



# EVANS SCHOOL OF PUBLIC POLICY & GOVERNANCE

UNIVERSITY of WASHINGTON

Evans School Policy Analysis and Research (EPAR)

## AgDev Priority Indicator Data Curation Exercise: Indicator Construction Summary Tables and Details

EPAR Technical Brief #335

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November 3, 2017

## Summary of Indicator Construction Decisions - Set “A”

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>1-6. Yield by crop (kg/ha) - bean, cowpea, maize, rice, sorghum, and cassava</b>	<p>Total quantity harvested/total <b>area harvested</b>; calculate <b>area</b> using GPS values if available, farmer-reported if not, then take proportion harvested to get area harvested (if not reported directly) and scale down area if sum of area harvested across crops on a plot is greater than total plot area; deal with <b>intercropping</b> by separately reporting yield for all plots and for pure-stand plots only; deal with multiple <b>seasons</b> by reporting yield for main season only; combine all <b>beans</b> into one category for most instruments, report cowpeas separately when included separately in instrument.</p> <p>Weight using HH weights*crop area planted (to estimate the yield of an average hectare of land where each crop was harvested in the country)</p> <p>Report by <b>gender</b> of plot manager (all female, all male, or mixed if reporting more than one), replacing with gender of HoH if plot manager not reported</p>				
	<p>-Only farmer-reported area; no intercropping recorded; does not ask about gender of plot manager (only of title/certificate holder and decision-makers for owned plots); does not list cassava or sorghum; does not distinguish beans or cowpeas from other legumes</p> <p>-Dropped HH-crop observations with rice yields above 10,000 kg/ha and maize yields above</p>	<p>Only farmer-reported area; does not list cowpeas or cassava</p>	<p>Does not report different seasons; does not list cowpeas</p>	<p>Cannot calculate yield for cassava because no area harvested is reported for permanent crops and yields are unreasonably small when using whole plot area</p>	<p>Various types of intercropping listed are combined; does not separate cowpeas from beans</p>

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*Please direct comments or questions about this research to Principal Investigators Leigh Anderson and Travis Reynolds at [eparinfo@uw.edu](mailto:eparinfo@uw.edu).*

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	5,000 kg/ha and 6,000 kg/ha (depending on variety), following IRRI code conventions				
<b>7. Gender-based productivity gap (%)</b>	<p>Calculated as (male-only managed plot mean productivity - female-only managed plot mean productivity) / (male-only managed plot mean productivity) where plot-level production is the gross value of all crops produced on the plot in this agricultural season (for places with one season) or over the past year (if multiple seasons reported). Crops are valued based on (a) farmer estimates, where available, otherwise (b) multiplying production quantity by reported prices on HH sales or local median prices (per crop-kg or per crop-unit, depending on the survey). When every crop harvest observation has a value, this is collapsed (summed) to the plot-level. That plot observation is then merged with its size (in hectares, either estimated or measured, where available) and with a gender indicator (based on decision-making for the plot).</p> <p>To the extent possible we followed methods from <a href="#">Levelling the Field</a> report, but we did not control for plot characteristics other than the gender of the plot manager. This is an option going forward, as is to compare male-only vs. female-only vs. joint-managed land, and male-only vs. any-female.</p>				
<b>8. Average HH Annual Milk Productivity per Milk-Producing Animal</b>	<p>Liters/milk-producing animal/year, report separately on cows and buffalo for India; do not calculate for other animals. We do not construct this indicator for small ruminants or if we only have data on livestock <i>owned</i> instead of producing. HH weights are used, though livestock weights can be constructed so the estimate is average productivity by head rather than average productivity by household.</p> <p>Report estimates by gender of the head of household.</p>				
	Two indicators: We aggregate total production into liters per cow and liters per buffalo due to small sample sizes of types (desi vs. improved crossbreed). Question does not ask about liters over entire year, but rather asks about liters during “peak milking” and liters during “lean milking.” It is not clear how this would lead to overestimates, however, unless respondents are giving the maximum value of production and applying that to the entire period.	Cannot calculate: quantity of milk produced is not reported	One indicator: cows; ignore camels, goats, sheep	One indicator: large ruminants (cows); ignore small ruminants (goats and sheep)	Cannot calculate: milk production is reported only in aggregate and not by animal type, and number of milk-producing animals by type is not reported
<b>9. Average HH Annual Egg Productivity per Egg-Producing Animal</b>	<p>Eggs/egg-laying poultry/year for chickens/hens; do not calculate for other animals. We do not construct this indicator if we only have data on poultry <i>owned</i> instead of egg-producing. HH weights are used, though livestock weights can be constructed so the estimate is average productivity by animal rather than average productivity by household.</p>				

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	Report estimates by gender of the head of household.				
	One indicator: we aggregate local hens, hybrid hens, and exotic hens because of small sample sizes	<u>Cannot calculate:</u> quantity of eggs produced is not reported	One indicator: hens	<u>Cannot calculate:</u> number of egg-producing poultry by type is not reported (only poultry owned)	<u>Cannot calculate:</u> egg production is reported only in aggregate and not by poultry type, and number of egg-producing poultry by type is not reported
<b>10. Women's Diet Quality: proportion of women consuming nutrient-rich foods (%)</b>	<p>Follow <a href="#">MDD-W</a> construction method for baselines (not possible to construct indicators for individual diet diversity from LSMS-ISA) - dummy variable for "did respondent eat at least 5 of 9 food groups yesterday" for females ages 15-49</p> <p>We attempted to construct a <b>second indicator for household diet diversity</b> following <a href="#">HDDS</a> construction method (count from 0-12 of food groups eaten by the HH in the last day, using specific HDDS food groups) for the LSMS-ISA. However, the LSMS-ISA only reports household consumption for the past week, and in that time frame the vast majority of households report consuming a count of food groups higher than the HDDS threshold for diverse diets. We therefore do not report on those estimates.</p> <p>Report estimates by gender of the head of household.</p>				
	MDD-W only; multiple women in HH completed diet module, so interpretation is in fact % of women, not just of female respondents	MDD-W and HDDS (both possible in this instrument only); note that only 1 woman per HH completed diet module, so interpretation will be % of female respondents, not % of women	HDDS only	HDDS only	HDDS only
<b>11. % of women who make decisions about the use of HH income (WEIA Indicator)</b>	<p>Follow <a href="#">WEIA</a> construction method</p> <p>For baselines: Code as 1 if an adult woman (age 18 or above) is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 1 income-related areas; can only report on % of <b>female respondents</b> who make decisions (the main female decision-maker in each household answered the WEIA decision-making questions).</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is listed as one of the decision-makers for at least 1 income-related area (most questions allow respondents to name 2 decision-makers); can report on % of <b>adult women</b> who make decisions, taking total number of adult women HH members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p>				

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	Report estimates by gender of the head of household.				
	Decision-making areas: food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major HH expenditures (not minor HH expenditures)	Decision-making areas: food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major HH expenditures (not minor HH expenditures).  It seems that no one answered the various income decision-making questions, which have missing values for all individuals. We need to understand if the question was not actually asked or if wrongly coded in the data as missing. We therefore cannot calculate this indicator for this instrument.	Decision-making areas: farming income (disposition of harvests, use of income from crop sales), non-farming enterprise income (including as owner), livestock income, transfers, pensions, rental income, sale of assets	Decision-making areas: farming income (disposition of harvests, use of income from crop sales), non-farming enterprise income (including as owner), livestock income, transfers, pensions, rental income, sale of assets	Decision-making areas: crop income (unprocessed, processed, byproducts), wage earnings, non-farm enterprise (including as owner), savings interest, investment, rental property, other income
<b>12. % of women who make decisions (alone or jointly) about agricultural activities - WEIA indicator</b>	<p>Follow <a href="#">WEIA</a> construction method</p> <p>For baselines: Code as 1 if an adult woman (age 18 or above) is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 2 agricultural activities; in Ethiopia we can only report on % of <b>female respondents</b> who make decisions while in India we report on the % of women, as multiple women per HH completed the module.</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is listed as one of the decision-makers for at least 2 plot, crop, or livestock activities; can report on % of <b>adult women</b> who make decisions, taking total number of adult women HH</p>				

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	<p>members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p> <p>Report estimates by gender of the head of household.</p>				
	Decision-making areas: food crop farming, cash crop farming, livestock raising, fish/fishpond culture, input selection, choosing types of crops, use of crop production, crop planting activities	Decision-making areas: food crop farming, cash crop farming, livestock raising, fish/fishpond culture, input selection, choosing types of crops, use of crop production, crop planting activities.  Only 1 woman per HH completed the module, so interpretation will be % of female respondents, not % of women.	Decision-making areas (any plot, crop, or livestock decision): plot management (crops to plant, input use, timing of activities), use of crop output/harvest, crop sales, taking crops to market, use of sales earnings (crop, fruit/perm)	Decision-making areas (any plot, crop (both seasons), or livestock decision): what to plant, input use, use of harvest (crop/fruit/perm), negotiating sale (crop/fruit/perm/by-product), use of sale earnings (crop/fruit/perm/by-product/alive livestock/slaughtered livestock/milk/other livestock products)	Decision-making areas (any plot, crop, or livestock decision): plot management, owned and rented plot decision-making, use of harvested crop, taking to market/negotiating (crop, processed crop, by-product), use of earnings from sales (crop, processed crop, crop by-product, livestock by-products)
<b>13. % of women who are sole or joint owners of productive assets (including land and livestock) (WEIA Indicator)</b>	<p>Follow <a href="#">WEIA</a> construction method</p> <p>For baselines: Code as 1 if an adult woman (age 18 or above) is sole or joint owner of any specified productive asset; in Ethiopia we can only report on % of <b>female respondents</b> who make decisions while in India we report on the % of women, as multiple women per HH completed the module.</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is sole or joint owner of any specified productive asset; can report on % of <b>adult women</b> who make decisions, taking total number of women HH members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p> <p>Report estimates by gender of the head of household.</p>				
	Productive assets: agricultural land, large livestock, fish ponds, mechanized farm equipment, house, large household durables, mobile	Productive assets: agricultural land, large livestock, fish ponds, mechanized farm equipment,	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	phone, non-agricultural land, means of transportation, (not small livestock, non-mechanized equipment, or small consumer durables)	house, large household durables, mobile phone, non-agricultural land, means of transportation, (not small livestock, non-mechanized equipment, or small consumer durables).  Only 1 woman per HH completed the module, so interpretation will be % of female respondents, not % of women.	equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone	equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone	equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone
<b>15. Crop Production Costs per Hectare</b>	<p>Construct using <b>both implicit and explicit costs</b> for all pre-harvest (and harvest) activities. Also include costs directly related to these activities, like transportation costs for seeds. Include costs for <b>all growing seasons/the full year</b>. Do not calculate implicit costs of machinery/tools (generally not possible to calculate amortized costs), but include explicit machinery/tool costs (e.g. purchases, rentals). For household and hired labor, assume male when gender is missing and adult when age is missing. Estimates are at the <b>household level</b>, not the household-crop level (most production costs are reported at plot or HH level). Divide total costs by total area planted in ha across all plots.</p> <p>Report estimates separately for explicit and implicit costs and explicit costs only, and by gender of plot manager.</p> <p>For implicit costs: Use price of purchased seeds to value price of own/free seed. Use price of hired labor (that is, labor the household hires) as price for family/free/bartered labor. Use seasonal rental price of land to value land planted. For these values, we will construct medians at the lowest geographic area <b>with at least 10 observations</b>. We will only replace non-missing values and will use reported household values where available.</p>				
	-Irrigation costs included -We only include purchased seeds in the indicator due to the large number of non-traditional units and small sample sizes of non-purchased seeds.	-Household labor not included in instrument -We do not include rented land in the gender-disaggregated indicators	Animal and machine hire costs not included; herbicide/pesticide costs not included -We do not currently value "share paid" for sharecropping.	-We are not able to include animal and machine hire in the gender-disaggregated indicators because they are at different levels of construction. -Daily wage is constructed as total	-We only include purchased seeds in the indicator due to the large number of non-traditional units and small sample sizes of non-purchased seeds. -We construct the daily wage as total paid per

Indicator	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	<p>-Daily wage is explicitly asked as per person in the survey</p> <p>-To value non-traditional/uncommon units, we construct “price ratios” and assume the ratio of a price across two units is consistent with the ratio of weights (kg).</p>	<p>because rent is at a different aggregation than decision-maker.</p> <p>-Daily wage is explicitly asked as per person in the survey</p>	<p>-Seed value is not included in the gender-disaggregated indicators because seeds are at the crop, not plot-crop, level.</p> <p>-Daily wage is constructed as amount paid divided by number of individuals hired. We assume the payment question is total paid per day, for all workers. Please note that the questionnaire explicitly says “per person per day,” but we believe the values are too high and the enumerator manual also suggests otherwise.</p>	<p>paid <i>over the entire season</i> divided by total number of days hired over entire season, across men, women, and children.</p>	<p>day divided by number of persons hired. We assume the total paid is for all individuals hired <i>per day</i>.</p>
<b>16. Inorganic fertilizer application rate (kg/ha)</b>	Sum quantity used for inorganic fertilizer across plots by gender of plot manager(s), divide by area planted across those plots. We also calculated but do not report organic fertilizer application rates. Reports estimates by gender of plot manager.				

## Summary of Indicator Construction Decisions - Set “B”

### Notes:

1. All LSMS-ISA estimates for variables in set “B” are restricted to rural households only (baseline surveys already restricted to rural households).
2. Dollar values for all relevant set “B” variables are estimated using the exchange rate towards the middle of the reference agricultural year. These values do not account for purchasing power parity.
3. For the “proportion of SHF HH” indicators, following the RuLIS definition of SHFs leads to very small sample sizes, which do not always align with the population of interest for the specific adoption question. We therefore present estimates for the sample of rural farm HHs for these indicators, further restricting the sample as relevant (e.g. livestock farm HHs only for the vaccine question, crop farm HHs only for the seed question). In our spreadsheet of estimates, we present the estimates with these samples as the primary estimates, but also present estimates for SHFs only as defined by RuLIS for comparison.
  - a. RuLIS defines SHFs as HHs that are a) in the bottom 40% of the cumulative distribution of land size (ha); b) in the bottom 40% of the cumulative distribution of livestock heads (TLUs); and c) in the bottom 40% of the cumulative distribution of total revenues. This is quite different from an absolute threshold such as total landholding between  $0 < \text{ha} \leq 4$  and  $\leq X$  number of tropical livestock units. Under RuLIS, depending on the country landholding distribution, the range of SHF ha across countries could differ considerably - it captures the “smallest” landholders, which may differ from what one considers “small” landholders. Typically less than 20% of the sample in each of the instruments we analyze is categorized as SHFs based on the RuLIS definition, and some of these include the urban poor unless urban households are excluded.

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>1. Share of non-farm income in total income</b>	<p>Non-farm income = Net income from self-employment + earnings from non-agricultural wage work + income from other sources, remittances, and other assistance + land rental income + net income from fishing (except fish ponds).</p> <p>Farm income = Net crop income + net livestock income + net income from fish ponds + earnings from agricultural wage work (construction of net crop income and net livestock income detailed below - these are separate indicators)</p> <p>Farm income is defined to include income from agricultural activities either on- or off- the household farm, so includes agricultural wage work. Income from agricultural processing/by-products and farm asset or livestock rental/care is counted as non-farm income.</p> <p>Fixed costs in crop production (e.g. purchase of a tractor or land) are not generally recorded in the instruments, and following RuLIS we do not attempt to net them out from the crop income indicator. Livestock purchases are netted out of livestock income, following RuLIS, which though we think this poses some consistency problems.</p> <p>Total income = non-farm income + farm income</p> <p>If total income is negative for a HH, this indicator will be undefined. If total income is positive but the numerator is negative, we will follow the RuLIS approach of setting negative numerator categories to zero and scale the remaining shares so they sum to one (e.g., this indicator will take a value of 0 if non-farm income is negative but total income is positive)</p>				



	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	Separately report total income, total non-farm income, and total farm income to better illustrate differences in numerator and denominator. Report separately by gender of the head of household.				
	-self-employment income is based on wages (gross) -assistance income not included -remittances are specified as received from migrants -fishing income is not net of expenses; exclude income from fish ponds	-self-employment income is based on estimated profit (net) -other income sources includes pensions, misc. rentals, caring for other HH's animals -fishing income not included	-self-employment income is based on sales minus expenses (net) -other income sources include pensions, investments, sales, misc. rentals, and inheritance -fishing income not included -To our understanding, Ethiopia LSMS seems to overlook seasonal crop income from the Belg season, while Ethiopia Baseline is located in areas with Belg season production. This may contribute to the difference in estimates.	-self-employment income is based on estimated profit (net) -asks about income from sales of ag by-products (net) -fish trading included separately -other income sources include pensions, rentals, and other -fishing income is net of costs; fish ponds not captured	-self-employment income is based on estimated profit (net) -asks about income from sales of ag by-products (gross) -remittances are specified as received from overseas -other income sources include investments, rentals, and other -fishing income is net of costs; exclude income from fish ponds
<b>2. Crop income</b>	<p>Net crop income = gross crop income - crop expenses</p> <p>Crop expenses are the sum of all explicit crop expenses reported in each instrument (including expenses associated with crop sales). Implicit costs (e.g., household labor, rental value of owned land, recycled seed) are not included.</p> <p>Gross crop income = value of crop production across all seasons - value lost post-harvest</p> <p>Crop production is valued either by respondent's own valuation (if available) or by multiplying quantities produced by the sales values observed by the HH for each crop if they sold that crop. If the HH did not sell a crop that it produced, the value per unit is imputed using the median per-unit value of observed sales at the smallest geographic unit for which we have at least 10 observations (where possible we will convert units to kgs using provided conversion factors). We will treat "other" subgroups of crops as though they were crop categories and use median unit prices to value production. Where we cannot calculate a per-unit price for a given crop-unit combination, we assign a value of 0 to the production of that crop.</p> <p>Report separately by gender of the head of household.</p>				
	-does not include agricultural asset rental or crop sales transport expenses	-does not include organic fertilizer, agricultural asset	-does not include pesticide, herbicide, organic fertilizer, animal traction, or	-does not include permanent/tree crop seed/planting material	-does not include crop sales transport expenses

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	<ul style="list-style-type: none"> <li>-includes crop storage rental expenses</li> <li>-does not ask about value lost post-harvest</li> </ul>	<ul style="list-style-type: none"> <li>rental, or crop sales transport expenses</li> <li>-% lost post-harvest captured only for some specific crops</li> <li>-Large outliers in crop prices are removed/imputed using the median value, noting that some respondents seem to provide per-sale (not per-unit) responses.</li> </ul>	<ul style="list-style-type: none"> <li>machine traction expenses</li> <li>-reports % lost post-harvest by crop</li> <li>-To our understanding, Ethiopia LSMS seems to overlook income from the Belg season (seasonal crops harvested April-August).</li> <li>-Sharecropping costs are estimated using the % of value of crop production.</li> </ul>	<ul style="list-style-type: none"> <li>or animal traction expenses</li> <li>-respondent directly estimates value of production for temporary crops, but not for permanent/tree crops</li> <li>-includes value of crop residue sold</li> <li>-reports value lost post-harvest (cap at value of production)</li> </ul>	<ul style="list-style-type: none"> <li>-respondent directly estimates value of production for crops</li> <li>-also asks quantity of crops still to be harvested, which must be valued separately</li> <li>-reports % lost post-harvest by crop</li> </ul>
<b>3. Livestock income</b>	<p>Livestock income = Gross income from livestock products (valuing all production of all items captured in each survey) + gross income from livestock (valuing sales and animals slaughtered for own consumption) - expenses on purchased animals - all animal upkeep expenses (all expenses captured in each survey).</p> <p>We do not include “stock variation”, the change in value of livestock holdings, except to the extent that it is reflected by counting as positive income the value of livestock sold or consumed and then subtracting the cost of purchasing animals. We could include a “stock variation” proxy as the value of livestock holdings at the time of survey and one year prior at the median local imputed value per-animal, but these values were not estimated by the household to reflect changing herd quality, and per RuLIS guidelines, are then set to 0.</p> <p>Prices per animal (or livestock product) are as observed by the household if the household sold this animal/product. If not, the value is imputed using the local median per-animal (per-item-unit) price observed at the smallest geographic area for which we have 10 observations. Where we cannot calculate a per-unit price for a given product-unit combination, we assign a value of 0 to the production of that product.</p> <p>Slaughtered animals are valued at the live animal price (imputed median values), unless the observed income from sales of slaughtered animals exceeds that estimate.</p> <p>We include all expenses captured in each survey, assuming differences arise because some items are not relevant in a given setting or are covered under an “other” category. This is consistent with the RuLIS technical guidelines, except that expenses don’t always fall neatly into the categories indicated in the guidelines.</p> <p>A side note on Tropical Livestock Units: Where livestock are recorded that don’t have coefficients, we’ve made an educated guess of the appropriate value (e.g. a goat is approximately equivalent to a sheep). The exception is beehives, which we exclude for now for lack of any coefficient to assign.</p> <p>Report separately by gender of the head of household.</p>				

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	<p>-we value duck/sheep/pig meat by assuming their value is the same as the value for goat meat</p> <p>-does not capture water or hired labor expenses but does count “other costs”</p>	<p>-only reports the value of livestock products sold, not the amount of livestock products produced</p> <p>-does not capture water, vaccine, or treatment expenses, but does count “all other costs”</p>	<p>-does not capture number of animals slaughtered for own consumption</p> <p>-does not capture hired labor expenses</p>		<p>-The survey seems to refer to the <i>agricultural season</i>, not necessarily an entire year. This module was conducted in the post-planting (not post-harvest) survey. There is a discrepancy between the time interval indicated in the enumerator manual, paper instrument, and variable labels in the data set. Given the values that are produced from the data set, it seems clear that we are not capturing the livestock income of agricultural households over the full previous year.</p>
<b>4. Per capita income</b>	<p>Per capita income = total household income / household size</p> <p>Total household income is defined as above (under share of non-farm income in total income). Household size is the number of individuals considered to be members of the household, per the definition applied in each survey.</p> <p>Report separately by gender of the head of household.</p>				
	Definition of a household is not provided	A household is defined as a group of people who normally live and eat their meals together, sharing expenses. More specifically,	A household is defined as residents that have a common housekeeping arrangement with a common household budget.	A household is defined as those who share the meal in the household and contribute to the household income.	All persons who usually eat and sleep in the dwelling are considered to be household members.

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		household members have to meet at least one of the following criteria: <ul style="list-style-type: none"> <li>• Has lived with and eaten with the household (sharing expenses) for at least six months of the past year and continues to do so, OR</li> <li>• Has joined the household within the past six months and now lives and eats with the household, sharing expenses.</li> </ul>			Generally, persons that have been away from the household for more than six months are not considered to be household members.
<b>5. Land productivity (crop production)</b>	<p>Value of crop production (across all seasons/over the previous year) / Area used for crop production (ha)</p> <p>See RuLIS indicator #2 for calculation of the value of crop production across all crops and seasons</p> <p>Area used for crop production (ha) includes owned and rented-in land used for crop cultivation in any season in last year (sum of plot areas).</p> <p>Weight using HH weights*area used for crop production (to estimate the productivity of an average hectare of land used for crop production in the country, not just an average farm)</p> <p>Report separately by gender of the head of household. This variable is called “Land productivity - Farm level”.</p> <p>We also calculate this variable at the plot-level: Value of crop production on the plot (across all seasons/over the previous year) / Plot area (ha). This is reported by gender of plot manager (all female, all male, or mixed if reporting more than one), replacing with gender of HoH if plot manager not reported. This variable is called “Land productivity - Plot level”.</p> <p>Weight using HH weights*plot area (to estimate the productivity of an average hectare of land used for crop production in the country, not just an average farm)</p>				
<b>6. Labor productivity (crop production)</b>	<p>Value of crop production (across all seasons/over the previous year) / labor applied on the farm (days)</p> <p>See indicator #2 for calculation of the value of crop production across all crops and seasons</p> <p>Labor applied on the farm: Sum of agriculture hired labor days, family labor days, and exchange labor days summed over all relevant seasons. We do not distinguish between man-days, woman-days, and child-days because these aren’t distinguished in all surveys, and because we have no ready method to weight them as “man-equivalents”.</p>				

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	Weight using HH weights*labor days (to estimate the productivity of an average day of labor in the country, not just an average farm)				
	Report separately by gender of the head of household.				
	-Made an assumption that each person did one crop-task per day. If anything, this assumption would over-count labor inputs. But the numbers for India seem very low.	-Household labor not included in instrument			
<b>7. Average household farm size</b>	Weighted mean of HH total agricultural land (ha).				
	The RuLIS indicator measures total landholding rather than farm size, and therefore includes land used for forests, pasture, and non-agricultural land. Based on our discussion, we define farm size to only include land used for agricultural purposes. We therefore include owned and rented-in land used for agriculture (cultivated land, land prepared for next agricultural season / fallow land, pasture land). Exclude rented-out land and other non-agricultural land (to distinguish this from a measure of total landholding). Non-agricultural uses include forest/virgin land and the homestead. We use GPS area when available and farmer reported otherwise (see dataset-specific differences below).				
	Report separately by gender of the head of household.				
	-Farmer reported area, convert to ha -regionally representative survey weights provided	-Farmer reported area, already converted to ha -no survey weights provided	-Use GPS area, convert to ha. For fields without GPS measurements, and without a conversion factor provided, this is estimated using the median per-unit area at the smallest geographic level with at least 10 measured observations, multiplied by the number of units.	-Use GPS area, convert to ha, use farmer reports for missing areas -All farmer reports are given in acres, not other units	-Use GPS area, convert to ha. For plots without GPS measurements, this is estimated using the respondent's area estimated, coupled with a conversion factor provided with the data set.
<b>8. Proportion of rural farm HHs with livestock using vaccines</b>	# of rural livestock farm HHs with at least 1 livestock vaccinated in the last 12 months/# of rural farm HHs with any livestock, weighted				
	Report separately by gender of the head of household.				
					Asks for the # of livestock

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
					currently vaccinated by species, rather than whether livestock were vaccinated in the last 12 months
<b>9. Proportion of <del>SHE</del> rural crop farm HHs using inorganic fertilizer</b>	<p># of rural crop farm HHs using any amount of inorganic fertilizer on at least 1 plot (in any season)/ total # of rural crop farm HHs, weighted</p> <p>In the denominator, we only include HHs with cultivated area &gt; 0 (defined as crop farm HHs). Report separately by gender of the head of household.</p>				
	-specifically asks about Urea, DAP, NPS, other	-specifically asks about Urea, DAP, NPS, other	-specifically asks about Urea, DAP, NPS, other	-asks generally about inorganic fertilizer, allows respondents to give details about two types	-specifically asks about DAP, UREA, TSP, CAN, SA, NPK, MRP, other -use data from both post-planting and post-harvesting instruments
<b>10. Proportion of <del>SHE</del> rural crop farm HHs using improved seed</b>	<p># of rural crop farm HHs using any amount of improved seed for any crop (in any season)/ total # of rural crop farm HHs, weighted. Assume that crops where seed information is not specified do not use improved seed.</p> <p>Include improved, hybrid, and high-yielding seeds as “improved”, including recycled (saved and re-used) seeds of these types. In the denominator, we only include HHs with cultivated area &gt; 0 (defined as crop farm HHs). Report separately by gender of the head of household.</p>				
	-hybrid and high-yielding seeds are coded as improved	-cannot calculate this indicator: no question on whether seeds used are improved	-improved seeds are coded as improved	-improved and improved recycled seeds are coded as improved -does not ask if seeds/cuttings for tree/fruit/root crops are improved	-hybrid and improved seeds are coded as improved
<b>11. Proportion of <del>SHE</del> rural farm HHs reached by all extension</b>	<p># of rural farm HHs who have received information from or used extensions service from any source/total # of rural farm HHs, weighted.</p> <p>This measures those receiving (and in some cases using) extension services, not the presence of extension services in an area. Include all private and government-related extension services in numerator. In the denominator, we include as rural farm HHs any HHs with any crop production, livestock, livestock production, or income from crop or livestock/livestock product sales. Report separately by gender of the head of household.</p>				

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
	-extension sources: government, private, NGO, radio, video, phone	-extension sources: ECX signboard, extension service/DA, coop staff, ECX interactive voice response, extension, coop, newspaper, radio, tv	-does not ask about provider of extension services, just participation in extension -does not ask about specific areas of extension assistance, just general participation	-extension sources: government, NGO, co-op/farmer's association, radio, publication	-extension sources: government, private, government fishing, NGO, co-op/farmer's association, fishing co-op, field school, village ag ext meeting, ag extension course electronic media, paper media
<b>12. Proportion of rural farm HHs using formal financial services</b>	<p># of rural farm HHs using at least 1 type of financial services/total # of total rural farm HHs, weighted.</p> <p>Include loans (general or for enterprise activity), credit, savings, accounts, MM use (regardless of account status), and insurance (of any type) in numerator if they are used. Do not include if HHs have access to services but do not use them. For loans, only include in numerator if SHF has received loan, not if they have only applied for loan. Include services only from formal institutions including banks, mortgage companies, microfinance institution, insurance company, and other formal institutions, but not from informal institutions including NGOs, money lenders, and village or social savings/loan providers (SACCO, esusu, etc). Inclusion of informal services yield very high percentages</p> <p>In the denominator, we include as rural farm HHs any HHs with any crop production, livestock, livestock production, or income from crop or livestock/livestock product sales. Report separately by gender of the head of household.</p>				
	Only includes banks and DFS as providers	Includes formal and informal service providers	Includes formal and informal service providers	Includes formal and informal service providers	Includes formal and informal service providers
<b>13. Average daily wage in agriculture</b>	<p>Average daily wage across all activities for hired labor (including value of in-kind payments if specified). For instruments reporting on multiple seasons, we only use information from the primary agricultural season. In the ETH baseline, Meher represents 99.52% of observations, and in TZ LSMS-ISA, hired labor is only used on 258 plots in the SRS.</p> <p>Report when possible wage by gender of workers.</p>				
	-take average of wages by each type of laborers, weighted by number of days worked by each type	-disaggregation by activity not possible -disaggregation by gender not possible -average daily wage directly reported	-take average of wages by each type of laborers, weighted by number of days worked by each type	-disaggregation by gender not possible -take average of wages across all laborers	-take average of wages by each type of laborers, weighted by number of days worked by each type

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>14.Value of crop sold, share of total value of crop production</b>	<p>We report on value of crop sold as of the survey date, as this can be calculated directly from the instruments, while value of crop used for own consumption would have to inferred by subtracting value of crop sales and estimates of value of crop stored, bartered, or lost post-harvest from the total value of crop production.</p> <p>See RuLIS indicator #2 for calculation of value of crop production across all crops and seasons.</p> <p>Report separately by gender of the head of household.</p>				



## Detail by Indicator - Set “A”

### 1-6. Yield by crop (kg/ha) - bean, cowpea, maize, rice, sorghum, and cassava

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Area of field</b>	Farmer reported only	Farmer reported only	GPS if available, farmer reported if not	GPS if available, farmer reported if not	GPS if available, farmer reported if not	GPS if available, farmer reported if not
<b>Area planted with crop</b>	Farmer reported area planted	Farmer reported area planted	Farmer reported percentage of field planted, use (percent planted X area of field) to construct area planted.	Farmer reported percentage of field planted, use (percent planted X area of field) to construct area planted.	Farmer reported area planted	Use farmer reported
<b>Area rescaled</b>	Yes, if total area planted across crops > area of plot	Yes, if total area planted across crops > area of parcel, sequential planting and replanting taken into account	Yes, if total percentage planted on plot > 100	Yes, if total percentage planted on plot > 100	Yes, if total area planted across crops > area of field	Scale down if planted area across crops larger than total area of plot (unless specifying relay cropping in Ethiopia baseline and Nigeria LSMS)
<b>Intercropping</b>  Check to see which crops are predominantly intercropped	Not asked	Intercropped if farmer reports intercropped, raw data only reports main crop as intercropped on each plot, data was cleaned so that all crops on plot are tagged as intercropped if one crop was tagged as intercropped.	Intercropped if farmer reports crops mixed on field (options 1. Purestand; 2. Mixed)	Intercropped if farmer reports intercropped (Asks: Was cultivation intercropped?)	Farmer reports: mono-crop, inter-crop, mixed, relay, alley, and strip. Purestand is monocrop and relay-crop.	Use purestand vs. other  For relay, if planted in sequence then do not rescale, but if area planted larger than total then check to see if multiple planting cycles.
<b>If harvest not yet complete</b>	Not directly asked.	Asked.	Asked.	Asked.	Asked.	Construct using both harvested (yield) and planted (productivity) area denominators  For productivity, retain pre-harvest loss (drought/disease), and drop if not yet harvested.  For yield, use area harvested even if harvest not complete.
<b>Different seasons</b>	Reports by season (3 in total).	Reports for Meher and Belg	Doesn't report different seasons, uses summed area	Reports for LRS and SRS	Only includes one growing season	Yield - calculate only for primary season (Kharif & Rabi in India: Kharif is main season for rice,

					(or all crops grown that year)	Rabi main season for maize, Meher in Ethiopia, LRS in Tanzania  Productivity - take max of area planted across seasons and sum of quantities produced across seasons
<b>Gender of plot manager</b>	Not directly asked. Uses 'male dominated HH' and 'female involved' indicator.  Other options: 1) (if owned plot) which HH member acquired the plot, 2) (if owned plot with title) Whose name is on the title, 3) (if owned plot with certificate) Whose name is on the certificate, 4) (if owned plot) who can decide to rent out this plot, 5) (if owned plot) who can decide to sell or give away this plot	Which family member had main responsibility for farming this plot (up to 2)	Who makes primary decisions concerning the plot (1, then up to 2 additional)	Who decided what to plant on this plot in LRS (up to 3)	Who in the HH manages this plot (up to 2) and other HH members who are decision-makers on this plot (up to 4)	Use gender of plot manager except for India (no explicit plot level manager questions), replace with gender of HoH if plot manager missing
<b>Quantity harvested</b>	Reports harvest in kilograms	Quantity harvested converted to kilograms and included in raw data	Use farmer reported units with conversion factor (farmer estimate in kg is also given in survey).	Reports harvest in kilograms	Use farmer reported units with conversion factor (Quantity harvested in kg not included or asked for in survey)	Use kilograms; set production quantity to 0 for crop-unit combinations with missing conversion factors
<b>Beans</b>	All legumes reported together; this includes beans such as black gram,	Faba/horse beans, haricot beans	Haricot beans, horse beans, mung beans, red	Beans, cowpeas, soyabeans	Beans/cowpeas reported together	Include all 'beans' and list what is included under this categorization; report on cowpeas separately only if

	cluster bean, cowpea, green gram, horse bean, kidney bean, red gram (pigeon pea), soyabean, but these are not separate from other legumes		kidney beans, soya beans			disaggregated from other beans in the instrument (Tanzania LSMS-ISA only)
<b>Weights</b>	Uses survey weights, regionally representative	No weights included, not nationally representative	Uses survey weights	Uses survey weights	Uses survey weights	Use weights when available, multiply by area planted with crop for each crop yield estimate
<b>Construction</b>	<p>Total quantity harvested/total <b>area harvested</b>; calculate <b>area</b> using GPS values if available, farmer-reported if not, then take proportion harvested to get area harvested (if not reported directly) and scale down area if sum of area harvested across crops on a plot is greater than total plot area; deal with <b>intercropping</b> by separately reporting yield for all plots and for pure-stand plots only; deal with multiple <b>seasons</b> by reporting yield for main season only; combine all <b>beans</b> into one category for most instruments, report cowpeas separately when included separately in instrument.</p> <p>Weight using HH weights*crop area planted (to estimate the yield of an average hectare of land where each crop was harvested in the country)</p> <p>Report by <b>gender</b> of plot manager (all female, all male, or mixed if reporting more than one), replacing with gender of HoH if plot manager not reported</p>					
	-Only farmer-reported area; no intercropping recorded; does not ask about gender of plot manager (only of title/certificate holder and decision-makers for owned plots); does not list cassava or sorghum; does not distinguish beans or cowpeas from other legumes -Dropped HH-crop observations with rice yields above 10,000 kg/ha and maize yields above 5,000 kg/ha and 6,000 kg/ha (depending on variety), following	Only farmer-reported area; does not list cowpeas or cassava	Does not report different seasons; does not list cowpeas	Cannot calculate yield for cassava, because no area harvested is reported for permanent crops and yields are unreasonably small when using whole plot area	Various types of intercropping listed are combined; does not separate cowpeas from beans	

	IRRI code conventions					
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## 7. Gender-based productivity gap (%)

Use construction for land productivity (RuLIS indicator #5)

Calculated as (male-only managed plot mean productivity - female-only managed plot mean productivity) / (male-only managed plot mean productivity) where plot-level production is the value of all crops produced on the plot in this agricultural season (for places with one season) or over the past year (if multiple seasons reported). Crops are valued based on (a) farmer estimates, where available, otherwise (b) multiplying production quantity by reported prices on HH sales or local median prices (per crop-kg or per crop-unit, depending on the survey). When every crop harvest observation has a value, this is collapsed (summed) to the plot-level. That plot observation is then merged with its size (in hectares, either estimated or measured, where available) and with a gender indicator (based on decision-making for the plot).

To the extent possible we followed methods from [Levelling the Field](#) report; but we did not control for plot characteristics other than the gender of the plot manager. This is an option going forward, as is to compare male-only vs. female-only vs. joint-managed land, and male-only vs. any-female.

## 8. Milk Productivity

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Type of animal</b>	Desi cows, improved crossbreed cows, desi buffalos, improved crossbreed buffalos		Camels, cows, goats, sheep	Large ruminants (cows) and small ruminants (goats and sheep).	Cow, goat, sheep, camel
<b>Number of animals</b>	Number <i>producing milk</i> of each type of animal, last 12 months		Number <i>producing milk</i> for each type, last 12 months.	Number <i>producing milk</i> for each type, last 12 months.	Number <i>owned</i> currently.
<b>Total production</b>	Asks about total production in last year. Most observations (95.6 percent) are liters. Some in kilograms (3.96 percent). Very small percentage (0.44) are “number” for units.		No total production question. Survey instead asks about average liters per day AND average number of months milked over last 12 months. We can construct average over entire year using these two. All responses in liters/day.	No total production question. Survey instead asks about average liters per day AND average number of months milked over last 12 months. We can construct average over entire year using these two. All responses in liters/day.	Average production per month. 82 percent (96 total) of observations are in liters, between 1 and 5 observations for around a dozen other units, though four of these can be turned into liters (kg, g, 20-liter jerry cans, 50-liter jerry cans)
<b>Total production by animal type</b>	We aggregate total production into liters per cow and liters per buffalo		Possible to disaggregate into the four animals. Only one type of cow, though.	Possible to disaggregate into large and small ruminants only.	Not possible to disaggregate by type of animal. Only total milk production is asked.

	due to small sample sizes of types.				
<b>Notes/Assumptions Required</b>	The questionnaire suggests there should be questions regarding most and least productive animal (by season) in the Milk_production data (see page 8 of the Female questionnaire). However, the data only contain information about “peak milking period” and “lean milking period” instead of individual animals.			Must assume large ruminants are cows only or come up with a ratio.	To construct an indicator like other surveys, we must make an assumption about the number of animals milking. Survey only asks about animals <i>owned</i> , not animals milking separately. We can use another survey to try to come up with a common percent of animals owned.
<b>Indicator Construction</b>	Liters/milk-producing animal/year, report separately on cows and buffalo for India; do not calculate for other animals. We do not construct this indicator for small ruminants or if we only have data on livestock <i>owned</i> instead of producing. HH weights are used, though livestock weights can be constructed so the estimate is average productivity by head rather than average productivity by household.				
	Two indicators: We aggregate total production into liters per cow and liters per buffalo due to small sample sizes of types (desi vs. improved crossbreed)	<u>Cannot calculate:</u> quantity of milk produced is not reported	One indicator: cows; ignore camels, goats, sheep	One indicator: large ruminants (cows); ignore small ruminants (goats and sheep)	<u>Cannot calculate:</u> milk production is reported only in aggregate and not by animal type, and number of milk-producing animals by type is not reported

## 9. Egg Productivity

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Type of animal</b>	Local hens, hybrid hens, exotic hens		Hens	Chickens, ducks, other poultry, indigenous and improved/exotic for all	Chicken - layer, duck, turkey
<b>Number of animals</b>	Number <i>laying eggs</i> , last three months, disaggregated into quarters (summer, monsoon, kharif harvest, after kharif harvest).		Number of <i>laying eggs</i> in last 12 months.	Number <i>owned</i> currently.	Number <i>owned</i> currently.

<b>Total production</b>	Total number of eggs produced, disaggregated into quarters (summer, monsoon, kharif harvest, after kharif harvest).		Number of clutching periods (on average) per hen, last 12 months. Number of eggs per clutching period, last 12 months.	Number of months produced, last 12 months. Average quantity produced per month <i>during those months in which any were produced.</i>	Number of months produced, last 12 months. Average quantity produced per month <i>during those months in which any were produced.</i>
<b>Total production by animal</b>	Can separate by hen type (local, hybrid, and exotic). However, we aggregate into a single indicator due to small sample sizes.		Only a single hen type.	Not possible to disaggregate across different poultry types. 96 percent of observations use pieces as units. 3.61 percent are liters and 0.39 are kilograms.	Not possible to disaggregate across different poultry types. 18 percent of observations are non-standard (e.g. heap, bowl, etc.)
<b>Notes/Assumptions Required</b>	The survey doesn't specify whether hens laying eggs in different quarters are the same hens. As such, to get a yearly average (eggs/hen), we need to make an assumption about how many hens are laying across the entire year (instead of by quarter). We take the maximum number of hens in a single season as the number of hens over the year. This may be undercounting hens slightly.			The survey doesn't specify the number of egg-laying animals. To create an indicator like the other surveys, we need to assume the percentage of total animals that are egg-laying (and percent of total eggs that belong to each type of animal).	The survey doesn't specify whether eggs come from chicken or other poultry (e.g. ducks). We do know number of egg-laying chickens, however.
<b>Indicator Construction</b>	Eggs/egg-laying poultry/year for chickens/hens; do not calculate for other animals. We do not construct this indicator if we only have data on poultry <i>owned</i> instead of egg-producing. HH weights are used, though livestock weights can be constructed so the estimate is average productivity by animal rather than average productivity by household.				
	One indicators: we aggregate local hens, hybrid hens, and exotic hens because of small sample sizes	<u>Cannot calculate:</u> quantity of eggs produced is not reported	One indicator: hens	<u>Cannot calculate:</u> number of egg-producing poultry by type is not reported (only poultry <i>owned</i> )	<u>Cannot calculate:</u> egg production is reported only in aggregate and not by poultry type, and number of egg-producing poultry by type is not reported

## 10. Women's Diet Quality: proportion of women consuming nutrient-rich foods (%)

**MDD-W** constructs this using “Did the respondent eat at least 5 food group yesterday” and asks question similarly

**LSMS** asks “over past week, did you or others in your HH consume [food item] [weight]” and “how many days over last week did your HH consume {food group}]”

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Food category</b>  LSMS asks about specific food for quantity and food groups for frequency	(grains) cereals, white roots/tubers/other starches, (pulses) (nuts)nuts/seeds, (diary) milk/milk products, (meat) flesh foods, (eggs) eggs, (veggies) leafy green vegetables, (vit_a) vit a fruits, and vegetables and tubers, (other veggies), (other fruits), (dropped) oils/fats, condiments/seasonings, savory and fried snacks, sweets, sugar sweetened beverages, other beverages and food	(grains, white roots and tubers, and plantains), (pulses) (nuts and seeds) (diary) milk products, (meat, poultry, fish), (eggs), (dark green leafy vegetables), (other vitamin A rich fruits and vegetables) mango/papaya/guava, pumpkin/squash/chili peppers/tomato/carrot, (other vegetables) (other fruits), (dropped) vegetable oil/butter/other fats, condiments/seasonings, salty snacks, sweets, sweet drinks	teff, other cereal, potatoes/other root crops, pasta/macaroni/biscuits, sugar/sugar products, beans/haricot beans/lentils/nuts /other pulses, vegetables, fruits, beef/sheep/goat/ red meat/pork, poultry, eggs, fish, oils/fats/butter, milk, yogurt, cheese/other dairy, other condiments/spices, kocho/bula	cereals/grains/cereal products, roots/tubers/plantains, nuts and pulses, vegetables, meat/fish/animal products, fruits, milk/milk products, fats/oils, sugar/sugar products/honey, spices/condiments	grains/flours, starchy roots/tubers/plantains, pulses/nuts/seeds, vegetables, meat/fish/animal products, meat/fish/animal products used as condiments, fruits, milk/milk products, oils/fats, sugar/sugar products/honey, spices/condiments	Include 10 major categories defined by MMD-W for India Baseline and Ethiopia Baseline.  Include 12 major categories defined by HDDS for LSMS.
<b>Time period</b>	day	day	week	week	week	Use time frame available
<b>Unit of measure</b>	Yes/no	Yes/no	Weight and frequency	Weight and frequency	Weight and frequency	Code as 1/0 if food group eaten at all
<b>Level of aggregation</b>  No individual consumption for LSMS	individual level	individual level	HH level	HH level	HH level	Use level available and state specific definition

<b>Trimming</b>	Drop if <15 or >49 years old (only child bearing years)	Drop if <15 or >49 years old (only child bearing years)	none	none	none	Cannot trim LSMS because it is at HH level
<b>Construction</b>	<p>Follow <a href="#">MDD-W</a> construction method for baselines (not possible to construct indicators for individual diet diversity from LSMS-ISA) - dummy variable for “did respondent eat at least 5 of 9 food groups yesterday” for females ages 15-49</p> <p>We attempted to construct a <b>second indicator for household diet diversity</b> following <a href="#">HDDS</a> construction method (count from 0-12 of food groups eaten by the HH in the last day, using specific HDDS food groups) for the LSMS-ISA. However, the LSMS-ISA only reports household consumption for the past week, and in that time frame the vast majority of households report consuming count of food groups higher than the HDDS threshold for diverse diets. We therefore do not report on those estimates.</p>					
	MDD-W only; multiple women in HH completed diet module, so interpretation is in fact % of women, not just of female respondents	MDD-W only; note that only 1 woman per HH completed diet module, so interpretation will be % of female respondents, not % of women	HDDS only	HDDS only	HDDS only	

## 11. % of women who make decisions about the use of HH income (WEIA Indicator)

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Decision-making</b>	Who normally makes decisions about minor or major HH expenditures?	Do you participate in [activity]?  Missing data for question about use of income.	Who decided what to do with money from various earnings?	Who decided what to do with money from various earnings?	Who decides what to do with money from various earnings?	If a woman is listed as a decision maker for any income question, then the woman is listed as a 1, if not the woman is listed as a 0.
<b>Income generating areas</b>  Include any income generating activities	food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major and minor HH expenditures	food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major and minor HH expenditures	farming, non-farming enterprises, livestock, transfers, pensions, rental income, sale of assets	farming, non-farming enterprises, livestock, transfers, pensions, rental income, sale of assets	crops (unprocessed, processed, byproducts), wage earnings, non-farm enterprise, savings interest, investment, rental property, other income	Include all income disposal categories asked about in each survey (not standardized across surveys).
<b>Construction</b>	Follow <a href="#">WEIA</a> construction method					



<p>For baselines: Code as 1 if an adult woman (age 18 or above) is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 1 income-related areas; can only report on % of <b>female respondents</b> who make decisions (the main female decision-maker in each household answered the WEIA decision-making questions).</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is listed as one of the decision-makers for at least 1 income-related area (most questions allow respondents to name 2 decision-makers); can report on % of <b>adult women</b> who make decisions, taking total number of adult women HH members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p>					
Code as 1 if a woman is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 1 of these income generating areas: food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major HH expenditures (not minor HH expenditures)	Code as 1 if a woman is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 1 of these income generating areas: food crop farming, cash crop farming, livestock, fish/fishpond culture, wage and salary, major HH expenditures (not minor HH expenditures)	Code as 1 if a woman is listed as one of the decision makers for any income category: farming (disposition of harvests, use of income from crop sales), non-farming enterprise income (including as owner), livestock income, transfers, pensions, rental income, sale of assets	Code as 1 if a woman is listed as one of the decision makers for any income category: farming (disposition of harvests, use of income from crop sales), non-farming enterprise income (including as owner), livestock income, transfers, pensions, rental income, sale of assets	Code as 1 if a woman HH is listed as one of the decision makers for any income category: crops (unprocessed, processed, byproducts), wage earnings, non-farm enterprise, savings interest, investment, rental property, other income	<p>% of female respondents (baselines) or women (LSMS-ISA)</p> <p>For baseline, mark as having power if those which respondent are involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent</p> <p>For LSMS, include if responded yes to any</p>

## 12. % of women who can make decisions, either alone or jointly, about agricultural activities (WEIA Indicator)

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Decision-making questions</b>	<ul style="list-style-type: none"> <li>-Do you yourself participate in decisions</li> <li>-Who normally makes decisions about</li> <li>-How much input do you having making decisions</li> <li>-To what extent do you feel you can make personal decisions about</li> </ul>	<ul style="list-style-type: none"> <li>-Do you yourself participate in decisions</li> <li>-Who normally makes decisions about</li> <li>-How much input do you having making decisions(few decisions, some, most, all, no decision made)</li> <li>-To what extent do you feel you can make personal decisions about (not at all, small extent, medium extent, high extent)</li> </ul> <p>Only 1 woman per HH completed the module, so interpretation will be % of female respondents, not % of women.</p>	<ul style="list-style-type: none"> <li>-Who in HH makes primary decisions about planted crops, input use, timing of crop activities, livestock-related activities;</li> <li>-Do other members consult on this (names)</li> <li>-Who in HH makes decision about crop output use</li> </ul>	<ul style="list-style-type: none"> <li>-Who decided to plant</li> <li>-Who made input decision</li> <li>-Who made decisions about harvest crops</li> <li>-Who made decisions about fruit harvested</li> </ul>	<ul style="list-style-type: none"> <li>-Are there other HH members who cultivate crops for which they are decision makers</li> <li>-Who makes decision about use of harvest</li> <li>-Who are the primary decisions makers for this plot</li> </ul>	<p>Baseline: if a woman answers that she has some input into crop choice then HH is listed as a 1, 0 if she answers that she has no input.</p> <p>LSMS: If a woman is primary decision maker about plot or crop then she is a 1, otherwise she is a 0.</p>
<b>Activities included</b>	Decision-making areas: food crop farming, cash crop farming, livestock raising, fish/fishpond culture, input selection, choosing types of crops, use of crop production, crop planting activities	Decision-making areas: food crop farming, cash crop farming, livestock raising, fish/fishpond culture, input selection, choosing types of crops, use of crop production, crop planting activities	Decision-making areas (any plot, crop, or livestock decision): plot management (crops to plant, input use, timing of activities), use of crop output/harvest, crop sales, taking crops to market, use of sales earnings (crop, fruit/perm)	Decision-making areas (any plot, crop (both seasons), or livestock decision): what to plant, input use, use of harvest (crop/fruit/perm), negotiating sale (crop/fruit/perm/by-product), use of sale earnings (crop/fruit/perm/by-product/alive livestock/slaughtered livestock/milk/other livestock products)	Decision-making areas (any plot, crop, or livestock decision): plot management, owned and rented plot decision-making, use of harvested crop, taking to market/negotiating (crop, processed crop, by-product), use of earnings from sales (crop, processed crop, crop by-product, livestock by-products)	Baseline: crop choice LSMS: primary decision maker about plot/crops

<b>Construction</b>	<p>Follow <a href="#">WEIA</a> construction method</p> <p>For baselines: Code as 1 if an adult woman (age 18 or above) is involved in some, most or all decisions or feels they can make personal decisions to a medium or high extent in at least 2 agricultural activities; in Ethiopia we can only report on % of <b>female respondents</b> who make decisions while in India we report on the % of women, as multiple women per HH completed the module.</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is listed as one of the decision-makers for at least 2 plot, crop, or livestock activities; can report on % of <b>adult women</b> who make decisions, taking total number of adult women HH members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p>
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### 13. % of women who are sole or joint owners of productive assets (including land and livestock) (WEIA Indicator)

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Ownership status</b>	<ul style="list-style-type: none"> <li>-Does anyone in the HH have XX item</li> <li>-Do you own(solely or jointly)</li> </ul>	<ul style="list-style-type: none"> <li>-Does anyone in the HH have XX item</li> <li>-Do you own(solely or jointly)</li> </ul> <p>Only 1 woman per HH completed the module, so interpretation will be % of female respondents, not % of women.</p>	<ul style="list-style-type: none"> <li>-How many [livestock] does holder own</li> <li>-Who mainly keeps/manages [livestock]</li> <li>-Who has right to sell/use [parcel] as collateral</li> <li>-Under whose name is the [parcel's] certificate</li> <li>-Who in HH owns [asset]</li> </ul>	<ul style="list-style-type: none"> <li>-How was plot acquired</li> <li>-With whom do you co-own</li> <li>-With whom do you co-rent</li> <li>-Who in HH owns [asset]</li> </ul>	<ul style="list-style-type: none"> <li>-Who are owner of this [plot]</li> <li>-Under who's name did you acquire this plot</li> <li>-Who in HH owns [livestock]</li> <li>-Who in HH owns [asset]</li> </ul>	If a woman owns any land, livestock, or productive assets then she is coded as a 1, if not she is coded as a 0.
<b>Assets</b>	Productive assets: agricultural land, large livestock, fish ponds, mechanized farm equipment, house, large household durables, mobile phone, non-agricultural land, means of transportation, (not small livestock, non-mechanized equipment, or small consumer durables)	Productive assets: agricultural land, large livestock, fish ponds, mechanized farm equipment, house, large household durables, mobile phone, non-agricultural land, means of transportation, (not small livestock, non-mechanized equipment, or small consumer durables)	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone	Productive assets: agricultural land (owner), non-poultry livestock (keeps/manages), transportation, farm equipment (mechanized), non-farm equipment, large durables/appliances, mobile phone	Include owner of agricultural land and livestock for all surveys, and other productive assets as listed in specific surveys (not standardized in LSMS).
<b>Construction</b>	Follow <a href="#">WEIA</a> construction method					

	<p>For baselines: Code as 1 if an adult woman (age 18 or above) is sole or joint owner of any specified productive asset; in Ethiopia we can only report on % of <b>female respondents</b> who make decisions while in India we report on the % of women, as multiple women per HH completed the module.</p> <p>For LSMS-ISA: Code as 1 if an adult woman (age 18 or above) is sole or joint owner of any specified productive asset; can report on % of <b>adult women</b> who make decisions, taking total number of adult women HH members as denominator, but may be biased downward if some women would have been listed after the first 2 decision-makers in given areas.</p>
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#### 14. Share of women among owners or rights-bearers of agricultural land, by type of tenure

Not prioritized for indicator construction

#### 15. Crop Production Costs per Hectare

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Land costs</b>	Land rental cost for Pre-kharif, kharif, and rabi seasons separately	Rent paid, time unit for rent (season/year), and management (rented in/owned/etc.) in each season. We do not differentiate between seasonal and yearly rent. We do not include rented land in the gender-disaggregated indicators because rent is at a different aggregation than decision-maker.	Land rental cost cash paid, in-kind paid. We do not currently value "share paid" for sharecropping.	Land rental cost (long and short rainy seasons for all questions)	Land rental cost cash paid, in-kind paid (this question is in both post-planting and post-harvest questionnaire)
<b>Hired labor</b>	Separately for all three seasons: Male and female separately - total days worked and average number of laborers worked a day, average daily wage. Contractor costs separately. Activities: Land prep, nursery prep, transplanting/planting, application of fertilizer, application of pesticide, irrigation, weeding, harvesting, bundling, threshing, drying, transporting	Total days of: land prep/planting, weeding/pesticide application, fertilizer application, organic input application, pest control, harvest and post-harvest together (average wage per day for these); total costs	Post-planting: total number of hired male, female, child days; daily male, female, child wage Post-harvest: total number of hired male, female, child days; daily male, female, child wage	Total wages for land prep/planting, total wages for weeding, total wages for other non-harvest activities, total wages for harvest activities	Separately for land prep, labor between planting and harvest, and harvest/threshing: Days hired for males, females, children and average pay per day for each

	Daily wage is explicitly asked as per person in the survey. We assume this value is correct.	of other hired labor (total value)  Daily wage is explicitly asked as per person in the survey. We assume this value is correct.	Daily wage is constructed as amount paid divided by number of individuals hired. We assume the payment question is total paid per day, for all workers. Please note that the questionnaire explicitly says “per person per day,” but we believe the values are too high and the enumerator manual also suggests otherwise.	Daily wage is constructed as total paid <i>over the entire season</i> divided by total number of days hired over entire season, across men, women, and children.	We assume the “days” variable in the survey is total days of hired labor, not days per person. In theory, we believe it should actually be persons times days, but the resulting indicators do not seem correct.  We construct the daily wage as total paid per day divided by number of person hired. We assume the total paid is for all individuals hired <i>per day</i> .
<b>Household Labor</b>	Separately for all three seasons: Male and female separately - total days worked and average number of members worked a day. Activities: Land prep, nursery prep, transplanting/planting, application of fertilizer, application of pesticide, irrigation, weeding, harvesting, bundling, threshing, drying, transporting	Not included	Post-planting: weeks and average days/week and hours/day per HH member Post-harvest: weeks and average days/week and hours/day per HH member	Total days for land prep/planting, total days for weeding and other non-harvest activities; total days for harvest; typical number of hours per day by activity	Separately for land prep, labor between planting and harvest, and harvest/threshing: by HH member, weeks worked, days/week, hrs/day
<b>Irrigation activities</b>	Yes (machine/animal hire but not payments for water)	No	No	No	No
<b>Animal hire</b>	Separately for all three seasons: land prep, irrigation, transplanting/seeding, weeding, pesticide application, harvesting, threshing, drying, transporting (total value for each activity separately)	Single question (value of tractor and other non-labor)	No animal hire question	Yes, though this is a separate module that only asks about hiring different things over the last year. It is not possible to allocate them to individual crops or even plots.	Yes (cash and in-kind)  To construct values, we assume 0.5 per acres per day for animal hire (from <a href="https://www.ncbi.">https://www.ncbi.</a>

				Module includes: hand hoe, hand-powered sprayer, ox plough, ox seed planter, ox cart, tractor, tractor plough, tractor harrow, sheller/thresher, hand mill/grinder, watering can, farm buildings/storage facilities, ger cans/drums, power tiller, other (only 4.5 percent of observations have any value for renting/hiring)	<a href="http://nlm.nih.gov/pmc/articles/PMC4635562/">nlm.nih.gov/pmc/articles/PMC4635562/</a> ).
<b>Machine hire</b>	<p>Separately for all three seasons: land prep, irrigation, transplanting/seeding, weeding, pesticide application, harvesting, threshing, drying, transporting (total value for each activity separately).</p> <p>Fuel for machines is included separately. Type of machine used is also specified (e.g. 4-wheel tractor, sprayers, combines, etc.)</p> <p><u>do file</u>: Just summing across activities</p>		Not valued	<p>We are not able to include animal and machine hire in the gender-disaggregated indicators because they are at different levels of construction.</p>	Yes (cash and in-kind)
<b>Seeds</b>	<p>Quantity of seeds used; quantity purchased in last 12 months, average price per unit, total value of purchased seed</p> <p>We only include purchased seeds in the indicator due to the large number of non-traditional units and small sample sizes of non-purchased seeds.</p>	Quantity of seed saved, quantity obtained free/for barter, quantity purchased and value of purchased seed	Quantity of total seed used; Amount spent on improved seeds; quantity and value of seed purchased this season (not clear if improved seed is subsumed in this) and transport cost; quantity of free seed used and transport cost; quantity of leftover seed used. Seed value is not	<p>Quantity of seed saved, quantity of seed purchased, total amount paid for seeds</p> <p>We assume same price for different seed types (improved, hybrid, etc.) due to small sample sizes.</p>	<p>Quantity of saved and free seed; transport costs for free seed; quantity and value of seed purchased (from two different sources), transport costs for purchased seed</p> <p>We only include purchased seeds in the indicator due to the large number of</p>

			included in the gender-disaggregated indicators because seeds are at the crop, not plot-crop, level.		non-traditional units and small sample sizes of non-purchased seeds.
Fertilizers	Separately for all three seasons: UREA, DAP, Potash, NPK brands, compost (average price per unit included)	Yes (total cost)	UREA, DAP, NPS, other fertilizers (each separately). Organic fertilizers are not valued in the questionnaire.	Organic and two kinds of inorganic (total value for each)	Inorganic (two sources) and organic (total amount paid for each)
Herbicide	Yes (average price per unit included)	Single question (total value)	Not value	Yes	Yes (two sources); cash and in-kind
Pesticide	Liquid and powder (average price per unit included)		Not value	Yes	Yes (two sources); cash and in-kind
Indicator Construction	Construct using <b>both implicit and explicit costs</b> for all pre-harvest (and harvest) activities. Also include costs directly related to these activities, like transportation costs for seeds. Include costs for <b>all growing seasons/the full year</b> . Do not calculate implicit costs of machinery/tools (generally not possible to calculate amortized costs), but include explicit machinery/tool costs (e.g. purchases, rentals). For household and hired labor, assume male when gender is missing and adult when age is missing. Estimates are at the <b>household level</b> , not the household-crop level (most production costs are reported at plot or HH level). Divide total costs by total area planted in ha across all plots.  Report estimates separately for explicit and implicit costs and explicit costs only, and by gender of plot manager.  For implicit costs: Use price of purchased seeds to value price of own/free seed. Use price of hired labor (that is, labor the household hires) as price for family/free/bartered labor. Use seasonal rental price of land to value land planted. For these values, we will construct medians at the lowest geographic area <b>with at least 10 observations</b> . We will only replace non-missing values and will use reported household values where available.				
Notes	-Irrigation costs included -We only include purchased seeds in the indicator due to the large number of non-traditional units and small sample sizes of non-purchased seeds. -Daily wage is explicitly asked as per person in the survey -To value non-traditional/uncommon units, we construct “price ratios” and assume the ratio of a price across two units is consistent with the ratio of weights (kg).	-Household labor not included in instrument -We do not include rented land in the gender-disaggregated indicators because rent is at a different aggregation than decision-maker. -Daily wage is explicitly asked as per person in the survey	Animal and machine hire costs not included; herbicide/pesticide costs not included -We do not currently value “share paid” for sharecropping. -Seed value is not included in the gender-disaggregated indicators because seeds are at the	-We are not able to include animal and machine hire in the gender-disaggregated indicators because they are at different levels of construction. -Daily wage is constructed as total paid <i>over the entire season</i> divided by total number of days	-We only include purchased seeds in the indicator due to the large number of non-traditional units and small sample sizes of non-purchased seeds. -We construct the daily wage as total paid per day divided by number of persons hired. We assume the total paid is for all

			<p>crop, not plot-crop, level.</p> <p>-Daily wage is constructed as amount paid divided by number of individuals hired. We assume the payment question is total paid per day, for all workers. Please note that the questionnaire explicitly says “per person per day,” but we believe the values are too high and the enumerator manual also suggests otherwise.</p>	<p>hired over entire season, across men, women, and children.</p>	<p>individuals hired <i>per day</i>.</p>
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## 16. Inorganic fertilizer application rate (kg/ha)

Variable	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS	Construction
<b>Inorganic fertilizer</b>  LSMS asks per plot main and secondary fertilizers while baseline asks totals	Asks quantity of Urea, DAP, NPS, and other in total (separately)	Asks quantity of Urea, DAP, NPS, and other in total (separately)	Asks quantity of Urea, DAP, NPS, and other per plot (separately)	Asks main and secondary type and quantity of fertilizer used per plot- DAP, Urea, NPK, TSP, CAN, SA, MRP, other	Asks main and secondary type and quantity of free and purchased fertilizer used per plot- NPK, Urea, other	Use all inorganic fertilizers
<b>Organic fertilizer</b>  Not all instruments ask for quantity  Current baseline construction does not use organic	Asks quantity of manure used, and if HH refuse, mulch/compost, crop residue, bio-fertilizer, or other used (separately)	Asks quantity manure used and what types of other were used (separately)	Asks if manure, compost, and other is used (separately), but does not ask quantity	Asks quantity of fertilizer used (not specific type)	Asks quantity of fertilizer used (not specific type)	Do not include in indicator



Level of aggregation	HH	HH	plot	plot	plot	Aggregate to total HH ag area  sum areas if applied in multiple seasons
Construction	Sum quantity used for inorganic fertilizer across plots by gender of plot manager(s), divide by area planted across those plots. We also calculated but do not report organic fertilizer application rates. Reports estimates by gender of plot manager.					

## Detail by Indicator - Set “B”

### 1. Share of non-farm income in total income

#### 1.1 Non-farm income (exclusive of fishing income)

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Self-employment</b>	For each non-farm enterprise, annual profit = “Wage” multiplied by the number times this wage was received in the past 12 months	For each non-farm enterprise, annual profit = months active * Estimated monthly profit (a net value)	For each off-farm enterprise, annual profit = months active * (Average monthly sales minus estimated expenses)	For each non-agricultural, non-farm enterprise, annual profit = months active * Estimated monthly profit (a net value)	For each non-agricultural, non-farm enterprise, annual profit = months active * Estimated monthly profit (a net value)
<b>Notes</b>			Estimated expenses are captured across categories. This differs from some other surveys.		Months active is asked for more than 12 months, and is not systematically related to time of interview. We’ll take the time interval Feb 15 - Jan 16.  We notice that the earnings reported here are always positive, implying that respondents are not actually providing the net values.
<b>Off-farm agricultural business (captured separately for Tanzania and Nigeria)</b>				Sum across crops the value of total sales of agricultural byproducts  Sum across crops the expenses incurred and the value (imputed) of the quantity of crop used in production.	Sum across crops the value of total sales of agricultural byproducts  Costs are never explicitly captured. We have deducted the value of 1-unit of raw crop for each 1-unit of processed product, with these values capped at the processed-product price reported.
<b>Fish trading (captured separately for Tanzania)</b>				(Weekly sales from fish trading - weekly costs from fish trading) *	

				Weeks in past year engaged in fish trading	
<b>Wage income</b>	For the household and for each wage job undertaken by a household member, annual earnings = Wage multiplied by the number times this wage was received in the past 12 months  Count agricultural wage work separately	For the household and for each wage job undertaken by a household member, wage earnings = months active * Estimated monthly earnings  Count agricultural wage work separately	For each household member, sum income from their main and secondary wage job. Most recent payment per payment period * estimated number of payment periods worked in past year. Add income earned from PSNP.  Count agricultural wage work separately	For each household member, sum income from their main wage job. Most recent payment per payment period * estimated number of payment periods worked in past year.  Count agricultural wage work separately	For each household member, sum income from their main and secondary wage job that was active within the past 7 days. Most recent payment per payment period * estimated number of payment periods worked in past year. If individual did not work in past week, annual earnings from one additional wage job is captured. Count agricultural wage work separately
<b>Notes</b>	Captured at household, not individual-level.	Captured at household, not individual-level.	If payment period is less than a month, estimate number weeks worked. If less than a week, estimate number of days worked (assuming 8-hour workday) or number hours worked. An annual payment period is taken as the annual payment, regardless of number months worked.	Not enough information to estimate earnings from a secondary job. Respondents were only asked their most recent payment/payment period and the number of hours worked in past week, not the months/weeks worked over past year.	This differs from other surveys which allow up to two wage jobs, even if they were not active in the past 7 days.
<b>Assistance income (formal)</b>	Not captured.	Amount received over previous 12 months from PSNP, food aid, food-for-work (valued), and other. Estimated as months received * average monthly amount.	Amount received over previous 12 months from PSNP, food aid, food-for-work (valued), and other.	Amount received over previous 12 months from food aid, food-for-work (valued), scholarships, and other.	Amount received over previous 12 months from food aid, food-for-work (valued), scholarships, and other.
<b>Remittances and informal transfers</b>	Amount received from remittances of migrants over previous 12 months.	Amount received over previous 12 months from relatives/friends. Estimated as months received * average monthly amount.	Amount received over previous 12 months from relatives/friends in the form of cash, food (valued), or other in-kind assistance (valued).	Amount received over previous 12 months from relatives/friends in the form of cash or other in-kind assistance (valued).	Amount received only from OVERSEAS remittances over previous 12 months from relatives/friends in the

	Assistance and other income sources are not captured.	It's not clear from the enumerator manual whether in-kind assistance is valued.			<p>form of cash or other in-kind assistance (valued).</p> <p>It seems like an oversight that this is limited to overseas transfers. Foreign currencies are valued at the June 5, 2015 exchange rate.</p>
<b>Land rental income</b>	Sum of revenue from renting out plots in three time intervals (pre-Kharif, Kharif, and Rabi).	<p>Sum of revenue from renting out plots in Belg or Meher seasons.</p> <p>If time unit for rental is a season, we are not assuming it was rented for two seasons. These seasons seem to overlap.</p>	<p>Captured within amount received over previous 12 months from rental of buildings, tools, land, and transport animals.</p> <p>This is captured in the agriculture module, though it seems <i>not possible</i> (I think) to value the income from sharecropping out land. "Other income" also includes land rental, but we assume these don't overlap (i.e., we've summed both values).</p>	Sum of revenue from renting out plots in main and short season.	<p>Sum of revenue (in cash and in-kind, valued) from renting out plots within the past year.</p> <p>Year of rental = 2015 (earlier years are dismissed)</p>
<b>Other income (sales of items or real estate; rental of buildings, tools, draft animals; inheritance; pensions and investments)</b>	Not captured.	<p>Sum of estimated annual income from pensions and miscellaneous rentals. Plus the sum of estimated income from caring for other households' animals (in cash and valued in-kind). Plus income from ox rental, camel rental, and cow rental.</p> <p>No "other" category. Income from caring for other animals is not explicitly captured in other surveys.</p>	<p>Sum of estimated annual income from pensions, investments, sales, miscellaneous rentals, and inheritance.</p> <p>Income from renting out animals is captured in livestock module. This may also be aggregated into the "other income" estimates, but we assume these don't overlap (i.e., we've summed both values).</p>	Sum of estimated annual income from pensions, rentals, and "other".	<p>Sum of estimated annual income from investments, rentals, and "other".</p> <p>This data set also captures income from gathering forest products. However, because the values are often negative (suggesting enumerators didn't understand the module), we don't include it.</p>

<b>Indicator Construction</b>	<p>Non-farm income = Net income from self-employment + earnings from non-agricultural wage work + income from other sources, remittances, and other assistance + land rental income + net income from fishing (except fish ponds).</p> <p>Farm income = Net crop income + net livestock income + net income from fish ponds + earnings from agricultural wage work (construction of net crop income and net livestock income detailed below - these are separate indicators)</p> <p>Farm income is defined to include income from agricultural activities either on- or off- the household farm, so includes agricultural wage work. Income from agricultural processing/by-products and farm asset or livestock rental/care is counted as non-farm income. Fixed costs in crop production (e.g. purchase of a tractor or land) are not generally recorded in the instruments, and following RuLIS we do not attempt to net them out from the crop income indicator. Livestock purchases are netted out of livestock income, following RuLIS, which though we think this poses some consistency problems.</p> <p>Total income = non-farm income + farm income</p> <p>If total income is negative for a HH, this indicator will be undefined. If total income is positive but the numerator is negative, we will follow the RuLIS approach of setting negative numerator categories to zero and scale the remaining shares so they sum to one (e.g., this indicator will take a value of 0 if non-farm income is negative but total income is positive)</p> <p>Separately report total income, total non-farm income, and total farm income to better illustrate differences in numerator and denominator. Report separately by gender of the head of household. Non-farm income / Total income</p>				
<b>Notes</b>	<ul style="list-style-type: none"> <li>-self-employment income is based on wages (gross)</li> <li>-assistance income not included</li> <li>-remittances are specified as received from migrants</li> <li>-fishing income is not net of expenses; exclude income from fish ponds</li> </ul>	<ul style="list-style-type: none"> <li>-self-employment income is based on estimated profit (net)</li> <li>-other income sources includes pensions, misc. rentals, caring for other HH's animals</li> <li>-fishing income not included</li> </ul>	<ul style="list-style-type: none"> <li>-self-employment income is based on sales minus expenses (net)</li> <li>-other income sources include pensions, investments, sales, misc. rentals, and inheritance</li> <li>-fishing income not included</li> <li>-To our understanding, Ethiopia LSMS might be overlooking seasonal income from the Belg season.</li> </ul>	<ul style="list-style-type: none"> <li>-self-employment income is based on estimated profit (net)</li> <li>-asks about income from sales of ag by-products (net)</li> <li>-fish trading included separately</li> <li>-other income sources include pensions, rentals, and other</li> <li>-fishing income is net of costs; fish ponds not captured</li> </ul>	<ul style="list-style-type: none"> <li>-self-employment income is based on estimated profit (net)</li> <li>-asks about income from sales of ag by-products (gross)</li> <li>-remittances are specified as received from overseas</li> <li>-other income sources include investments, rentals, and other</li> <li>-fishing income is net of costs; exclude income from fish ponds</li> </ul>

## 1.2 Fishing income (Income from fish ponds derived using the same methods, but counts as farm income)

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Expenses associated with fishing or fish ponds</b>	Expenses associated with fish cultivation were listed in the survey	Not captured	Not captured	Hired labor costs were found in survey instrument but not in the	Hired labor - Fixed payments for hired labor

	instrument but not found in the data set (FishCultivation data file).			<p>data set (section 10 = missing).</p> <p>Boat costs</p> <ul style="list-style-type: none"> <li>- Rental expenditures on boats and gear</li> <li>- Costs of fuel, oil, and maintenance</li> <li>- Other costs (nets, etc.) excluding taxes</li> <li>- Purchases of boats in the past 12 months are captured in the data set and can potentially be deducted, though fixed costs in crop production (the recent purchase of a tractor or a piece of land) are <i>not</i> captured in the data set. Livestock purchases <i>are</i> netted out of livestock income.</li> </ul>	<ul style="list-style-type: none"> <li>- Payments in quantity of fish (will be valued)</li> <li>- Cash from boat revenue</li> <li>- Other in-kind payments (valued by respondents)</li> </ul> <p>Boat costs</p> <ul style="list-style-type: none"> <li>- Rental expenditures on boats</li> <li>- Costs of fuel, oil, and maintenance</li> </ul> <p>Estimated weekly costs of raising fish</p>
<b>Gross revenue from fishing or fish ponds</b>	<p>Per fish species, the amount (in kgs) of production in past 12 months</p> <p>Per-kg price</p> <p>Gross income = observed or imputed per-kg value of sales * quantity of production), summed across fish species</p> <p>Fish ponds = counts as farm income</p>			<p>Per fish species, the amount of fish caught in past 12 months estimated as number weeks spent fishing or raising fish * average number of units caught or harvested.</p> <p>Per-unit value of sales</p> <p>Does not capture fish ponds</p>	<p>Per fish species, the amount of fish caught in past 12 months estimated as number weeks spent fishing or raising fish * average number caught or harvested. (Units are not standardized)</p> <p>Per-unit value of sales</p> <p>Fish ponds = counts as farm income</p>
<b>Notes</b>	Because of the small number of sales, the median per-species imputed price comes			When units caught and units sold don't match, or when a household did not sell fish, we use the	When units caught and units sold don't match, or when a household did not sell fish, we use the

	from the median found in the data set.			<p>median price in the country for the fish species-unit combination.</p> <p>For species-units that are not sold, I've valued the units with that of a similar unit for that species (small heap/ medium heap).</p> <p>"Other" fish that aren't sold cannot be valued with this method.</p> <p>I am assuming a given unit of processed fish can be used to value the same unit of fresh fish.</p>	<p>median price in the country for the fish species-unit combination.</p> <p>For species-units that are not sold, I've valued the units with that of a similar unit for that species (small heap/ medium heap).</p> <p>"Other" fish that aren't sold cannot be valued with this method.</p> <p>Harvested fish are valued at their whole-fish price.</p>
<b>Indicator construction</b>	Summed value of all fish caught (or harvested) minus sum of all operating costs captured in each data set.				
<b>Notes</b>	The way fishing modules are structured, it seems often difficult to value fish income. Weeks fishing are per species and/or per individual, boat costs are per week, we don't know whether fishing across species (or individuals) was sequential or concurrent. It's difficult to value various fish-unit combinations, so not asking respondents to either value their income or estimate the quantities harvested & sold in kgs doesn't necessarily produce a more accurate view of fishing income. The last point also applies to livestock products income (for example, in Nigeria, where units are very diverse).				

## 2. Crop income

### 2.1 Crop expenses

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>EXPENSES</b>	In all income estimates, we consider as operating expenses all explicit costs.				
<b>Hired labor</b>	Daily wage * number days hired, aggregated over the three seasons	Daily wage * number days hired + Additional wages paid (if not paid per day)	Daily wage * number days hired (captured in post-planting and post-harvest survey)	Sum of total wages paid over main and short season	Daily wage * number days hired (captured in post-planting and post-harvest survey) + Value of quantity of crops given as payment
<b>Inorganic fertilizer</b>	Estimated value of all fertilizer used.	Estimated value of all fertilizer used.	Sum of values of urea, DAP, NPS, and other chemical fertilizers	Sum of value of inorganic fertilizer purchased (allowed to list up to 2	Sum of value of inorganic fertilizer purchased (allowed to list up to 2

			purchased + imputed value of fertilizers used but not purchased	types) + imputed value of fertilizers used but not purchased	types) + imputed value of fertilizers used but not purchased
<b>Other chemical inputs</b>	Value of herbicide + value of pesticide	Value of herbicide + value of pesticide	No quantities or values recorded	Value of herbicide + value of pesticide	Value of herbicide + value of pesticide
<b>Manure</b>	Value of organic fertilizer purchased	No value	No value	Value of organic fertilizer purchased  Value of inputs obtained on credit must overlap with value of inputs purchased so is not relevant here.	Value of organic fertilizer purchased + expenditures on transportation  We include fertilizer transport expenditures here. If transport expenditures are captured, it might be because it is relevant only in Nigeria.
<b>Seed</b>	Expenditure on seed purchases	Expenditure on seed purchases	Value of purchased seed (improved or traditional); cost of transport for purchased and free seed	Expenditure on seed purchases  Planting material for permanent and tree crops (cassava, banana) are not captured anywhere.	Expenditure on seed purchases; cost of transport for purchased seed
<b>Land rental</b>	Rental costs incurred	Rental costs incurred  We value the cost of sharecropping arrangements based on the % of crop value produced on the plot.	Rental costs incurred  We value the cost of sharecropping and mixed fixed cost/sharecropping arrangements based on the % of crop value produced on the plot.	Rental costs incurred	Rental costs incurred  It's not clear why this question is asked twice
<b>Rental cost - Agricultural assets</b>	Not captured	Not captured	Rental costs incurred (aggregate value)	Rental costs incurred	Rental costs incurred
<b>Rental cost - Animal traction</b>	Rental costs incurred	Captured within a broader category	Not captured (seems like a big oversight in Ethiopia)	Not captured	Cost is captured per unit of time, it's not easy to estimate overall cost  Cost of feeding the animals
<b>Rental cost - Machine traction</b>	Rental costs incurred  Cost of fuel for own machines	Captured within a broader category	Not captured	Rental costs incurred	Rental costs incurred



Rental cost - Crop storage facility	Rental costs incurred	Not captured (maybe not relevant)	Not captured	Not captured	Not captured
Notes	Crop expenses = Sum of all expenses captured in each survey.				

## 2.2 Crop revenue

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Production</b>	<ul style="list-style-type: none"> <li>Quantity harvested</li> <li>Units for quantity harvested</li> </ul> <p>Crops are specified in production file (i.e., within the category “fruit”), but are not identified so specifically in the sales file.</p>	<ul style="list-style-type: none"> <li>Quantity harvested (already converted to kgs)</li> </ul>	<ul style="list-style-type: none"> <li>Quantity harvested (already converted to kgs)</li> </ul>	<p>Temporary crops: Quantity harvested in kgs Value of harvest (farmer-estimated) Permanent/tree crops: Quantity harvested in kgs</p>	<ul style="list-style-type: none"> <li>Quantity harvested</li> <li>Units for quantity harvested</li> <li>Value of harvest (farmer-estimated)</li> <li>Quantity still to be harvested</li> <li>Units for quantity still to be harvested (not necessarily the same)</li> </ul>
<b>Sales</b>	<p>Price received per kg, for whatever was sold.</p> <p>For garden production, prices are captured per crop-unit combination.</p>	<p>Price received per kg, for whatever was sold.</p>	<ul style="list-style-type: none"> <li>Quantity sold</li> <li>Units for quantity sold</li> <li>Value of sales</li> </ul>	<ul style="list-style-type: none"> <li>Quantity sold in kgs</li> <li>Value of sales</li> </ul>	<p>Sales information is not used to value production.</p>
<b>Conversion files</b>	<p>Units for crop harvested are in kg-bags (e.g., 25 kg bag, 80 kg bag). Without a conversion file, we are assuming that a 40-kg bag = 40 kgs of harvested crop, across all crops.</p>		<p>Conversion file for crop-units to kgs (very long but still very incomplete)</p> <p>Among observations for which we have a conversion unit, we can estimate the price per kg.</p>		<p>Conversion file for crop-units to kgs (very long but still so incomplete that it can’t be used. Respondents were allowed to be very creative in their unit responses.)</p>
<b>Method for valuing crop production</b>	<p>If a household sold the crop this year, its observed sales value is used. Otherwise, the value of crops is imputed using the median per-kg value of observed sales at the smallest geographic unit for which we have at least 10 observations. These include the village, tehsil,</p>	<p>If a household sold the crop, its observed sales value is used. Otherwise, the value of crops is imputed using the median per-kg value of observed sales at the smallest geographic unit for which we have at least 10 observations. These include the kebele,</p>	<p>If a household sold the crop, its observed sales value is used. Otherwise, the value of crops is imputed using the median per-kg value of observed sales at the smallest geographic unit for which we have at least 10 observations. These include the kebele,</p>	<p>For temporary crops, the farmer’s valuation is used.</p> <p>For permanent/tree crops, if a household sold the crop, its observed sales value is used. Otherwise, the value of crops is imputed using the median per-kg value of observed sales at the smallest</p>	<p>The farmer’s valuation of already-harvested is used.</p> <p>For still-to-be-harvested crops, where the unit is the same as for already-harvested, the household’s price-per-unit is used.</p> <p>Where the unit differs, we take the median per-crop-</p>

	<p>district, state, and country.</p> <p>A “crop” here includes “fruit”, “vegetable”. We will treat these as though they are crop categories and use the median values accordingly.</p> <p>For garden production, prices are imputed using the median sales price per crop-unit combination observed in the state (if we have 10 observations) or data set.</p>	<p>woreda, zone, region, and country.</p>	<p>woreda, zone, region, and country.</p> <p>Survey weights are used when estimating median values (across all surveys that have weights).</p>	<p>geographic unit for which we have at least 10 observations. These include enumeration area, ward, district, region, and country.</p>	<p>unit price (farmer-estimated values) observed in the country. Missing observations for already-harvested value are also imputed in this way.</p> <p>Value of harvest is the value already harvested + imputed value still to be harvested.</p>
Notes	<p>Across all countries, crop prices are imputed for the year, not the season.</p>		<p>When we compare estimated kgs of crop harvest with imputed kgs (using number and units of harvest, and a conversion file), the two are well-aligned for larger units (e.g., 50-kg bags). They sometimes diverge for smaller units. However, because the survey requires farmers to quantify harvest using units (not always easy for small quantities of garden production, for example) and the conversion file is also incomplete, I feel the respondent estimates are more appropriate.</p> <p>***We note that Ethiopia LSMS seems to not capture the production of seasonal crops in the Belg season. For example, cereals are never recorded as</p>	<p>When the farmer has sold a crop, her valuation of the total production seems to be well-aligned (in an informal review of the data).</p>	

			harvested at the end of the Belg season (Feb-June). Thus, this may not be a full accounting of crop income for farm-households over the previous year.		
<b>“Other” crops And Missing values</b>	<p>“Other” crops that were not sold by the households have no value using this method. They receive a value of zero so we don’t drop the entire household.</p> <p>For garden production, if there is no observed sale of a crop-unit combination, the value is assumed to be zero so we don’t drop the entire household. (This is rare.)</p>	<p>In this data set, “other” crops are often categorized into subgroups (other legume, other spice...). We will treat these as though they are crop categories and use the median values accordingly.</p> <p>For the odd remaining miscellaneous “other” crops, we have no value using this method. It receives a value of zero so we don’t drop the entire household.</p>	<p>In this data set, “other” crops are categorized into subgroups (other legume, other spice...). We will treat these as though they are crop categories and use the median values accordingly.</p> <p>If a crop is never sold, we have no value using this method. It receives a value of zero so we don’t drop the entire household.</p>	<p>If an “other” crop in the permanent/tree crops file is not sold (has no farmer-provided value), we have no value using this method. It receives a value of zero so we don’t drop the entire household.</p>	<p>Where we don’t have a valuation and otherwise don’t find the crop-unit combination in the data set, we have no value using this method. It receives a value of zero so we don’t drop the entire household.</p> <p>Nigeria LSMS has no “other” crop category.</p>
<b>Crop residue</b>	Not captured	Not captured	Not captured	<p>Sum across crops the value of crop residue sold</p> <p>It’s not clear whether sales of crop residue are captured as off-farm earnings for other surveys, omitted, not relevant, etc.</p>	Not captured
<b>Transportation costs associated with crop sales</b>	Not captured	Not captured	Captured for temporary crops only (section 11 but not section 12)	Captured for temporary crops only (section 5 but not section 7)	Not captured
<b>Value lost post-harvest</b>	Not captured	% lost is captured for some ( <i>but not all</i> ) specific crops.	Respondents report either the quantity and units lost or the percent lost. We’ll take the percent.	Value lost post-harvest is estimated by the respondent. A crude percent is also available (in increments of 10%).	Quantity lost and units for quantity lost are given, but we’ll use the farmer-estimated share lost, since it seems quite difficult to value units in Nigeria.
<b>Notes</b>		However, this is a general question and is inclusive of	Post-harvest losses cover the time period from the	If estimated value lost for a given crop exceeds value	

		crops in storage from an earlier harvest. (The merge is very messy.) We've deducted losses only for crops produced in a given season.	harvest to the survey date. They don't reflect the future amount that will be lost of what has been harvested and stored.	of the crop production, losses are capped at value of production.	
<b>Indicator construction</b>	<p>Value of crop production: Aggregated value of crop production across all crops and seasons</p> <p>Gross crop income: Value of crop production - Transportation costs associated with crop sales - Value lost post-harvest</p> <p>Net crop income = gross crop income - crop expenses</p> <p>Crop expenses are the sum of all explicit crop expenses reported in each instrument (including expenses associated with crop sales). Implicit costs (e.g., household labor, rental value of owned land, recycled seed) are not included.</p> <p>Gross crop income = value of crop production across all seasons - value lost post-harvest</p> <p>Crop production is valued either by respondent's own valuation (if available) or by multiplying quantities produced by the sales values observed by the HH for each crop if they sold that crop. If the HH did not sell a crop that it produced, the value per unit is imputed using the median per-unit value of observed sales at the smallest geographic unit for which we have at least 10 observations (where possible we will convert units to kgs using provided conversion factors). We will treat "other" subgroups of crops as though they were crop categories and use median unit prices to value production. Where we cannot calculate a per-unit price for a given crop-unit combination, we assign a value of 0 to the production of that crop.</p>				
<b>Notes</b>	<ul style="list-style-type: none"> <li>-does not include agricultural asset rental or crop sales transport expenses</li> <li>-includes crop storage rental expenses</li> <li>-does not ask about value lost post-harvest</li> </ul>	<ul style="list-style-type: none"> <li>-does not include organic fertilizer, agricultural asset rental, or crop sales transport expenses</li> <li>-% lost post-harvest captured only for some specific crops</li> <li>-Large outliers in crop prices are removed/imputed using the median value, noting that some respondents seem to provide per-sale (not per-unit) responses.</li> </ul>	<ul style="list-style-type: none"> <li>-does not include pesticide, herbicide, organic fertilizer, animal traction, or machine traction expenses</li> <li>-reports % lost post-harvest by crop</li> <li>-To our understanding, Ethiopia LSMS seems to overlook income from the Belg season (seasonal crops harvested April-August).</li> <li>-Sharecropping costs are estimated using the % of value of crop production.</li> </ul>	<ul style="list-style-type: none"> <li>-does not include permanent/tree crop seed/planting material or animal traction expenses</li> <li>-respondent directly estimates value of production for temporary crops, but not for permanent/tree crops</li> <li>-includes value of crop residue sold</li> <li>-reports value lost post-harvest (cap at value of production)</li> </ul>	<ul style="list-style-type: none"> <li>-does not include crop sales transport expenses</li> <li>-respondent directly estimates value of production for crops still to be harvested, which must be valued separately</li> <li>-reports % lost post-harvest by crop</li> </ul>

### 3. Livestock income

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Gross Revenue (animals)</b>	Value of sales (estimated by respondent)  Value of animals slaughtered, including for own-consumption (estimated)	Number sold (alive or slaughtered) * price per animal  Number slaughtered for own-consumption * price per animal	Number sold (alive) * price per animal  Number slaughtered * price per animal	Number sold *(alive or slaughtered) price per animal  Number slaughtered for own-consumption * price per animal	Number sold (alive or slaughtered) * price per animal  Number slaughtered for own-consumption * price per animal
<b>Notes</b>	Across all surveys, gifts given out receive zero income, so are valued at zero.	Across all surveys (except India animals), and for both livestock and livestock products, prices per animal (or item) are as observed by the household if the household sold this item. If not, the value is imputed using the local median per-animal (per-item-unit) price observed at the smallest geographic area for which we have 10 observations.	Slaughtered animals are valued at the live animal price (imputed median values), unless the observed income from sales of slaughtered animals exceeds that estimate. The number slaughtered for own-consumption is not captured in Ethiopia LSMS.	Slaughtered animals are valued at the live animal price (imputed median values), unless the observed income from sales of slaughtered animals exceeds that estimate.	Survey seems to refer to the <i>agricultural season</i> , not necessarily an entire year. This module was conducted in the post-planting (not post-harvest) survey. There is discrepancy between the time interval indicated in the enumerator manual, paper instrument, and variable labels in the data set.  Given the values that are produced from the data set, it seems clear that we are not capturing the livestock income of agricultural households over the previous year. We are unsure what can be done about this.
<b>Gross Revenue (livestock products)</b>	Value produced of milk, eggs, meat, and other	Estimated annual <i>earnings</i> from milk, dairy, eggs, honey, dung, and other		Value of milk, eggs, honey, and skins produced. Plus the value of dung sold.	Value of milk, eggs, honey, skins, palm wine, and other products (values imputed with observed item-unit sales)
<b>Notes</b>	Due to few sales observations, imputed values (median prices) for livestock prices are at the state and country level.	The survey captures the value of sales, not the amount of livestock products produced. This is an oversight.		Quantity of dung produced can't be valued. In other surveys, this is not asked. However, both dung and draught power would	Mushrooms and hunting cannot be valued  Because the units in this data set are so diverse, and many combinations

	We can't value duck/sheep/pig meat unless we assume their value = goat.			wash out in household-level income estimates as they would also be inputs on the farm.	of item and unit are not observed in the sales, I credited unobserved units as though they were 1-piece, as much as possible.  A number of units don't make sense (e.g. pieces of milk, liters of eggs) and can't be valued
<b>Expenses</b>	Value of livestock purchases (estimated)	Value of livestock purchases (estimated)	Value of livestock purchases (estimated)	Value of livestock purchases (estimated)	Value of livestock purchases (estimated)
			Water	Water	Water
	Fodder	Fodder	Fodder	Fodder	Fodder
	Vaccines		Vaccines	Vaccines	Vaccines
	Treatments		Treatments	Treatments	Treatments
	Hired labor not captured		Hired labor not captured	Hired labor	Hired labor
	Insemination				
	"Other costs"	"All other costs"			
<b>Indicator construction:</b>	<p>Livestock income = Gross income from livestock products (valuing all production of all items captured in each survey) + gross income from livestock (valuing sales and animals slaughtered for own consumption) - expenses on purchased animals - all animal upkeep expenses (all expenses captured in each survey).</p> <p>We do not include "stock variation", the change in value of livestock holdings, except to the extent that it is reflected by counting as positive income the value of livestock sold or consumed and then subtracting the cost of purchasing animals. We could include a "stock variation" proxy as the value of livestock holdings at the time of survey and one year prior at the median local imputed value per-animal, but these values were not estimated by the household to reflect changing herd quality, and per RuLIS guidelines, are then set to 0.</p> <p>Prices per animal (or livestock product) are as observed by the household if the household sold this animal/product. If not, the value is imputed using the local median per-animal (per-item-unit) price observed at the smallest geographic area for which we have 10 observations. Where we cannot calculate a per-unit price for a given product-unit combination, we assign a value of 0 to the production of that product.</p> <p>Slaughtered animals are valued at the live animal price (imputed median values), unless the observed income from sales of slaughtered animals exceeds that estimate.</p>				

	<p>We include all expenses captured in each survey, assuming differences arise because some items are not relevant in a given setting or are covered under an “other” category. This is consistent with the RuLIS technical guidelines, except that expenses don’t always fall neatly into the categories indicated in the guidelines.</p> <p>A side note on Tropical Livestock Units: Where livestock are recorded that don’t have coefficients, we’ve made an educated guess of the appropriate value (e.g. a goat is approximately equivalent to a sheep). The exception is beehives, which we exclude for now for lack of any coefficient to assign.</p>				
<b>Notes</b>	<p>-we value duck/sheep/pig meat by assuming their value is the same as the value for goat meat</p> <p>-does not capture water or hired labor expenses but does count “other costs”</p>	<p>-only reports the value of livestock products sold, not the amount of livestock products produced</p> <p>-does not capture water, vaccine, or treatment expenses, but does count “all other costs”</p>	<p>-does not capture number of animals slaughtered for own consumption</p> <p>-does not capture hired labor expenses</p>		<p>-The survey seems to refer to the <i>agricultural season</i>, not necessarily an entire year. This module was conducted in the post-planting (not post-harvest) survey. There is a discrepancy between the time interval indicated in the enumerator manual, paper instrument, and variable labels in the data set. Given the values that are produced from the data set, it seems clear that we are not capturing the livestock income of agricultural households over the full previous year.</p>

#### 4. Per Capita Income

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Total household income</b>	Crop income + Livestock income + Non-farm income (from self-employment and agricultural businesses, wage employment, other income, and transfers) + Agricultural wage earnings Note: Crop, livestock, self-employment/ag business incomes are NET values				
<b>Household size</b>	Number of individuals considered to be members of the household, per the definition applied in each survey.				
<b>Notes: Household member definitions</b>	Definition of a household is not provided	A household is defined as a group of people who	A household is defined as residents that have a	A household is defined as those who share the meal	All persons who usually eat and sleep in the

		normally live and eat their meals together, sharing expenses. More specifically, household members have to meet at least one of the following criteria: • Has lived with and eaten with the household (sharing expenses) for at least six months of the past year and continues to do so, OR • Has joined the household within the past six months and now lives and eats with the household, sharing expenses.	common housekeeping arrangement with a common household budget.	in the household and contribute to the household income.	dwelling are considered to be household members. Generally, persons that have been away from the household for more than six months are not considered to be household members.
<b>Indicator construction</b>	<p>Per capita income = total household income / household size</p> <p>Total household income is defined as above (under share of non-farm income in total income). Household size is the number of individuals considered to be members of the household, per the definition applied in each survey.</p>				

## 5. Land productivity

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Value crop production</b>	See table for “Crop Income” above. Value of crop production: Aggregated value of crop production across all crops and seasons → This is an annual value.				
<b>Land size</b>	Sum of areas of plots that were cultivated by the household at some point in the previous year.				
<b>Indicator construction</b>	<p>Value of crop production (across all seasons/over the previous year) / Area used for crop production (ha)</p> <p>See RuLIS indicator #2 for calculation of the value of crop production across all crops and seasons</p> <p>Area used for crop production (ha) includes owned and rented-in land used for crop cultivation in any season in last year (sum of plot areas).</p> <p>Weight using HH weights*area used for crop production (to estimate the productivity of an average hectare of land used for crop production in the country, not just an average farm)</p> <p>Report separately by gender of the head of household. This variable is called “Land productivity - Farm level”.</p>				



	<p>We also calculate this variable at the plot-level: Value of crop production on the plot (across all seasons/over the previous year) / Plot area (ha). This is reported by gender of plot manager (all female, all male, or mixed if reporting more than one), replacing with gender of HoH if plot manager not reported. This variable is called “Land productivity - Plot level”.</p> <p>Weight using HH weights*plot area (to estimate the productivity of an average hectare of land used for crop production in the country, not just an average farm)</p>
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## 6. Labor productivity

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Value crop production</b>	See table for “Crop Income” above. Value of crop production: Aggregated value of crop production across all crops and seasons → This is an annual value.				
<b>Hired labor</b>	Number days * Number individuals hired (including men and women)	Number days	Number days * Number individuals hired (including men, women, and children)	Number days * Number individuals hired (including men and women)	Number days * Number individuals hired (including men, women, and children)
<b>Family labor</b>	Number days * Number individuals working on farm (including men and women)	Not captured	Number weeks * Number days/week, summed over up to <b>four</b> household members	Number days, summed over up to <b>six</b> household members	Number weeks * Number days/week, summed over up to <b>four</b> household members for post-planting survey, and up to <b>eight</b> household members for post-harvest survey
<b>Other labor (free/exchange)</b>	Not captured	Not captured	Number individuals * number days	Not captured	Not captured
<b>Labor applied on the farm</b>	Sum of hired labor days and family labor days, summed over all relevant seasons. We won’t distinguish between man-days, woman-days, and child-days because these aren’t distinguished in all surveys, and because we have no ready method to weight them as “man-equivalents”.				
<b>Indicator construction</b>	<p>Value of crop production (across all seasons/over the previous year) / labor applied on the farm (days)</p> <p>See indicator #2 for calculation of the value of crop production across all crops and seasons</p> <p>Labor applied on the farm: Sum of agriculture hired labor days, family labor days, and exchange labor days summed over all relevant seasons. We do not distinguish between man-days, woman-days, and child-days because these aren’t distinguished in all surveys, and because we have no ready method to weight them as “man-equivalents”.</p> <p>Weight using HH weights*labor days (to estimate the productivity of an average day of labor in the country, not just an average farm)</p>				

## 7. Average household farm size

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Area units</b>	Local, local units equal to 1 hectare	Local, converted hectares	Local units, sq. meters (GPS)	Acres, sq. meters (GPS)	Local units, acres (GPS)
<b>Type of land</b>	Annual crops, tree/perennials, livestock, wood lots/forest, fallow, unused land, other	Annual crops, tree/perennials, livestock, wood lots/forest, fallow, unused land, other	Cultivated and uncultivated land; cultivated, pasture, fallow, forest, land prepared for belg season, home/homestead, other	Cultivated, fallow, forest, other (specify)	Left fallow, forest/woodland, pasture, other (specify)
<b>Source of reported area</b>	Farmer reported	Farmer reported	Farmer reported, GPS	Farmer reported, GPS	Farmer reported, GPS
<b>Weights</b>	Uses survey weights, regionally representative	No weights included, not nationally representative	Uses survey weights	Uses survey weights	Uses survey weights
	-Farmer reported area, convert to ha	-Farmer reported area, already converted to ha	-Use GPS area, convert to ha. For fields without GPS measurements, this is estimated using the median per-unit area at the smallest geographic level with at least 10 measured observations, multiplied by the number of units.	-Use GPS area, convert to ha, use farmer reports for missing areas -All farmer reports are given in acres, not other units	-Use GPS area, convert to ha. For plots without GPS measurements, this is estimated using the median per-unit area at the smallest geographic level with at least 10 measured observations, multiplied by the number of units.
<b>Construction</b>	<p>Weighted mean of HH total agricultural land (ha).</p> <p>The RuLIS indicator measures total landholding rather than farm size, and therefore includes land used for forests, pasture, and non-agricultural land. Based on our discussion, we define farm size to only include land used for agricultural purposes. We therefore include owned and rented-in land used for agriculture (cultivated land, land prepared for next agricultural season / fallow land, pasture land). Exclude rented-out land and other non-agricultural land (to distinguish this from a measure of total landholding). Non-agricultural uses include forest/virgin land and the homestead. Use GPS area when available and farmer reported otherwise (see dataset-specific differences above).</p>				

## 8. Proportion of ~~SHF~~ rural farm HHs with livestock using vaccines

India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
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Level of aggregation	Species (all, some, none)	Species (all, some, none)	Species (all, some, none)	Species (all, some, none)	Species (count)
Time frame	In last 12 months	In last 12 months	In last 12 months	In last 12 months	Currently vaccinated
Construction	# of rural livestock farm HHs with at least 1 livestock vaccinated in the last 12 months/# of rural farm HHs with any livestock, weighted				

## 9. Proportion of ~~SHF~~ rural crop farm HHs using inorganic fertilizer

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
Included fertilizers	-specifically asks about Urea, DAP, NPS, other	-specifically asks about Urea, DAP, NPS, other	-specifically asks about Urea, DAP, NPS, other	-asks generally about inorganic fertilizer, allows respondents to give details about two types	-specifically asks about DAP, UREA, TSP, CAN, SA, NPK, MRP, other -use data from both post-planting and post-harvesting instruments
Question construction	Was used	Was used	Was used	Was used since beginning of season	First and second type used
Level of aggregation	plot	plot	plot	plot	plot
Construction	# of rural crop farm HHs using any amount of inorganic fertilizer on at least 1 plot (in any season)/ total # of rural crop farm HHs, weighted  In the denominator, we only include HHs with cultivated area > 0 (defined as crop farm HHs). Report separately by gender of the head of household.				

## 10. Proportion of ~~SHF~~ rural crop farm HHs using improved seed

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
Seed types	traditional, hybrid, High-yielding, don't know, other	No question found	regular, improved	improved, traditional, improved recycled, other/specify  does not ask for tree/fruit/root crops	hybrid, improved, traditional, local
Level of aggregation	plot	-----	Field, total seeds	plot	plot
Question formation	Seed used	-----	Seed used	Main seed used, type of seeds used from previous season	Seed used

<b>Construction</b>	<p># of rural crop farm HHs using any amount of improved seed for any crop (in any season)/ total # of rural crop farm HHs, weighted. Assume that crops where seed information is not specified do not use improved seed.</p> <p>Include improved, hybrid, and high-yielding seeds as “improved”, including recycled (saved and re-used) seeds of these types. In the denominator, we only include HHs with cultivated area &gt; 0 (defined as crop farm HHs).</p>
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## 11. Proportion of SHE rural farm HHs reached by all extension (public and private)

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Extension providers</b>	govt ext, private ext, NGO, radio, video, phone;	ECX signboard, extension service/DA, coop staff, ECX interactive voice response, newspaper, radio, tv; extension, coop	-----	Govt extension, NGO, co-op/farmer's association, radio, publication	gov't ext, private ext, govt fishing ext, NGO, coop/farmer's assoc, fishing coop, field school, village ag ext meeting, ag extension course, electronic media, paper media
<b>Areas of assistance</b>	seeds, fertilizer, diseases, land management, post-harvest, sales/marketing, fish, livestock, livestock diseases, breeding	crop production methods, crop markets and prices, livestock production; who provide combine harvester services	Is plot under extension program, participation in extension	Seeds/planting, fertilizer, land management, agro-processing, marketing, fishing, livestock, livestock diseases prevention, ag prices	New Seed Varieties, Pest Control, Fertilizer Use, Irrigation, Composting (Manure), Marketing/Crop Sales, Growing/Selling Tobacco, Access to Credit, Forestry, General Animal Care, Animal Diseases / Vaccination, Fishery Production, Other (specify)
<b>Misc</b>		Asks about main sources			Asks in planting and harvesting instruments Asks about main sources
<b>Extension types</b>	Include explicit extensions: govt extensions, private extensions, and their related services/programs Include quasi-extensions: NGOs, farmer associations, co-ops, Ethiopian Commodity Exchange, field school Include media: electronic, video, paper (assuming that information is provided by extension programs)				
<b>Construction</b>	# of rural farm HHs who have received information from or used extensions service from any source/total # of rural farm HHs, weighted.				

This measures those receiving (and in some cases using) extension services, not the presence of extension services in an area. Include all private and government-related extension services in numerator. In the denominator, we include as rural farm HHs any HHs with any crop production, livestock, livestock production, or income from crop or livestock/livestock product sales. Report separately by gender of the head of household.

## 12. Proportion of SHF rural farm HHs using *formal* financial services

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Financial services</b>	Access to services, bank account, MM, insurance (crop, livestock, life, health)	Credit/loan, mobile money, bank account, agricultural insurance	Account, saving, credit for enterprise, insurance (general)	Loan, DFS money transfer, bank account	Credit for business, bank account, loan, insurance (self or property), mobile banking activities; used co-op, saving assoc, microfinance institution
<b>Providers</b>	Bank, DFS	money lender, cooperative, bank, SACCO, Iqub, MFI, VSLA, others	bank, microfinance institution, SACCO, mobile banking, or other institution;	commercial bank, micro-finance unit, building soc/mortgage, insurance companies, other financial institution, money lender, employer, NGO; DFS	bank loan, money lender, esusu, other loan, coop/trade assoc, other;
<b>Construction</b>	<p># of rural farm HHs using at least 1 type of financial services/total # of total rural farm HHs, weighted.</p> <p>Include loans (general or for enterprise activity), credit, savings, accounts, MM use (regardless of account status), and insurance (of any type) in numerator if they are used. Do not include if HHs have access to services but do not use them. For loans, only include in numerator if SHF has received loan, not if they have only applied for loan. Include services only from formal institutions including banks, mortgage companies, microfinance institution, insurance company, and other formal institutions, but not from informal institutions including NGOs, money lenders, and village or social savings/loan providers (SACCO, esusu, etc). Inclusion of informal services yield very high percentages</p> <p>In the denominator, we include as rural farm HHs any HHs with any crop production, livestock, livestock production, or income from crop or livestock/livestock product sales</p>				
<b>Notes</b>	Only includes banks and DFS as providers	Includes formal and informal service providers	Includes formal and informal service providers	Includes formal and informal service providers	Includes formal and informal service providers

### 13. Average daily wage in agriculture

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Activities</b>	Reports wage for a detailed set of activities (12). Group these activities in two: i) pre-planting + planting + other non-harvesting (land preparation, Nursery and planting, transplanting /planting, application of chemical fertilizer/organic fertilizer, application of pesticide, irrigation Weeding) and ii) harvesting + threshing (bundling, threshing, and drying). Exclude transporting since none of the other instrument has this activity.	Does not disaggregate wage by type of activity.	Activities already grouped in two: i) pre-planting + planting + other non-harvesting (land preparation, planting, ridging, weeding and fertilizing) and ii) harvesting + threshing (does not include transportation).	Activities already grouped in two: i) pre-planting + planting + other non-harvesting (land preparation, planting, ridging, weeding and fertilizing) and ii) harvesting + threshing (does not include transportation).	Reports wage from three groups of activities that need to be further grouped in tow to be consistent with other instruments as follows: : i) pre-planting + planting + other non-harvesting (land preparation and planting, ridging, post-planting and pre-harvesting) and ii) harvesting + threshing.
<b>Differentiation by gender and age</b>	Separate wage for men and women. No information for children	No gender differentiation; also cannot estimate wage for children	Separate wage for men, women, and children (<15)	Reports amount of hired labor: man days, women days, and children days, but total wage paid (no by group). Need additional assumptions to estimate wage by gender and for children (some adult equivalent conversion formula for farm labor). The interviewer manual seems to have suggested to enumerators to assume women and men are paid the same wage and that children (<15) are not-paid helpers (see	Separate wage for men, women, and children (<15)

				interviewer_manual_nps_y4_english_final p: 123-124).	
<b>Average daily wage</b>	Weighted average of wage for each group with the weights being the number of men/women-days	Directly available in the data	Weighted average of wage for each group with the weight being the number of men/women/children-days	Total wage paid/(man days + women days)	Weighted average of wage for each group with the weight being the number of men/women/children-days
<b>Multiple seasons</b>	Does not report by season	Reports for Belg and Meher seasons (but Meher season represents 99.52 % of observations)	Does not report by season	Reports for both LRS and SRS (but hired labor is used on only 258 plots during the SRS)	Does not report by season
<b>Level of aggregation</b>	Plot	plot	plot	plot	plot
<b>Construction</b>	Average daily wage across all activities for hired labor (including value of in-kind payments if specified). For instruments reporting on multiple seasons, we only use information from the primary agricultural season. In the ETH baseline, Meher represents 99.52% of observations, and in TZ LSMS-ISA, hired labor is only used on 258 plots in the SRS.  Report when possible wage by gender of workers.				
<b>Notes</b>	-take average of wages by each type of laborers, weighted by number of days worked by each type	-disaggregation by activity not possible -disaggregation by gender not possible -average daily wage directly reported	-take average of wages by each type of laborers, weighted by number of days worked by each type	-disaggregation by gender not possible -take average of wages across all laborers	-take average of wages by each type of laborers, weighted by number of days worked by each type

#### 14. Value of crop ~~used for own consumption~~ sold, share of total value of crop production

	India Baseline	Ethiopia Baseline	Ethiopia LSMS	Tanzania LSMS	Nigeria LSMS
<b>Quantity harvested</b>	Reports harvest in kilograms.	Quantity harvested converted to kilograms and included in raw data	Use farmer reported units with conversion factor (farmer estimate in kg is also given in survey).	Reports harvest in kilograms.	Use farmer reported units with conversion factor (Quantity harvested in kg not included or asked for in survey).
<b>Consumption by HH members</b>	Quantity of crop consumed at home in kg	Quantity of crop consumed at home in farmer reported units. Use conversion factors from harvest data	Quantity of crop consumed at home in farmer reported units. Use conversion factors from food and crop conversion file	Quantity of crop consumed at home in kg	Quantity of crop consumed at home in farmer reported units. Use conversion factors from food and crop conversion file

<b>Animal feed</b>	Quantity of crop used as feed for animals in kg	Quantity of crop used as feed for gifts, barter, & other in in farmer reported units. Use conversion factors from harvest data	Quantity of crop consumed at home in farmer reported units. Use conversion factors from food and crop conversion file	Quantity of crop used as feed for animals in kg	Quantity of crop consumed at home in farmer reported units. Use conversion factors from food and crop conversion file
<b>Gifts/donations</b>	Not available	Quantity used as feed for animals in in farmer reported units. Use conversion factors from harvest data	Quantity consumed at home in farmer reported units. Use conversion factors from food and crop conversion file	Quantity used for gifts in kg	Quantity consumed at home in farmer reported units. Use conversion factors from food and crop conversion file
<b>Quantity stores for as seed for the next season</b>	Reports quantity stored to be used as seed	Reports quantity stored to be used as seed	Reports quantity stored to be used as seed	Reports quantity stored to be used as seed	Reports quantity stored to be used as seed
<b>Stock from previous harvest</b>	Reports stock from previous harvest	Does not report stock from previous harvest	Does not report stock from previous harvest	Does not report stock from previous harvest	Does not report stock from previous harvest
<b>Post-harvest loss</b>		Share of harvest	Quantity and share of harvest	Quantity and value	quantity and share of harvest
<b>Crop sales prices</b>	Reports unit price for sold crops	Reports unit price for sold crops	Estimate unit value of sold crop as total value of sales / amount of sold crop in kg	Estimate unit value of sold crop as total value of sales / amount of sold crop in kg	Estimate unit value of sold crop as total value of sales / amount of sold crop in kg
<b>Multiple seasons</b>	Sum across all seasons	Sum across all seasons	Does not report by season	Sum across all seasons	Does not report by season
<b>Level of aggregation</b>	crop	crop	crop	crop	crop
<b>Weights</b>	Uses survey weights, regionally representative	No weights included, not nationally representative	Uses survey weights	Uses survey weights	Uses survey weights
<b>Construction</b>	<p>We report on value of crop sold as of the survey date, as this can be calculated directly from the instruments, while value of crop used for own consumption would have to inferred by subtracting value of crop sales and estimates of value of crop stored, bartered, or lost post-harvest from the total value of crop production.</p> <p>See RuLIS indicator #2 for calculation of value of crop production across all crops and seasons.</p>				



Note: Tropical Livestock Unit Coefficients (from FAO Guidelines)

HGT-V: Cells in gray are not valued. Blue = Our best guess. Orange = A rough average of coefficients because the category is aggregated.

Ethiopia LSMS			Tanzania LSMS		
livestock_name	livestock_code	tlu_coefficient	livestock_name	livestock_code	tlu_coefficient
Bulls	1	0.5	Bulls	1	0.5
Oxen	2	0.5	Cows	2	0.5
Cow	3	0.5	Steers	3	0.5
Steers	4	0.5	Heifers	4	0.5
Heifers	5	0.5	Male calves	5	0.5
Calves	6	0.5	Female calves	6	0.5
Goats - He	7	0.1	Goats	7	0.1
Goats - She	8	0.1	Sheep	8	0.1
Goats- Kids	9	0.1	Pigs	9	0.2
Sheep - Rams	10	0.1	Chickens	10	0.01
Sheep - Ewes	11	0.1	Ducks	11	0.01
Sheep - Lambs	12	0.1	Other poultry	12	0.01
Camels - He	13	0.7	Rabbits	13	0.01
Camels - She	14	0.7	Donkeys	14	0.3
Camels - Kids	15	0.7	Dogs	15	
Chicken - cocks / broilers	16	0.01	Other	16	
Chicken - hens	17	0.01			
Chicken - layers	18	0.01			
Chicks	19	0.01			
Horses	20	0.5			
Mules	21	0.6			
Donkeys	22	0.3			
Bee Colony	23				

Nigeria LSMS			Ethiopia AgDev			India AgDev		
livestock_name	livestock_code	tlu_coefficient	livestock_name	livestock_code_	tlu_coefficient	livestock_name	livestock_code	tlu_coefficient
CALF FEMALE	101	0.5	Ox / bull	81	0.5	Buffalo	1	0.5
CALF MALE	102	0.5	Cows / calves	82	0.5	Desi dairy cattle	2	0.5
HEIFER	103	0.5	Horse/donkey/ mule	83	0.5	Improved/Exotic/Crossbred dairy cattle (over 2 years)	3	0.5
STEER	104	0.5	Camel	84	0.7	Non-milking cattle (bulls & bullocks) (over 2 years)	4	0.5
COW	105	0.5	Goats	85	0.1	Heifers/Calves (Under 1 year)	5	0.5
BULL	106	0.5	Sheep	86	0.1	Heifers/Calves (Under 1-3 years)	6	0.5
OX	107	0.5	Pigs	90	0.2	Heifers/Calves (over 3 years)	7	0.5
DONKEY	108	0.3	Chickens	87	0.01	Goats	8	0.1
HORSE	109	0.5	Other livestock	88		Sheep	9	0.1
GOAT	110	0.1	Honey bees	89		Chicken	10	0.01
SHEEP	111	0.1				Ducks	11	0.01
PIG	112	0.2				Pigs	12	0.2
CHICKEN-LAYER	113	0.01						
CHICKEN-LOCAL	114	0.01						
CHICKEN-BROILER	115	0.01						
CHICKEN-COCKERY	116	0.01						
TURKEY	117	0.01						
DUCK	118	0.01						
RABBIT	119	0.01						
GUINEA FOWL	120	0.01						
FISH	121	0.01						
CAMEL	122	0.7						
OTHER (SPECIFY)	123							