

Rural Livelihoods Monitor:

Methodological Note for Household Survey Processing

FAO Statistics Division

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About this note

This note was collectively prepared by the Rural Livelihoods Monitor (RLM) team and reviewed continuously by several team members. It is meant to be a living document, to be updated and amended until the RLM will reach a more advanced stage. This version was compiled with substantial inputs from several team members. In particular Erdgin Mane (Sections 1, 10 and coordination), Andrea Borlizzi (Sections 2.1.9, 6.2, 7, annexes 1-3 and coordination); Firas Yassin, Evgeniya Koroleva and Giulia Ponzini (Section 2), Gianluigi Nico (Section 3, Annex 4), Michele Rocca (Section 4, Annexes 5, 6), Mario Spiezio (Section 5), Giulia Ponzini (Section 8), Chiara Brunelli, Nynne Warring and Marya Hillesland (Sections 6.3, 9), Filippo Gheri (Section 11), Piero Conforti (overall coordination).

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1. Introduction

Rural livelihoods are a broad concept, which stretches across a number of domains and disciplines to capture the different ways in which socio-economic and ecological systems and their governance contribute to determine income generation and distribution in rural areas. Obtaining relevant and well-organized information on rural livelihoods is crucial for informing governments and international policy makers, and for promoting the formation of evidence-based decisions.

In order to describe rural livelihoods, a number of indicators are required, and those already existing are spread across institutions at the sub-national, national and international level. The lack of a systematically organized data repository linking different aspect of rural livelihoods, therefore, makes it difficult for existing information to support decision making for reducing rural poverty and food insecurity.

In order to fill this gap and provide policy makers with a unique platform that encompasses all relevant data and indicators required, FAO is developing a Rural Livelihoods Monitor (RLM). This effort requires wide collaboration with member countries and other development partners, including agencies such as the World Bank, the ILO, the UN Statistics Division and IFAD. The idea behind the RLM is to create a platform that collects and harmonizes in a comprehensive repository all available indicators on rural livelihoods, welfare and wellbeing in rural areas¹ according to standard templates.

The RLM also aims at providing a host of data and indicators for monitoring the progress towards FAO's Strategic Objective 3, which focuses on supporting rural poverty reduction (R. Vos, 2014), with the objective of drawing a comprehensive picture of the rural livelihoods for as many countries as possible by providing data on the following dimensions:

- (1) *Social capital*: degree of organization and empowerment of the rural population including producer and community organizations;
- (2) *Natural capital*: access to land, water and other natural resources and their sustainable management;
- (3) *Knowledge capital*: access of (poor) rural producers and households to appropriate technologies, knowledge, inputs and markets;
- (4) Physical capital: access to rural *Infrastructure* and rural *Services* (including financial and environmental services)

¹ The RLM has the ambition to go beyond rural areas, by considering also urban population involved in jobs that are performed in rural areas. The main current limitation in developing this aspect is the availability of data.

- (5) Human capabilities and *Decent Rural Employment* opportunities in both on-farm and non-farm activities
- (6) Access to *Social protection* and risk management mechanisms.

To evaluate policy impacts and monitor progress towards FAO's Strategic Objective 3, a set of indicators has been built by processing and analysing household survey data. Other indicators already available from internal and external sources, such as the Faostat, World Bank and the ILO, have also been included in the RLM platform. The full inventory of RLM indicators is presented in Annex 1.

In fact, grouping indicators in the six above-mentioned categories proved to be impractical. For many of them the assignment to one particular "capital" was not intuitive, nor straightforward. As a result, potential users of the dataset may find it difficult to imagine which indicators could be found within each category. For this reason, in the current test version of the web-based FENIX platform that hosts the dataset the indicators were re-organized in a structure that does *not* reflect the "capitals" classification reported above. Indicators were grouped in nine clusters whose definition was aimed at increasing the readability for the final user. These are as follows:

- Employment, health and education
- Land and natural resources
- Livestock
- Infrastructure and services
- Inputs and technology
- Income, productivity and inequality
- Social protection
- Community characteristics
- Household characteristics

This note describes the procedures and criteria employed in each domain for identifying and extracting variables from household survey data, and for combining them to obtain indicators included in each domain.

The RLM aims at utilizing all surveys from national and international sources for which micro data are available. This requires flexibility in the procedures adopted to extract the data. Scripts have been adapted to the specific characteristics of each survey, in an attempt to maintaining consistency and comparability across surveys. For a number of indicators, the RLM has used as a starting point the methodology developed and adopted by the Rural

Income Generating Activities (RIGA) project – which was implemented by FAO and the World Bank in the past years². The RIGA procedures have been deeply revised, integrated and extended to other domains of the RLM which were not covered in that project. In general, the approach adopted in building indicators for the RLM was leading to generate data which can be used for analysis, while the RIGA was more directly aimed at generating analysis and policy support.

The present notes are structured as follows: the criterion for measuring household income is presented in the next section. Section 3 presents the methodology for obtaining decent work indicators, while Section 4 introduces social protection indicators and related procedures for extracting and processing data. All the relevant information that is obtained by analysing the community-level section of the household survey questionnaire is presented in Section 5. Section 6 presents the methodology for obtaining indicators of the natural capital dimension, while indicators of access to inputs, technology and markets are presented in section 7. A definition of Smallholder agriculture and the procedure for classifying households as smallholders are described in section 8. In compliance with the FAO Gender Policy – according to which all major FAO statistical databases should incorporate sex-disaggregated data where relevant and as available – recommendations on gender mainstreaming are provided in Section 9. In the last two sections of the note the methodology adopted for outlier detection, as well as guidelines on data analysis by the final users of the RLM platform, are finally described.

For the time being, the RLM methodology has been implemented with two different software packages: Stata and R. The procedures for processing elementary information from survey to obtain relevant variables are written as Stata do-files, as this is particularly convenient software for processing micro-data, and starting points were already available from the RIGA project. However, in the long run, the RLM aims at prioritizing the use of open source software, consistent with the policy of the FAO Statistics Division. For this reason, Stata procedures have been replicated in R for some countries and domains. Moreover, the computation of the actual indicators included in the RLM, starting from the variables obtained from survey's micro-data, has been performed using the R software. Once consolidated with a sufficient number of surveys, these scripts will be used to produce an

² The RIGA project aimed at constructing comparable income measures from household surveys in order to provide annualized benchmark aggregates which, despite differences in the quality of information in each survey, would be suitable for cross-country analyses (Carletto et al., 2007).

RLM User Manual for the analysts interested in reproducing the results starting from the raw data made available by the countries.

2. Household Income

Indicators of household income are found under the clusters “Income, Productivity and Inequality” and “Livestock” – see the inventory of indicators (Annex 1).

2.1. Concepts and definitions

The income-related part of the data extraction procedure is based on the methodology developed by the RIGA project³, which was revised on the basis of the goals of the RLM⁴. The RIGA household-level income aggregate module (RIGA-H) aims at providing a comprehensive measure of household income⁵. It includes both aggregated and disaggregated data on the various income sources such as: wage employment (both agricultural and non-agricultural), crop and livestock production, fishery and forestry activities, non-farm self-employment, transfers, and non-labour earnings at the household-level and, where possible, at the individual-level by sex. The composition of household-level income aggregate and the definitions of each component are explained separately in the following sections.

2.1.1. Wage Income

Wage income is an employee’s compensation received either in cash or in kind from primary, secondary and any additional jobs held in a 12-month period, including benefits received from the employer. The wage income is categorized into three main industries as reflecting 1) agriculture, 2) mining and manufacturing and 3) services. One additional category has been created in case specific information on the employee’ industry cannot be retrieved from the survey questionnaire. The latter captures employees working in: 4) “other not specified industries”. Section 3 on decent work related indicators contains information on how wage income is computed.

2.1.2. Self-employment Income

Self-employment income is made of the earnings from all **non-farm** household enterprises, including all cash and in-kind earnings and non-durable, recurrent expenditures for all non-farm businesses operated by any member of the household over a 12-month period. All

³ Available at: <http://www.fao.org/economic/riga/rural-income-generating-activities/en/>

Useful additional information can be found at: http://en.wikipedia.org/wiki/RIGA_Project

⁴ Some of the main changes implemented are represented by the addition of social protection, decent work, social capital and deflation of monetary values modules, described in separate chapters of the present notes.

⁵ ILO definition of income: *Household Income consists of all receipts whether monetary or in kind (good and services) that are received by the household or by individual members of the household at annual or more frequent intervals, but excludes windfall gains and other such irregular and typically onetime receipts. Household income receipts are available for current consumption and do not reduce the net worth of the household through a reduction of its cash, the disposal of its other financial or non-financial assets or an increase in its liabilities* (ILO 2003).

expenditures for equipment and machinery purchases and other such investment expenses are not included in the aggregate⁶. According to UN's ISIC classification, self-employment income is categorized into agricultural **processing** activities⁷ and non-agricultural activities (table 2.1). According to the RIGA methodology, total self-employment income is weighted by the share of the enterprise owned by the household, since non-farm enterprises may be owned by more than one household.

Table 2.1. Self-employment income

| <i>UN's International Standard Industrial Classifications (ISIC industry)</i> | |
|---|--|
| Agricultural processing activities | Non-agricultural (mining, manufacturing, etc.) |

2.1.3. Income from Crop Production

Gross income⁸ from crop related activities is obtained as a sum of: i) income from crops, ii) income from by-products production; and iii) income from crops received as result of sharecropping⁹ activities.

Gross income from **crop production** is equal to *the monetary value of the total quantity harvested minus operating costs, and minus the monetary value of product wasted*. In general terms, the *value of the total quantity harvested* is the value of all crop quantities used for different purposes, including those marketed (e.g. crop sold, bartered or provided as payments in kind to hired labour) and own-consumed (e.g. value of crop consumed by the household or retained for use in future production). *Operating costs* comprise all variable costs (payments in cash and in kind of agricultural inputs as fertilizer, seeds, and occasional labour) and fixed costs (hired labour, land rent and technical assistance costs). Similarly, **gross income from by-product production** equals *the total values of by-products produced*, including all its market and own final uses, *minus operating costs*. Finally, **sharecropping earnings** accrue to income. These should not be confused with the share of crop production given to the land lord as a result of sharecropping, which appears as a cost in the crop production balance.

It is worth mentioning that the depreciation of assets used in production is not considered, as such information is generally not available in household surveys. Moreover, due to

⁶ For example, in RIGA methodology for Malawi 2010-11 the aggregate *self-employment income* is the monetary value of total value of sales less expenditures (in cash and in-kind) related to raw materials, purchase of inventory, fuel/oil, electricity, water, insurance.

⁷ To be distinguished from the income of the primary agricultural production that comes from crop production and livestock, described in the next two sections.

⁸ We use the term "gross income" as we are not accounting for depreciation of assets in the calculation of income.

⁹ An agricultural system in which a landowner allows a tenant to use the land in return for a share of the land produces.

difficulties in measuring taxes in rural context, direct taxes or employment-related obligations are also not deducted¹⁰.

Table 2.2 reports all the components of income derived from crop-related activities, distinguishing revenues and costs. Part A refers to the crop activity *sensu stricto*; Part B refers to by-product production; and Part C refers to sharecropping.

Following the operational definition and distinction of crop income component in table 2.3, income from crop production is calculated using the following formula¹¹:

Table 2.2. Income from crop activities and by-product production: revenues and costs.

| Revenues (+) | Costs(-) |
|---|---|
| A. Crop activities | |
| - Crop sold | - Crop used for paying labor |
| - Crop for own consumption | - Crop used for paying rent |
| - Crop used as feed | - Crop used for paying inputs |
| - Crop saved for seed | - Crop given out in sharecropping agreement (sharecrop out) |
| - Crop stored | - Crop saved for seed |
| - Crop used for byproducts | - Inputs paid in cash |
| - Crop given as gift, | - Land Rent |
| - Crop used for paying labor | - Technical assistance/extension costs |
| - Crop used for paying rent | - Crop wasted |
| - Crop used for paying inputs | |
| - Crop given out in sharecropping agreement (sharecrop out) | |
| - Crop wasted | |
| B. By-product production | |
| - By-product sold | - Crop used for by-products |
| - By-product used for barter or used for payment in kind | - Total value of input purchased, comprise those reimbursed in kind |
| - By-product used for own consumption | |
| - By-product given as gift | |
| C. Sharecropping earnings | |
| - Crop received in sharecropping agreements | |

¹⁰ The lack of detail on taxes and deductions is a reflection of the reality of the large scale of the informal sector in low income countries in which taxes are often not collected and deductions not applied (Aksoy et al. 2010).

¹¹ Our formula is consistent with input-output tables in "International Livestock Research Institute (ILRI), 1995. *Livestock Policy Analysis*. ILRI Training Manual 2. ILRI, Nairobi, Kenya." Available at: <http://www.fao.org/wairdocs/ilri/x5547e/x5547e0q.htm>. As suggested there, output components that are also costs are first added then subtracted.

crop income = income from crop production + income from byproducts + sharecropping earnings,

where:

income from crop production

*= (crop sold + own consumption + crop stored + crop used as feed
+ crop saved for seed + crop used for byproducts + crop given as gift
+ crop used for paying labor + crop used for paying rent
+ crop used for paying inputs + sharecrop out + waste)
– crop saved for seed – crop used for paying labor
– crop used for paying rent – crop used for paying inputs – sharecrop out
– inputs paid in cash – rent paid in cash – technical assistance costs
– waste*

And:

income from by products

*= (by products sold
+ by products used as barter or used as payment in kind
+ by products used for own consumption + by products given as gift)
– crop used for byproducts – total value of input purchased¹²*

The own crop consumption is a key component in the computation of crop production income. Its evaluation is conducted using two different approaches, utilizing - respectively - the information available in the agricultural module or the food consumption section of the questionnaire (depending on the availability and quality of the data in each country). In the first approach, when the agricultural module does not explicitly ask for the quantity of production used as own-consumption, this is measured as the residual of total quantities harvested minus all quantities designed for other uses. The second approach allows for a better comparability with consumption-base welfare measures, and this is why the RIGA project has followed this approach for most countries. For the RLM purposes, however, quantities from the production side are generally used whenever they are deemed more accurate, in order to avoid double counting between food stored and food consumed. The two approaches for measuring crop consumption are described in table 2.3.

¹² Including those reimbursed in kind.

Table 2.3. *Own-consumption of crops.*

| <i>Own-consumption of crop produce can be estimated with two different approaches depending on the availability and quality of data in each country:</i> | |
|--|---|
| Quantities produced for own consumption (from the agricultural module of the questionnaire) | Quantities own-consumed during the reference period (from the food expenditure section of the questionnaire) |
| <p>The monetary value of the quantities obtained is estimated according to one of the following procedures:</p> <ul style="list-style-type: none"> - The value of the reported quantities of own-consumption is estimated by imputing the unit values. Median unit values are estimated from crop sales for every crop-unit combination at the cluster and higher geographic (e.g. district, region, etc.) levels. Or, - The price questionnaire is used to estimate median unit prices at the cluster or higher geographic levels, which are then applied to quantities consumed by the household. Or, - Median unit values are estimated using the self-reported values of consumption by households in the cluster or at higher geographic levels. | |

2.1.4. Income from Livestock

The **total gross income from livestock** is obtained by summing up the monetary values of three main aggregates: i) livestock activities, ii) livestock by-products (i.e. milk, eggs, honey etc.) production, and iii) livestock stock variation (table 2.5).

The outcome of livestock *activities* consist in livestock sales, consumption of livestock owned and also gifts given away, minus livestock purchased and total value of additional cash expenditures for livestock on hired labor, fodder, medicine, vaccination, utensils, the monetary value of crops used as feed, and technical assistance costs.

Monetary value of livestock *by-products* production consists in income from sales, consumption of by-products produced, by-products used to pay for reimbursements for land, labor or any other services received and for reimbursements for inputs borrowed or acquired on credit, less the total value of production expenditures (such as land, labour, services received, payments for credit, additional input and transport).

The *stock variation* component of income from livestock is given by the difference between the closing stocks (value of herds at the end of the year) and the initial stocks (value of herds at the beginning of the year). In principle this allows accounting for the change in the value of livestock due not only to a change in the herds' headcount, but also to a change in the age and weight of livestock. Most of the household survey questionnaires, however, are not designed to capture the value of livestock but only the number of heads. This makes it impossible to account for the variation of stock value due to the change in size and value of livestock. Since the stock variation is given by the number of various flows, we account for

the stock variation through the following flows: livestock gifts received, gifts received from non-government organisations, livestock bought, livestock born less livestock gifts given away, livestock lost or stolen, livestock sold, livestock slaughtered for sales or consumption.

Then the monetary values are estimated using the price questionnaire, according to the methodology described in table 2.4 below.

Table 2.4. Livestock revenues, costs and stock variation.

| Revenues (+) | Costs(-) |
|--|--|
| A. Livestock activities | |
| livestock sold (alive) | livestock bought |
| livestock for own consumption | livestock additional expenditures ¹³ |
| livestock gifts given away | crop used as feed |
| | technical assistance/extension costs |
| B. Livestock by-product production | |
| livestock by-products sold | livestock by-products pay away |
| livestock by-products used for own consumption (meat excluded) | livestock by-products credit away |
| livestock by-products pay away ¹⁴ | livestock by-products add. expenses ¹⁶ |
| livestock by-products credit away ¹⁵ | |
| C. Livestock stock variation (Closing/ End-of-Year value – Initial/ Beginning-of- Year value) | |
| livestock gifts received | livestock gifts given away |
| livestock gifts from NGO | livestock lost or stolen |
| livestock born | livestock sold |
| livestock bought | livestock slaughtered for sales or consumption ¹⁷ |

Accordingly, net income is measured as:

livestock gross income

$$\begin{aligned}
&= (\text{livestock sold} + \text{livestock for own consumption} \\
&+ \text{livestock gifts given away} - \text{livestock bought} \\
&- \text{livestock add. expenditures}) + (\text{livestock **byproducts** sold} \\
&+ \text{livestock byproducts used for own consumption} \\
&+ \text{livestock byproducts paid away} + \text{livestock byproducts credited away} \\
&- \text{livestock byproducts paid away} - \text{livestock byproducts credited away} \\
&- \text{livestock byproducts additional expenses} - \text{crops used as feed}) \\
&+ \text{stock variation}
\end{aligned}$$

¹³ Total value of additional cash expenditures on hired labor[1], fodder[2], medicine[3], vaccination[4], utensils[5].

¹⁴ Total value of reimbursements for land, labor or any other services received.

¹⁵ Total value of reimbursements for inputs borrowed or acquired on credit.

¹⁶ Total value of additional cash expenses incurred in production of livestock by-product: labor cost, additional input, transport

¹⁷ Total value of livestock units slaughtered for sales or consumption.

Where the stock variation is given by:

$$\begin{aligned} \text{stock variation} &= \text{livestock now} - \text{livestock year ago} = \\ &= (\text{livestock gifts received} + \text{livestock gifts from NGO} + \text{livestock born} \\ &+ \text{livestock bought}) - \text{livestock gifts given away} - \text{livestock lost or stolen} \\ &- \text{livestock sold} - \text{livetsock slaughtered for sales or consumption} \end{aligned}$$

And own consumption is given by:

$$\begin{aligned} \text{livestock for own consumption} &= (\text{livestock year ago}^{18} + \text{livestock bought} + \text{livestock gifts from NGO} \\ &+ \text{livestock gifts received} + \text{livestock born}) \\ &- \text{livestock now}^{19} - \text{livestock sold (alive)} - \text{livestock lost or stolen} \\ &- \text{livestock gifts given away} - \text{livestock byproducts (meat) sold} \end{aligned}$$

The monetary value of own-consumed livestock is one of the key components in the computation of livestock income. Similarly to the own crop consumption, its evaluation can be conducted using two different approaches, depending on the availability and quality of data in each country, drawing from either the agricultural module or the food consumption section of the questionnaire. The RIGA project has followed the second approach in most countries to improve the comparability with consumption-base welfare measures. For the RLM purposes, quantities from the *production* side are generally used, whenever they are deemed more accurate, in order to avoid double counting between food stored and food consumed. When the agricultural module does not explicitly ask for the quantity of production used as own-consumption, the latter is measured as the residual of total quantities raised, born and purchased minus all quantities handed out or sold. The two approaches for measuring livestock consumption are described in table 2.5.

As in the crop income section, finally, depreciation of assets used in production is not taken into account. Moreover, due to difficulties in measuring taxes in rural context, deduction of direct taxes or employment related obligations is not applied.

¹⁸Value of livestock at the beginning of the reference period.

¹⁹Value of livestock at the end of the reference period.

Table 2.5. Livestock for own consumption

| <i>Own consumption of livestock (products) can be estimated with two different approaches depending on the availability and quality of data in each country:</i> | |
|---|---|
| Quantities produced for own consumption (from the agricultural module of the questionnaire) | Quantities own consumed during the reference period (from the food expenditure section of the questionnaire) |
| <p>The monetary value of the quantities obtained is estimated according to one of the following procedures:</p> <ul style="list-style-type: none"> - The value of the reported quantities of own-consumption is estimated by imputing the unit values. <i>Median unit values</i> are estimated from livestock sales for every livestock-unit combination at the cluster and higher geographic (e.g. district, region, etc.) levels. Or, - The price questionnaire is used to estimate <i>median unit prices</i> at the cluster or higher geographic levels, which are then applied to quantities consumed by the household. Or, - <i>Median unit values</i> are estimated using the self-reported values of consumption by households in the cluster or at higher geographic levels. | |

2.1.5. Income from Fisheries and Forestry

a. Fisheries

Income from fisheries derives from fish catching (including small-scale harvesting), processing and trading activities, plus revenues from the rental of fishery tools, net of expenses related to fishery activities.

Net income from *catching* and *processing* activities equals the monetary value of all fresh and processed fish for market and final consumption utilization, minus operating costs.

Net income from fish *trading* is the income from selling in wholesale or retail fresh or processed fish bought from others, net from purchase expenditures and other operating costs.

Net income from fishery is computed using the following formulae:

$$\begin{aligned}
 &\text{fisheries net income} \\
 &= \text{net income from catching and processing activities} \\
 &+ \text{net income from trading activities} + \text{rental of fishery gear}
 \end{aligned}$$

Where,

$$\begin{aligned}
 &\text{net income from catching and processing activities} \\
 &= \text{captured fresh fish sold} + \text{captured processed fish sold} \\
 &+ \text{captured fresh fish for own consumption} \\
 &+ \text{captured processed fish for own consumption} - \text{fishing gear expenditure} \\
 &- \text{hired labour expenditures.}
 \end{aligned}$$

And,

$$\begin{aligned}
& \text{net income from trading activities} \\
& = \text{traded fresh fish sold} + \text{traded processed fish sold} \\
& - \text{fresh fish purchases} - \text{processed fish purchases} - \text{other costs}
\end{aligned}$$

Table 2.6: Fisheries revenues and costs.

| Revenues (+) | Costs (-) |
|---|---------------------------|
| A. Fish-catching and processing activities | |
| Captured fresh fish sold | Fishing gear expenditures |
| Captured processed fish sold | Hired labor expenditures |
| Captured fresh fish for own consumption | |
| Captured processed fish for own consumption | |
| B. Trading activities | |
| Traded fresh fish sold | Fresh fish purchases |
| Traded processed fish sold | Processed fish purchases |
| | Other related costs |
| C. Rental of fishery gears | |

b. Forestry

Forestry activities can be an important source of income. However, surveys processed so far did not report information on forestry activities. As data becomes available, the RLM will construct income from forestry activities in a separate section.

The methodology for income from forestry will follow the general principles presented in the other sections, and will be developed at a later stage.

2.1.6. Income from Transfers

Transfers refer to both private and public transfers received by the household, both in cash and in-kind. The definition of transfer income and the construction of its components are based on the RIGA methodology, which is summarized in the following table:

Table 2.7. Income from Transfers.

| | |
|---|--|
| Private transfers primarily refer to incoming remittances and to: | Public transfers are divided into: |
| - Benefits from private organizations and/or associations, | - State-funded pensions, and |
| - Gifts and contributions not associated with the performance of a job or the provision of a service. | - Social benefits, which include welfare support, maternity benefits, and educational transfers. |

It should be noticed that pensions and social benefits reported in table 2.7 do not include benefits received from employers, as those are reported under the wage employment component.

Outgoing transfers, which are usually private, are not taken into account, given that it is not possible to determine whether: (1) the money is to be returned, in which case the flow should rather be classified as a loan, which is not accounted for in an income aggregate; or (2) the transfer is used for consumption or investment, the latter of which is also not considered in the income aggregate since it would not be a regular expenditure on the part of the recipient household. All components of private and public transfers are further analysed to produce the indicators of the Social Protection module (see Section 4).

2.1.7. Other Sources of Income

Other sources of income include all non-labour income components that do not fall into the previous five categories. As summarized in table 2.8 below, the two main components of the other sources of income are: a) rent coming from land, real estate and owned assets, and b) any other non-specified source of income included in the questionnaire.

Table 2.8. *Other Sources of Income.*

| <i>Other income consists of:</i> | |
|--|--|
| Gross non-labour income from farm land rental, non-farm real estate rental, rental of owned assets. | Other miscellaneous sources not specified in the questionnaire. |

Caution should be exerted when comparing this income category across countries, as different surveys may include different sources of income. In the vast majority of cases, however, the *other income* category only represents a small portion of total income.

2.1.8. Income Aggregates Components

The different sources of rural incomes are summed up to compute the overall household income. Table 2.9 summarizes the household income components used by the RIGA project, which corresponds to the standard classifications of industries and occupations.

$$\begin{aligned}
 totalincome = & wageemployment:agr + wageemployment:non - agr \\
 & + selfemployment: farm/crops + selfemployment: farm/livestock \\
 & + selfemployment: farm/fisheries + selfemployment: non - farm \\
 & + transfers + otherincome
 \end{aligned}$$

Table 2.9. Income Aggregate Components in RIGA

| Principal Income Categories | Disaggregated Components |
|-----------------------------|--|
| Wage Employment | Agricultural, Forestry & Fishing |
| | Non-agricultural |
| | Mining & Manufacturing |
| | Services |
| | Other unknown industries |
| Self-Employment | Non-farm |
| | Agriculture, Forestry & Fishing |
| | Mining & Manufacturing |
| | Services |
| | Other unknown industries |
| | Farm |
| | Crop Production |
| | Livestock production |
| Transfers | Fishery and Forestry |
| | Private Transfers |
| | Public Transfers |
| | Pensions |
| Other Income Sources | Social Transfers |
| | Non-farm Rental Income |
| | Farm Rental Income |
| | Other, Miscellaneous Income |
| Total income | Wage employment + Self-employment +Transfers + Other |

2.1.9. Deflation of monetary values

Households are interviewed over a survey period of a length that may be different from country to country, going from a few months to an entire year. Since monetary values for both consumption and income figures are measured in nominal local currencies, changes in price levels over time may distort the reported figures²⁰. In order to track the real value of income and consumption, it is necessary to net out prices from inflation and/or deflation phenomena. Once any change attributable to the general price movements is removed, inflation-adjusted indicators allow comparing expenditure and income levels of households interviewed at different points in time.

To deflate a nominal series what it is needed – besides the nominal values – is 1) the “reference period”, i.e. the time of occurrence of the expenditure/income component under observation, and 2) an appropriate price index. The RLM project uses four indexes: Consumer Price Index (CPI) and Food Price Index (FPI), both from the ILO; Agricultural Producer Price

²⁰ Further details are provided at: <http://www.dallasfed.org/research/basics/nominal.cfm>

Index (APPI), from FAOSTAT, and GDP deflator (from the IMF). The first two indexes are used to deflate monetary values of food and non-food consumption, respectively; the CPI is also used to deflate wages, transfers and other types of income. For agricultural productions, the agricultural PPI – from FAOSTAT – is used whenever available. For non-agricultural productions, or whenever the agricultural PPI is not available in FAOSTAT, the GDP deflator (as calculated by IMF) is used instead. It is important to note that, while for consumption-related indices *monthly* values are available, for agricultural PPI and GDP deflator only *annual* figures are provided, making the adjustment of monetary values unfeasible. In order to overcome this problem, the RLM assumes linear price fluctuations within a year, attributing to each month of a given year 1/12 of the total annual inflation or deflation.

From an operational point of view, the first step consists in identifying the point in time in which every single item or payment has been purchased or received. In order to do so, two elements are needed: the date of the interview and the recall period. While the first one is immediately identifiable for each household, the second one depends on the variable under observation (and on the country/survey processed). For food consumption, for example, the recall period is generally 7 days, while for other consumption goods can be either 1 month, 3 months, 6 months or 1 year. For wages and other income variables, on the other hand, the recall period is generally one month. However, information on the exact day when an item was bought or an amount of money received is not available. Therefore, we assumed that each item was either acquired or received at the mid-point of the recall period²¹. In the following step, the appropriate value of the deflator is associated to that particular item, depending on the nature of the item and on the month during which the monetary value is referred to.

The final step consists in deflating all the monetary values, using the above mentioned indexes, to the base period, which is conventionally the central month of the survey period.

2.2. Data processing and indicators of Income, Productivity and Inequality

The processing of micro data consists in producing several sets of intermediate variables - through separate STATA *do files* described in Annex 7 - starting from the elementary information of the household surveys. The intermediate variables, described in Annex 2, allow constructing the indicators on Income, Productivity and Inequality²², which are made

²¹ For instance, for items with a recall period of 12 months, we assumed that the purchase occurred exactly six months prior to the day of the interview.

²² Indicators are listed in Annex 1 of the present notes.

available in the RLM platform. Table 2.10 displays indicators of the “Income, Productivity and Inequality” cluster that can be obtained from survey data.

Table 2.10. Indicators of Income, Productivity and Inequality

| Indicator | Questionnaire module |
|---|----------------------------------|
| Agricultural Income (crop, livestock, fishery, ag. wage), share of total income (%) | Hh, Ag. & Fishery questionnaires |
| On-farm income (crop, livestock, fishery), share of total income (%) | Hh, Ag. & Fishery questionnaires |
| Total Value of food production per capita (current LCU) | Hh & Ag. questionnaires |
| Total Value of food production per capita, PPP (current int'l \$) | Hh & Ag. questionnaires |
| Value of production per hectare/year in female managed land (current LCU) | Ag. questionnaire |
| Value of production per hectare/year in female managed land, PPP (current int'l \$) | Ag. questionnaire |
| Value of production per hectare/year in male managed land (current LCU) | Ag. questionnaire |
| Value of production per hectare/year in male managed land, PPP (current int'l \$) | Ag. questionnaire |
| Value of production per hectare/year (current LCU) | Ag. questionnaire |
| Value of production per hectare/year, PPP (current international \$) | Ag. questionnaire |
| Gini coefficient of per capita expenditure (real number) | Hh. questionnaire |
| Per capita income disparity between urban and rural areas, urban to rural ratio (real number) | Hh. questionnaire |
| Per capita expenditure disparity between urban and rural areas, urban to rural ratio (real number) | Hh. questionnaire |
| Per capita income of female-headed households (current LCU) | Hh. questionnaire |
| Per capita income of female-headed households, PPP (current int'l \$) | Hh. questionnaire |
| Per capita income of male-headed households (current LCU) | Hh. questionnaire |
| Per capita income of male-headed households, PPP (current int'l \$) | Hh. questionnaire |
| Working poor, share of total employment, ages 15-64 (%) | Hh. questionnaire |
| Average wage in agriculture (current LCU) | Hh. & Ag. questionnaires |
| Average wage in agriculture, PPP (current int'l \$) | Hh. & Ag. questionnaires |
| Average wage in mining and manufacturing (current LCU) | Hh. questionnaire |
| Average wage in mining and manufacturing, PPP (current int'l \$) | Hh. questionnaire |
| Average wage in services (current LCU) | Hh. questionnaire |
| Average wage in services, PPP (current int'l \$) | Hh. questionnaire |
| Average wage in other not specified industries (current LCU) | Hh. questionnaire |
| Average wage in other not specified industries, PPP (current int'l \$) | Hh. questionnaire |
| Average wage in non-agricultural employment (current LCU) | Hh. questionnaire |
| Average wage in non-agricultural employment, PPP (current int'l \$) | Hh. questionnaire |
| Low pay rate in agriculture, share of employment in agriculture (%) | Hh. & Ag. questionnaires |
| Low pay rate in mining and manufacturing, share of employment in mining and manufacturing (%) | Hh. questionnaire |
| Low pay rate in services, share of employment in services (%) | Hh. questionnaire |
| Low pay rate in other not specified industries, share of employment in other not specified industries (%) | Hh. questionnaire |

3. Decent Work

Indicators of decent work are found under the cluster “Employment, Health and Education” – see the inventory of indicators (Annex 1)

3.1. Concepts and definitions

Rural employment can be defined with reference to both a residence-based concept and a job-based concept. As a *residence-based concept*, a person is said to hold a rural employment if s/he resides in an area qualified as rural, and is employed. In other words, rural residents are considered to be in rural employment if they are employed, irrespective of the area in which they perform their job. As a *job-based concept*, a person is said to hold a rural employment if her/his job is carried out in an area qualified as rural area, irrespective of her/his area of residence. The same concepts apply to urban employment.

Table 3.1: Residence-based vs. Job-based concept

| Job-based concept | Residence-based concept | |
|-------------------|-------------------------------|-------------------------------|
| | Urban residence | Rural residence |
| Urban job | Urban residence and urban job | Rural residence and urban job |
| Rural job | Urban residence and rural job | Rural residence and rural job |

The job-based approach is more accurate but is also more difficult to implement, for two reasons. Firstly, it is difficult to compute the size of the working age population, as we don’t know where the persons who are not currently working would accept to work. Secondly, even for the persons in employment, it is difficult to obtain information on the exact place in which they perform their job. At the same time, since most people perform their job relatively close to the area in which they live, the use of the resident-based approach offers a good proxy of the job-based concept.

As to the definition of *rural areas*, there is no single agreed definition thereof. The UN Statistics Division has proposed a minimum set of criteria for international comparability. Accordingly, rural areas are classified based on “*the size of locality or, if it is not possible, as the smallest administrative division in the country*”²³.

The definition of *Agricultural employment* is based on the classification of the UN International Standard Industrial Classification of economic activities (ISIC). The revision of the ISIC should be chosen on the basis of the year of the survey.

²³ <http://unstats.un.org/unsd/demographic/sconcerns/densurb/densurbmethods.htm#B>

The definition of *working age population* in rural areas embraces all persons residing in rural areas who are “*above a specified minimum age threshold and for which an inquiry on economic activity is made*” (see, ILO, 2012 p.46)²⁴. There is no international standard on age limits. However, for statistical measurement, it is commonly considered the population aged 15 to 64. The United Nation Statistics Division also defines as “youth” those persons aged 15 to 24 and as “children” those aged 5 to 17, but also accepts other definitions provided by Member States. In some developing countries, for instance, the age group of the youth often includes persons aged 15 to 34 (for youth neither in employment nor in education or training) or 15-35 (for employment related indicators).

The concepts of *employment* and *unemployment* refer to the supply of labour.

The internationally recognized definition of *employed person* comes from the ILO and states that: “*the employed comprise all persons of working age who during a specified brief period, such as one week or one day, were in the following categories: a) paid employment (whether at work or with a job but not at work); or b) self-employment (whether at work or with an enterprise but not at work). Temporary absence from work includes reasons such as illness, maternity and parental leave, holiday, training, and industrial disputes*”.

Similarly, the *unemployed* covers “*all persons of working age who were: a) without work during the reference period, i.e. who were not in paid employment or self-employment; b) currently available for work, i.e. were available for paid employment or self-employment during the reference period; and c) seeking work, i.e. had taken specific steps in a specified recent period to seek paid employment or self-employment*”.

Due to the scarce availability of labour market institutions in developing countries, especially in rural areas, it is difficult to accurately capture the statistics surrounding “work seekers.” Thus, the calculation of the unemployment rate is “relaxed,” whereupon the aforementioned criterion c is excluded from the factors determining unemployment. This relaxed definition captures more appropriately true unemployment rates and makes comparisons between developed and developing countries more precise.

It is worth noting that the concept of rural employment (unemployment) should not be seen as synonymous of agricultural employment (unemployment). In some instances rural and agricultural employment (unemployment) may overlap, but in general they are not the same: activities in rural areas may be dominated by agriculture, but they cannot be uniquely

²⁴ http://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/publication/wcms_229374.pdf

identified with it. Therefore, it is important to keep the concepts of "*employed persons in the agricultural sector*" separated from that of "*employed persons in rural areas*".

The definition of the *labour force* or *currently active population* is obtained by adding up the number of employed and unemployed persons. This includes "*all persons who fulfill the requirements for inclusion among the employed or the unemployed*", as previously defined. It therefore consists of all persons of working age who were either employed or unemployed.

Household budget surveys may also include information on *own-account* and *contributing family workers*, which are typically engaged in agriculture.

According to the International Classification of Status in Employment (ICSE), *own-account workers* are "*those workers who, working on their own account or with one or more partners, hold a 'self-employment job' and have not engaged on a continuous basis any employees to work for them during the reference period. The partners may or may not be members of the same family or household*".

Contributing family workers, on the other side, are "*those workers who hold a 'self-employment' job in a market-oriented establishment operated by a related person living in the same household, who cannot be regarded as partners, because their degree of commitment to the operation of the establishment, in terms of working time or other key factors, is not at a comparable level to that of the head of the establishment*". In the context of family farming, children play a key role in contributing to household activities. While it is important to recognize that some participation of children in productive non-hazardous activities can be positive, most of the work carried out by children should be targeted for elimination.

The ICSE also defines *self-employment jobs* as "*those jobs where the remuneration is directly dependent upon the profits (or the potential for profits) derived from the goods and services produced*".

Additional categories of workers typically involved in agriculture activities are the *subsistence, seasonal and casual workers*. Also on these types of work, Households Budget Surveys may report some useful information. By definition, subsistence workers are those who "*hold a self-employment job and in this capacity produce goods or services which are predominantly consumed by their own household and constitute an important basis for its livelihood*". Seasonal workers are defined as workers whose "*contract duration is influenced by seasonal factors*". Similarly, *casual workers* hold a contract that "*is not expected to continue for more than a very short period*". It is worth noting that the two concepts are not the same. The above mentioned categories of workers (casual and seasonal) are considered to

hold a precarious job. The common elements that characterize precarious workers are both the instability of the job and the short-term nature of the contracts.

The concept of *working time* refers to the number of hours devoted to working activities. In order to measure the time spent at work, we need to obtain information on employment by *working time bands*. In Households Budget Surveys, data on working time may be found in terms of hours worked in different activities. This may allow identifying full-time and part-time jobs. Moreover, labour time characteristics of jobs are of particular interest because they are likely to influence employees' earning (wage)²⁵. By definition, employees' earning is made up of all income sources from labour activities which are received in the form of employees' compensation²⁶.

Concerning the exploitation of children in prohibited work, there is a need to translate *child labour* in a statistical measure. This exercise requires a definition. In general, child labour "*reflects the engagement of children in work that is prohibited, or, more generally, in work to be eliminated as socially and morally undesirable*"²⁷. Agriculture is the sector where the largest share of child labourers is found, although the involvement of children in family farming does not necessarily translate into their exploitation. This means that key criteria to capture child labour need to be clarified. Unless we rely on a National Child Labour surveys²⁸, Household surveys are not an effective data collection tool to obtain data on children engaged in child labour and hazardous work. However, Household Surveys allow collecting information on persons aged 5 to 17 engaged in agricultural activities, and their share in total persons of the same age.

Finally, Household Surveys may allow obtaining data on a residual category of youth, in total number of youth, who is neither in Employment nor in Education or Training (**NEET**). As it will be discussed later on, this requires matching data on education (e.g. participation of youth in education) with data on employment.

²⁵ Employee's earnings are computed at the individual level. Nevertheless, income aggregates at the household level can be obtained by aggregating wages earned by all members of a given household.

²⁶ Either in cash or in kind.

²⁷ ILO Convention 138 on Minimum Age for Admission to Employment, ILO Convention 182 on the Elimination of Worst Forms of Child Labour and the UN Convention on the Rights of the Child.

²⁸ Information can be collected through dedicated tools, such as National Child labour surveys, or Labour Force Surveys with a child labour module. There are, at the same time, surveys that include more or less accurate questions on working children.

3.2. Data processing and Decent Work indicators

Decent Work Indicators provide useful insights on the quantity and quality of labour available in agriculture and rural areas. The procedures described in these notes allow for calculating a vast range of indicators. Since the RLM also collects Decent Work Indicators from other sources – mainly the ILO – the indicators discussed here are only those that are computed starting from household survey data (see Annex 1 and Annex 4 for a list of such indicators).

Much of the relevant variables are typically contained in the labour module of Household Budget Surveys. It is worth noting that, although Household Budget Surveys collect information mainly at the household level, labour modules are usually designed at the individual level. The way in which these modules are designed permits the estimation of the number of persons employed and unemployed as well as related decent work conditions. The variables for the computation of Decent Work indicators – expressed at the individual level - are grouped according to six main domains:

1. Labour market participation (employed and. unemployed);
2. Labour market status (employee; own account; including vulnerable employment);
3. Labour time (part/full time; part/full year; including precarious workers);
4. Wage employment;
5. Participation of children in working activities; and
6. School-to-work transition status.

3.2.1. Labour Market participation

Labour market participation captures the involvement of the working-age-population in the labour market. There are three key variables in this domain:

- Unemployed population
- Employed population
- The labour force

Based on the ILO definition of unemployed, a household member is in unemployment if, during the reference period (typically the last four weeks), s/he is:

- a. without work (criterion *a*)
- b. available to work (criterion *b*)
- c. actively seeking for work (criterion *c*).

In some Household Budget Surveys criterion *c* is left undefined as the question on the person's action to look for any kind of work (criteria *c*) is not always asked. When this

happens, a household member can be classified as unemployed based on a *relaxed* definition which considers a worker without work (a) and willing to accept a job (b). These are minimum conditions for the unemployment classification²⁹.

The appropriate approach for computing the employed population is to use the criterion proposed in the ILO definition (mentioned above). A working age person - typically aged 15-64 -is considered in employment if during the reference week was: either in paid employment or in self-employment. A working-age person is employed even if she/he did not work during the reference week but provided that she/he was temporarily absent due to reasons such as sickness, vacation, maternity, leave *etc.* In other words, s/he has a formal job attachment and s/he will return to work.

The labour force variable can be derived by adding up the two above mentioned variables (employed workers + unemployed workers).

3.2.2. Status in employment

Status in employment refers the type of explicit or implicit contract of the employed person. The variables that measure the “*labour market status*” follow the guidelines of the International Standard Classification of Status in Employment (ICSE-93). There are five codes for the interviewer to be used and according to which one can produce the relative variables:

1. Employees
2. Employers
3. own-account workers
4. Members of producers’ cooperatives
5. Contributing family workers

The major distinction in the above classification is between paid-employees (code 1) and the self-employed (codes 2 to 5).

Some of the statuses in employment that are under the category of the self-employed may suffer from higher decent work deficits than paid-employees. By definition, their status in employment may place them at a high risk of “vulnerable employment”.

People in vulnerable employment are generally defined as those whose status in employment is either own-account or contributing family workers. Also subsistence farmers - i.e. farmers that consume most of what they produce in their own household - should be included among those who are in vulnerable employment.

²⁹ The relaxed definition is generally applied in developing countries.

The vulnerable employment rate is obtained by calculating the sum of the three mentioned categories as a proportion of total employment.

Most of the Household Budget Surveys do not explicitly ask about the employment status, allowing only for a main distinction between self-employment versus paid employment in agriculture. In contrast, Labour Force Surveys are designed to capture own-account workers or self-employed workers through direct questions. The same applies to contributing family workers.

3.2.3 Labour time

Several Household Budget Surveys collect information on the hours and months worked in different activities. To compute the Decent Work Indicators reported in Annex 2, two main variables are required. These are the duration and the frequency of jobs.

The *duration* refers to the length of time that a job has been continuously worked at by a specific person in a given time span. It is measured in terms of total hours worked in different activities over the last week.

The *Frequency* refers to how often a job is worked at by an individual in a given time span; it is measured in terms of the total months worked in a given job by an individual over the last 12 months.

The use of these variables allows calculating two additional variables relatively to thresholds of reference:

- i. part-time and full-time jobs; and
- ii. part-year and full-year jobs.

Thresholds for part-time (full-time) and part-year (full-year) jobs are:

$$duration \begin{cases} \text{full year job} \geq 10 \text{ working months per year} \\ \text{Part year job} < 10 \text{ working months per year} \end{cases}$$

$$frequency \begin{cases} \text{full time job} \geq 35 \text{ hours per week} \\ \text{Part time job} < 35 \text{ hours per week} \end{cases}$$

Explicit questions on casual and seasonal workers are not often asked in household surveys; nonetheless, it is still possible to obtain the number of seasonal and casual workers by combining duration and frequency of the job.

The approach used in the RLM is aligned to the one employed by the RIGA project, and is summarized in table 3.2 below.

Table 3.2: Job duration and frequency

| | | Duration | |
|-----------|---------|------------|------------|
| | | ≥ 10 month | < 10 month |
| Frequency | ≥35 hrs | Full-time | Seasonal |
| | <35 hrs | Part-time | Casual |

In particular, if the hours devoted to work exceed 35 hours per week and the job is performed less than 10 months per year, we obtain:

iii. Part-year-full time (PYFT).

It can be assumed that the PYFT variable captures seasonal employment.

However, if the hours devoted to work are less than 35 and the job is performed less than 10 months per year, we obtain:

iv. Part-year-part time (PYPT).

The PYPT variable captures *casual* employment.

The rate of precarious employment³⁰ is computed by summing up those in casual and those in seasonal employment and considering their share in total employment³¹.

Household Budget Surveys also attempt to measure the extent of **overemployment** and **underemployment** in agriculture. Overemployment and underemployment are based on the frequency worked at a given job over the last week. More in detail:

- I. overemployment is a situation in which workers spend more than 48 hours in agricultural activities; and
- II. underemployment is a situation in which workers spend less than 35 hours in agricultural activities.

For measurement purposes, the two reference thresholds have been established on the basis of guidelines from the ILO. In order to be deemed underemployed (overemployed), a respondent should have expressed a willingness to increase (decrease) her/his working hours.

³⁰ Based on the ILO definition, workers in precarious employment can either: (a) be workers whose contract of employment leads to the classification of the incumbent as belonging to the groups of “casual workers”, “short-term workers” or “seasonal workers”; or (b) be workers whose contract of employment will allow the employing enterprise or person to terminate the contract at short notice and/or at will, with the specific circumstances to be determined by national legislation and custom

³¹ For a statistical definition of persons in employment see domain 1, “labour market participation”, under the category of “employed population”.

3.2.4 Wage employment

Household Budget Surveys usually collect information on wages for paid employees, who are usually asked to report the total amount of earnings from wages, salaries, commissions or any other payment in kind they obtained from their jobs. Agricultural workers are frequently engaged in more than one job, hence the same question is asked with reference to all jobs performed, including the second, third and fourth job.

The most common recall period for income-related questions is 12 months; accordingly, estimates of wages earned by employees are usually reported on an annual basis.

Time units (i.e. days, weeks and months) are necessary to standardize wages over the 12-month recall period. Firstly, the respondent is generally asked about the frequency of payment. S/he may report that the amount of wage earnings is related to the last month, the last week or even the last day. This information is used to standardize wage earnings to the annual level. Secondly, to obtain an estimate of total wages over the last 12 months, s/he is asked how many months per years, weeks per month and days per week the respondent worked in the main, secondary, third and fourth job. If the respondent has reported that the amount of wage earnings is related to the last day and s/he worked a total of 100 days per year then: the annual earnings from wage are computed by multiplying the number of days worked by the amount of wage earned per day.

Since agricultural employees may frequently perform more than one job, the approach used to compute total earning is as follows:

- I. Computation of the total wage earned in the main job (both in cash and in kind) over the last 12 months;
- II. Computation of the total wage earned (both in cash and in kind) in second (third, fourth, etc.) job over the last 12 months;
- III. Computation of the total earning over the last 12 months obtained by adding up all wages from different jobs.

If agriculture accounts for the largest income share, total income should be labeled as “earning from agriculture”, otherwise it should be labeled as “earning from non-agriculture”.

The variable “earning from agriculture” allows for computing the following indicator:

- Low pay rate in agriculture: number of employees in agriculture whose total earning is less than two-thirds of the median total earning in total employees in agriculture.

3.2.5. Participation of children in agricultural activities

By and large, the International Programme on the Elimination of Child labour (IPEC³²) sets three main criteria to identify a child engaged in in child labour:

- a) Employment below the minimum age³³,
- b) Worst form³⁴ of child labour, and
- c) Hazardous unpaid household services³⁵.

A combination of these criteria is then used to compute two main indicators to monitoring child labour:

1. Child labour rate; and
2. Child in light work.

These indicators can be computed by means of “*ad hoc*” child labour surveys. National child labour surveys take the form of stand-alone or modular survey. The way in which the questionnaire is designed reflects the need to capture information on the engagement of children in prohibited activities, (*i.e.* child labour or child in light work).

Information on child labour activities is seldom collected in Household Surveys; albeit information on the engagement of children in agriculture activities is collected, this does not necessarily translate in child labour activities. Household surveys thus frequently allow computing only an indicator of “Children in agricultural activities”.

This only provides information on the share of children engaged in agricultural activities in total children in the same age group (5-17). It can be computed by generating two variables:

- I. Children in employment³⁶ (5 to 17 years)
- II. Total children (in the same age group).

3.2.6. School-to-work transition status

Household Budget Surveys report information on education and training. The questionnaire module on education allows inferring the number of youth (aged 15 to 24) who

³² <http://www.ilo.org/ipec/lang--en/index.htm#a1>

³³ Minimum age is left to the discretion of national authorities in consultation with worker and employer organization. See ILO convention 138.

³⁴ “Worst forms other than hazardous” refer to children trafficked for work, forced and bonded child labour, commercial sexual exploitation *etc.* “Hazardous work” by children is defined in term of the engagement of children in activities designed as hazardous or as work under hazardous conditions (*e.g.* long hours of work)

³⁵ Hazardous work by children is statistically defined in terms of the engagement of children in activities of hazardous nature. Activities of hazardous nature are designed by the ILO according to industries or occupations. Work under hazardous condition includes: long hours of work in tasks and duties which by themselves may or may not be of a hazardous nature for children.

³⁶ For a definition of employment see par. 3.1.

are currently attending school³⁷. In order to monitor the school-to-work transition status in rural areas, the first variable to be computed is Youth in education, that is, the number of youth who are currently attending school or are in education programmes.

Two more variables need to be computed for monitoring youth who transit from school to work, which are usually reported in the labour module:

- I. Youth in employment
- II. Youth in vocational training

Youth in vocational training include everyone aged 15 to 24 who is doing a formal vocational training; as to youth in employment, the relevant definition is the same as the one adopted in domain i. - Labour Market Participation.

Once the three above variables have been generated, a residual category of youth can be computed in order to identify those who are Neither in Employment nor in Education or Training (NEET). The NEET share in total employment indicates the size of the deficit in decent work.

3.3. Gender Mainstreaming in Decent Work Indicators

Since the analysis of decent work is based on individual data, DW indicators can easily be disaggregated by sex to help identify gender-biases in the opportunities to access more decent employment. Cross-tabulation with variables such as age and level of education and household income may yield particularly interesting results.

Additional information on sex-disaggregated indicators in the RLM is provided in Section 9. In Annex 1, finally, sex-disaggregated indicators are listed under cross-cutting cluster 9.

³⁷ If the questionnaire is administered during not-school session, the respondent is asked if s/he has planned to attend next session

4. Social Protection

Indicators of Social Protection are found under the corresponding cluster “Social Protection” - see the inventory of indicators (Annex 1).

4.1 Concepts and definitions

The UN Social Protection Floor initiative³⁸ identifies two core sets of social security guarantees:

- I. a basic set of social transfers, both in cash and in kind, aimed at ensuring a minimum income and/or employment and livelihood security for the unemployed and working poor; and
- II. a set of social services in the areas of health, water and sanitation, education, food security, housing and other services, identified according to national priorities.

The social protection classification criteria³⁹ presented in this methodological note refer to a measurable definition implemented by the World Bank’s ASPIRE⁴⁰ Project. This includes both public and non-public transfers, also referred to as “formal” and “informal” Social Protection⁴¹ (SP).

Similarly to the ASPIRE’s classification matrix⁴², we classify the various types of *public* (or formal) transfer programmes under two macro groups: Social Insurance and Social Assistance. We also classify *non-public* (or informal) transfer programmes under two groups: domestic remittances, income and support from charities; and remittances from abroad. As opposed to the ASPIRE’s classification matrix, remittances from abroad constitute an independent group⁴³.

4.2. Processing survey data⁴⁴

In order to create Social Protection aggregates comparable across countries, the following criteria are applied:

- aggregates are built at the *household level* ;
- SP aggregates are computed on an *annual basis* ;

³⁸<http://www.socialprotectionfloor-gateway.org/>

³⁹ Annex 6 presents a schematic synthesis on the aggregation procedure adopted for the Malawi 2010 Integrated Household Survey (IHS3).

⁴⁰ Atlas of Social Protection – Indicators of Resilience and Equity, The World Bank

⁴¹ The literature often refers to this distinction as formal vs informal social protection. Given the available data in household surveys, the two classifications (public/non-public and formal/informal), although conceptually different, are equivalent.

⁴² See Annex 5 for the ASPIRE classification matrix.

⁴³ See Annex 6 for an example.

⁴⁴ For each survey an R-script is available to replicate this procedure.

The raw data on Social Protection transfers are usually collected through two to three modules of the household questionnaires while remittances - and especially international remittances - are collected either in a separate module or in a sub-section of the Migration module.

Raw data on general Social Assistance (e.g. Free maize, Food/Cash-for-Work programme, School feeding programme) and Social Insurance (e.g. Pension Income), on the other hand, are included in a specific module, usually called “Social Transfers”, “Social Assistance” or “Other Incomes”. For agricultural inputs, like seeds and fertilizers, data are collected through the agricultural questionnaire.

In several surveys, SP transfers received by households are reported in terms of the amount received in a reference period. If the information on the reference period is absent, it is assumed that the amount refers to one year. This assumption, however, was dropped for particular programmes⁴⁵. In absence of information on the amount transferred, observations were dropped⁴⁶. Values are normally expressed in local currency, except in the case of international remittances. In order to ensure cross-country comparability, values were converted using Purchasing Power Parity (PPP)⁴⁷ factors for the reference year.

For in-kind transfers (e.g. Kilogram of Free Maize received, Food for work programme, Free Food), it was necessary to convert physical amounts into monetary values (in dollars per day). Usually each questionnaire asks the respondent to report the cash value of the transfer. Missing values in this field were imputed using the median of the values reported by other respondents. If the questionnaire doesn't include any cash value, missing values were imputed by using either external sources⁴⁸ or microdata available in the food consumption section of the household questionnaire (e.g.: food received as gift).

Once all the amounts are expressed in the same unit of measurement and referred to the same reference period, the values are aggregated at the household level according to the classification criteria described above. The number of Social Protection variables depends on the questionnaire design and the sample size of each programme⁴⁹.

⁴⁵ e.g.: Old Age Pension in Malawi, as this programme refers generally to one month.

⁴⁶ For the School Feeding programme in Malawi (Annex 6), the only available information was given by a “Yes-No” dummy variable, hence we could only evaluate the coverage rate of this programme.

⁵² Information available at: <http://data.worldbank.org/indicator/PA.NUS.PPP>

⁴⁸ In the case of “Free Maize” programme in Malawi (Annex 6), for example, it was used the median of the monthly maize retail price (LCU/Kg) included in GIEWS (Global Information Early Warning System, F.A.O.) over the survey period (March 2010 – March 2011).

⁴⁹ Annex 6 presents a schematic synthesis on the aggregation procedure in the survey of Malawi 2010.

At the end of the aggregation procedure, an outlier detection procedure was applied, as described in section 10. Table 4.1 below shows the intermediate variables constructed in order to build the final Social Protection indicators.

Table 4.1: Variables required to build Social Protection indicators

| Variable name | Description |
|----------------|--|
| covintrem | International remittances coverage |
| covprivtrans | Private transfers coverage |
| covsocass | Social assistance coverage |
| covsocins | Social insurance coverage |
| femOwnPubTr | Households in which a woman manages public transfers |
| int_rem | Total International remittances received in the household |
| int_rem_pc | International remittances per capita |
| soc_ins | Total Social Insurance received in the household |
| soc_ins_pc | Social Insurance per capita |
| NGOCharHelpSck | Households participating in private emergency programs (NGOs, religious institutions and others) |
| priv_trans | Total Private transfers received in the household |
| priv_trans_pc | Private transfers per capita |
| PubHelpSck | Households participating in public emergency programs |
| soc_ass | Total social assistance received in the household |
| soc_ass_pc | Social assistance per capita |
| coupon | Household receiving free agricultural input coupon |

4.3. Indicators of Social Protection

The set of Social Protection indicators included in the RLM inventory includes ⁵⁰:

- a subset of the full list provided by the ASPIRE Project. A complete list of indicators and their definitions is provided in the ASPIRE documentation section⁵¹.
- Some new indicators developed in the framework of the RLM Project.

The following three indicators drawn from the ASPIRE Project were considered as the most relevant for the RLM:

- The Average Transfer Value: per capita amount received by the beneficiary households in a group⁵²;
- The Coverage: share of population in each group that receives the transfer;
- The Relative Incidence: transfer amount received by a group as a share of total welfare aggregate of the group.

⁵⁰ See also Annex 1, Pillar 6.

⁵¹ Available at: <http://datatopics.worldbank.org/aspire/>

⁵² The word “group” refers to: income deciles, smallholders vs. non smallholders, etc., i.e. to the “qualifiers” used in the RLM platform to disseminate statistics at a higher level of detail.

The new indicators proposed by RLM Project are:

- The Use of vouchers for agricultural inputs: proportion of population in each group that receive free seeds, fertilizers, etc.
- The Coverage of population receiving *governmental* support aftershocks: proportion of population in each group that receives public help after natural shocks or wars.
- The Coverage of population receiving *private* support aftershocks: proportion of population in each group that receives private help after natural shocks or wars.
- The Rate of public transfers managed by women: proportion of population in each group where at least one type of transfer aggregate is managed by women (when available).

5. Social Capital, Infrastructure and Services: Community-level data

The indicators discussed in this section are found under the clusters “Infrastructure and Services”, “Inputs and Technologies” and “Community Characteristics” – see the inventory of indicators (Annex 1).

5.1. Concepts and Definitions

Many Household Budget Surveys include Community Questionnaires that provide both information on the availability of rural infrastructure and services, and insights on the extent of social capital of the surveyed communities⁵³. The added value of community-level data - gathered by interviewing key-informants - lies in the possibility of analysing formal and informal Member-Based Organizations (MBOs⁵⁴), rural institutions, infrastructure and services that can hardly be captured by simply asking the household members and hence are not part of the household questionnaire. Community profiles can then be drawn, providing insightful details on the local context in which households live and operate.

It is to be noted, however, that the definition of community adopted by National Household Surveys does not necessarily correspond to the sociological definition of “community”, being the community in many cases identified with the enumerator areas of the census, or with the village/city surrounding the enumerator area and where most of the surveyed households declare they live in.

According to the World Bank, “*Social Capital refers to the norms and networks that enable collective action. It encompasses institutions, relationships, and customs that shape the quality and quantity of a society's social interactions*”. The main dimensions of social capital identified by the World Bank in the Social Capital Assessment Tool (SOCAT) are: Groups and Networks; Trust and Solidarity; Collective Action and Cooperation; Social Cohesion and Inclusion; Information and Communication. The RLM is mainly focused on collective action; social capital indicators do not capture the purpose of collective action, but they serve as a proxy of the civic/community engagement and the density of organizations/groups. Initially, the RLM will measure the existence of Agricultural

⁵³ Due to the absence, in most cases, of community weights to be used to expand the results to the population, community-level indicators are only referred to the sample of communities surveyed in each country.

⁵⁴ Member-Based Organizations include Agricultural Cooperatives, Farmers and Women’s Groups, and Credit & Saving Groups.

Cooperatives, Farmers and Women's Groups, as well as the level of community members' participation.

The RLM also investigates the availability of rural infrastructures such as roads, irrigation and storage, and services like microfinance institutions and saving & credit groups operating in the community.

5.2. Data processing and Indicators of Social capital, infrastructure and services

Different sections of the community questionnaire are used to gather both basic information - such as the size of the community population - and data on social capital and availability of infrastructure and services. A complete list of community-level indicators is provided in Annex 1 ⁵⁵.

5.2.1. Social Capital

The indicators on social capital can be tabulated by rural and urban location of the household, providing information on three units of observations: i) Communities; ii) Groups/Organizations, iii) Group members⁵⁶. The latter allows for the estimation of sex-disaggregated indicators. The RLM measures the existence of - and the level of participation of community members in - Agricultural Cooperatives, Farmers Groups, Women's Groups and Savings & Credit Groups⁵⁷. Participation is reflected by the number of affiliated members of groups by community, and can be further disaggregated by gender, to build female to male ratio for each category of Organizations. Participation in MBOs is then expressed as share of community population, when the latter is available. As previously stated, total population does not correspond to the national population, but is obtained by summing up the reported populations of the surveyed communities. This choice is mainly data-driven, due to differences in the definition of communities and sampling design. The incidence of each group of MBO on the total number of groups in a given community is also computed (e.g.: number of agricultural cooperatives on total number of MBOs).

⁵⁵ Cluster 4 - Infrastructure and Services – and Cluster 8 – Community Characteristics.

⁵⁶ Group member refers to individuals living in the community and participating to groups/organizations.

⁵⁷ Raw data are available for all the MBOs listed in the survey community module, but indicators are only built for the four typologies of organizations mentioned above.

5.2.2. Infrastructure and Services

The availability of rural infrastructures and services such as roads, irrigation, storage facilities, health and education facilities, and microfinance in the community is also monitored. Main indicators are the presence/absence and the distance to a given type of facility/service.

When household-level data can be matched on a one-to-one basis with community-level data – i.e. each household can be uniquely associated to a community and vice versa - indicators on distance to services or presence of infrastructures were built using expansion factors to expand the results to the whole population. When a full matching could not be performed⁵⁸, indicators were either constructed using re-scaled expansion factors (when only a few households were miss-matched), or not built.

⁵⁸ Some communities might have not been selected, or may have not responded to the community questionnaire.

6. Natural Capital: Access to Land, Water and Natural Resources

The indicators discussed in this Section are found under the corresponding cluster “Land and Natural Resources” – see the inventory of indicators (Annex 1).

6.1. Concepts and definitions

Land, water and other natural resources are fundamental sources of livelihood in rural areas. Access to adequate surface areas of agricultural land, to water for irrigation purposes, to forests for wood, etc. represents a pre-requisite for the achievement of food security goals in rural areas. Average size of managed land, distribution of ownership, land losses, availability of irrigation systems are therefore important dimensions of the Natural Capital that are to be investigated in order to have a better understanding of rural people’s livelihoods.

6.2. Survey Processing and Indicators of Natural capital

The relevant variables for building indicators of Land and Natural Resources are drawn from the agricultural questionnaire of the surveys⁵⁹, where information on land ownership, crops cultivated, irrigation, etc. are available at the level of each parcel/plot managed by the household. In particular, it is possible to derive, for each parcel, identity and sex of the holder, surface area, value of land, number and type of crops cultivated, quantities harvested, and types of irrigation systems in place. Intermediate variables are then built aggregating parcel data at both the household level and the individual level, in order to obtain the total figures of operated land, arable land, irrigated land, distribution of ownership by sex of the holder, as well as the amount of area rented.

A complete list of Land and Natural Resources indicators (including both indicators derived from internal and external sources) is displayed in annex 1. Table 6.1 shows the Land and Natural Resource Capital indicators that can be obtained starting from household survey data.

6.3. Sex-disaggregated Indicators of Natural capital

Agricultural land is one of the most critical assets for which gender-based disparities are to be considered, as it provides rural households with the basic means for subsistence and market production. Much agricultural policy, however, fails to consider the differences in resources

⁵⁹ With the only exception of the indicator on land losses in estates, obtained using community-level data. Final statistics are therefore derived only taking into account the subset of households that were administered the agricultural questionnaire.

available to men and women. Improvements in the quality and availability of gender-relevant information and analysis are therefore required to enable policy makers to make gender-aware decisions about the sector (FAO, 2011).

The importance of sex-disaggregated data on land ownership has been recognized by the international community. The Inter-Agency Expert Group on Gender Statistics (IAEG-GS), for instance, included the *Proportion of adult population owning land, by sex (indicator 12)* in the Minimum Set of Gender Indicators presented at the 43rd session of the United Nations Statistical Commission (UNSC).

In order to contribute to filling the gap, the RLM provides a set of sex-disaggregated indicators⁶⁰ on land, listed in annex 1 under pillar 2 “Land and Natural Resources”. The main categories of RLM sex-disaggregated indicators are as follows:

1. Distribution of landownership (female/male agricultural landowners over total agricultural landowners * 100)
2. Incidence of landownership (female/male agricultural landowners over female/male adult population * 100)

All the other indicators on land and natural resources are also tabulated by sex of the household head through the qualifier male- and female-headed household.

Table 6.1 Indicators of Land and Natural Resources Capital

| Indicator | Questionnaire module |
|---|----------------------|
| Average households farm size (ha) | Agriculture |
| Smallholder households, share of agricultural households (%) | Agriculture |
| Non-smallholder households, share of agricultural households (%) | Agriculture |
| Gini coefficient of total cultivated land, irrigated and rain fed (real number) | Agriculture |
| Gini coefficient of owned arable land (real number) | Agriculture |
| Distribution of land ownership (%) | Agriculture |
| Incidence of land ownership (%) | Agriculture |
| Average owned arable land, without landless households (real number) | Agriculture |
| Household land owned by men only, share of household owned land (%) | Agriculture |
| Household land owned by women only, share of household owned land (%) | Agriculture |
| Household land owned jointly by women and men, share of household owned land (%) | Agriculture |
| Household land value owned by men only, share of household owned land value (%) | Agriculture |
| Household land value owned by women only, share of household owned land value (%) | Agriculture |
| Household land value owned jointly by women and men, share of hh owned land value (%) | Agriculture |
| Agricultural land lost in estates, share of community land area (%) | Community |
| Average household expenditures on potable water (current LCU) | Household |
| Average household expenditures on potable water, PPP (current international \$) | Household |
| Population with private or public access to safe water within 30 meters of residence, share of total population (%) | Household |

⁶⁰ A complete set of gender and land indicators is disseminated through the FAO Gender and Land Right Data Base , available at: <http://www.fao.org/gender/landrights/home/en/>

7. Knowledge assets: Access to technology, inputs and markets

The indicators described in this Section are found under the clusters “Inputs and technology” and “Livestock” – see the inventory of indicators (Annex 1).

7.1 Concepts and definitions

Enhanced access to technology, inputs and markets help smallholders - and farmers in general - increase their income and overall food security (Bitzer, 2012). In many developing countries, rural development is hampered by the use of inadequate/inappropriate technologies and poor access to input and product markets⁶¹. Indicators on knowledge assets help policy makers better target rural development policies aiming at filling this gap.

7.2 Data processing and Indicators of Knowledge access

Relevant information to build indicators of knowledge assets was drawn from the household, the agriculture or the community questionnaire - depending on the indicator - as shown in table 7.1.

Community-level indicators typically inform on the presence/absence of a market or extension services in a given community, or the distance between the community and such services. As discussed in Section 5, whenever possible – i.e. when a complete mapping of households and communities was feasible – the results were expanded to the population. In presence of an incomplete mapping, either weights were re-scaled, or the results are not published.

Most of data on inputs were derived from the agricultural questionnaire, particularly those related to the use of improved seeds, inorganic fertilizers, chemicals, or with the adoption of irrigation schemes. For chemicals, fertilizers, seeds and irrigation, the shares were calculated on the basis of the total number of crop farms – i.e. excluding households who did not fill the agricultural questionnaire and those who are only involved in livestock rearing. Analogously, indicators on livestock improved technologies only takes into account livestock farms.

Credit is another key input for farms, and more generally for households. Data on credit were drawn from the household questionnaire, and expressed both in local currencies and international dollars.

⁶¹ *Advancing agriculture in developing countries through knowledge and innovation*. Conference Proceedings. IFPRI, 2008.

Table 7.1 Indicators of knowledge assets

| Indicator | Pillar | Questionnaire module |
|---|-------------------------------------|----------------------|
| Livestock farms with at least one animal vaccinated, share of livestock farms (%) | 3. Livestock | Agriculture |
| Livestock farms covered by veterinarians or paraprofessionals, share of livestock farms | | Agriculture |
| Communities that live more than 5 km to a daily/permanent market, share of total communities (%) | | Community |
| Communities that live more than 5 km to an extension service agent/center, share of total communities (%) | 4. Infrastructure and Services (IS) | Community |
| Community with permanent or daily/weekly markets, share of total communities (%) | | Community |
| Average distance of communities to the nearest extension service agent/center (km) | | Community |
| Average distance of communities to the nearest daily/permanent market (km) | | |
| Average amount of credit obtained by households (current LCU) | 5. Inputs and Technologies (IT) | Household |
| Average amount of credit obtained by household, PPP (current international \$) | | Agriculture |
| Crop farms using chemicals, share of crop farms (%) | | Agriculture |
| Crop farms using inorganic fertilizers, share of crop farms (%) | | Agriculture |
| Crop farms using improved seeds, share of crop farms (%) | | Agriculture |
| Crop farms trained in the use of improved inputs, share of crop farms. | | Agriculture |
| Farms with access to training or extension, share of total farms (%) | | Agriculture |
| Farms using mechanical equipment (owned or rented), share of total farms (%) | | Agriculture |
| Irrigated crop land, share of farm crop land (%) | | Agriculture |
| Crop farms with superficial water irrigation systems, share of total crop farms (%) | | Agriculture |
| Crop farms with deep water irrigation systems, share of total crop farms (%) | | Agriculture |
| Crop farms with network irrigation schemes, share of total crop farms (%) | | Agriculture |
| Crop farms with other irrigation systems, share of total crop farms (%) | | Agriculture |
| Crop farms with no irrigation systems, share of total crop farms (%) | | Agriculture |
| Communities with extension services available, share of total communities (%) | | Community |

8. Smallholder Agriculture

Whenever data are available, indicators in all clusters of the RLM are presented separately for smallholder and non-smallholder households. Hence smallholder agriculture is a so-called “qualifier” in the RLM, corresponding to a cross-cutting theme.

8.1 Concepts and definitions

A universal definition of smallholder agriculture does not exist. Different ways of defining it reflect heterogeneous historical, institutional and eco-systemic contexts, and depends on the specific role of small-scale agriculture and the rural sector in a given country. Also, the farm-size distribution across countries depends upon country-specific factors, such as agro-ecological and demographic conditions, as well as socioeconomic and technological factors. Accordingly, the definition of smallholders proposed for the RLM is not free from ambiguity and problems.

Beyond the physical size of the farm, an accurate definition of smallholder agriculture can only be obtained by considering a wide set of characteristics, including the ownership and management status of the holding, the type and quality of labour, and the economic size. Where farmers face low capital transaction costs and can spread capital over large areas, some farms can reach a relatively large economic size. On the contrary, where capital transaction costs are high and labour transaction costs are low, agriculture makes a more intensive use of labour, while land or other capital can be quite limited.

Although in principle an agricultural holding can be considered small irrespective of its management status, the vast majority of definition of smallholder agriculture coincides with that of small *family* farms. This is mainly because families manage small farms, whose size is limited by the scarce resources they have access to⁶².

A comprehensive definition of smallholder agriculture - including also forestry, fishery and aquaculture activities - is provided by the Report of The High Level Panel of Experts on Food Security and Nutrition (see BOX 1). Despite being comprehensive, this definition cannot be directly employed to identify small-scale agricultural households across different countries in a comparable way, due to the country-level specificities and the multidimensionality implied by the concept. Rather, the RLM project requires an operational definition of smallholder agriculture based on a standardized internationally comparable criterion to identify

⁶² Committee on Food Security, HLPE (2013).

smallholders that takes into consideration the heterogeneous factors determining different farm size across countries.

BOX 1. Smallholding definition - High Level Panel of Experts on Food security and Nutrition

.. an agricultural holding run by a family using mostly (or only) their own labour and deriving from that work a large but variable share of its income, in kind or in cash. The family relies on its agricultural activities for at least part of the food consumed – be it through self-provision, non-monetary exchanges or market exchanges. The family members also engage in activities other than farming, locally or through migration. The holding relies on family labour with limited reliance on temporary hired labour, but may be engaged in labour exchanges within the neighbourhood or a wider kinship framework.

8.2 Identification: the physical unit-weighted median procedure

According to the HLPE, smallholders are small due to resources constraints. Land is in general the scarcest resource. However, sometimes small land area reflects a higher involvement in other agricultural activities that use land in a smaller extent. For this reason, the RLM looks at both land and livestock capital to determine the farm scale, and the land size criterion is extended to pastoralist activities.

Thresholds for land are computed using the hectare-weighted median suggested by Key and Roberts (2007a and 2007b)⁶³ by ordering farms from smallest to largest and choosing the farm size at the middle hectare. Thus, half of all land (rather than half of all farms) is on farms smaller than the median.

The RLM adopts a similar criterion for livestock and calculates the threshold by ordering herders from “smallest” to “largest” in terms of Tropical Livestock Units of livestock managed and choosing the livestock farm size at the middle unit. Thus, half of total livestock (rather than half of all farms) is on farms smaller than the median.

The variables over which the two thresholds are computed are *Operated Land* and *Tropical Livestock Unit*. Operated Land is defined as *the land owned by the household plus the agricultural land rented/borrowed/sharecropped in, minus the agricultural land rented/lent/sharecropped out*. It includes farm yards and land left fallow⁶⁴ as well. Forest land and land abandoned prior to the reference period were excluded. Where information on land use was incomplete, data on *cultivated* land were used instead.

⁶³ A similar hectare-weighted median was used by FAO for identification of Smallholder in the *Data portrait of Smallholders Farms*.

⁶⁴ An area that is left uncropped at the time of data collection, and is not dedicated to grazing.

The Tropical Livestock Unit (TLU) is a standardized measure that report different livestock types to a single metric. TLUs are obtained by multiplying the number of effective livestock units by conversion factors valid for specific livestock varieties of a given region. The mean of comparison is the basal metabolic rate, defined as the energy expenditure per unit body-weight per unit time (i.e., kcal heat/weight/day)⁶⁵.

An example of Stata procedure (*routine*) to generate TLU - using data from Malawi IHS3 - is provided in annex 7, as well as routines to construct thresholds and identify smallholders. The criterion adopted to identify Smallholder households is an indicator function that takes value equal to one if both the physical unit for land and livestock are lower than the respective physical weighted median threshold and equal to zero if at least one of the two physical units is above the respective threshold.

⁶⁵ For further info see: <http://www.fao.org/ag/againfo/programmes/en/lead/toolbox/Mixed1/TLU.htm#Metabolic>

9. Sex disaggregated indicators in the RLM

Whenever data are available, indicators in all clusters of the RLM are presented separately for males and females, and for male- and female-headed households. Hence sex-disaggregation is a so-called “qualifier” in the RLM, corresponding to a cross-cutting theme.

The FAO corporate Gender Policy - adopted in 2012 - recommends that *all major FAO statistical databases incorporate sex-disaggregated data, where relevant and as available*. Consistently with this policy, RLM intermediate variables and final indicators are disaggregated by sex at the individual level, whenever possible and conceptually relevant. The majority of the indicators are also disaggregated by the sex of the household head, which can provide a useful way of categorizing types of households. However, this classification cannot be used without some qualifications. Within economic surveys and censuses, the concept of the household head often refers to the either (1) household’s primary economic provider, (2) the household decision-maker, or (3) the person ascribed by other household members as the household head. For example, the enumerator manual in the Niger 2011 LSMS-ISA survey states that a “household is defined as the group of persons (...) living habitually in the same dwelling, pooling their resources, sharing their meals, and recognizing the authority of the same person known as the household head.” In the Uganda 2009/10 LSMS-ISA, the manual states that the head of the household is the person ascribed by other household members and that “[i]n most cases, the head of the household is the one who manages the income earned and expenses incurred by the household, and who is the most knowledgeable about other members of the household”. The manual further clarifies that only one individual can be identified as the household head and suggests that, if more than one person is identified as such, there may be more than one household living under the same roof.

These definitions are based on a fairly rigid understanding of household formation and headship, which was formalized by Gary Becker (1981), an economist from the University of Chicago, who conceptualized a household head as a single decision-maker that represents all the household’s interests. Among the implicit assumptions are that households are hierarchal (i.e. there is a single household decision-maker for all members in the household) and - even within Gary Becker’s text - the role of the primary decision-maker within the household is presumed male unless an adult male is not present, in which case the head of the household is female.

An obvious drawback with conceptualizing households in this way is that it is not clear that all households in all contexts fit these assumptions. There are single female household, single male households, couple households, multigenerational households, extended family units, polygamous households and/or a combination thereof. Additionally, households may or may not be hierarchical. There may be more than one household decision-maker and multiple economic providers. Even if we were to believe that most households do have a single authority, the notion of headship may differ across surveys based on the definitions used in the manual, and when the survey respondents are asked to determine the household head.⁶⁶ As a result, female-headed households (and male-headed households) cannot be presumed to be comparable across countries. Even within the same country and context, headship may differ by survey.

A second qualification is that gender analyses from the sex of the household head can provide a completely different picture from gender analyses between men and women in general. For example, Deere, Alvarado, and Twyman (2010) show how using the sex of the household head underestimates women's ownership of assets in Latin America. Other papers also highlight the problems with simply using the sex of the household head as a way to understand differences and agricultural production by sex⁶⁷.

An overview of the type of sex-disaggregated data available in the RLM and the relative challenges is displayed in Table 9.1.

Sex-disaggregated indicators currently available in the RLM are reported in Annex 1 and table 9.2. Additional sex-disaggregated indicators will possibly be added to the platform in the near future, as more data become available.

⁶⁶ For the definitions of the household and household head in the LSMS-ISA surveys see the enumerator manuals available as part of the survey documentation at <http://research.worldbank.org/lsmssurveyfinder.htm>

⁶⁷ See Doss and Morris 2001; Peterman, Quisumbing, Behrman, and Nkonya (2011).

Table 9.1. Challenges and limitations in disaggregating data by sex

| Data collection level | Minimum gender disaggregation required | Main Challenges / limitations | Recommendations to overcome the challenges / limitations |
|-----------------------|--|---|---|
| Household level | Use the sex of the household head and <u>differentiate between female and male headed households</u> | <ul style="list-style-type: none"> Impossible to capture intra-household differences/inequalities Definition of household and household head differ by survey Household formations differ by country and context (polygamy, multigenerational households, multifamily households, etc.) Female headed households (and male headed households) are not homogenous even within the same country and context. The types of household formations that fall under male-headed household or female headed households differ by country. The limited number of observations in the category “female-headed households” may affect the robustness of the statistics. | <p><i>No solution</i></p> <ul style="list-style-type: none"> Add further levels of disaggregation. For instance, distinguish the male/female heads according to the head’s marital status, or the kind of household⁶⁸, or the level of education of the household head; etc. It is of crucial importance to keep such additional variables in the databases, in order to allow for additional analysis. We may discuss internally on the variables and standard categories to use. The list of variables is provided below. Understanding of how the household head was defined and designated within the survey and the types of family formation that may fall within male-headed and female-head households. Complement the point estimates with confidence intervals or standard deviations. |
| Individual level | <u>Disaggregated by sex of the individuals</u> | <ul style="list-style-type: none"> This will be feasible only for a limited number of indicators, mainly decent work indicators. | |

⁶⁸E.g., One-person household, households of lone parents with children, etc. Some examples can be found at: <http://faostat3.fao.org/faostat-gateway/go/to/download/D/HS/E> or in *The World's Women 2010: Trends and Statistics* (<http://unstats.un.org/unsd/demographic/products/Worldswomen/WW2010pub.htm>).

Table 9.2. Sex-disaggregated indicators available in the RLM platform

| INDICATOR | CLUSTER | SOURCE OF DATA |
|--|---|------------------------------------|
| Female labour force, share of total labour force (%) | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Female agricultural employment, share of total female employment, ages 15-64 (%) | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Male agricultural employment, share of total male employment, ages 15-64 (%) | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Female labour for cropping activities, share of family labour for cropping activities (%) | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Female child labour for cropping activities, share of family labour for cropping activities, ages 5-17 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Female child labour for cropping activities, share of family labour for cropping activities, ages 5-11 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Male labour for cropping activities, share of family labour for cropping activities (%) | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Male child labour for cropping activities, share of family labour for cropping activities, ages 5-17 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Male child labour for cropping activities, share of family labour for cropping activities, ages 5-11 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Household land owned by men only, share of household owned land (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land owned by women only, share of household owned land (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land owned jointly by women and men, share of household owned land (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land value owned by men only, share of household owned land value (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land value owned by women only, share of household owned land value (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Incidence of land ownership (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land value owned jointly by women and men, share of household owned land value (%) | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Livestock farms in which men own <i>bovinae</i> , share of livestock farms owning <i>bovinae</i> (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which men own goats, sheep or pigs, share of livestock farms owning goats, sheep or pigs (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which men own horses or donkeys, share of livestock farms owning horses or donkeys (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which men own poultry, share of livestock farms owning poultry (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which women own <i>bovinae</i> , share of livestock farms owning <i>bovinae</i> (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which women own goats, sheep or pigs, share of livestock farms owning goats, sheep, or pigs (%) | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farms in which women own horses or donkeys, share of livestock farms owning horses or donkeys (%) | 3. Livestock | HH survey: ag. questionnaire |

Table 9.2 (cont'd) Sex-disaggregated indicators available in the RLM platform

| INDICATOR | CLUSTER | SOURCE OF DATA |
|--|--|------------------------------|
| Livestock farms in which women own poultry, share of livestock farms owning poultry (%) | 3. Livestock | HH survey: ag. questionnaire |
| Value of production per hectare/year in female managed land (current LCU) | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year in female managed land, PPP (current international \$) | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year in male managed land (current LCU) | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare in male managed land, PPP (current international \$) | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Per capita income of female-headed households (current LCU) | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita income of female-headed households, PPP (current international \$) | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita income of male-headed households (current LCU) | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita income of male-headed households, PPP (current international \$) | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Female population owning private transfers, share of total population receiving public transfers (%) | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Female Community Members participating in Women's Groups, share of total community members (%) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Women's Groups, share of total groups in the community (%) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Ratio of Females to Males in agricultural cooperatives (real number) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Ratio of Females to Males in farmers' groups (real number) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Ratio of Females to Males in credit & saving groups (real number) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Ratio of Females to Males in women's groups (real number) | 8. Community Characteristics (CC) | HH survey: community quest. |
| Male headed households, share of total households (%) | 9. Household Characteristics | HH Survey: hh questionnaire |
| Female headed households, share of total households (%) | 9. Household Characteristics | HH Survey: hh questionnaire |

10. Outlier detection and imputation

Household survey data are prone to various data entry mistakes, which lead to having a considerable amount of outliers in the elementary data. The RLM data processing adopts a statistically robust approach to detect potential outliers and to consequently impute those values. The median is adopted as a measure of the central tendency, and the Median Absolute Deviation (MAD) is used as a measure of variability. This approach is developed for two types of probability distributions: normal and lognormal⁶⁹. The first one is used for random variables with a symmetric probability distribution function and the second for the asymmetric distributions.

In order to automatize the implementation of the approach described above, two Stata commands were constructed: *impoutmad* and *impoutlogmad*. In the first command, the observations are considered as outliers when their value is higher or lower than $3 \times 1.4826 \times \text{MAD}$ from the median. This choice is equivalent to 3 standard deviations for normally distributed variables, which means that the probability of classifying as outlier a true observation is only 0.27 percent. However, the commands allow changing the number of SD used to detect an outlier through the *range* option. Therefore, the first command is applied only on univariate variables that are normally distributed or at least have a symmetric shape. The second command is instead applied on skewed variables by running the same approach after the logarithmic transformation of the variables. The latest assumes that the variables are log normally distributed, which is quite common in socio-economic indicators.

The observations detected as outliers are then imputed through medians computed by logical variable(s) specified in the option *bylist*. In general, this included categorical variables as: regions, industries, income level, food groups, etc...

Moreover, the RLM data processing is performed by following these general rules:

1. The outlier detection is implemented on all continuous variables (for example, quantities and monetary values), which values have been converted in the same unit of measurement (KG, liter, km, USD, etc...).
2. Values are imputed only once, at the lowest level of aggregation;
3. Before deciding which command to apply, the frequency distribution of the variables is checked by analyzing their kernel density; *impoutlogmad* is used every time the variable is skewed.

⁶⁹ For other distributions, the methodology adopted for outlier detection and imputation may not work properly; in those cases, outlier detection and imputation may require a manual check.

4. The outlier detection is performed at multiple levels; each executed by relevant geographic and administrative aggregation. In general, the geographical levels are three: enumeration area, region and national. Starting from the lowest geographical level, the value detected as outlier is imputed only if that geographical level counts at list 50 observations. If this is not the case, the imputation is performed at a higher geographical level up to the final national level. The same applies even when a non-geographic variable (e.g. crop code, sectors, animal types, industry) is added to the geographical one in the *bylist* option.
5. The share of replaced data is never allowed to be higher than 5 percent. Whenever the share is higher, the MAD distance from the median value is increased, by specifying a higher range.

11. The FENIX platform

Currently, the Rural Livelihoods Monitor is disseminated on a test FENIX platform⁷⁰ that hosts data and metadata. Information can be loaded on the platform and modified by the RLM team. The current platform offers access to a harmonized collection of indicators derived from National Household Surveys through the standardized processing procedures described in the previous sections, or collected from other international agencies such as WB, ILO, and UNDESA. Whenever possible, indicators are tabulated by country, year and a set of so-called “qualifiers”, described in table 11.1 below.

In the “download” tab of the platform, data can be previewed and downloaded by “Indicator” or by “Country” through a step-by-step hierarchical guided application that facilitates the users in their research. In the “Download by Indicator” tab, the user starts from the selection of one indicator and then chooses one or more countries, years, and qualifiers. Choices in the platform are guided by the availability of data for that indicator. In the “Download by Country” option, instead, the user starts from selecting one country. This selection guides the choice of one or more indicators, and finally of one or more years and qualifiers.

Table 11.1. Qualifiers in the RLM platform

| Category | Qualifier | Description |
|------------------------------|--|---|
| Farm holding size | Non-farmers | Hhs non participating in crop/livestock activities |
| | Non-smallholder farms | Farm size > middle hectare; TLU > middle TLU |
| | Smallholder farms | Farm size ≤ middle hectare; TLU ≤ middle TLU |
| Sex | Male / Male headed household | Depending on the type of underlying data (Individual vs. household) |
| | Female / Female headed household | |
| | Income Quintile 1 | |
| Income Quintile | Income Quintile 2 | |
| | Income Quintile 3 | |
| | Income Quintile 4 | |
| | Income Quintile 5 | |
| Participation in agriculture | Income from agriculture greater than 30% | Households involved in crop/livestock activities |
| | Income from agriculture lower than 30% | |
| | No income from agriculture | Hhs not involved in crop/livestock activities |
| Geographic area | Urban | |
| | Rural | |

Indicators are grouped by clusters and identified by source (from household surveys or external sources); the time series data gathered from external sources are preceded by a capital “E”. As noted in the introduction, clusters do not reflect the Section structure of this

⁷⁰ Temporarily available at: <http://fenix.fao.org/demo/rlm/#home>

note (natural capital, social capital, etc.). Indeed, for many indicators the assignment to one particular “capital” proved not to be intuitive nor straightforward, and it was felt that potential users of the dataset may find it difficult to imagine which indicators could be found within each category.

Qualifiers are grouped by category as well. Among them, the qualifier “Participation in Agriculture” required an additional thinking on how to calculate income shares. Although conceptually easy, the calculation of the shares of income from various sources is complicated by the presence of negative values in those economic activities, where income is measured as a difference between revenues and costs. Such negative values are meaningful from a conceptual point of view, since they imply a loss in the economic activity. However, in the calculation of shares of total income, they lead to share values that are either below 0 or above 1 for a considerable number of observations (generally around 10 percent of the observations). Such values, beyond being of difficult economic interpretation, affect significantly the averages of the various aggregates. For this reason, it was decided to bound the income shares for each household within 0 and 1 according the following scheme:

Table 11.2. Calculation of Income shares

| | Numerator <i>Source of Income</i> | Denominator <i>Total Income</i> | Share <i>Source / Total Income</i> | Bounding |
|---------------|---|---|--|-----------------|
| Case 1 | + | + | > 1 | 1 |
| Case 2 | + | - | < 0 | 1 |
| Case 3 | - | + | < 0 | 0 |
| Case 4 | - | - | > 1 | 1 |

The case 1 occurs when total income is lower than the income from one source because another source has negative income. Case 2 is an extension of case 1, but loss in the other source is higher than the income in the numerator. Case 3 occurs when the income from the source in the numerator is negative, while total income is positive because of other positive sources. Finally, case 4 is a particular case that occurs when the loss in the income sources in the numerator is much higher than the positive income from another source. Here, it was decided to bound at 1, since the negative income was driven by the loss of the source in the numerator. The negative side of this choice is that the sum of shares from all sources will not be equal to one, but equal to two, since another source will also have share equal to one (as from case 2).

After the user's selection, the results (data and metadata) can be previewed and downloaded in csv format. The current version of the RLM platform is considered as a first step in the development of the dataset. The current set of indicators, however wide, implies a number of choices, and limits the ability of users to break down the data by predetermined dimensions. The RLM aims at offering users the possibility to define and compute customized indicators beyond those currently proposed, starting from the intermediate variables extracted from the household survey data.

The second step is the inclusion of a key functionality, allowing users the possibility to process the intermediate variables extracted from household survey. Specifically, users would be allowed to combine intermediate variables by applying sums, multiplications and by selecting records in the variables. This corresponds to the possibility of observing indicators for more than one "qualifier". Users may have the possibility, in other words, to compute indicators for more than one "qualifier" at the time, or for other specific criteria.

Adding this functionality would greatly enhance the flexibility and the usefulness of the dataset; but it requires overcoming one major problem. For confidentiality reasons, users should be allowed to process intermediate variables, but not to access them as such – as this would imply accessing the elementary survey data, which are publicly available only for some of the household surveys. Technical solutions for overcoming this problem have been discussed with the FENIX team.

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Annex 1: Inventory of RLM indicators

In *Italics* indicators drawn from external sources

| INDICATOR | GROUPING | | SOURCE of the indicators/raw variables |
|--|--------------------------------------|--|---|
| | SECTION (Methodological notes) | CLUSTER (Platform) | |
| Labour force, relaxed definition, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour force, strict definition, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour force, relaxed definition, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour force, strict definition, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour-force-to-population rate, relaxed definition, ages 15-64 | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour-force-to-population rate, strict definition, ages 15-64 | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour-force-to-population rate, relaxed definition, ages 15-24 | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Labour-force-to-population rate, strict definition, ages 15-24 | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 15-64 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 15-17 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 12-14 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 5-17 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 5-14 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Employment-to-population ratio, ages 5-11 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment in total labour force, relaxed definition, ages 15-64 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment in total labour force, strict definition, ages 15-64 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment in total labour force, relaxed definition, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|--|----------|---|------------------------------------|
| | SECTION | CLUSTER | |
| Unemployment in total labour force, strict definition, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment, relaxed definition, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment, strict definition, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment, relaxed definition, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Unemployment, strict definition, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| NEET, Share of youth neither in employment nor in education or vocational training, ages 15-34 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| NEET, Share of youth neither in employment nor in education or vocational training, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Agricultural employment, share of total employment, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural employment, share of total employment, ages 5-17 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural employment, share of total employment, ages 15-64 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural employment, ages 15-64 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural employment, ages 15-24 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural employment, ages 5-17 (number of people) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 15-64 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 15-24 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 15-17 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 12-14 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 5-17 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 5-14 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employment-to-population ratio in agriculture, ages 5-11 (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Households participating in wage employment agricultural activities, share of total households (%) | 2, 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Agricultural own-account and contributing family workers, share of total agricultural employment (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Employees in agriculture, share of total agricultural employment (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Self-employed in agriculture, share of total agricultural employment (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Seasonal workers in agriculture, share of total agricultural employment (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Casual workers in agriculture, share of total agricultural employment (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |

| INDICATOR | GROUPING | | SOURCE |
|--|----------|--|------------------------------------|
| | SECTION | CLUSTER | |
| Hired labour for cropping activities, share of labour for cropping activities | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Free labour for cropping activities, share of labour for cropping activities | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Unpaid family labour, share of total labour hours for cropping activities (%) | 3 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Female labour force, share of total labour force (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| Female agricultural employment, share of total female employment, ages 15-64 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Male agricultural employment, share of total male employment, ages 15-64 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Unpaid female labour hours, share of total unpaid family labour hours for cropping activities, ages 18 and older (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Unpaid female labour hours, share of total unpaid family labour hours for cropping activities, ages 5-17 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Unpaid female labour hours, share of total unpaid family labour hours for cropping activities, ages 5-11 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Unpaid male labour hours, share of total unpaid family labour hours for cropping activities, ages 18 and older (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaires |
| Unpaid male labour hours, share of total unpaid family labour hours for cropping activities, ages 5 - 17 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Unpaid male labour hours, share of total unpaid family labour hours for cropping activities, ages 5 - 11 (%) | 3, 9 | 1. Employment, Health and Education (EHE) | HH survey: hh & ag. questionnaire |
| Literate population over 15, share of total population over 15 (%) | . | 1. Employment, Health and Education (EHE) | HH survey: hh questionnaire |
| <i>Employment in agriculture (% of total employment), female headed households</i> | 3 | <i>1. Employment, Health and Education (EHE)</i> | <i>World Bank (WDI)</i> |
| <i>Employment in agriculture (% of total employment), male headed households</i> | 3 | <i>1. Employment, Health and Education (EHE)</i> | <i>World Bank (WDI)</i> |
| <i>Employment in agriculture (% of total employment), national</i> | 3 | <i>1. Employment, Health and Education (EHE)</i> | <i>World Bank (WDI)</i> |
| <i>Prevalence of Undernourishment (%)</i> | . | <i>1. Employment, Health and Education (EHE)</i> | <i>FAO, Statistics Division</i> |
| <i>Malnutrition prevalence, weight for age (share of children under 5)</i> | . | <i>1. Employment, Health and Education (EHE)</i> | <i>World Bank (WDI)</i> |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|--|------------------------------|
| | SECTION | CLUSTER | |
| <i>Mortality rate, under-5 (per 1,000 live births)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Maternal mortality ratio (modeled estimate, per 100,000 live births)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Immunization, DPT (% of children, ages 12-23 months)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Immunization, measles (% of children, ages 12-23 months)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Births attended by skilled health staff (% of total)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Pregnant women receiving pre-natal care (%)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Community health workers (per 1,000 people)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Improved water sources (% of population with access)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Improved sanitation facilities (% of population with access)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Literacy rate, adult (% of people, ages 15 and above)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| <i>Mean years of schooling of adults (years)</i> | . | 1. Employment, Health and Education (EHE) | World Bank (WDI) |
| | | | |
| Average households farm size (ha) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Smallholder farms, share of agricultural households (%) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Non-smallholder farms, share of agricultural households (%) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Gini coefficient of total cultivated land, irrigated and rain fed (real number) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Gini coefficient of owned arable land (real number) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Distribution of land ownership (%) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Incidence of land ownership (%) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Average owned arable land, without landless households (real number) | 6, 8 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land owned by men only, share of household owned land (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land owned by women only, share of household owned land (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land owned jointly by women and men, share of household owned land (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land value owned by men only, share of household owned land value (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Household land value owned by women only, share of household owned land value (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|--|----------|--|------------------------------|
| | SECTION | CLUSTER | |
| Household land value owned jointly by women and men, share of household owned land value (%) | 6, 9 | 2. Land and Natural Resources (LNR) | HH survey: ag. questionnaire |
| Agricultural land lost in estates, share of community land area (%) | 6 | 2. Land and Natural Resources (LNR) | HH survey: community quest. |
| Average annual household expenditures on potable water (current LCU) | 6 | 2. Land and Natural Resources (LNR) | HH survey: hh questionnaire |
| Average annual household expenditures on potable water, PPP (current international \$) | 6 | 2. Land and Natural Resources (LNR) | HH survey: hh questionnaire |
| Population with private or public access to safe water within 30 meters of residence, share of total population (%) | 6 | 2. Land and Natural Resources (LNR) | HH survey: hh questionnaire |
| <i>Arable land (ha)</i> | 6 | <i>2. Land and Natural Resources (LNR)</i> | <i>FAOSTAT</i> |
| <i>Per capita arable land (ha)</i> | 6 | <i>2. Land and Natural Resources (LNR)</i> | <i>FAOSTAT</i> |
| <i>Arable land and permanent crops (ha)</i> | 6 | <i>2. Land and Natural Resources (LNR)</i> | <i>FAOSTAT</i> |
| <i>Adjusted savings: net forest depletion (% of GNI)</i> | 6 | <i>2. Land and Natural Resources (LNR)</i> | <i>WORLD BANK (WDI)</i> |
| | | | |
| Average Tropical Livestock Units owned by farms (TLU) | 2 | 3. Livestock (L) | HH survey: ag. questionnaire |
| Livestock farm households with at least one animal vaccinated, share of livestock farm households (%) | 7 | 3. Livestock (L) | HH survey: ag. questionnaire |
| Livestock farm households covered by veterinarians or paraprofessionals, share of livestock farm households | 7 | 3. Livestock (L) | HH survey: ag. questionnaire |
| Livestock farm households in which men own bovines, share of livestock farm households owning bovines (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which men own goats, sheep or pigs, share of livestock farm households owning goats, sheep or pigs (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which men own horses or donkeys, share of livestock farm households owning horses or donkeys (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which men own poultry, share of livestock farm households owning poultry (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which women own bovines, share of livestock farm households owning bovines (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which women own goats, sheep or pigs, share of livestock farm households owning goats, sheep, or pigs (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Livestock farm households in which women own horses or donkeys, share of livestock farm households owning horses or donkeys (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|--|------------------------------|
| | SECTION | CLUSTER | |
| Livestock farm households in which women own poultry, share of livestock farm households owning poultry (%) | 2, 9 | 3. Livestock | HH survey: ag. questionnaire |
| Households with electricity hook-ups, share of total households (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Average household annual expenditures on energy, share of total annual expenditures (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Average annual household expenditure on firewood and charcoal (current LCU) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Average annual household expenditure on firewood and charcoal, PPP (current international \$) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Population with private flush toilet, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Population with access to fixed telephone line, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Population with access to mobile telephone, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Population with access to credit, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: hh questionnaire |
| Communities located more than 5 km from Government primary schools, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from Government secondary schools, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from health facility, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from bus stops, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from a tar/asphalted road, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from post office, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from bank, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from a microfinance institution, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities located more than 5 km from a daily/weekly market, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|-------------------------------------|-----------------------------|
| | SECTION | CLUSTER | |
| Communities located more than 5 km from an extension service agent/center, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with a Government primary school, share of total communities. | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with a Government secondary school, share of total communities. | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with a bus stop, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with tar/asphalted roads, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with health facilities, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with an irrigation scheme, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with warehouse, share of communities producing crops (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Community with daily/weekly markets, share of total communities (%) | 7 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Community with a post office, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Community with a bank, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with micro finance institution, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with an irrigation scheme, share of communities producing crops (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with daily/weekly markets, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with warehouse, share of communities producing crops (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Communities with an extension service agent/center, share of total communities (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest Government primary school (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest Government secondary school (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest bank (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest post office (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest microfinance institution (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest bus stop (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest health facility (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest tar/asphalted road (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from the nearest daily/weekly market (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Average distance of communities from an extension service agent/center (km) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |

| INDICATOR | GROUPING | | SOURCE |
|--|----------|--------------------------------------|------------------------------|
| | SECTION | CLUSTER | |
| Population that lives more than 5 km from bank, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from bus stop, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from health facility, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from post office, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from Government primary school, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from Government secondary school, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from tar/asphalted road, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from a microfinance institution, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from a daily/weekly market, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| Population that lives more than 5 km from an extension service agent/center, share of total population (%) | 5 | 4. Infrastructure and Services (IS) | HH survey: community quest. |
| | | | |
| Average amount of credit obtained by households over the year (current LCU) | 5 | 5. Inputs and Technology (IT) | HH survey: hh questionnaire |
| Average amount of credit obtained by households over the year, PPP (current international \$) | 5 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop farm households using chemicals, share of crop farm hhs (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop farm hhs using organic fertilizers, share of crop farm hhs (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop farm households using improved seeds, share of crop farm hhs (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop farm households trained in the use of improved inputs, share of crop farm households. | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| farm households with access to training or extension, share of total farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Farm households using mechanical equipment (owned or rented), share of total Farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Irrigated crop land, share of farm crop land (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|---|---|
| | SECTION | CLUSTER | |
| Crop Farm households with superficial water irrigation systems, share of total Crop Farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop Farm households with deep water irrigation systems, share of total crop Farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop Farm households with other irrigation systems, share of total crop Farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Crop Farm households with no irrigation systems, share of total crop Farm households (%) | 7 | 5. Inputs and Technology (IT) | HH survey: ag. questionnaire |
| Communities with extension services available, share of total communities (%) | 7 | 5. Inputs and Technology (IT) | HH survey: community quest. |
| Communities located more than 5 km from a daily/weekly market, share of total communities (%) | 5 | 5. Inputs and Technology (IT) | HH survey: community quest. |
| Communities located more than 5 km from an extension service agent/centre, share of total communities (%) | 5 | 5. Inputs and Technology (IT) | HH survey: community quest. |
| Average distance of communities from the nearest extension service agent/centre (km) | 5 | 5. Inputs and Technology (IT) | HH survey: community quest. |
| Average distance of communities from the nearest daily/weekly market (km) | 5 | 5. Inputs and Technology (IT) | HH survey: community quest. |
| <i>Agricultural area actually irrigated, share of arable land and permanent crops (%)</i> | 7 | <i>5. Inputs and Technology (IT)</i> | <i>FAOSTAT</i> |
| Agricultural Income (crop, livestock, forestry, fishery, ag. wage), share of total income (%) | 2, 8 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh, ag. & fishery questionnaires |
| On-farm income (crop, livestock, forestry, fishery), share of total income (%) | 2, 8 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh, ag. & fishery questionnaires |
| Value of production per hectare/year in female managed land (current LCU) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year in female managed land, PPP (current international \$) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year in male managed land (current LCU) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|--|----------|--|-------------------------------------|
| | SECTION | CLUSTER | |
| Value of production per hectare/year in male managed land, PPP (current international \$) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year (current LCU) | 2 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare/year, PPP (current international \$) | 2 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Value of production per hectare, PPP (current international \$) | 2 | 6. Income, Productivity and Inequality (IPI) | HH survey: ag. questionnaire |
| Gini coefficient of per capita expenditure (real number) | . | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita income disparity between urban and rural areas, urban to rural ratio (real number) | . | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita expenditure disparity between urban and rural areas, urban to rural ratio (real number) | . | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita daily income of female-headed households (current LCU) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita daily income of female-headed households, PPP (current international \$) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita daily income of male-headed households (current LCU) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Per capita daily income of male-headed households, PPP (current international \$) | 2, 9 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Working poor, share of total employment, ages 15-64 (%) | 2, 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in agriculture (current LCU) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. & ag. questionnaires |
| Average annual wage in agriculture, PPP (current international \$) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. & ag. questionnaires |
| Average annual wage in mining and manufacturing (current LCU) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in mining and manufacturing, PPP (current international \$) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in services (current LCU) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in services, PPP (current international \$) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in other not specified industries (current LCU) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Average annual wage in other not specified industries, PPP (current international \$) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Low pay rate in agriculture (%) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. & ag. questionnaires |
| Low pay rate in mining and manufacturing (%) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Low pay rate in services (%) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |
| Low pay rate in other not specified industries (%) | 3 | 6. Income, Productivity and Inequality (IPI) | HH survey: hh. questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|---|------------------------------|
| | SECTION | CLUSTER | |
| <i>Agriculture, value added (percent of GDP)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Agriculture, value added (annual % growth)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Agriculture, value added per worker (constant 2000 US \$)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Poverty gap at \$1.25 a day (PPP) (%)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Poverty gap at \$2 a day (PPP) (%)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Poverty gap at National poverty lines (%)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Poverty headcount ratio at \$ 1.25 a day (PPP) (% of population)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| <i>Poverty headcount ratio at \$ 2 a day (PPP) (% of population)</i> | . | <i>6. Income, Productivity and Inequality (IPI)</i> | <i>World Bank (WDI)</i> |
| Households using vouchers for agricultural inputs, share of agricultural households (%) | 4 | 7. Social Protection (SP) | HH survey: ag. questionnaire |
| Participation in private emergency programs, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Participation in public emergency programs, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual transfer of Social Insurance per capita (current LCU) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual transfer of Social Insurance per capita, PPP (current international \$) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Population with Social Insurance, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Relative incidence of Social Insurance in total income (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual transfer of Social Assistance per capita (current LCU) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual transfer of Social Assistance per capita, PPP (current international \$) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Population with Social Assistance, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Relative incidence of Social Assistance in total income (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual amount of International Remittances per capita (current LCU) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual amount of International Remittances per capita, PPP (current international \$) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Population with International Remittances, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Relative incidence of International Remittances in total income (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Average annual amount of Private Transfers per capita (current LCU) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|--|-----------------------------|
| | SECTION | CLUSTER | |
| Average annual amount of Private Transfers per capita, PPP (current international \$) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Population with Private Transfers, share of total population (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Relative incidence of Private Transfers in total income (%) | 4 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Female primary decision makers on the use of public transfers, share of total population receiving public transfers (%) | 4, 9 | 7. Social Protection (SP) | HH survey: hh questionnaire |
| Community members participating in Member-Based Organizations/groups, share of total community population (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Community members participating in Agricultural Cooperatives, share of total community members (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Community members participating in Farmers' Groups, share of total community population (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Community members participating in Savings and Credit Groups, share of total community population (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Female Community Members participating in Women's Groups, share of total community members (%) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Agricultural Cooperatives, share of total Member-Based Organizations/groups in the community (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Farmers' Groups, share of total Member Based Organizations/groups in the community (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Savings and Credit groups, share of total groups in the community (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Women's Groups, share of total Member-Based Organizations/groups in the community (%) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Communities with Agricultural Cooperatives, share of total communities (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Communities with Farmers' Groups, share of total communities (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Communities with Savings and Credit Groups, share of total communities (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Communities with Women's Groups, share of total communities (%) | 5 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Females to Males Ratio in agricultural cooperatives (real number) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Females to Males Ratio in farmers' groups (real number) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |

| INDICATOR | GROUPING | | SOURCE |
|---|----------|--|---|
| | SECTION | CLUSTER | |
| Females to Males Ratio in credit & saving groups (real number) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Females to Males Ratio in MBOs/groups (real number) | 5, 9 | 8. Community Characteristics (CC) | HH survey: community quest. |
| Total number of households in the sample (real number) | . | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Total number of households (real number) | . | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Rural households, share of total households (%) | . | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Urban households, share of total households (%) | . | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Male headed households, share of total households (%) | 9 | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Female headed households, share of total households (%) | 9 | 9. Household Characteristics (HC) | HH survey: hh questionnaire |
| Households with income from agriculture greater than 30%, share of total households (%) | 2 | 9. Household Characteristics (HC) | HH survey: hh, ag. & fishery questionnaires |
| Households with income from agriculture lower than 30%, share of total households (%) | 2 | 9. Household Characteristics (HC) | HH survey: hh, ag. & fishery questionnaires |
| Households with no income from agriculture, share of total households (%) | . | 9. Household Characteristics (HC) | HH survey: hh, ag. & fishery questionnaires |
| <i>Rural/Urban population, share of total population (%)</i> | . | <i>9. Household Characteristics (HC)</i> | <i>FAOSTAT</i> |

Annex 2: List of RLM intermediate variables

To build the indicators listed in Annex 1 starting from the elementary data provided by household surveys, the construction of intermediate variables is required. In the first step of the RLM project only the final indicators will be available to the users. Later on, data users will be allowed to visualize and manipulate intermediate variables as well, in order to build indicators of their own interest. The table below provides an example of the variables of the Social protection cluster with the correspondent indicators.

| Variable name | Description | Indicator | Cluster |
|----------------|--|---|----------------------|
| covintrem | International remittances coverage | Population with international remittances, share of total population (%) | 7. Social Protection |
| covprivtrans | Private transfers coverage | Population with private transfers, share of total population (%) | 7. Social Protection |
| covsocass | Social assistance coverage | Population with social assistance, share of total population (%) | 7. Social Protection |
| covsocins | Social insurance coverage | Population with social insurance, share of total population (%) | 7. Social Protection |
| femOwnPubTr | Households in which a woman manages public transfers | Female primary decision makers on the use of public transfers, share of total population receiving public transfers (%) | 7. Social Protection |
| int_rem_pc | International remittances per capita | Average annual amount of international remittances per capita (current LCU / current international \$) | 7. Social Protection |
| soc_ins_pc | Social Insurance per capita | Average annual transfer of social insurance per capita (current LCU / current international \$) | 7. Social Protection |
| NGOCharHelpSck | Households participating in private emergency programs (NGOs, religious institutions and others) | Participation in private emergency programs, share of total population (%) | 7. Social Protection |
| priv_trans_pc | Private transfers per capita | Average annual amount of private transfer per capita (current LCU / current international \$) | 7. Social Protection |
| PubHelpSck | Households participating in public emergency programs | Participation in public emergency programs, share of total population (%) | 7. Social Protection |
| soc_ass_pc | Social assistance per capita | Average annual transfer of social assistance per capita (current LCU / current international \$) | 7. Social Protection |
| coupon | Household receiving input coupon | Household using vouchers for agricultural inputs, share of agricultural household (%) | 7. Social Protection |
| int_rem | Total international remittances received in the household | Relative incidence of international remittances in total income (%) | 7. Social Protection |

| Variable name | Description | Indicator | Cluster |
|---------------|---|---|----------------------|
| priv_trans | Total private transfers received in the household | Relative incidence of private transfers in total income (%) | 7. Social Protection |
| soc_ass | Total social assistance received in the household | Relative incidence of social assistance in total income (%) | 7. Social Protection |
| Soc_ins | Total social insurance received in the household | Relative incidence of social insurance in total income (%) | 7. Social Protection |

Annex 3: List of processed surveys

| | Country | Year | Survey name | Region (M-49) | Domains | No of sampled hh |
|---|-----------|---------|---|-----------------|--|------------------|
| 1 | Ethiopia | 2013-14 | Ethiopia Socio-Economic Survey (ESS) Wave Two (2013/2014) | Eastern Africa | Country; Urban and Rural; Regions (6) and Urban-Rural distinction within region; Zones; Woreda; Kebele. | 5,262 |
| 2 | Malawi | 2010-11 | Third Integrated Household Survey (IHS3) | Eastern Africa | Country; Major Regions (North, Center, South); Urban and Rural; District | 12,271 |
| 3 | Tanzania | 2012-13 | National Panel Survey (NPS 2012-2013) | Eastern Africa | Country, all regions, Urban and Rural. | 5,004 |
| 4 | Uganda | 2010-11 | Uganda National Panel Survey (UNPS) | Eastern Africa | Country; Urban and Rural; Region (Kampala, Central, Eastern, Northern, Western) | 2,714 |
| 5 | Niger | 2011 | 2011 National Survey on Household Living Conditions and Agriculture (ECVM/A-2011) | Western Africa | Country; City of Niamey and other Urban areas; Rural areas and, within them, agricultural zones, agro-pastoral zones and pastoral zones. | 3,968 |
| 6 | Nigeria | 2012-13 | General Household Survey - Panel | Western Africa | Country; Urban and Rural; Region (North Central, North West; South East; South South; South West) | 4,800 |
| 7 | Guatemala | 2011 | Encuesta Nacional de Condiciones de Vida (ENCOVI) | Central America | Country; Urban and Rural; Region: <i>Departamento</i> ; | 13,482 |

Annex 4: Overview of decent work indicators that can be calculated using HBS

| | <u>Indicator</u> | <u>description</u> | <u>rural areas</u> | <u>agricultural sector</u> | <u>concepts</u> | <u>main source</u> | <u>Module</u> |
|----|---|--|--------------------|--|--|--------------------|---------------|
| 1 | Proportion of own-account workers | Share of own account workers in total number of employed | • | • | employed persons; status in employment | HSBs and LFSs | Labour |
| 2 | Proportion of unpaid/contributing family workers | Share of unpaid family workers in total number of employed | • | • | employed persons; status in employment | HSBs and LFSs | Labour |
| 3 | Proportion of Own account workers and contributing family workers | Share of own-account and unpaid family workers in total number of employed | • | • | employed persons; status in employment | HSBs and LFSs | Labour |
| 6 | vulnerable employment rate | Total number of persons employed as subsistence, own account and contributing workers in total employment | • | • | Employed persons; self-employed; subsistence workers | HSBs and LFSs | Labour |
| 7 | Seasonal worker rate | Total number of seasonal workers employed in total number of employed | • | • | Employed persons; seasonal workers | HSBs and LFSs | Labour |
| 8 | Casual worker rate | Total number of casual workers in total number of employed | | • | Employed persons; casual workers | HSBs and LFSs | Labour |
| 9 | Underemployment rate | Percentage of employed persons who worked less than a given threshold in total number of employed persons | • | It might even be computed for agriculture but an ad hoc definition of working time in this sector is advisable | employment; working time | HSBs and LFSs | Labour |
| 10 | Excessive hours of work | Percentage of employed persons whose hours worked during the reference week exceed a given threshold in total number of employed persons | • | It might even be computed for agriculture but an ad hoc definition of working time in this sector is advisable | employment; working time | HSBs and LFSs | Labour |
| 11 | Part time employment | Share of the employed population who hold a part-time job in total employment | • | • | Employed Working time | HSBs or LFSs | Labour |
| 12 | Full time employment | Share of the employed population who hold a full-time job in total employment | • | • | Employed Working time | HSBs or LFSs | Labour |

| | <u>Indicator</u> | <u>description</u> | <u>rural areas</u> | <u>agricultural sector</u> | <u>concepts</u> | <u>main source</u> | <u>Module</u> |
|----|---|---|--------------------|----------------------------|--|--------------------|------------------|
| 13 | Neither in Employment not in Education or Training (NEET) | Share of youth neither in employment nor in education or training in total youth 15-24 (15-34) | • | • | Non employed youth, not in Education youth, not in training youth | HSBs and LFSs | Labour Education |
| 14 | Children in agriculture activities | Share of children involved in agricultural activities in total children 5-17 | • | • | Employed children Children 5-17 | HSBs and LFSs | Labour |
| 15 | Low pay rate in agriculture | Number of employees in agriculture whose total income is less than two-third of the median total income in total employees in agriculture | • | • | Employees in agriculture Total earning from agriculture | HBSs or LFSs | Labour |
| 16 | Average nominal wage | Average Gross remuneration in cash and in kind paid to employees | • | • | Gross remuneration in cash and in kind paid to employees. This variable is presented by economic activity. | HSBs and LFSs | Labour |

Annex 5: ASPIRE classification matrix

| SPL Area | Program category | Program sub-category |
|-------------------|---|---|
| Social Insurance | Contributory pensions | Old age pension (all schemes, national, civil servants, veterans, other special) |
| | | Survivors pension (all schemes, national, civil servants, veterans, other special) |
| | | Disability pension (all schemes, national, civil servants, veterans, other special) |
| | Other Social insurance | Occupational injuries benefits |
| | | Paid sickness leave benefits |
| | | Health |
| | | Maternity/Paternity benefits |
| Labor market | Labor market policy measures (active LM programs) | Training (vocational, life skills, cash for training) |
| | | Employment incentives/wage subsidies |
| | | Employment measures for disabled |
| | | Entrepreneurship support /startup incentives (cash and in kind grant, microcredit) |
| | | Labor Market services and intermediation through PES |
| | | Other Active Labor Market Programs |
| | Labor market policy supports (active LM programs) | Out-of-work income maintenance (Unemployment benefits, contributory) |
| | | Out-of-work income maintenance (Unemployment benefits, non-contributory) |
| Social Assistance | Unconditional cash transfers | Poverty targeted cash transfers and last resort programs |
| | | Family/ children/orphan allowance (including orphan and vulnerable children benefits) |
| | | Non-contributory funeral grants, burial allowances |
| | | Emergency cash support (including support to refugees/returning migrants) |
| | | Public charity, including zakat |
| | Conditional cash transfers | Conditional cash transfers |
| | Social pensions (non-contributory) | Old age social pensions |
| | | Disability benefits/war victims noncontributory related |
| | | Survivorship |
| | Public works,workfare and direct job creation | Cash for work |
| | | Food for work (including food for training, food for assets etc.) |
| | | Food stamps, rations and vouchers |
| | Food and in-kind transfers | Food distribution programs |
| | | Nutritional programs (therapeutic, supplementary feeding and PLHIV) |
| | | In kind/non-food support (education supplies, free texts and uniforms) |
| | School feeding | School feeding |
| | Fee waivers and subsidies | Health insurance exemptions and reduced medical fees |
| | | Education fee waivers |
| | | Food subsidies |
| | | Housing subsidies and allowances (and "privileges") |
| | | Utility and electricity subsidies and allowances |
| | Other Social assistance | Agricultural inputs subsidies |
| | | Scholarships/education benefits |
| | | Free health benefits |
| | | Social care services, transfers for care givers |
| | | What is left out from above categories |
| Private transfers | Domestic private transfers | Domestic transfers, inter-family in kind gifts and monetary transfers |
| | | Alimony (divorce and food) |
| | International private transfers | Income and support from charity/ private zakat, support for churches and NGOs (depending on country and how NGOs are financed,transfers from NGO may be classified as social assistance) |
| | | Remittances from abroad |

Source: The World Bank, ASPIRE: The Atlas Social Protection – Indicators of Resilience and Equity

Annex 6: Malawi Example on Social Protection

| 2010 - 2011 | Malawi Third Integrated Household Survey | | | | | | |
|---------------------------|---|---|----------------------|---|-------------------------------------|--|------------------------------------|
| SPL Area | Program classification | Program Name | Type of variable | Original variable | Module/Section in the survey | Question in the survey | Participation Rate in total sample |
| Social Insurance | Old Age Contributory Pension | Pensions | Monetary | transfers105 | Module P: Other Income | P01. During the last 12 months, did you or any members of your household receive any [SOURCE]? | 0.62% |
| | Other Social insurance | NA | NA | NA | NA | NA | NA |
| Labor Market | Labor Market Programs | NA | NA | NA | NA | NA | NA |
| Social Assistance | Social Pensions | NA | NA | NA | NA | NA | NA |
| | Other Cash Transfers Programs: family, child or disability allowances | NA | NA | NA | NA | NA | NA |
| | Conditional Cash Transfers | NA | NA | NA | NA | NA | NA |
| | In-kind Food Programs | Free food (other than maize) | Monetary | hh_r02a hh_r02b | Module R: Social Safety Nets | R02. In the last 12 months, what was the total assistance received from [PROGRAMME]? Item 102: Annual Free Food (other than Maize) | 2.63% |
| | | Free maize | Monetary(Kg in-kind) | hh_r0a | | Item 101: Free Maize | |
| | Public Works | MASAF, PWP | Monetary | hh_r02a hh_r02b | | Item 103. Annual Food/Cash-for-Work Programme (MASAF, PWP)) | 2.29% |
| | | inputs for work program | Monetary | hh_r02a hh_r02b | | Item 104. Annual Inputs-For-Work Programme | |
| | Other Social Assistance | Scholarship for secondary education | Monetary | hh_r02a hh_r02b | Module R: Social Safety Nets | Item 108. Annual Scholarships/Bursaries for Secondary Education (e.g CRECCOM) | 1.20% |
| | | Annual scholarship for tertiary education | Monetary | hh_r02a hh_r02b | | Item 109. Annual Scholarships for Tertiary Education (University, Upgrading Teachers) | |
| | | Government loan for university | Monetary | hh_r02a hh_r02b | | Item 110. Annual Cash - Government Loan for University and Other Tertiary Education | |
| | | Direct cash transfer | Monetary | hh_r02a hh_r02b | | Item 111: Direct cash transfer from Government | |
| | | Direct cash transfer | Monetary | hh_r02a hh_r02b | | Item 112: Direct Cash Transfers from others (Development Partners, NGOs). | |
| | | Other | Monetary | hh_r02a hh_r02b | | Item 113. Annual Other | |
| Non Public Transfers | Private Transfers | Domestic transfers | Monetary | hh_O14 hh_O17 | Module O: Children living elsewhere | How much cash/estimated food and other in-kind did [NAME] send to this household each month during the last 12 months? | 36.39% |
| | | Inter-family in kind gifts and monetary transfers | Monetary | transfers101, transfers 102, transfers103 | Module P: Other income | How much of [Cash/Food/Non food in-kind Gifts] came from rural/urban/international locations? | |
| International Remittances | Private Transfers | Remittances from abroad | Monetary | hh_O14 hh_O17 | Module O: Children living elsewhere | How much cash/estimated food and other in-kind did [NAME] send to this household each month during the last 12 months? | 3.33% |
| | | Inter-family in kind gifts and monetary transfers | Monetary | transfers101, transfers 102, transfers103 | Module P: Other income | How much of [Cash/Food/Non food in-kind Gifts] came from rural/urban/international locations? | |

Annex 7: STATA and R codes

The RLM methodology has been implemented with two different software packages: Stata and R. All the procedures for processing raw survey data to obtain intermediate variables are implemented through Stata do-files. In the long run, the RLM aims at prioritizing the use of open source software, consistent with the policy of the FAO Statistics Division. For this reason, Stata procedures have been replicated in R for some countries, and the latter software is employed to compute final indicators from the intermediate variables computed from micro-data.

In this Annex, some examples of RLM Stata routines – developed for the IHS3 survey of Malawi - are reported.

BOX 2. Tropical Livestock Unit (TLU), example of Stata Routine from Malawi

```
*AFRICA SOUTH OF SAHARA CONVERSION FACTORS
gen cfcattle71 = 0.5
gen cfsheep = 0.1
gen cfgoats = 0.1
gen cfpigs = 0.2
gen cfchicken = 0.01
gen cfhorses = 0.45
gen cfpoultry = cfchicken
gen cfotheranim = 0.2
gen cfoxen = cfcattle

*Conversion of HH's animals in TLU
gen TLU_cattle = ncattle * cfcattle
gen TLU_oxen = noxen * cfoxen
gen TLU_pigs = npigs*cfpigs
gen TLU_sheep = nsheep * cfsheep
gen TLU_goats = ngoats * cfsheep
gen TLU_chicken = nchicken * cfchicken
gen TLU_donkeyhorses = ndonkeyhorse * cfhorses
gen TLU_poultry = npoultry*cfpoultry
gen TLU_otheranim = notheranim * cfotheranim

egen TLU_total = rsum(TLU_cattle TLU_oxen TLU_pigs TLU_sheep TLU_goats TLU_chicken
TLU_donkeyhorses TLU_otheranim)
```

⁷¹ cf = conversion factor

BOX 3. STATA procedure to construct thresholds and identify smallholders

| Land | Livestock |
|---|---|
| sort opland | sort TLU |
| gen landcumul = sum(opland) | gen TLUcumul = sum(TLU) |
| egen landmax = max(landcumul) | egen TLUmax = max(TLUcumul) |
| gen landhalf = landmax/2 | gen TLUhalf = TLUmax/2 |
| replace landhalf = round(landhalf) | replace TLUhalf = round(TLUhalf) |
| replace landcumul = round(landcumul) | replace TLUcumul = round(TLUcumul) |
| list opland if landhalf == landcumul | list TLU if TLUhalf == TLUcumul |
| gen landwmed = `ha displayed value’ | gen TLUwmed = `displayed value’ |
| label var landwmed "Land weighted median" | label var TLUwmed "Tropical livestock unit weighted median" |
| drop landcumul landmax landhalf | drop TLUcumul TLUmax TLUhalf |

Smallholder indicator

```
gen dsmall = ((opland < `displayed value (ha)’ & dcrop_prod == 1) & (TLU < `displayed value (TLU)’ & dliv_prod == 1))
```

Where:

- *Opland* stands for Operated land;
- *TLU* stands for Tropical Livestock Unit;
- The two dummy variables *dcrop_prod* and *dliv_prod* identify the existence of farming activities, i.e. of positive revenues from either crop or livestock production.