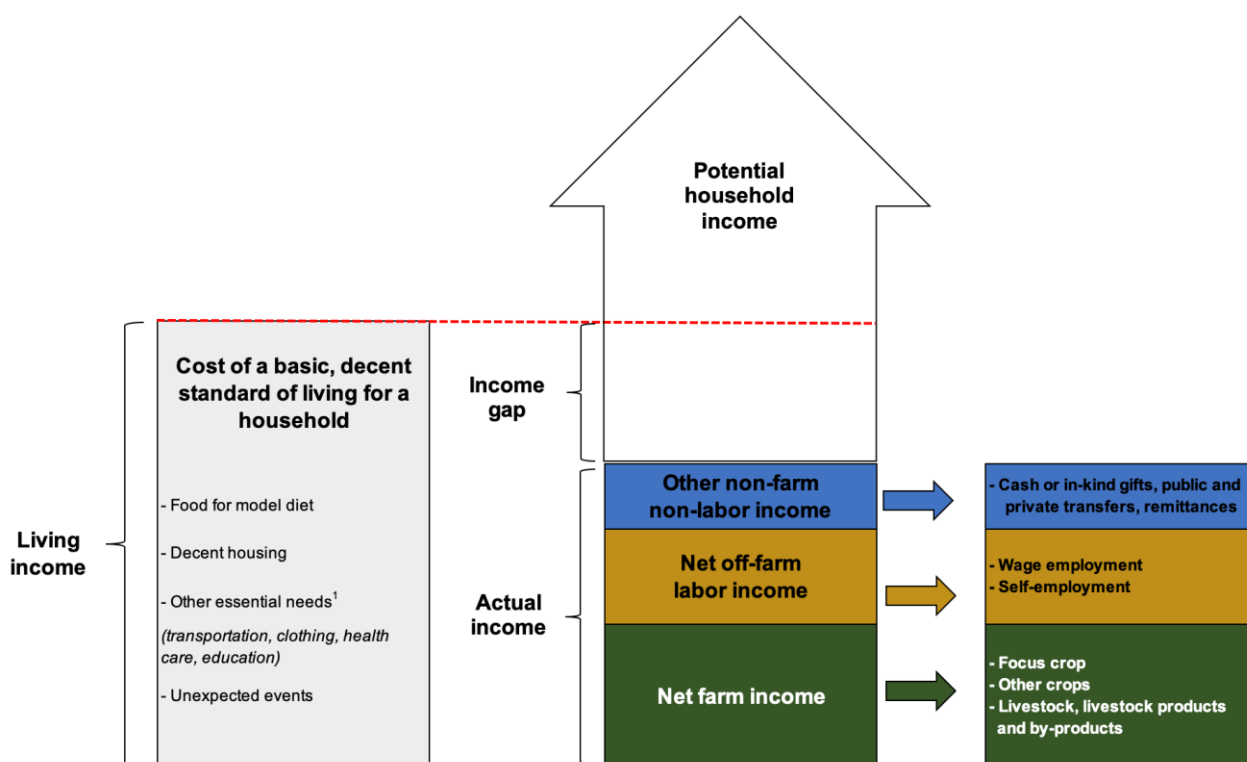
Given the seasonality of agriculture and the agricultural productive cycle, actual income is defined as the net income generated by household members during the yearly production cycle, which is

² For further details on the living income gap, please see 'Guidance manual on calculating and visualizing income gap to a living income benchmark' (**coming soon**)

³ <https://www.living-income.com/the-concept>

typically considered as the ca. 12-month period between harvests of the main crop.⁴ Such income can stem from a wide array of farm and non-farm activities that complement each other, as well as from other non-labor sources that will be described later in this document (See Figure 1).

Figure 1: The living-income approach



Source: adapted from <https://www.living-income.com/measurement-actual-income>

Composition of household incomes for agricultural smallholders

The rural space where agriculture takes place encompasses a wide range of areas from dispersed rural settlements to functionally linked towns where non-farm services and commercial activities occur, generating dynamic economies. Agricultural smallholder households, depending on the context in which they live, can have a myriad of farm and non-farm income sources to feed their incomes.

Based on the literature on rural household incomes (Reardon *et al*, 2007; Haggblade *et al*, 2010), we identify three main sources of income: farm net income, non-farm net income, and other income, which essentially represents non-labor income (See Figure 1). The summation of the three income sources comprises the smallholder total actual income (See Figure 2).

⁴ Some countries consider the “agricultural year,” which is the 12-month period which starts with the beginning of the rainy season. In some practical approaches, others consider the productive cycle of the perennial main crop. Sometimes the main crop is harvested twice a year or more; here, we consider the 12-period between the most important harvests of the crop.

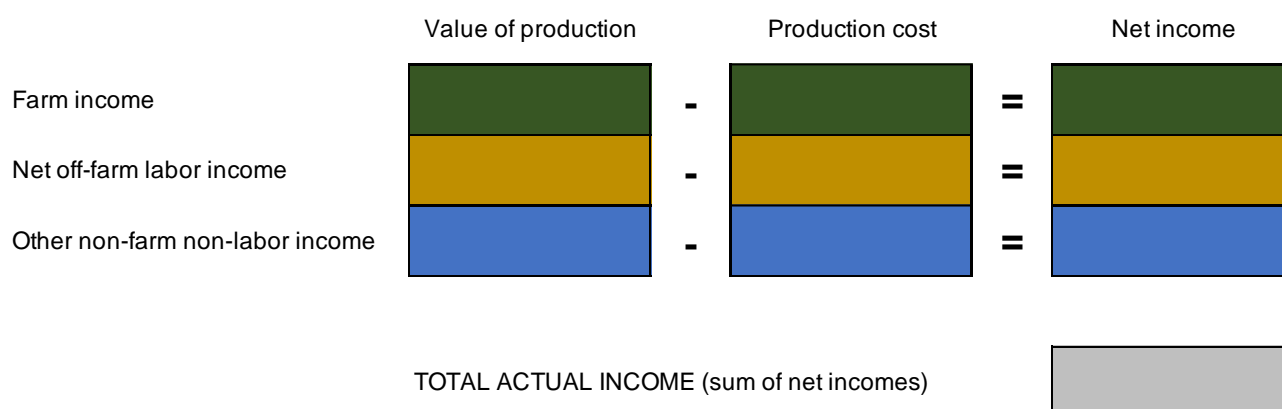
Farm income comes from various sources, as many smallholder farmers in developing economies grow multiple crop species on their farms (Bellon *et al*, 2020) and raise major and minor livestock units that can be sold and/or supply a wide array of products and by-products (e.g. milk, cheese, eggs, meat, wool, honey, amongst others)⁵. Such production not only significantly contributes to total household incomes, but is considered an important source of household consumption.

Net non-farm labor income is defined as *all income coming from all economic activities other than the production of primary agricultural commodities (farm income)*.

In rural areas, non-farm earnings account for 35% to 50% of total household incomes (see for example: Reardon *et al*, 2007; Deininger & Olinto, 2001; Deininger & Okidi, 2001). Non-farm income activities come from a set of wage-employment and self-employment activities. Wage-employment activities involve at least an implicit employment contract or arrangement, where the employer can give orders to the employee (Reardon, 1997). Typical wage-employment activities include hired agricultural labor or working as a teacher in a village. On the other hand, self-employment activities involve ownership of the firm (business or shop) that produces goods or services (Reardon, 1997). Typical self-employment activities are petty trading, cottage industries, handy-crafts, amongst others.

Finally, **other non-farm non-labor income** relates to other incomes obtained from off-farm non-labor activities, such as cash or in-kind gifts, public or private transfers, remittances, amongst others.

Figure 2: Calculating the actual income



The subsequent sections of the guidance note examine each element in more detail, explaining how the information could be captured in a survey. Each element has an accompanying module in the model survey.

When taking this general guidance and applying it in a specific case, context will matter. What to include as income is highly dependent on the context and characteristics of the population being studied (e.g. economic practices, focus crop, geography, farmer characteristics, amongst others). In

⁵ Goods and services provided by the cooperatives to farmers oriented to produce a particular crop (e.g. fertilizers, pesticides, bags, transportation of inputs, technical assistance services, amongst others) are either considered as both an income and a cost, or not considered at all for calculating the actual income for calculating the income gap.

this sense, we encourage a preliminary context assessment to learn about the most important income sources and characteristics of the study area, to develop a more relevant and effective survey (e.g., contexts where land leases are common are a clear signal to include such costs, as opposed to a situation where the majority of farmers own their own land). These elements are clearly highlighted in this document, along with advice on circumstances where it may be relevant to include such elements.

There are more elements that users may choose to include in a household survey and that can provide additional analytical power for purposes other than measuring the income gap. While not necessary for the actual calculation of the living income gap, they may be powerful for decision making in other contexts. Some of these elements are included where relevant, and their potential value explained.

Net farm income

Net farm income is defined as *the total value of farm production minus the total costs of farm production*.

In this section we will introduce the user to the calculation of the total value of production taking into consideration two key topics: on the one hand, to consider the value of both sold and unsold (i.e. consumed by the household) production; and, on the other hand, that the value of production involves the value of a wide range of farm activities that includes focus crop cultivation, other crop cultivation, and the production of livestock and livestock products and by-products. We will also discuss the production costs that should be associated to each farm product as well as all the elements that should be incorporated, considering that the final use case of this guidance is to calculate the total actual income. Each concept is referred to in the survey model accompanying this guide.

Box 1: Delimiting the farm

In order to adequately capture household farm income, we should clearly identify the land owned and/or produced by all household member ('Guidance manual on calculating and visualizing income gap to a living income benchmark' – **coming soon**). Farm is the total land that ANY household member either:

- i. Owns (with or without ownership title),
- ii. Has rights to use (possession, land reform titles, etc.),
- iii. Has any land-use arrangement with third parties (loans, rentals),
- iv. Uses as a sharecropper.

In this sense, farm mapping is a good tool for placing the farmer into the farm context. Diagramming the household's plots in production during the reference period (production cycle), may help identify main crops harvested during the past production cycle, and identify key characteristics that may help reconstruct farm income in the survey.

Total value of production

Total value of production is the sum of the value of production of each specific product produced in the farm. Total value of production for a specific crop or product can be calculated as the product of

the total production,⁶ and the average price received by the farmer^{7, 8}. Note that we consider the total value of production as opposed to the value of sales, as a household may not sell all their production to the market, instead using all or some of the production for self-consumption, as inputs or as gifts, or for exchanges, losses, or even stored while waiting for better prices. We consider that a reasonable choice to value unsold production is to use the average price received by the farmer.⁹ Also, farmers can produce several farm products (crops or livestock products or by-products) that were not sold in the market. In such cases, we advise using local average prices received by farmers for such products to estimate their production value.

For practical purposes, we consider that total value of production comes from three main sources:¹⁰

- Focus crop (e.g. cacao, coffee);^{11 12}
- Other crops;¹³
- Livestock and livestock products and by-products (change in livestock value, milk, cheese, eggs, meat, manure, skin, hides, horns, amongst others)^{14,15}

While in theory farm income comprises information from all three income sources, there may be some contexts where not all income sources are relevant. The user who is developing a survey to calculate household income should identify the relevance of including all of these sources of farm income in the survey, as the more detailed the survey is, the costlier it is in terms of time and resources (See Box 2). In this sense, given that farmers operate in very different contexts (e.g., different regions, crops), we recommend conducting a context assessment first, to clearly identify

⁶ The total production of a particular crop can also be calculated as the product of the average productivity (expressed in unit of mass per unit of land) and total area allocated to commodity (expressed in units of land). We should be aware, that while technically equivalent, both methods may lead to different results, and for consistency and comparability, we should use only one method. We recommend the calculation of the value of production as the product of total production and the average market price.

⁷ As can be seen in the model survey, there are some cases where every time the producer delivers her/his production, price paid may be different due to market conditions, type of buyer, quality of product, special characteristics of the product (e.g. certified production quota), etc. In those cases, we recommend to ask for the volume and price for each relevant sale to obtain the value of production per sale, and then sum them all to obtain the total value of production for a particular crop.

⁸ We consider the overall price received by the farmer including quality bonuses or discounts, as well as premiums.

⁹ For the unsold production, the user should consider the price of the crop given the quality of the unsold product, as sometimes farmers sell only the higher quality part of their production. If the unsold production is minimal or the quality is similar to that sold, the user can use the average price received by the farmer.

¹⁰ While in some contexts, woodlots may be a relevant source of income, we argue that we can include them under the other crop section.

¹¹ Our approach to total value of production suggests a detailed set of questions for the focus crop. For the calculation of the value of production of a particular focus crop, see the example of “coffee production” and “coffee sales” sheets in SurveyExample.xlsx.

¹² Include woodlots if relevant as “other crop”

¹³ For the calculation of the value of production of other crops, our approach, while comprehensive, is less demanding than for the focus crop. For an example, please see the “other crops” sheet in SurveyExample.xlsx, from questions othc_1 to othc_9

¹⁴ For the calculation of the value of production of livestock products and by-products, see the “livestock” sheet in SurveyExample.xlsx, from questions stk_1 to stk_2 and from stk_7 to stk_12. For assessing the net income from livestock management see questions stk_1 – stk_6

¹⁵ Livestock products and by-products may not be relevant in all contexts.

the productive characteristics of the population of study and identify the relevant farm income sources that need to be deeply assessed in the survey.

Box 2: On survey development

If the farm's value of production (from sold and unsold production) comes from a combination of crops and/or livestock-by-products, the user may balance precision against costs in terms of time and resources. Given the heterogeneity of the contexts where an individual or an organization may need to develop a household survey to calculate smallholders' actual income, we present some typical cases the user may find, and how to tackle them:

- There are some contexts in which most of the farmer's value of production (from sold and unsold production) comes from the focus crop (e.g. a coffee farm). For these cases, the best approach may be to develop a detailed questionnaire about the focus crop, and then ask what portion of their total farm income comes from the focus crop.

- In regions where the presence of livestock units is minimal and where the total value of livestock products and by-products (sold and unsold) is not relevant for the overall income, there may not be a need to develop a specific survey section to capture this information. In each survey, though, we should ask what portion of their total farm income comes from the focus crop.

- Similarly, the user should be cautious about the number of other crops to consider at the farm level, as there are some products that may not be as relevant for the overall household value of production (e.g. a couple of orange trees in a coffee monocrop farm).¹⁶ For such farmers (or regions), the user should define a maximum number of crops to ask in each individual survey and consider asking what portion of their total farm value of production comes from the focus crop and the assessed crops.

- On the other hand, when farm incomes depend on several small contributions that add up to a significant portion of income, the user may consider to group crops as "mixed vegetables" and / or "mixed fruits" and provide estimates of its value of production (and estimated costs of production of the mixed bundles).

- Finally, the approach proposed in the model survey is to ask detailed questions around a focus crop, and a less exhaustive set of questions for the other crops and livestock, and livestock products and by-products. The model survey allows for capturing information on all the crops harvested and products and by-products produced in the past production cycle (including intercropping crops, or crops harvested twice during the production cycle). However, the user can also choose to replicate the focus crop set of questions in the model survey to assess other crops when relevant.

Total costs of production

While in the previous section we discussed the total value of production, this section will focus on some key aspects of production costs calculation. Furthermore, we will provide guidance on the cost structure and on which elements are relevant for inclusion into the overall calculation.

To calculate total production costs, we follow Fair Trade USA & Cornell University (2017) and the COSA set of indicators.¹⁷ This approach adds to a typical variable cost approach¹⁸ some elements that, depending on the context, may be relevant (or not) to include: fixed costs, depreciation costs,

¹⁶ Minor crops may be important to the farm economy and may reduce costs of food or feed inputs but these are not as relevant to the defined calculation of household income sources.

¹⁷ <https://thecosa.org/master-list/>

¹⁸ The variable cost approach typically considers production inputs such as paid labor, fertilizers, and pesticides used in the production cycle. Some others include the cost of credit and transportation of inputs and output.

and a valuation of some relevant opportunity costs, as well as the amortized costs of establishment for perennial crops.¹⁹

The cost structure presented below (see Figure 3) applies, in general, to all crop farm production activities.²⁰ We suggest considering a detailed set of questions for the focus crop, and a more general approach for other crops and/or livestock products and by-products if any were produced by the household during the past production cycle. The model survey offers a specific cost section for production costs of “other crops”²¹ and for “livestock products and by-products.”²²

Figure 3: Crop production cost structure

	Crop-specific costs	Farm-level costs
Variable costs	Costs of hired labor	
	Costs of fertilizers (include foliar if relevant)	
	Cost of insecticides, pesticides, fungicides, nematocides	
	Cost of credit	
	Cost of seeds	
	Cost of transportation of inputs and products (*)	
Fixed costs	Cooperative membership fees (*)	
		Security (*)
		Taxes (*)
Depreciation and costs of operation and maintenance		Operation and maintenance of productive assets and vehicles (*)
		Depreciation of productive assets and vehicles (*)
Opportunity costs and amortized costs of establishment	Cost of land (*)	
	Amortized costs of establishment of perennial crops (*)	

(*) To be used only when relevant to the overall production costs

¹⁹ In a general context of smallholder farming, there are some costs which may not be relevant: fixed costs, depreciation costs and the opportunity costs of land and capital. However, we consider it relevant to include them as there may be some specific contexts where some of those may apply.

²⁰ As noted in the introduction, this guidance focuses on smallholder contexts where crop agriculture is the primary source of income. For livestock farming, the cost structure may have some specific variable costs such as veterinary costs, costs of feed, costs of vaccines, amongst others. In some cases where farmers produce their own animal feed by planting pastures and forage, typical crop production cost structure applies.

²¹ See othc_10 – othc_13 in the “other crops” section.

²² See stk_5a, stk_5b, stk_5c and stk_13 in the “livestock” section.

While the majority of the listed costs in Figure 3 are crop-specific, there are some costs that are conceived at the farm level (e.g. security, taxes, depreciation costs, and maintenance). Such costs should be considered at the farm level only and deducted from the net income (if value of production and costs are considered at the crop / livestock product or by-product level) as shown in Figure 4.

Users may also consider the possibility of using the cost structure from Figure 3 at the aggregate level for all their farm. While this alternative may be less precise than a more crop-specific cost structure, and will provide less information (e.g. focus crop profit and labor use may not be possible to calculate), it is a less time-intensive and less costly alternative. If this alternative is chosen, farm-level costs are simply considered in the overall cost calculation.

Variable costs are directly related to the output. These include total costs of hired labor (salary plus food, if applicable),²³ inputs used in the crop during the production cycle (e.g. fertilizers, foliar, pesticides, insecticides, fungicides, nematicides, amongst others),²⁴ costs of credit associated to the crop production, costs of seeds / plants, and transportation costs associated to the purchase of inputs plus the transportation costs associated with the product delivery to the point of sale.²⁵

Fixed costs are costs that may be incurred, whether or not any crop is produced, to keep the farm operating in the short-run. These costs typically include annual payments for cooperative memberships, taxes (if applicable), and security, amongst others. In general, amongst smallholders, fixed costs do not represent a significant cost; however, if in a particular context those costs are relevant, they should be included in the cost structure.

Depreciation and costs of operation and maintenance are considered for all productive assets that are to be used in more than one harvest cycle. This includes productive equipment (e.g. wheelbarrows, spray equipment, pruning implements, small-scale processing equipment) and vehicles (COSA Field Guide 2014; Fair Trade USA & Cornell University, 2017). In both cases, there are replacement costs and operation costs.

If we consider a depreciation rate of 10% for productive equipment and vehicles, each year we should account for 10% of the value of these productive assets as part of the production costs. Furthermore, for some assets, there may be relevant operation costs.

In general, smallholders do not have significant productive assets or vehicles; however, if in a particular context those assets have a significant value and depreciation costs are relevant, they should be included in the cost structure.

Opportunity costs and amortized costs of establishment. In the case of the opportunity costs of land, we consider the income that the farm owner would have received if they rented the land. This is an important cost for landless farmers or farmers renting land to expand their farm productive area. For tree crops (perennials), land rentals are not that frequent, although depending on the context

²³ For the calculation of labor costs of focus crop, see the “labor” sheet in SurveyExample.xlsx (questions labor_1 to labor_9). The survey only asks whether the payment for a particular activity included meals. To calculate food costs (if applicable), we ask for the typical cost of a meal for farm laborers and add those costs to the total cost paid. For the calculation of other crops’ labor costs, we ask the enumerator to include the total costs of hired labor, which should include food (See the “other crops” sheet in SurveyExample.xlsx, question othc_12).

²⁴ For the calculation of fertilizer and crop protection product costs (pesticides, insecticides, fungicides, nematicides, amongst others) of the focus crop, see the “fert” and “pest” sheets respectively in SurveyExample.xlsx. Our approach accounts for all the inputs applied for the focus crop. We suggest using a graphic representation of the farm and diverse elements of each plot to help visualize the farmer’s context.

²⁵ If some of these costs are not relevant for the specific context, the user should not include them in the survey. For example, there are some contexts where credit is unavailable or where labor costs include food, or where the buyer collects the produce from the farm.

some alternatives may exist (e.g. sharecropping). We advise to use this cost only when there is a significant percentage of target farmers (see Box 2) involved in temporary land agreements in the focus crop, such as land rentals, sharecropping agreements, etc. When those do not exist, such opportunity costs are almost irrelevant and therefore we exclude them.

In the case of tree crops, we consider the amortized costs of establishment, which include the value of replacement of old trees with new trees.²⁶ This calculation should be imputed according to the average cost of establishment per tree, the number of trees at productive age,²⁷ and the life expectancy of a tree under optimal production. These costs will allow the farmer to maintain the plot as productive over time. In case of annual crops, there are no amortized costs of establishment, but only the costs of preparing seeding and planting the annual crop, which are typically considered in paid and household labor.

Box 3: Calculating costs of establishment

Calculating the costs of establishing perennial crops requires the user to identify the local average cost of establishment per unit of area ($Cxha$), the crop's area (S), the percentage of trees in production ($1 - \%p$) and the number of years of optimal production of the tree (t). With the combination of local and individual data, we can estimate the annual cost of establishment for a perennial tree as:

$$D = (Cxha). (S). (1 - \%p)/t$$

The treatment of unpaid household labor

In the calculations of crop production costs, it is typical to incorporate into the cost structure the value of unpaid labor (understood as an opportunity cost of labor). The opportunity cost of labor, due to its relative importance especially amongst smallholders where household labor can easily account for a large percentage of overall farm labor, should be a valuable indicator to have. This calculation is particularly relevant for use cases where there is a need to understand the overall production costs of a specific crop or when we are assessing crop profitability or farm labor allocation. Given its importance, we advise to collect this data if possible, but not to include it in the household actual income calculation. Typically, unpaid labor is valued by determining the time invested in all activities and considering a market price for such time.²⁸

However, when assessing overall household income, adding such cost should definitively imply adding such income elsewhere as an "off-farm" labor income (See Figure 4), regardless of the valuation of unpaid labor. We advise to consider gathering data on unpaid labor for further relevant analysis, but it will not be useful for the calculation of household actual income. Figure 4 explicitly

²⁶ Given that we are considering the amortized cost of establishment (for perennial trees), the actual establishment of new production trees is considered an investment and not a typical yearly expenditure. While it is true that some farmers will incur significant costs of tree renovation in a particular year, others will not. We advise to incorporate a yearly cost (that not all farmers may incur) for tree renovation to be considered for the overall sample.

²⁷ Productive age is considered at the moment where the tree is actually producing fruits (e.g. for coffee trees it will be the third year)

²⁸ The value of using household labor is that there is no cash requirement as typically household labor is unpaid. For the calculation of unpaid household labor of focus crop see the "labor" sheet in SurveyExample.xlsx (question labor_10); for the calculation of unpaid labor in other crops' see the "other crops" sheet in SurveyExample.xlsx (question othc_13)

presents the issue. The imputed value of unpaid labor has to be incorporated as another source of income. However, it does not imply any cash movement.

Figure 4: The role of unpaid labor in calculating actual income

Farm net income				470
	Production	Unit	Price (\$) per unit	Value of production (\$)
Coffee production	800	kg GBE	2.75	2200

	Amount used	Unit	Price (\$) per unit	Cost (\$)
Paid labor	100	Days	15	1500
Fertilizer - urea	4	quintals	25	100
Fertilizer - 202020	4	quintals	20	80
Pesticides - alto 99	1	liter	50	50
Imputed cost of unpaid labor	40	Days		

Non-farm income				1080
	Quantity	Unit	Income (\$) per unit	Income (\$)
Part-time work grocery store	6	Month	180	1080
Imputed income from unpaid labor	40	Days		

TOTAL HOUSEHOLD ACTUAL INCOME		1550
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Note: A bracket on the left side of the table groups the 'Imputed cost of unpaid labor' and 'Imputed income from unpaid labor' rows, with arrows pointing to the 'Imputed cost of unpaid labor' row in the Farm net income table and the 'Imputed income from unpaid labor' row in the Non-farm income table. A plus sign (+) is located to the right of the Non-farm income total.

Source: COSA (2018). Sub-sample data of coffee farmers in Jinotega

Calculating net farm income

The net farm income is determined as the total value of farm production (which can be expressed as the product of the price received by the farmer and total production) minus its associated production costs. Both are calculated over a 12-month period based on the productive cycle. Ideally, this calculation should be done for each item produced at the farm including focus crops, other relevant crops, livestock and livestock by-products, and then summed to calculate the total farm net income (see Figure 5).

Figure 5: Calculation of total farm net income

	Value of production	-	Crop-specific production costs	=	Sub-total
Focus crop		-		=	
Other relevant crop #1		-		=	
Other relevant crop #2		-		=	
...		-		=	
Other relevant crop #c		-		=	
Relevant livestock, livestock product or by-product #1		-		=	
Relevant livestock, livestock product or by-product #1		-		=	
...		-		=	
Relevant livestock, livestock product or by-product #l		-		=	
	NET INCOME (without considering farm-level costs)				
	- Total farm-level costs				
	TOTAL FARM NET INCOME				

While ideal to calculate total farm net income, there may be different contexts (see Box #1) where it is not possible or relevant to collect all the data. In general, our approach is to gather detailed data on the focus crop for both the value of production and the associated production costs, and to collect more general data (aggregated production and focus on variable costs) for all of the other farm income sources. However, there may be cases where the user may need to incorporate detailed information on a secondary crop (for example when it is considered as a key candidate for a livelihood enhancement project). In such cases, the user can use the same framework applied to the focus crop for the secondary crop.

Furthermore, there may be cases where the user may only have access to information on the focus crop; in such cases, it may be useful to include a question asking about the portion of total farm net income coming from the focus crop.²⁹ This will allow the user to estimate total farm net income by dividing the main crop's net income by the portion of total farm net income it represents. Note that the precision of the estimation of farm net income depends on the portion the main crop actually represents. The higher the portion of farm net income coming from the focus crop, the more precise the estimate will be.

²⁹ We maintain that adding the question “what portion of your total farm income comes from the focus crop” is a valid question that may be useful not only in cases when other farm income data is not available (i.e. income from other crops or income from livestock by-products), but also as a cross-check question.

Net off-farm labor income

Net off-farm labor income is defined as *the income coming from all economic activities other than the production of primary agricultural commodities (farm income)*.

In rural areas, non-farm earnings account for 35% to 50% of total household incomes (see for example: Reardon *et al*, 2007; Deininger & Olinto, 2001; Deininger & Okidi, 2001).³⁰

Labor income in the rural non-farm economy comes from a highly heterogeneous set of economic activities, ranging from part-time labor on other farms or self-employment in household-based cottage industries or other small businesses to full-time labor in factory manufacturing, services, and trade (Haggblade *et al*, 2010). Even within the same country, the rural non-farm economy is highly heterogeneous, depending on differences in natural resource endowments, labor supply availability, location, and infrastructure, amongst others.

Non-farm labor incomes may be highly seasonal and may fluctuate with household labor and financial flows between farm and non-farm activities. While some farmers rely on the non-farm economy for survival, others use the non-farm economy as a means of risk diversification, to modulate seasonal income, and to finance agricultural inputs. In fact, in the rural world, livelihood diversification and non-farm employment are important levers for rural economic growth (Pingali *et al*, 2019) and resilience. Returns to the non-farm economy may also be very heterogeneous, varying substantially as a function of differing physical and human capital requirements. Poorer farmers typically engage in low-return activities such as small-scale trading and unskilled wage labor in both agriculture and non-farm businesses, while women dominate many of the low-return cottage industries (Haggblade *et al*, 2010).³¹

The rural non-farm economy is growing over time and its importance as a source of income and employment in rural areas is also growing, although the farm economy is still an important source of income and self-employment to most rural households. Often, data on non-farm employment is underestimated as it does not necessarily include all household members and/or excludes secondary and seasonal pursuits.

In general, non-farm labor income comes from two main sources, local business and wage-employment:

Self-employment.³² Self-employment activities involve ownership of a business that produces and sells goods or services. The owner receives payment from customers for products or services delivered. Given the relatively simple business structure in rural areas, we consider that the business net income is the amount that customers pay for the goods and services provided minus the costs of making them during a specific period of time (revenue minus costs). However, in some cases, farmers do know the net daily amount received for operating the business (e.g. selling food). Some examples of businesses are owning retail shops, clothing-making shops and taxis where the driver

³⁰ These are average figures, summarizing 54 rural household income surveys from the 1990s and 2000s. While they are limited to represent specific characteristics of a particular study region, they show the magnitude of the rural non-farm economy in the rural world, which in fact is growing over time as the urban areas are reaching the rural ones.

³¹ According to Haggblade *et al* (2010), the role of women in the non-farm economy accounts for about 25% of total full-time workforce in the developing world. Given their heavy household obligations, women also participate part-time in the non-farm economy, particularly in household-based manufacturing and service activities.

³² For the calculation of the net income from local businesses, see the “business & transfers” sheet in SurveyExample.xlsx, from questions bus_1 to bus_12

keeps all the fares and pays all the costs of the taxi, household-based cottage industries (handy crafts, textiles, ceramics), selling food, amongst others.

Wage-employment.³³ Wage income is defined as *the income received from all household members for their labor with third parties and typically implies at least an implicit employment contract arrangement.*

Wage income implies remuneration and it can be earned from agricultural (e.g. doing farming activities for other farms) or non-agricultural sources (e.g. teacher, lawyer, working at the municipality, etc.) Income from commuting (working away from home) or temporary and seasonal migration from household members is considered part of the non-farm income. Typically, we ask for the net income from wage employment (what the person receives for their work), which implies the income received and disposable. Typical wage-employment activities include hired agricultural labor and working as a teacher in a village.

Our approach is to assess self-employment at the household level as it typically relates to business opportunities managed by one or more household members. We advise considering two self-employment activities, identifying the main and the secondary sources. On the other hand, we assess income from wage-employment for all household members above 14 years old. For each household member we ask for the main and the secondary wage income activity (See Figure 6).

Figure 6: Net non-farm income from labor activities

Self-employment (for the household)	Main household self-employment activity
	Secondary household self-employment
Wage-employment for household member i (for each household member above 14 years old)	Main wage income for household member i
	Secondary wage income for household member i

Where i represents all household members above 14 years old

³³ For the calculation of wage income, see the “nonfarm income” sheet in SurveyExample.xlsx, from questions wage_1 to wage_10

Box 4: On collecting data on household non-farm income

The survey should capture all household member (above 14 years old) total earnings in the rural non-farm economy during the period of analysis (production cycle). For such purposes, the survey should include:

- Under the household characteristics section, a set of specific questions related to each member's participation in the rural non-farm economy. This question will inform the survey to ask questions that are more specific about each member who earned wage income (See the "household" section in Survey Example.xlsx)
- Ask about the most important source of employment in the rural non-farm economy and also about any other secondary employment each household member had during the period of analysis (be clear about this).

Other income (non-farm non-labor)

Non-farm non-labor income mainly comes from public and private transfers, gifts, and remittances from non-household sources (e.g. government, nonprofit organizations, former household members or relatives) as well as income from land rentals or from sharecropping. A typical source of non-farm non-labor income comes from public initiatives for social protection or economic inclusion of poor households, as well as from non-household members sending remittances.³⁴

Calculating actual household incomes

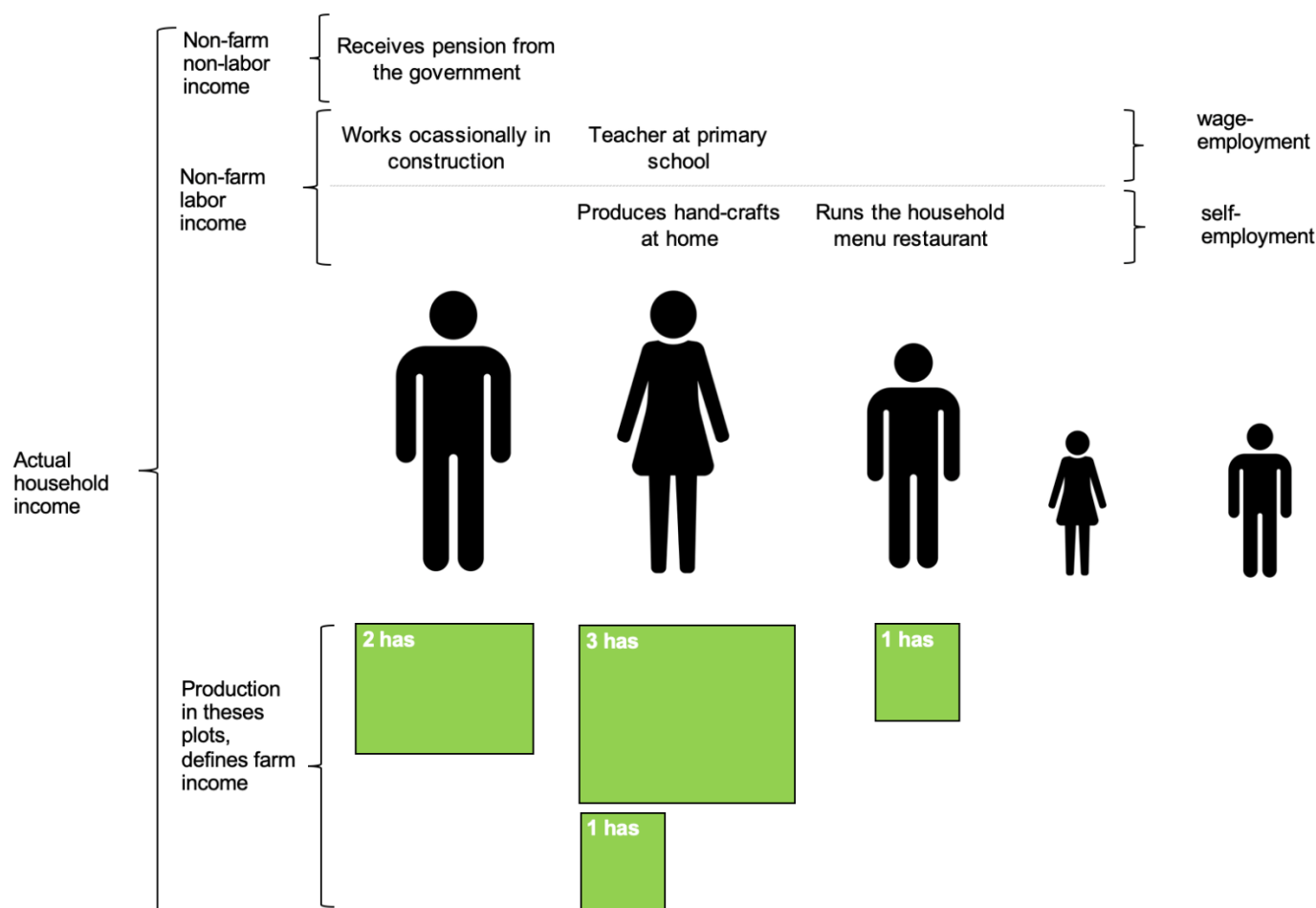
Actual household incomes in an agricultural context are defined as *the total net income produced or received in cash or in kind by any household member over a 12-month period, as demarcated by the production cycle in the study area.*

Smallholder's household income comes from the farm, but also from the growing non-farm economy. In this sense, it is calculated as the sum of the total net farm income, the net non-farm labor income and non-farm non-labor income (See Figure 1 and Figure 2).

To adequately estimate actual household income, the user should clearly identify the household members (see 'Guidance manual on calculating and visualizing income gap to a living income benchmark' - **coming soon**) to be able to capture income from the non-farm economy, but also to be able to delimit the farm to identify the farm net income (See Box 1). As an example, Figure 7 presents a representation of a typical household, where land is produced (or owned) by different household members, and where non-farm incomes come from different household members and from different sources.

³⁴ For the calculation of the income from transfers and remittances, see the "business & transfers" sheet in SurveyExample.xlsx, from questions trf_1 to trf_5

Figure 7: Actual household income



Considerations for household surveys

As we mentioned before, rural families have a variety of farm and non-farm income sources. Estimating total household income requires estimating the contribution of each household member to the total household income. This is difficult data to collect since it would require either interviewing every contributing household member or assuming the selected respondent has accurate information about all household members. In general, we suggest interviewing the household head and/or the most knowledgeable household member on the focus crop production (these are typically the same person). However, in order to capture precise information on incomes, the user may consider asking the interviewee to call relevant household members to provide information on their contribution to total household income.³⁵

If the relative importance of the focus crop in overall household income is large enough,³⁶ for practical reasons (time and cost saving) we recommend asking detailed questions on the focus crop, and adding a question on the proportion of total household income coming from the focus crop,

³⁵ Users should avoid intra-household conflicts or complications (disagreements) on reporting income data. This is the reason why we recommend in general to have only one interlocutor. However, to capture precision on other income sources where the household head is not familiar with, we also suggest asking the relevant household members.

³⁶ As a rule of thumb, we consider beyond 75% a good threshold.

considering that the larger the weight of the focus crop in total household income, the higher precision in the estimation of the household income data. In this sense, it is important to identify interview the household head and/or the most knowledgeable household member on the focus crop production.³⁷

Given the complexities and time required for capturing production costs, we recommend – in general – to ask detailed questions only about the focus crop. For the rest of farm income sources, we suggest having either a lighter set of questions (see “other crops” and “livestock income” on the model survey) or to estimate farm income using the proportion of total farm income coming from the focus crop.

Users should be aware that respondents might misreport because of a farmer’s privacy concerns and interests. In this sense, and for data transparency, we recommend that data collection be done by an independent source which may be able to capture more truthful information (e.g. may capture side selling if not recognized as coming from the cooperative, or higher incomes if not recognized as a government official providing financial aid).

We also recommend specialized training for enumerators in order to better capture household income sources. Training should be on one side sufficiently technical to provide a basic understanding of the household income sources and potential problems arising in a particular context. On the other side, training should be able to provide the enumerator with the skills to adequately and efficiently manage the survey and to generate the needed trust with the farmer.

Enough probing needs to take place to make sure underreporting is minimized and nothing is forgotten. A focused effort is needed to understand differences between gross and net income flows, and flows where discounts are already being made. Any kind of aggregated records would be useful to verify the information. For example, producer organizations that record farmer production for payments can be an important source of data for triangulation with calculated incomes. If farmers received inputs or loans based on their production or land size, the data supporting the inputs distribution or loan allowance is also of value.

³⁷ We recognize that in practice, this means interviewing men. We have to be careful not to contribute to gender bias, or to omit relevant information for income calculation.

Appendix 1: Household income details and survey modules (an example for coffee as focus crop)

Income element	Survey module	Comment
	household	Identifies which member works in off-farm activities
	farm	Identifies farm and total plots produced by any household member in the past production cycle
Focus crop net income	coffee area	Defines the focus crop area
	coffee production	Focus crop production
	coffee sales	Focus crop sales and unsold production
	transport	Transportation costs
	credit	Cost of credit
	fert	Cost of natural and chemical fertilizers
	pest	Cost of natural and synthetic pesticides, fungicides, insecticides, etc.
	labor	Temporary labor, unpaid labor
	fam & perm labor	Detail on family labor and permanent labor
Other crops net income	other crops	Simplified version capturing the value of production and associated costs for all other crops
Livestock net income	livestock	General structure that captures livestock, livestock products and by-products value of production and costs
Non-farm income	nonfarm income	Captures main and secondary wage income from all household members
Non-farm non-labor income	business & transfers	Captures main and secondary household business net income and all non-labor income sources

Appendix 2: Sample context assessment checklist

- Main crops in the study area (list all the relevant)

Main crops	% farmers producing	% area

- Livestock

- List typical livestock managed within the study population
- Estimated % of total income coming from livestock activities from the study population

- Livestock management (list all the relevant)

Main products / by-products	% farmers producing

- Main fertilizers employed in focus crop production

Input	Market price

- Main pesticides, insecticides, fungicides, etc. employed in focus crop production

Input	Market price

- Credit availability

- What are the institutions providing credit to farmers?
- Percentage of farmers using credit for farming purposes
- What are the terms and conditions of such credit arrangements?
 - Time length
 - Interest rate
 - Other
 -

- Transportation costs
 - How far are commercial markets (for inputs) from the study population?
 - How do farmers typically buy their inputs?
 - Does cooperative provide inputs? Yes No
If yes, describe transportation of inputs to the farm
 - Do farmers get their inputs in the market? Yes No
If yes, describe transportation of inputs to the farm

- Cooperative
 - Does the cooperative only work with the focus crop or does it involve other crops?
 - Are there cooperative membership fees to be paid? How much?

- Security
 - Do farmers typically hire security to protect their production? Yes No
If yes, what percentage of farmers do actually pay for security?

- Taxes
 - Do farmers pay taxes over their crop production? Yes No
If yes, please describe

- Productive assets
 - Approximately, what percentage of farmers have ...
 - Vehicles
 - Tractors or other farming heavy machinery
 - Wet-processing equipment
 - Dry-processing equipment
 - Energy generation equipment

- Land ownership
 - What percentage of farmers own their own land?
 - What percentage of farmers rent land for farming?
 - What are the typical land rental conditions? (price per land unit, time of the rental contract, etc.)
 - What percentage of farmers produce land as sharecroppers?

Appendix 3: Model survey

See Excel versions that can be accessed and downloaded through the following link:

<https://drive.google.com/drive/folders/1ki5Q1Ry5FtIOGdHoQyIfJ8IkWEaaf5D?usp=sharing>

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