1. **Executive summary**

The objectives of the FY19 Amalima participant-based survey was to provide information on achievements of program agricultural outcome indicators over the period October 2018 to September 2019. The survey focused on the 18 outcome indicators[[1]](#footnote-1) that are reported at farmer and/ or household level. CNFA used the information from the survey for management decision making including revising of FY20 indicator targets for the program. The survey results were also used for reporting to FFP.

The main findings of the study were:

* 96% (64,312) of trained farmers adopted at least one improved technology or management practice[[2]](#footnote-2) in FY19; with 77,702ha of land put under at least one technology or management practice[[3]](#footnote-3). 80.7% (54,011) of trained farmers adopted at least five improved technologies or management practices[[4]](#footnote-4).
* 69.5% (46,482) of trained farmers participated in at least one value chain activity[[5]](#footnote-5). Main value chain activities included value added processing and use of improved agricultural inputs on cattle, goats and horticulture.
* 71.8% of dryland farmers (35,391) produced a crop combination conducive to preparation of a healthy plate i.e. rich in the four food groups (energy, protein, oils and fats, and vitamins and minerals)[[6]](#footnote-6).
* 45,447ha of improved small grains (sorghum and millet) was grown compared to the baseline (FY14) by 24,101 households in FY19. However, yields of small grains were low, at 0.1 and 0.14 tons/ha for sorghum and millet, respectively, due to drought in the program area during the 2018/19 season. Irrigated maize yields were also low at 3.14 tons/ha, possibly due to fall army infestation and shortage of irrigation water.
* 48.6% (9,618) of farmers who bought seed and/or fertilizer for dryland crop production, purchased the agricultural inputs before the expected start of the rains (before end of October 2018).
* Calving rate was 61% while kidding rate was 72% among program participants. Both rates were below target (75% and 120% respectively) possibly due to the drought that affected grazing and water resources for livestock.
* 36% of cattle (2,041) and 11% of goats (11,535) were sold in formal markets in FY19. This is much lower than the target of 75% for cattle and 40% for goat, and possibly reflects challenges of lack of cash and inflexible payment terms in the formal market in FY19.
* Incremental sales and Gross Margins for cattle and goats and horticultural crops were positive but generally below target in FY19. While this may reflect low productivity and pricing difficulties due to changing foreign currency policy, it may also be a reflection of poor record keeping on the part of program participants.

**Introduction**

Amalima is a 7-year $60,616,306 USAID Food for Peace (FFP) program that started in June 2013 and was initially planned to end in June 2018. In January 2018, Amalima was granted a 2-year extension to September 2020.

The program seeks to improve livelihoods through increased agricultural productivity, income diversification, increased access to markets and strengthened community-managed disaster risk reduction systems. Amalima also seeks to improve household nutrition through improved diets for women and children, improved caring practices for children and improved availability and use of water and sanitation.

Amalima is implemented by a consortium of local and international partners led by CNFA, including International Medical Corps (IMC), the Manoff Group, Africare, Dabane Trust and Organization of Rural Associations for Progress (ORAP).

The program’s goal is to improve household food security and nutrition. Amalima has three strategic objectives (SOs):

* SO 1: Household access to, and availability of food improved
* SO 2: Community resilience to shocks improved
* SO 3: Nutrition and health among pregnant and lactating women; boys and girls under 2 improved.

As of end FY18, the program has benefitted over 86,000 households in the districts of Tsholotsho in Matabeleland North province; Bulilima, Mangwe, and Gwanda in Matabeleland South province in Zimbabwe. A combination of capacity building, training and mentoring, food rations, vouchers, cash/food for assets, matching grants and community-based messaging and mobilization strategies were employed to achieve the results. The program which is in 65 wards in the four target districts, aims for comprehensive coverage in target areas and multiple interventions per household.

Amalima conducts annual participant-based surveys to enable reporting on adoption of improved agricultural technologies and management practices; and for reporting on productivity and profitability of promoted agricultural value chains. Previous participant-based surveys were conducted in FY18.

The primary objective of the FY19 participant-based survey was to assess the status of key FFP and program-specific outcome indicators and to compare the results with the targets for the indicators. The data was also used to estimate FY20 targets for the indicators. Findings of the survey were also used to inform management decision making.

The main audience for the survey was the Amalima program and USAID’s Food for Peace (FFP). The survey findings were used internally by program management to improve programming and decision-making on program interventions. The survey results enabled the program to accurately report achievements to FFP.

The report will begin with an overview of the study methods for the FY19 participant-based survey. The findings from the participant-based survey are presented for 18 FFP and program-specific annual outcome indicators. The 18 agriculture and livelihood outcome indicators covered by the participant-based survey are listed in Table 1.

**Table 1: Indicators for FY19 Participant Based Survey**

|  |  |
| --- | --- |
| Indicator number | Indicator |
| 3 | Irrigated maize yields (Grain) (MT/Hectare) |
| 4 | Sorghum yields (MT/Hectare) |
| 5 | Millet yields (MT/Hectare) |
| 6 | Calving rate among project beneficiaries |
| 7 | Kidding rate among project beneficiaries |
| 8 | Average weight of calves and lambs/kids at weaning (Kg) |
| 10. (4.5.2.2) (FFP -15) | Number of hectares under improved technologies or management practices as a result of USG assistance |
| 11. (4.5.2-5) (FFP-9) | Number of farmers and others who have applied new technologies or management practices as a result of USG assistance |
| 13 | Percentage of targeted farmers who used at least five sustainable agriculture (crop/ livestock and/ or NRM) practice/s and/or technologies in the past 12 months |
| 15 | Number of farmers purchasing inputs in advance through agrodealers |
| 21 | Number of HH growing improved small grain cereal crops as a result of USG assistance |
| 22 | Number of hectares under small grain production as a result of USG assistance |
| 23 | Number of producers growing a crop combination rich in energy, fat, protein, vitamin and minerals |
| 29. (FFP-27) | Number of farmers who practiced value chain activities promoted by the project in the past twelve months |
| 31 | Percentage large stock (of participant farmers) sold through formal market systems |
| 32 | Percentage of small stock (of participant farmers) sold through formal market systems |
| 33. (4.5.2-23) (FFP-16) | Value of incremental sales (collected at farm level) attributed to USG implementation |
| 34. (4.5-4) (FFP-8) | Gross margin in production per unit of land, kilogram, or animals of selected product (GM/ha for crops) (GM/animal for livestock) |

* **Methodology**

**3.1 Study design**

Two surveys were conducted in FY19 –a household survey and a farmer group survey. For each of the surveys, data was collected twice i.e. in April 2019 and in August 2019. The same farmers were interviewed in April and again in August. Upon analysis, data from the April and August surveys were merged and analyzed as one dataset.

**Household survey**

The householdsurvey targeted farmers who received training in Conservation Agriculture (CA) and/or Livestock Management during the period FY14 to FY18. For this survey, two questionnaires were administered. There was a CA questionnaire targeted at CA trainees that looked at adoption of crop technologies and management practices promoted by Amalima. A livestock questionnaire targeted at livestock trainees, looked at adoption of livestock technologies and management practices promoted by Amalima. Both questionnaires included questions on value chain activities, incremental sales and Gross Margins.

The following three indicators were used in the calculation of sample size for the household survey:

* FFP 15: Number of hectares under improved technologies or management practices
* FFP 9: Number of farmers who have applied improved technologies or management practices
* FFP 16: Value of incremental sales (livestock).

The three selected indicators have three different, but related populations. These are 1. farmers trained in conservation agriculture, 2. farmers trained in livestock and/or conservation agriculture (referred to as general agriculture trainees in figure 1 below), and 3. farmers trained in livestock management, respectively. Note that CA and livestock trainees are a subset of the agriculture trainees. See figure 1.

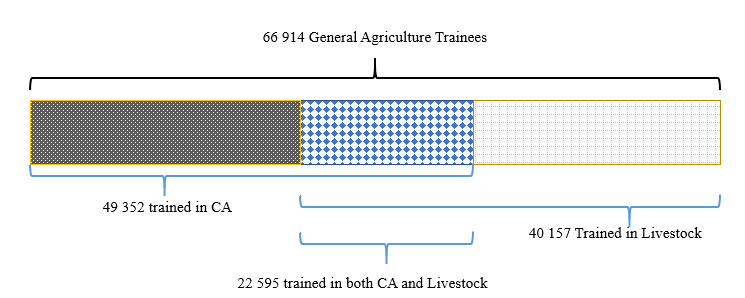


Fig 1: Population for the household survey

**Farmer groups survey**

The farmer groups survey targeted plot holders in gardens and irrigation schemes who received training in irrigated crop production during the period FY14 to FY18. For this survey, a questionnaire on adoption of irrigation crop technologies and management practices promoted by Amalima, was administered. The questionnaire looked at adoption of irrigated crop technologies and management practices, value chain activities, incremental sales and Gross Margins. The farmer group survey used the incremental sales indicator in the estimation of sample size.

A total of 4,288 farmers had received irrigated crop production training during the period FY14 to FY18.

3.2 Sample size calculation

The sample size calculation was done following guidelines given in the Participant-Based Survey Sampling Guide for Feed the Future Annual Monitoring Indicators (September 2018). CNFA used the number of farmers trained (FY14 to FY18), as given in the M&E database, and the approved indicator performance tracking table (FY18 ARR IPTT) targets for selected outcome indicators, to determine the sample sizes.

CNFA used the formula recommended by the Sampling Guide for the estimation of indicators of totals, for estimating sample sizes:

𝑖𝑛𝑖𝑡𝑖𝑎𝑙 𝑠𝑎𝑚𝑝𝑙𝑒 𝑠𝑖𝑧𝑒 = 𝑛𝑖𝑛𝑖𝑡𝑖𝑎𝑙 = 𝑁2∗𝑧2∗𝑠2

𝑀𝑂𝐸2

Where:

*N* = total number of participant farmers

*z* = critical value from Normal Probability Distribution

*s* = standard deviation of the distribution of participant data

*MOE* = margin of error.

**Table 2: Summary –Sample size calculation for household survey**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample Size for Household Survey** | |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **N** | **max** | **min** | **s** | **p** |  | **MOE** | **z** | **n initial** |  |  |  | **n final** |
| **INDICATOR** | **Population of beneficiaries (N)** | **Estimate of maximum (for s)** | **Estimate of minimum (for s)** | **Standard deviation (s)** | **Acceptable percentage error (for MOE)** | **Target value of indicator (for MOE)** | **Margin of Error (MOE)** | **Critical Value (z)** | **Initial Sample Size** | **Finite Population Correction needed?** | **Design effect** | **Non response rate** | **Final sample size** |
| 1. Number of hectares under improved technologies or management practices | 49,352 | 6 | 0.1 | 0.98 | 10% | 59,376 | 5,938 | 1.96 | 257 | No | 2 | 1.052632 | 540 |
| 2. Value of incremental sales (goats) | 40,157 | 120 | 40 | 13.33 | 10% | 631,327 | 63,133 | 1.96 | 276 | No | 2 | 1.052632 | 582 |
| 3. Number of farmers who have applied improved technologies or management practices | 66,914 | 1 | 0 | 0.50 | 10% | 49,000 | 4,900 | 1.96 | 179 | No | 2 | 1.052632 | 377 |

*Sample size for household survey*

From Table 2, for the two indicators in the household survey, (number of hectares under improved technologies and value of incremental sales), CNFA used the standard deviation from the 2018 participant-based survey. The recommended standard deviation calculation of 0.5. A 95% confidence level, a design effect of two, and a margin of error of 10%, was used from the USAID guide for the “Number of farmers and others using improved technologies” indicator.

From the sample size calculation summarized in table 2, there are three proposed samples; 540 for CA trained farmers; 582 for farmers trained in livestock management and 377 for all agriculture trainees. On the ground, because the third sample is a universe of the first two, the samples for CA and livestock were combined to constitute the third sample, giving a minimum sample size of about 1,122 farmers.

*Sample size for irrigation survey*

Table 3 shows sample size calculation for the farmer groups survey. From the table, the final sample size should be fixed at nfinal of 72. Since the calculated sample size is less than 525, a sample size of 525 was adopted for the irrigating groups per Participant-Based Survey Sampling Guide for Feed the Future Annual Monitoring Indicators (September 2018) recommendation.

To determine the number of irrigation groups (m) to be surveyed, the following formula was used:

m = round (n final)/b

Where

m is the number of farmer groups (clusters) to be surveyed.

n final is the sample size from the Value of Incremental Sales Indicator

b is a constant because the irrigation group size is roughly 26.

Replacing the formula (525/26) = 20 farmer groups was selected.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample Size for Household Survey | |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | **N** | **max** | **min** | **s** | **p** |  | **MOE** | **z** | **n initial** |  |  |  | **n final** |
| **INDICATOR** | **Population of beneficiaries (N)** | **Estimate of maximum (for s)** | **Estimate of minimum (for s)** | **Standard deviation (s)** | **Acceptable percentage error (for MOE)** | **Target value of indicator (for MOE)** | **Margin of Error (MOE)** | **Critical Value (z)** | **Initial Sample Size** | **Finite Population Correction needed?** | **Design effect** | **Nonresponse rate** | **Final sample size** |
| Value of incremental sales (horticulture) | 4,288 | 100 | 0 | 16.67 | 10% | 239,496 | 23,950 | 1.96 | 34 | No | 2 | 1.0526316 | 72 |

**Table 3: Summary –Sample size calculation (Farmer Groups Survey)**

3.3 Sampling frame(s) and coverage for participant-based survey

The FY19 participant-based surveys measured indicators for adoption of crop and livestock management practices at the household level. The household survey also measured gross margins and incremental sales related to livestock as well as value chain activities for livestock and crops. The farmer group survey measured performance of gross margins and incremental sales for irrigated crops.

Two stage cluster sampling was used to select beneficiaries for the household survey. The first stage sampling involved random selection of 25 clusters (wards) from the 65 Amalima wards. The selection of clusters was based on probability-proportionate-to-size (PPS) method that ensured that larger clusters (in terms of population of trainees) had a higher likelihood of being selected from the sample frame and smaller clusters had a smaller likelihood of being selected. The second stage involved random sampling (systematic random sampling) of 26 farmers from a list of livestock trainees in each of the 25 randomly selected clusters (sample size 650); plus an additional 23 farmers from a list of CA trainees in each of the 25 randomly selected clusters (sample size 575). Complete participant information organized by cluster and by training received, was available in the Amalima M&E database to create the second stage cluster frame. The Amalima Field Officers based in the sampled wards were asked to clean the lists of trainees before the second stage of sampling. Sampling frames were cleaned to remove the deceased, those who have relocated from the selected wards, and any duplicates. Sanitizing of the sampling frame was designed to reduce nonresponses.

Farmers selected from the livestock trainees list, had a livestock questionnaire administered to them, while those selected from the CA trainees list had a CA questionnaire administered to them. Due to close proximity of CA and livestock trainees (farmers living as neighbors within the same village) and significant overlap between them, the survey of CA and livestock trainees was taken as one combined sample survey with one or two questionnaires administered to respondents, depending on whether they were sampled for CA, livestock or both.

In the case of gardens/irrigation schemes, the first stage frame was gardens and irrigation schemes where farmers had received training from Amalima and were actively producing irrigated crops in the garden/irrigation scheme. 20 groups (gardens or irrigation schemes) were randomly selected from a list of 118 gardens/irrigation schemes. From the selected gardens/irrigation schemes, all trained and active irrigators were interviewed (‘take all’ approach). Interviews were conducted with individual farmers at the garden or irrigation scheme.

3.4 Questionnaires

CNFA used three questionnaires for the survey (see Annex 2). These are:

* 1. Dryland Crops –Adoption of practices (targeted at CA trainees -April and August)
  2. Livestock –Adoption of practices (targeted at livestock trainees -April and August)
  3. Irrigated crops –Adoption of practices (targeted at irrigated crop trainees --April and August).

All three questionnaires had been used in previous surveys (including FY18 Participant based surveys) and only needed minor updating for the FY19 participant-based surveys. The household questionnaires were administered using ODK on tablets, with hard copy backup, while irrigation questionnaires were administered using hard copy only. There were not enough tablet devices to cover both surveys running concurrently.

Enumerators were given translated hard copies of the questionnaires for reference when interviewing respondents. Use of translated questionnaires was meant to ensure uniformity in asking of questions by all the enumerators.

3.5 Fieldwork operations

CNFA hired enumerators (one enumerator per cluster (i.e. ward or garden/irrigation)) to administer questionnaires using face-to-face interviews with farmers. The enumerators were hired from the sampled wards and vicinity of gardens, to conduct the surveys within the same areas. Local enumerators had the advantage of being familiar with the local culture and traditions and were therefore less likely to be refused an interview or given false information. Logistical arrangements for reaching interviewees were also much easier with local enumerators since sampled farmers were often within walking distance. Enumerators were given a list of interviewees for their selected ward. This was a sample of trained farmers in that ward. The list for the household survey clearly indicated whether the sampled farmer was to be interviewed on CA, livestock management or both. At the homestead, the enumerator was required to take GPS coordinates, for the record and to facilitate any revisit. At the selected gardens and irrigation schemes, enumerators interviewed all the trained and active farmers.

Before the surveys, CNFA organized a training of enumerators to take place at district centers over a period of 2 or 3 days. CNFA M&E personnel led the training, beginning with an explanation of survey objectives and sampling design. The training discussed survey ethics as well as how to ask each of the question contained in the questionnaires. The training session included mock interviews among interviewers and discussions of any problems.

Field work started with the Amalima field officer for the ward (program employee based at the ward), introducing the enumerator to community leadership, followed by data collection from village to village. Field work took about three weeks and started immediately after enumerator training in April and August 2019. CNFA M&E staff monitored the data collection in the field. This involved checking responses recorded by enumerators including checking for inconsistency, any missing data etc. The M&E team also conducted re- interviews to confirm responses.

3.6 Data cleaning

For household questionnaires, there was no requirement for data entry as data was collected in ODK and uploaded in Excel for collation and analysis. M&E staff captured data from the garden/irrigated crops survey in Excel for collation and analysis.

Data cleaning involved checking and correcting for duplicate records, checking for data completeness and data validity (e.g. frequency distribution anomalies and out-of-range values) and data consistency.

**3.7 Sampling weights and the treatment of non-response**

CNFA calculated sampling weights for each participant who responded to the survey interview questions. The sample weights for each selected participant were applied to corresponding individual survey data records to inflate the participant data values up to the level of the population of program participants. The sample weights were calculated to account and compensate for:

* Probability of selection at each stage of sampling; and
* Non-response at the individual participant level.

**4.0 Findings**

Annex 1 gives a summary of the findings for 16 indicators covered by the FY19 surveys. The indicator on Incremental Sales is not included in the table as the data for incremental sales is wholly contained in the Gross Margin indicator.

**4.1 Household Survey Results (all trainees)**

Data from the household survey (covering CA, livestock management or both) was used to calculate FFP agricultural indicators on numbers of farmers who applied improved technologies or management practices and numbers of farmers who practiced value chain activities promoted by the project. These are technologies and management practices promoted by the program. Their adoption is expected to directly benefit households by leading to increased food security.

The household survey was completed by 1,093 farmers (898 females, 196 male); i.e. 82 percent female and 18 percent male. In terms of questionnaires, 518 were CA while 591 were livestock management. 19 farmers responded to both CA and livestock questionnaires.

**4.1.1 Number of farmers and others (associations) who have applied new technologies or management practices**

The indicator measures direct participant farmers that applied improved technologies or management practices during the reporting year. Improved technologies and management practices promoted by the program include:

* use of crop genetics (i.e. use of improved crop varieties),
* cultural practices (crop rotation, intercropping, mulching, weed control),
* livestock management (improved animal shelter, vaccination, deworming, castration, dehorning, dipping etc.),
* pest management (e.g., Integrated pest management; appropriate application of green and amber label insecticides and pesticides),
* disease management (for crops and livestock),
* soil related fertility and conservation (micro dosing with fertilizer, use of manure and/or compost),
* water management non-irrigation (e.g. use of dead level contours, infiltration pits etc.),
* climate adaptation (use of conservation agricultural practices for crops including minimum tillage),
* marketing and distribution (contract farming, selling to formal markets, or selling as a group)
* post-harvest handling and storage (improved transportation, bulk transportation etc.) and
* value added processing (grading, packaging etc.).

From the survey, 96.1 percent (64,312) of trained farmers adopted at least one technology or improved management practice. 80.7 percent of trained farmers (54,011) adopted at least five sustainable agriculture (crop/livestock/natural resources management) practices and/ or technologies.

Figure 2 shows a significant over-achievement on almost all promoted practices except marketing and distribution. Adoption of promoted practices was higher than anticipated due to drought conditions and a greater than originally planned number of household asset vouchers. Farmers utilized practices such as intercropping, rotation and mulching after receiving early warning messages of the impending drought. The program distributed 3,209 household asset vouchers, up from the original plan of 600 as a drought mitigation strategy. Through the vouchers, households were able to buy stock feed, farming equipment, livestock chemicals and quality seeds at subsidized prices. Higher voucher beneficiaries meant higher numbers of farmers using improved technologies and practices such as improved seed varieties, supplementary feeding of livestock, use of minimum tillage etc. Marketing and distribution target were under-achieved due to the economic crisis during FY19. FY19 was characterized by fluctuating exchange rates, high levels of inflation, and critical shortages of cash, among other things. Farmers utilized informal markets instead of formal ones in much higher numbers than anticipated.

**4.1.2 Number of farmers who practiced value chain activities promoted by the project**

The indicator measures the total number of farmers that practiced value chain activities promoted by the program. Strong agricultural value chains create livelihoods, increase incomes and promote economic growth. 69.5 percent of farmers (46,482) reported participating in at least one value chain activity. Amalima program promotes value chain activities in horticulture, irrigated maize, cattle and goats. Four value chain stages are considered under this indicator. These include use of improved inputs (e.g. use of quality seeds and fertilizer in crops or use of improved breeds and stock feed in livestock), post-harvest handling (e.g. storage and transportation), value added processing (drying, grading, packaging) and marketing/trading (e.g. contract farming, selling through formal markets etc.). The most common value chain activities practiced were use of improved inputs and value-added processing of produce (including drying of horticulture and meat products). On improved inputs, farmers mainly used drought and /or disease tolerant seed varieties from seed houses and/or from subsidized household asset vouchers. On livestock, farmers bought stock feed from agrodealers and/or from subsidized household asset vouchers. The survey results are shown in figure 3.

Compared to the target of 30,000, the 46,482 farmers practicing value chain activities promoted by the project in 2019, is significantly higher. This suggests that the 2019 target was unrealistic and should have been revised upwards. FY20 targets were revised to reflect this achievement.

**4.2 Household Survey Results (CA trainees)**

Data from CA questionnaires in the household survey was used to analyze the following indicators:

* producers growing a crop combination rich in the four food crops that constitute a healthy plate (energy, proteins, vitamins and minerals, oils and fats).
* hectares under improved technologies or management practices
* yields of sorghum and millet
* farmers purchasing inputs in advance through agrodealers
* households growing improved small grain cereal crops; and
* hectares under small grain production.

The CA survey questionnaire was completed by 518 farmers. Almost all the interviewees (517) planted a crop in FY19. The analysis for the above-listed indicators was based on farmers that planted a crop. Of the 517 farmers who planted, 85 percent were females and 15 percent were male.

**4.2.1 Number of producers growing a crop combination rich in four food groups –energy, fat, protein and vitamin and minerals**

Amalima encourages farmers to maintain a backyard garden where they grow a variety of vegetable crops, over and above their rain fed crops. The program promotes consumption of nutritious and balanced meals from local sources including own production.

From the survey, the most planted crops were maize, groundnuts, round nuts, millet, cowpeas and sorghum (figure 4). Farmers also reported planting pumpkin and vegetables such as tomatoes, onion, leafy vegetables, butternut and carrots in their gardens.

The indicator counts the number of farmers growing a combination of crops covering all the four nutrition classes. **Energy**-rich crops include maize, millet, sorghum, sweet potatoes and Irish potatoes; **Fat**-rich foods include sunflower and groundnuts; **Protein**-rich foods include round nut, sugar bean, cowpea and groundnut; **Vitamin and mineral**-rich foods includes tomato, carrot, onion, green bean, spinach, garlic, okra, pumpkin, butternut, brassicas, indigenous vegetables. The survey found that 71.8 percent (35,391) of CA trainees grew a crop combination rich in the four food groups. This was against a target of 27,200. FY20 targets were revised to reflect this high achievement.

**4.2.2 Hectares under improved technologies or management practices**

The indicator measures the area (in hectares) of land cultivated using program-promoted improved technologies or management practices in FY19. Adoption of improved technologies and management practices promoted by the program is expected to directly benefit households through increased and sustainable production leading to increased food security.

The participant-based survey collected hectares under the following agriculture-related, land-basedtechnologies and innovations:

* Crop genetics: e.g., use of improved/certified seed that could be higher-yielding, higher in nutritional content and/or more resilient to climate impacts
* Cultural practices: e.g., mulching, rotation, weeding, intercropping etc.
* Pest management: e.g., Integrated pest management; appropriate application of green and amber label insecticides and pesticides
* Soil-related fertility and conservation: e.g., use of fertilizers, compost, manure
* Water management: non-irrigation-based e.g., water harvesting i.e. area protected by conservation works such as dead level contours
* Climate mitigation: e.g., conservation agriculture, carbon sequestration through low- or no-till practices

From the survey, 77,702 hectares of land was under at least one technology at farmer level in the program area in FY19. This figure excludes 1,453ha under new technologies at group and community level (association applied). The group-level figure was collected through on-going monitoring of farmer-field school plots and of rehabilitation of grazing lands.

Figure 5 shows that the most popular technologies in terms of area committed by farmers were cultural practices (occupying 82% of area under improved technologies), soil related fertility conservation (46%), crop genetics (46%) and climate adaptation (29%). Cultural practices (rotation, intercropping, mulching or weeding) occupied a lot of land because the practices do not require any significant funds outlay while on the other end, climate adaptation (mainly CA basins) and water management, non-irrigation (involving digging of conservation structures) involved a lot of heavy manual labor and therefore occupied less land.

Compared to set targets, Figure 6 shows that the program significantly overachieved on all the six promoted technologies or management practices. FY20 targets were revised in line with this achievement.

**4.2.2 Small grain production**

The program promotes growing of improved small grains including sorghum and millet. The promotion is through training and demonstrations as well as availing of improved seeds through subsidized household asset vouchers. Small grains are drought tolerant and can withstand low rainfall levels typical of most of the program area. The indicators for measuring uptake of small grains include increase in the number of households growing improved varieties of small grain crops, increase in area grown to small grains, as well as increase in yields of the small grain crops. Increased production of small grains is expected to lead to increased household food security.

*Households growing improved small grains*

The FY19 survey found that 21,101 households grew improved small grains. This figure is significantly higher than the 2019 target of 11,000. This over achievement was driven by a higher than originally planned number of subsidized household asset vouchers, which included small grain seed. The program provided a larger number of subsidized household asset vouchers than originally planned, to respond to the FY19 drought. This was in part, a result of dissemination of information to farmers on low and limited rainfall projections and the crops management trainings during low rain yields. Though not confirmed, the challenges farmers faced when losing livestock during odd times, like after December, might have influenced them to realize that the season was bad.

*Number of hectares under small grain production*

The indicator on number of hectares under small grain production counts the additional area grown under small grain cereal crops promoted by the program (i.e. sorghum and millet) by trained dryland farmers compared to a baseline (2014) area grown. The survey found additional area grown of 45,447ha which is slightly higher than the target of 36,000ha. FY20 targets have been revised in line with this achievement.

*Yield of small grains*

Adoption of improved varieties of small grains together with good agronomic and post-harvest management practices is planned to lead to increased yields of small grains. The survey however found that 2019 yields of sorghum and millet were low at 0.1 and 0.14 tons/hectare respectively, against a target of 0.35 tons/hectare for both crops. Both sorghum and millet are rain fed crops. Yields were low due to a poor rainy season in the project area which started late (December 2018), leading to late land preparation. The rains were patchy and finished early, in February 2019, giving an insufficient growing period for rainfed crops, resulting in poor harvests.

**4.2.3 Number of farmers purchasing inputs in advance**

The indicator counts the number of farmers reporting advance purchase of agricultural inputs from agro-dealers. Advance purchase of inputs was analyzed for rain-fed crops only and looked at purchase of seed and fertilizer before 30 October 2018. The normal rainfall period in the program area is November – March. Early purchase of inputs allows for early planting with the first effective rains and often leads to better yields. The survey found that 9,618 farmers (48.6 percent of those who purchased seed and/or fertilizer for rain-fed crop production) bought the inputs in advance. This figure was higher than the set target of 8,400 because of a higher than planned number of subsidized household asset vouchers (that included seed packs) sold in August 2018. The target for FY20 has been adjusted in line with this achievement.

**4.3 Household Survey Results (Livestock management trainees)**

Data from the livestock management questionnaire in the household survey was used to analyze the following indicators:

* Calving and kidding rate
* Value of incremental sales (for cattle and goats)
* Gross Margins (for cattle and goats)

The Livestock survey questionnaire was completed by 591 farmers. Of these, 77 percent were females and 23 percent were male.

**4.3.1 Calving and kidding rates**

Calving rate measures number of calves born over a period of one year as a proportion of the number of breeding cows and heifers in the herd over the same period. Calving rate is a measure of cattle productivity in the program. Trained farmers that apply promoted livestock management practices are expected to realize positive results in the form of good calving rates. Calving rate was analyzed for respondents who kept cattle. 361 of the 591 livestock respondents kept cattle in 2019. 81.4 percent of these respondents were female, while 18.6 percent were male. Calving rate reported in FY19 was 0.61 calves per cow. This is against a target of 0.75. The lower than anticipated calving rate could be due to the drought that negatively affected grazing and water resources for livestock.

Kidding/lambing rate is a measure of goat/sheep productivity in the program. Amalima trains goat and sheep farmers on good livestock management practices with the expectation that they will apply the promoted management practices. Trained farmers that apply promoted goat and sheep management practices are expected to realize positive results in the form of good kidding and lambing rates. Kidding and lambing rate measures number of kids and lambs born over a period of one year as a proportion of the number of breeding goats and ewes in the flock over the same period. Kidding/lambing rate was analyzed for respondents who kept goats and/or sheep. 534 of the 591 livestock respondents kept goats and/or sheep in 2019. 82.6 percent of these respondents were female while 17.4 percent were male. However, the kidding/lambing rate for goats/sheep was lower than the target at 0.72 kids/lambs per ewe compared to a target of 1.2. The lower than anticipated kidding/lambing rate could be due to the drought that negatively affected grazing and water resources for livestock.

**4.3.2 Percent large and small stock sold through formal market systems**

The indicators measure proportion of cattle, goats and sheep sold through formal market systems by Amalima-trained livestock farmers. Amalima promotes farming as a business and encourages livestock farmers to sell their livestock to large, formal markets where they can get fair prices. Formal markets (including abattoirs and private/public auction floors) include sales outlets where there is a competitive bidding process and informed choice by both buyers and sellers.

Survey results showed a below target achievement for both cattle and goats/sheep. Thirty six percent of cattle sold by beneficiaries in FY19 were sold in the formal market against a target of 75 percent. For goats and sheep, the figure was 11 percent against a target of 40 percent. Due to the economic crisis, farmers tended to utilize informal markets which allow the use of different currencies, bartering, and more flexible payment terms. CNFA suspects that demand on the informal markets has increased as rural people seek livestock as a hedge in a highly inflationary and uncertain financial climate. FY20 targets have been revised in line with this achievement.

**4.3.3 Livestock value of incremental sales**

The indicator on value of incremental sales for livestock looks at the value (in USD) of the total amount of cattle or goats/sheep sold by project participants relative to a base year (2014). It is calculated as the total value of sales of livestock during the reporting year (FY19) minus the total value of sales in the base year. This indicator collects both volume (in metric tons) and value (in US dollars) of sales of cattle or goats/sheep by project participants. Table 4 shows that value of incremental sales for cattle and goats/sheep was significantly lower than target. The prevailing economic crisis in FY19 characterized by hyperinflation, changes in exchange rates, use of different currencies etc. made it difficult to accurately assess the value of sales in USD. Also, as the use of USD in formal markets was disallowed in June 2019, this caused a decrease in sales due to a lack of confidence in other currencies. FY20 targets have been revised in line with the FY19 achievement.

**Table 4: Cattle and goats/sheep incremental sales**

|  |  |  |
| --- | --- | --- |
| **Indicator/ Disaggregate** | **FY19 Target** | **FY19 Achievement** |
| Value of incremental sales (collected at farm level) attributed to USG implementation |  |  |
| Cattle | 4,234,180 | 2,269,169 |
| Goats/sheep | 631,327 | 504,875 |

**4.3.4 Livestock Gross Margin**

Gross Margin (GM) per animal is the difference between the total value of production of cattle or goats/sheep and the cost of producing the livestock, divided by the total number of the livestock kept. Gross margin per animal is a measure of net income for that livestock. It is the return to family labor and capital. Input costs for livestock include, among other things, stock feed, herding costs, etc.

**Table 5: Cattle and goats/sheep gross margin per animal**

|  |  |  |
| --- | --- | --- |
| **Indicator Disaggregate** | **FY19 Target** | **FY19 Achievement** |
| Farmer's gross margin per animal obtained with USG assistance |  |  |
| Cattle | 453 | 298 |
| Goats/sheep | 47 | 38 |

The survey results (Table 5) show that farmers had a positive Gross Margin on the cattle and goat value chain activities despite the unfavorable rainfall with its negative impact on grazing and water availability. Compared to targets, gross margins for cattle and goats/sheep were lower. This is as a result of prevailing economic crisis in FY19 characterized by hyperinflation, changes in exchange rates, use of different currencies etc. Disallowance of the use of foreign currency in the domestic market in June 2019 may have caused a decrease in sales due to a lack of confidence in the ZIM dollar. FY20 targets have been revised in line with the FY19 achievement.

**4.4 Farmer Groups Survey (Garden/Irrigation trainees)**

Data from the garden/irrigation survey was used to analyze indicators on irrigated maize and horticulture crops. 524 farmers were interviewed using the irrigation questionnaire. 82.8% (434) of these were female while 17.2% (90) were male. Indicators analyzed using the irrigation survey include:

* Irrigated maize yield
* Value of incremental sales for irrigated maize and horticulture
* Gross Margins for irrigated maize and horticulture

**4.4.1 Maize yield**

The indicator measures irrigated maize harvest per unit area for irrigation farmers who received irrigated crop training from Amalima. The analysis of irrigated maize yields was based on 222 farmers (78.8 percent female and 21.2 percent male) who planted maize in FY19 in the program area.

Irrigated maize yields at 3.14 tons per hectare from the survey, was low compared to the FY19 target of 5 tons per hectare. Irrigated maize yields were significantly impacted by drought which led to low water levels in most gardens and irrigation schemes. While FAW was limited this year due to the drought, it remained an issue affecting maize yields. Amalima continues to incorporate FAW management and FAW training materials developed in FY18 into all trainings. FY20 targets have been revised in line with the FY19 achievement.

**4.4.2 Value of incremental sales**

The analysis of irrigated maize value of incremental sales was based on 160 irrigation interviewees (73.8 percent female and 26.3 percent male) who sold their irrigated maize produce in FY19. The analysis of horticulture value of incremental sales was based on 521 farmers (83.9 percent female and 16.1 percent male) who sold their horticulture crop produce in the program area. Horticulture crops included in the analysis are sugar beans, tomato, leafy vegetables (kale), butternut and carrot.

**Table 6: Value of incremental sales for irrigated crops**

|  |  |  |
| --- | --- | --- |
| **Indicator Disaggregate** | **FY19 Target** | **FY19 Achievement** |
| Value of incremental sales (collected at farm level) attributed to USG implementation |  |  |
| Irrigated maize | -2,338 | -55,221 |
| Horticulture | 239,496 | 178,838 |

Results from the survey (table 6) show that value of incremental sales for horticulture crops was lower than target, while that for irrigated maize was negative. The prevailing economic crisis in FY19 characterized by hyperinflation, changes in exchange rates, use of different currencies etc. made it difficult to accurately assess the value of sales of horticulture crops in USD. This is compounded by poor record keeping among smallholder farmers on horticultural sales. Horticulture crops tend to be sold locally, in small quantities at a time, over an extended period. Accurate estimate of sales is a challenge where there are no good records. Amalima continues to incorporate record keeping training into all irrigated crop production trainings including farming as a business. FY20 targets for horticulture crops have been revised in line with the FY19 achievement.

Irrigated maize incremental sales were negative, as they have been most years, because per-farmer sales were considerably lower than the FY14 baseline, which consisted of experienced farmers with larger plots in existing irrigation schemes. The current irrigated maize farmers are primarily different from those in FY14, which only make up a small minority of those included in the FY19 results. The current irrigated maize crop was also highly affected by drought and to some extent, fall army worm. Poor record keeping of sales data was also an issue on the irrigated maize. FY20 targets for the indicator have been adjusted in line with the FY19 achievement.

**4.4.3 Gross Margin**

Gross Margin (GM) is the difference between the total value of irrigated crop and the cost of producing that crop, divided by the total number of hectares under the crop. Gross margin per hectare is a measure of net income for that crop. It is the return to family labor and capital. Input costs for irrigated crops include seed, fertilizer, pesticides, casual labor etc.

**Gross Margin Irrigated crops**

The survey results (see Figure 7) show that farmers had positive Gross Margins (GM) on all the value chain crops promoted by the project. The GM for all crops (except butternut) were generally lower than projected. Lower than expected GM on maize, tomato and sugar beans was possibly due to low productivity of the crops because of low water availability in gardens and irrigation schemes at critical periods during crop growth, due to drought. Pests and diseases such as fall army worm in irrigated maize and red spider mite in tomato, were an issue. The program continues to train farmers on fall army warm identification and control including use of environmentally friendly and PERSUAP compliant chemicals such as Lambda and Ecoterex. Training on control of red spider mite is also conducted. FY20 targets have been revised in line with this achievement. The significant difference between achievements and target for butternut and kale gross margin is likely due to issues related to errors converting commodity prices to USD terms. FY19 was characterized by hyperinflation, extreme changes in exchange rates, and the use of different currencies make it difficult to accurately assess the value of sales in USD. This is compounded by the fact that both butternut and kale are sold over an extended period over which a lot of changes take place which are not always recorded and availed for survey enumerators.

Amalima continues to incorporate record keeping training into all irrigated crop production trainings including farming as a business. FY20 targets for horticulture crops have been revised in line with the FY19 achievement.

**Annex 1: FY19 Amalima Indicators Achievement, 95% Confidence Intervals and Standard Error**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Indicator** | | **Indicator Value** | **95% CI** | | **Number of Records** | **Weighted Population** | **Standard Error** | **Standard Deviation** |
| Lower | Upper |
| 3 | Irrigated maize production (producers) | 244,841.78 | 192,552 | 297,132 | 222 | 1,407 | 26,679 | 199.771 |
| 3 | Irrigated maize area (producers) | 77.97 | 57.24 | 98.7 | 222 | 1,407 | 10.58 | 0.079 |
| 3 | Irrigated maize yield (Mt/Ha) | 3.14 |  |  |  |  |  |  |
| 4 | Sorghum yield (Mt/Ha) | 0.10 | 0.082 | 0.127 | 338 | 32,330 | 0.007 | 211.838 |
| 5 | Millet yield (Mt/Ha) | 0.14 | 0.118 | 0.167 | 376 | 36,311 | 0.009 | 243.662 |
| 6 | Calving rate | 0.61 | 0.554 | 0.659 | 361 | 21,920 | 0.018 | 0.512 |
| 7 | Kidding/lambing rate | 0.72 | 0.678 | 0.763 | 534 | 32,746 | 0.012 | 0.510 |
| 10 | Number of hectares under improved technologies or management practices as a result of USG assistance |  |  |  |  |  |  |  |
| 10 | Crop genetics | 35,667 | 30,969 | 40,365 | 517 | 49,267 | 2,397 | 0.782 |
| 10 | Cultural practices | 63,586 | 57,097 | 70,075 | 517 | 49,267 | 3,311 | 1.080 |
| 10 | Pest Management | 19,851 | 14,718 | 24,984 | 517 | 49,267 | 2,619 | 0.855 |
| 10 | Disease management | 19,851 | 14,718 | 24,984 | 517 | 49,267 | 2,619 | 0.855 |
| 10 | Soil -related fertility and conservation | 36,015 | 30,566 | 41,464 | 517 | 49,267 | 2,780 | 0.907 |
| 10 | Water management, non-irrigation based | 12,585 | 5,788 | 19,382 | 517 | 49,267 | 3,468 | 1.132 |
| 10 | Climate adaptation | 22,677 | 18,067 | 27,287 | 517 | 49,267 | 2,352 | 0.768 |
| 10 | Total with one or more improved technologies | 77,702 | 71,212 | 84,192 | 517 | 49,267 | 3,311 | 1.081 |
| 10 | Female | 65,059 | 59,107 | 71,011 | 423 | 41,239 | 2,747 | 1.071 |
| 10 | Male | 12,643 | 9,940 | 15,346 | 87 | 8,028 | 1,379 | 1.133 |
| 11 | Number of farmers and others who have applied new technologies or management practices as a result of USG assistance |  |  |  |  |  |  |  |
| 11 | Producers (farmers) | 64,312 | 63,235 | 65,389 | 1,093 | 66,914 | 550 | 0.192 |
| 11 | Crop genetics | 21,307 | 18,687 | 23,927 | 1,093 | 66,914 | 1,337 | 0.467 |
| 11 | Cultural practices | 29,199 | 26,416 | 31,982 | 1,093 | 66,914 | 1,420 | 0.496 |
| 11 | Livestock management | 32,824 | 30,019 | 35,629 | 1,093 | 66,914 | 1,431 | 0.500 |
| 11 | Pest Management | 36,030 | 33,236 | 38,824 | 1,093 | 66,914 | 1,425 | 0.498 |
| 11 | Disease management | 28,409 | 25,632 | 31,186 | 1,093 | 66,914 | 1,417 | 0.495 |
| 11 | Soil -related fertility and conservation | 19,409 | 16,868 | 21,950 | 1,093 | 66,914 | 1,297 | 0.453 |
| 11 | Water management, non-irrigation based | 10,299 | 8,262 | 12,330 | 1,093 | 66,914 | 1,036 | 0.362 |
| 11 | Climate adaptation | 16,871 | 14,419 | 19,323 | 1,093 | 66,914 | 1,251 | 0.437 |
| 11 | Marketing and distribution | 6,456 | 4,795 | 8,117 | 1,093 | 66,914 | 847 | 0.296 |
| 11 | Post-harvest handling & storage | 53,002 | 50,730 | 55,274 | 1,093 | 66,914 | 1,159 | 0.405 |
| 11 | Value-added processing | 43,974 | 41,304 | 46,644 | 1,093 | 66,914 | 1,362 | 0.476 |
| 11 | Total with one or more improved technology/practice | 64,312 | 63,235 | 65,389 | 1,093 | 66,914 | 550 | 0.192 |
| 11 | Female | 52,742 | 51,729 | 53,755 | 898 | 55,055 | 517 | 0.199 |
| 11 | Male | 11,570 | 11,199 | 11,941 | 196 | 11,859 | 189 | 0.158 |
| 13 | Number of targeted farmers who used at least five sustainable agriculture (crop/ livestock and/ or NRM) practice(s) and/or technologies in the past 12 months | 54,011 | 51,806 | 56,216 | 1,093 | 66,914 | 1,125 | 0.393 |
| 13 | Farmers trained/targeted | 66,914 |  |  | 1,093 | 66,914 |  |  |
| 13 | Percentage of targeted farmers who used at least 5 sustainable agricultural technologies in the past 12 months | =54,011/66,914 |  |  |  |  |  |  |
| 13 | Female targeted farmers who used at least 5 sustainable agricultural technologies in the past 12 months | 44,242 | 42,225 | 46,259 | 898 | 55,055 | 1,029 | 0.396 |
| 13 | Percentage of female targeted farmers who used at least 5 sustainable agricultural technologies in the past 12 months | =44,242/55,055 |  |  |  |  |  |  |
| 13 | Male targeted farmers who used at least 5 sustainable agricultural technologies in the past 12 months | 9,769 | 8,877 | 10,661 | 196 | 11,859 | 455 | 0.380 |
| 13 | Percentage of male targeted farmers who used at least 5 sustainable agricultural technologies in the past 12 months | =9,769/11,859 |  |  |  |  |  |  |
| 15 | Number of farmers purchasing inputs in advance through agro dealers | 9,618 | 7,709 | 11,527 | 207 | 19,778 | 974 | 0.501 |
| 21 | Number of households growing improved small grain cereal crops as a result of USG assistance | 24,101 | 21,098 | 27,104 | 517 | 49,267 | 1,532 | 0.500 |
| 22 | Number of hectares under small grain production as a result of USG assistance | =48,472-L108 |  |  | 517 | 49,267 |  | 0.356 |
| 23 | Number of producers growing a crop combination rich in energy, fat, protein, vitamin and minerals | 35,391 | 32,658 | 38,124 | 517 | 49,267 | 1,394 | 0.455 |
| 23 | Female | 29,618 | 27,113 | 32,123 | 431 | 41,239 | 1,278 | 0.455 |
| 23 | Male | 5,773 | 4,681 | 6,865 | 86 | 8,028 | 557 | 0.459 |
| 29 | Number of farmers who practiced value chain activities promoted by the project in the past twelve months | 46,482 | 43,856 | 49,108 | 1,093 | 66,914 | 1,340 | 0.468 |
| 29 | Female | 38,281 | 35,898 | 40,664 | 898 | 55,055 | 1,216 | 0.468 |
| 29 | Male | 8,201 | 7,093 | 9,309 | 196 | 11,859 | 565 | 0.472 |
| 29 | Use of improved inputs | 40,614 | 37,854 | 43,374 | 1,093 | 66,914 | 1,408 | 0.492 |
| 29 | Post-harvest handling | 18,322 | 15,842 | 20,802 | 1,093 | 66,914 | 1,265 | 0.442 |
| 29 | Value added processing | 37,442 | 34,648 | 40,236 | 1,093 | 66,914 | 1,425 | 0.498 |
| 29 | Marketing/trading | 5,088 | 3,590 | 6,586 | 1,093 | 66,914 | 764 | 0.267 |
| 31 | Percent of large stock (of participant farmers) sold through formal market systems | 0.36 | 26.40% | 44.8% | 93 | 6,267 | 0.034 | 0.448 |
| 32 | Percent of small stock (of participant farmers) sold through formal market systems | 0.11 | 6.4% | 15.7% | 167 | 11,345 | 0.009 | 0.303 |
| 34 | Gross Margin in production per unit of land, kilogram, or animals of select product (GM/ha for crops) (GM/animal for livestock) |  |  |  |  |  |  |  |
| 34 | Irrigated maize hectares planted (Value chain players) | 72 | 53.72 | 90.28 | 160 | 1,030 | 9.33 | 0.081 |
| 34 | Irrigated maize total production (Value chain players) | 204,730 | 158,153 | 251,307 | 160 | 1,030 | 23,764 | 206.357 |
| 34 | Irrigated maize value of sales (Value chain players) | 42,458 | 33,102 | 51,814 | 160 | 1,030 | 4,773 | 41.451 |
| 34 | Irrigated maize quantity of sales (Value chain players) | 22,808 | 14,992 | 30,694 | 160 | 1,030 | 4,023 | 34.938 |
| 34 | Irrigated maize purchased input cost (Value chain players) | 24,120 | 17,346 | 30,894 | 160 | 1,030 | 3,456 | 30.012 |
| 34 | Irrigated maize sellers (Value chain players) | 1,029 |  |  | 160 | 1,030 |  | 0 |
| 34 | Tomato hectares planted | 32 | 14.9 | 49.1 | 289 | 2,388 | 8.7 | 0.0144 |
| 34 | Tomato total production | 212,271 | 171,015 | 253,527 | 289 | 2,388 | 21,049 | 105.957 |
| 34 | Tomato value of sales | 84,192 | 65,469 | 102,915 | 289 | 2,388 | 9,553 | 48.086 |
| 34 | Tomato quantity of sales | 145,674 | 113,169 | 178,179 | 289 | 2,388 | 16,584 | 83.481 |
| 34 | Tomato purchased input cost | 7,685 | 5,878 | 9,492 | 289 | 2,388 | 922 | 4.640 |
| 34 | Tomato sellers | 2,388 |  |  | 289 | 2,388 |  | 0 |
| 34 | Kale hectares planted | 30 | 22.3 | 37.7 | 445 | 4,091 | 4.9 | 0.144 |
| 34 | Kale total production | 829,719 | 702,447 | 956,991 | 445 | 4,091 | 64,935 | 236.762 |
| 34 | Kale value of sales | 213,211 | 185,202 | 241,220 | 445 | 4,091 | 14,290 | 52.104 |
| 34 | Kale quantity of sales | 509,142 | 417,350 | 600,934 | 445 | 4,091 | 46,832 | 170.759 |
| 34 | Kale purchased input cost | 13,241 | 11,119 | 15,363 | 445 | 4,091 | 1,083 | 3.948 |
| 34 | Kale sellers | 4,091 |  |  | 445 | 4,091 |  | 0 |
| 34 | Butternut hectares planted | 0.96 | 0 | 2.5 | 84 | 667 | 0.8 | 0.008 |
| 34 | Butternut total production | 26,559 | 11,916 | 41,202 | 84 | 667 | 7,471 | 72.59 |
| 34 | Butternut value of sales | 24,761 | 15,233 | 34,289 | 84 | 667 | 4,861 | 47.23 |
| 34 | Butternut quantity of sales | 9,588 | 5,454 | 13,722 | 84 | 667 | 2,109 | 20.590 |
| 34 | Butternut purchased input cost | 783 | 105 | 1,462 | 84 | 667 | 346 | 3.355 |
| 34 | Butternut sellers | 667 |  |  | 84 | 667 |  | 0 |
| 34 | Carrot hectares planted | 0.25 | 0.14 | 0.36 | 35 | 315 | 0.06 | 0.0008 |
| 34 | Carrot total production | 5,769 | 4,001 | 7,537 | 35 | 315 | 902 | 11.978 |
| 34 | Carrot value of sales | 2,200 | 1,150 | 3,250 | 35 | 315 | 536 | 7.114 |
| 34 | Carrot quantity of sales | 3,384 | 2,200 | 4,568 | 35 | 315 | 604 | 8.020 |
| 34 | Carrot purchased input cost | 142 | 67 | 217 | 35 | 315 | 38 | 0.562 |
| 34 | Carrot sellers | 315 |  |  | 35 | 315 |  | 0 |
| 34 | Sugar bean hectares planted | 61.90 | 40.6 | 83.2 | 194 | 1,305 | 0.1 | 0.082 |
| 34 | Sugar bean production | 73,350 | 52,902 | 93,798 | 194 | 1,305 | 10,433 | 78.736 |
| 34 | Sugar bean value of sales | 48,087 | 27,454 | 68,720 | 194 | 1,305 | 10,527 | 79.448 |
| 34 | Sugar bean quantity of sales | 34,246 | 23,870 | 44,622 | 194 | 1,305 | 5,294 | 39.952 |
| 34 | Sugar bean purchased input cost | 14,116 | 8,773 | 19,459 | 194 | 1,305 | 2,726 | 20.573 |
| 34 | Sugar bean sellers | 1,305 |  |  | 194 | 1,305 |  | 0 |
| 34 | Cattle number | 108,372 | 78,566 | 138,178 | 93 | 6,267 | 2,193 | 16.547 |
| 34 | Cattle total production | 108,372 | 78,566 | 138,178 | 93 | 6,267 | 2,193 | 16.547 |
| 34 | Cattle value of sales | 4,131,825 | 2,545,863 | 5,717,787 | 93 | 6,267 | 116,662 | 880.448 |
| 34 | Cattle quantity of sales | 13,210 | 9,048 | 17,372 | 93 | 6,267 | 306 | 2.311 |
| 34 | Cattle purchased input cost | 1,586,081 | 699,959 | 2,472,203 | 93 | 6,267 | 65,182 | 491.931 |
| 34 | Cattle sellers | 6,267 |  |  | 93 | 6,267 |  | 0 |
| 34 | Goat number | 214,885 | 168,147 | 261,623 | 167 | 11,345 | 23,846 | 19.207 |
| 34 | Goats total production | 214,885 | 168,147 | 261,623 | 167 | 11,345 | 23,846 | 19.207 |
| 34 | Goats value of sales | 1,584,250 | 808,319 | 2,360,181 | 167 | 11,345 | 395,883 | 318.864 |
| 34 | Goats quantity of sales | 40,581 | 21,380 | 59,782 | 167 | 11,345 | 9,797 | 7.891 |
| 34 | Goats purchased input cost | 301,604 | 79,869 | 523,339 | 167 | 11,345 | 113,130 | 91.121 |
| 34 | Goats sellers | 11,345 |  |  | 167 | 11,345 |  | 0 |

**Annex 2: Questionnaires for the Survey**

**1.1 Dryland Crops –Adoption of Practices Questionnaire (March 2019)**

Date of questionnaire administration (day, month, year) ….………..…………………………………

Name of data recorder ……………………………………………………………………………..…..

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district …………………………………… Ward (number & name) ….………………….…..

Village ……………………..…..……. Name of farmer ……………..…………………………...

Sex of farmer (M/F) ……….…… Farmer’s contact cell number ………………………………….…..

Current Gendered Household Type (Tick appropriate response)

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (Over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (below 18 years) (CNA) |  |

Unique Identifier (Amalima Code) ……………………………………………………………………

1. Value chain activities

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period Oct 2018 to now | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages this year over the period Oct 2018 to now | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of feedlots, purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Green mealies |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

1. Did you plant the following crops in your field, garden or irrigation this year over the period Oct 2018 to now? Please tick (√) all the crops planted by farmer

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Maize | \_\_ | Sorghum | \_\_ | Millet | \_\_ | Groundnuts | \_\_ | Round nuts | \_\_ | Sunflower | \_\_ | Cowpeas | \_\_ |
| Okra | \_\_ | Sweet  potatoes | \_\_ | Pumpkin | \_\_ | Indigenous vegetables | \_\_ | Sugar beans | \_\_ | Irish potatoes | \_\_ | Garden vegetables[[7]](#footnote-7) | \_\_ |

***Dryland Crops Section***

1. Total area under dryland cropping this year (over the period Oct 2018 to now) ………………(ha)
2. Small grain cereal production

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop | Area planted 2018/19 (ha) | Area planted (2017/18) (ha) | Area under improved[[8]](#footnote-8) seeds regardless of source 2018/19 | Area under improved seeds regardless of source 2017/18 |
| Sorghum |  |  |  |  |
| Millet |  |  |  |  |

1. Small grain purchased input cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop | Give sum of the following expenses for the period October 2018 to now. (State currency) | | | |
| Seed (State currency) | Fertilizer (State currency) | Chemicals (State currency) | Casual labor (e.g. for ploughing, planting, weeding etc.) (State currency) |
| Sorghum |  |  |  |  |
| Millet |  |  |  |  |

1. Advance purchase of dryland crop inputs for the 2019/20 season

|  |  |  |
| --- | --- | --- |
| Input | Did you buy these for the 2019/20 season? (Include any HHAV purchases). Indicate Y/N | If ‘Yes’, state month and year of purchase |
| Dryland crop seeds |  |  |
| Basal fertilizer |  |  |
| Top dressing fertilizer |  |  |

1. Small grain sales

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Crop | Quantity of grain sold over the period Oct 2018 to now (kg) | Value ($) of grain sold over the period Oct 2018 to now | Quantity of grain exchanged/bartered over the period Oct 2018 to now (kg) | Value ($) of grain exchanged/bartered over the period Oct 2018 to now |
| Sorghum |  |  |  |  |
| Millet |  |  |  |  |

8. Technology application during the period October 2018 to now

|  |  |  |  |
| --- | --- | --- | --- |
| a. Technology | b. Did you apply the technology between October 2018 and now? Indicate Yes or No | c. If yes to ‘b’, please state area (in ha) where the technology was applied between October 2018 and now | d. Were you applying the technology before participating in Amalima training? Indicate Yes or No |
| Minimum tillage (basins or ripping) |  |  |  |
| Planting with the first effective rains |  |  |  |
| Manure, compost and/or fertilizer application |  |  |  |
| Mulching |  |  |  |
| Crop rotation |  |  |  |
| Weeding (2 – 3 times) |  |  |  |
| Intercropping |  |  |  |
| Conservation of natural predators |  |  |  |
| Use of green or amber label chemicals in pest management |  |  |  |
| Use of locally available plant and animal products in pest management |  |  |  |
| Use of improved/certified seed (include donations) |  |  |  |
| Planting of early maturing maize varieties |  |  |  |
| Improving infiltration using infiltration pits, dead level contours and vegetation strips |  | ………………………..  State area protected |  |
| Constructing micro catchments around fruit trees |  |  |  |
| Harvesting rainwater from roof tops for watering fruit trees and/or crops |  |  |  |
| Re-directing water flowing along roads onto fruit trees and/or crops |  |  |  |
| Using silt traps to reduce siltation of water bodies |  |  |  |

1. Please state the total dryland crop area under one or more of the technologies discussed in Q8, over the period Oct 2018 to now ……………………………….. (ha)

10a. Did you receive credit from a formal financial institution for your 2018/19 dryland crop production? Y/N ……..……….

|  |  |  |  |
| --- | --- | --- | --- |
| 10b. If yes, state value of dryland credit | ------------------- | 10c. Source of dryland credit | ---------------------------- |

10d. Who contributed most to the decision on accessing the dryland credit? (Circle one response below)

|  |  |  |
| --- | --- | --- |
| 1. self | 2. partner/spouse | 3. self and partner/spouse jointly |
| 4. other household member | 5. self and other household member(s) | 6. partner/spouse and other household member(s) |
| 7. someone (or group of people) outside the household | 8. self and other outside people | 9. partner/spouse and other outside people |
| 10. self, partner/spouse and other outside people |  |  |

**1.1b Dryland Post –Harvest Questionnaire (August/September 2019 )**

Date of questionnaire administration (day, month, year) …….………………………………….………

Name of data recorder …………………………………. …………………………………………….…

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district ……………………………………Ward (number & name) …………………………

Village ……………………..…..……. Name of farmer ……………………………………….…

Sex of farmer (M/F) …………… Farmer’s contact cell number …………………...………………….

**Current Gendered Household Type (Tick appropriate response)**

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (Over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (Below 18 years) (CNA) |  |

Unique Identifier (Amalima code) ………………………………………………………………………

1. **Value chain activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period April to September 2019 | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages in the past 6 months (April to September 2019) | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management, aggregation) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Irrigated maize |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

2a. Do you have access to an irrigation or garden plot? (Y/N) …………………

2b. Which of the following garden or irrigation crops did you grow this year, over the period April to Aug/Sept 2019?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tomatoes, onion, green leaf vegetable, butternut, carrots, okra | (Y/N) …… | Irish potatoes | (Y/N) …… | Sugar beans | (Y/N) …… |

1. Small grains harvest and sales

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Crop | Harvest in kg (2019) | Quantity (kg) of crop sold between April and Aug/Sept 2019 (including sales of grain from previous harvests | Value ($) of crop sold between April and Aug/Sept 2019 | Quantity (kg) of crop exchanged/ bartered between April and Aug/Sept 2019 | Value ($) of crop exchanged/ bartered between April and Aug/Sept 2019 |
| Sorghum |  |  |  |  |  |
| Pearl Millet |  |  |  |  |  |

1. Adoption of improved technology or management practices on dryland crop production

Post-harvest handling and storage

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period April to Aug/Sept 2019 (Y/N) | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Grain storage structure that is raised and sealed |  |  |
| Use of improved transportation |  |  |
| Decay and insect control (indigenous and/ or chemical pest control, hermetic bags etc.) |  |  |
| Temperature and humidity control e.g. use of jute bags, raised and aerated platform |  |  |
| Sorting, grading |  |  |
| Improved quality control technologies and practices –washing, wiping etc. |  |  |

1. Adoption of technology or management practices on dryland crop production

Value-added processing

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period April to Aug/Sept 2019 | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Improved packaging practices and materials |  |  |
| Food and chemical safety technologies and practices |  |  |
| Use of Improved preservation technologies and practices e.g. solar drying |  |  |

1. Adoption of technology or management practices on dryland crop production

Marketing and distribution

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period April to Aug/Sept 2019 | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Contract farming technologies and practices |  |  |
| Aggregating produce for the market |  |  |
| Improved market information system technologies and practices |  |  |
| Formal markets for produce sale |  |  |

**1.2a Livestock –Adoption of Technologies (March 2019)**

Date of questionnaire administration (day, month, year) ….………..…………………..…………….…

Name of data recorder ……………………………………………………………………………..….…

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district ……………………………… Ward (number & name).………………….………...…

Village ……………………..…..……. Name of farmer …………..………………………………

Sex of farmer (M/F) ……….…… Farmer’s contact cell number ………………..………………….…

**Current Gendered Household Type (Tick appropriate response)**

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (Over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (below 18 years) (CNA) |  |

Unique Identifier (Amalima code) ………………………………………………………………………

1. **Value chain activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period October 2018 to now | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages in the past 6 months (October 2018 to now) | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management, aggregation) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Irrigated maize |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

2a. Do you have access to an irrigation or garden plot? (Y/N) ………………………………………….

2b. Which of the following garden or irrigation crops did you grow this year, over the period Oct 2018 to now?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tomatoes, onion, green leaf vegetable, butternut, carrots or okra | (Y/N) …… | Irish potatoes | (Y/N) …… | Sugar beans | (Y/N) …… |

1. Livestock numbers at time of survey

|  |  |  |
| --- | --- | --- |
| Type of livestock | Number kept by the household | Number owned by the household |
| Cattle |  |  |
| Goats |  |  |
| Sheep |  |  |
| Indigenous chickens |  |  |
| Broilers |  |  |

1. Livestock births

|  |  |  |
| --- | --- | --- |
| Type of livestock | Number of breeding females | Number of offspring born in the past 6 months, over the period Oct 2018 to now |
| Cattle |  |  |
| Goats |  |  |
| Sheep |  |  |

1. Livestock purchased input cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of livestock | What was your expenditure on the following in the past 6 months (Oct 2018 to now) | | | |
| Medicines (state currency) | Stock feed (incl. transport) (state currency) | Transport to market (state currency) | Labor[[9]](#footnote-9) (state currency) |
| Cattle |  |  |  |  |
| Goats & sheep |  |  |  |  |

1. **Weight of calves at weaning**

6a. How many calves were weaned in the past 6 months (Oct 2018 to now) ……………..

6b. Did you weigh the calves weaned over the period Oct 2018 to now? Y/N ………….

6c. How many weaned calves were weighed …………………………

6d. Please give the weight of each of the calves weighed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calf 1 | …………… | Calf 2 | …………… | Calf 3 | …………… |
| Calf 4 | …………… | Calf 5 | …………… | Calf 6 | …………… |

1. **Weight of kids and /or lambs at weaning**

7a. How many kids/lambs were weaned in the past 6 months (Oct 2018 to now) ………

7b. Did you weigh the kids/lambs weaned over the period Oct 2018 to now? Y/N ……

7c. How many kids/lambs were weighed …………………………

7d. Please give the weight of each of the kids/lambs weighed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Kid/lamb 1 | …………… | Kid/lamb 2 | …………… | Kid/lamb 3 | …………… |
| Kid/lamb 4 | …………… | Kid/lamb 5 | …………… | Kid/lamb 6 | …………… |

1. **Livestock sales**

8a. Did your household sell any cattle in the past 6 months? (Oct 2018 to now) Y/N …………

8b. If yes, state the total number of cattle sold by your household in the past 6 months (Oct 2018 to now) ………………..

8c. State the number and value of cattle sold by your household at the various markets in the past 6 months (Oct 2018 to now) in the table below

|  |  |  |
| --- | --- | --- |
| Market | Number of cattle sold | Value of cattle sold (state currency |
| Local sales pens |  |  |
| Abattoirs |  |  |
| [[10]](#footnote-10)Informal markets |  |  |

**Enumerator please note**: *Sum of cattle sold at the 3 markets must equal to the total number of cattle sold in 8b*.

8d. What was the main reason for selling the cattle (Circle all relevant)?

|  |  |  |
| --- | --- | --- |
| 1. School/tertiary fees | 2. Family health related expenses | 3. Buying stock feed |
| 4. Buying livestock medicine | 5. Buying assets (machinery, livestock etc.) | 6. Settling debt |
| 7. Financing family function (wedding, funeral etc.) | 8. Financing business venture | 9. Other (specify) …………………… |
|  |  |  |

8e. Did your household sell any goats and/or sheep in the past 6 months? (Oct 2018 to now) (Y/N)…………

8f. If yes, state the total number of goats and/or sheep sold by your household in the past 6 months? (Oct 2018 to now) ………………..

8g. State the number and value of goats and/or sheep sold by your household at the various markets in the past 6 months? (Oct 2018 to now) in the table below

|  |  |  |
| --- | --- | --- |
| Market | Number of goats and/or sheep sold | Value of goats and/or sheep sold (state currency) |
| Local sales pens |  |  |
| Abattoirs |  |  |
| Informal markets |  |  |

**Enumerator please note**: *Sum of goats and/or sheep sold at the 3 markets must equal to the total number of goats and/or sheep sold in 8f*.

8h. What was the main reason for selling the goat(s)/sheep (Circle all relevant)?

|  |  |  |
| --- | --- | --- |
| 1. School/tertiary fees | 2. Family health related expenses | 3. buying stock feed |
| 4. Buying livestock medicine | 5. Buying assets (machinery, livestock etc.) | 6. Settling debt |
| 7. Financing family function (wedding, funeral etc.) | 8. Financing business venture | 9. Other (specify) …………… |
|  |  |  |

1. Adoption of improved technology or management practices on livestock

Livestock husbandry practices

|  |  |  |
| --- | --- | --- |
| Technology | Did you apply the technology this year, over the period Oct 2018 to now? (Y/N) | Were you applying the technology before participating in Amalima training? (Y/N) |
| Use of roofed shelters to house calves, sheep and/or goats |  |  |
| Vaccinating livestock |  |  |
| Dosing cattle |  |  |
| Dosing goats |  |  |
| Dipping cattle (plunge or spray, pour-on, spot dressing) |  |  |
| Dipping goats or sheep (plunge or spray, pour-on, spot dressing) |  |  |
| Castrating cattle |  |  |
| Castrating goats or sheep |  |  |
| Dehorning cattle |  |  |
| Weighing livestock |  |  |
| Use of artificial insemination |  |  |
| Replacing bulls, rams or roosters |  |  |
| Supplementary feeding of cattle |  |  |
| Use of bought stock feed |  |  |

1. Adoption of improved technology or management practices on livestock

Marketing and Distribution

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period Oct 2018 to now | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Contract farming technologies and practices |  |  |
| Aggregation of livestock for the market |  |  |
| Improved market information systems, technologies and practices |  |  |
| Formal markets (auction floors and or abattoirs) for livestock sales |  |  |

1. **Adoption of improved post-harvest handling technologies and value-added processing**

|  |  |  |
| --- | --- | --- |
| Technology | Did you apply the technology or management practice this year, over the period Oct 2018 to now? (Y/N) | Were you applying the technology or management practice before participating in Amalima training (Y/N) |
| Storing consumption eggs in a cool dry place |  |  |
| Storing consumption eggs in a reed woven basket |  |  |
| Drying meat (of cattle/goat) in the sun |  |  |
| Storing dried meat in well ventilated container |  |  |
| Storing dried meat in a cool room |  |  |
| Boiling fresh cattle milk to kill germs |  |  |
| Storing boiled milk in a cool place |  |  |
| Pouring fresh milk into a gourd/*igula* through a clean cloth to remove contaminants |  |  |
| Placing the milk in a warm place for at least 3 days to allow for fermentation |  |  |
| Storing the sour milk/*amasi* in clean plastic or metal container without signs of rust |  |  |
| Storing sour milk/*amasi* in a cool place to reduce further fermentation. |  |  |
| Pen fattening livestock |  |  |

12a. Did you receive any credit from a formal financial institution for your livestock activities in the past 6 months (Oct 2018 to now)? Y/N ……..……….

|  |  |  |  |
| --- | --- | --- | --- |
| 12b. If yes, state value of livestock credit | ------------------- | 12c. Source of livestock credit | ---------------------------- |

12d. Who contributed most to the decision on accessing the credit? (Circle one response from the list)

|  |  |  |
| --- | --- | --- |
| 1. self | 2. partner/spouse | 3. self and partner/spouse jointly |
| 4. other household member | 5. self and other household member(s) | 6. partner/spouse and other household member(s) |
| 7. someone (or group of people) outside the household | 8. self and other outside people | 9. partner/spouse and other outside people |
| 10. self, partner/spouse and other outside people |  |  |

**1.2b Livestock –Adoption of Technologies (Aug/Sept 2019)**

Date of questionnaire administration (day, month, year) ….………..…………………..…………….…

Name of data recorder ……………………………………………………………………………..….…

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district ……………………………… Ward (number & name).………………….………...…

Village ……………………..…..……. Name of farmer …………..………………………………

Sex of farmer (M/F) ……….…… Farmer’s contact cell number ………………..………………….…

**Current Gendered Household Type (Tick appropriate response)**

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (Over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (below 18 years) (CNA) |  |

Unique Identifier (Amalima code) ………………………………………………………………………

1. **Value chain activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period April to September 2019 | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages in the past 6 months (April to September 2019) | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management, aggregation) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Irrigated maize |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

2a. Do you have access to an irrigation or garden plot? (Y/N) ………………………………………….

2b. Which of the following garden or irrigation crops did you grow this year, over the period April to Aug/Sept 2019?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Tomatoes, onion, green leaf vegetable, butternut, carrots or okra | (Y/N) …… | Irish potatoes | (Y/N) …… | Sugar beans | (Y/N) …… |

1. Livestock numbers at time of survey

|  |  |  |
| --- | --- | --- |
| Type of livestock | Number kept by the household | Number owned by the household |
| Cattle |  |  |
| Goats |  |  |
| Sheep |  |  |
| Indigenous chickens |  |  |
| Broilers |  |  |

1. Livestock births

|  |  |  |
| --- | --- | --- |
| Type of livestock | Number of breeding females | Number of offspring born in the past 6 months, over the period April to Aug/Sept 2019 |
| Cattle |  |  |
| Goats |  |  |
| Sheep |  |  |

1. Livestock purchased input cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type of livestock | What was your expenditure on the following in the past 6 months (April to Aug/Sept 2019) | | | |
| Medicines (state currency) | Stock feed (incl. transport) (state currency) | Transport to market (state currency) | Labor[[11]](#footnote-11)( state currency) |
| Cattle |  |  |  |  |
| Goats & sheep |  |  |  |  |

1. **Weight of calves at weaning**

6a. How many calves were weaned in the past 6 months (April to Aug/Sept 2019) ……………..

6b. Did you weigh the calves weaned over the period April to Aug/Sept 2019? Y/N ………….

6c. How many weaned calves were weighed …………………………

6d. Please give the weight of each of the calves weighed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Calf 1 | …………… | Calf 2 | …………… | Calf 3 | …………… |
| Calf 4 | …………… | Calf 5 | …………… | Calf 6 | …………… |

1. **Weight of kids and /or lambs at weaning**

7a. How many kids/lambs were weaned in the past 6 months (April to Aug/Sept 2019) ………

7b. Did you weigh the kids/lambs weaned over the period April to Aug/Sept 2019? Y/N ……

7c. How many kids/lambs were weighed …………………………

7d. Please give the weight of each of the kids/lambs weighed

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Kid/lamb 1 | …………… | Kid/lamb 2 | …………… | Kid/lamb 3 | …………… |
| Kid/lamb 4 | …………… | Kid/lamb 5 | …………… | Kid/lamb 6 | …………… |

1. **Livestock sales**

8a. Did your household sell any cattle in the past 6 months? (April to Aug/Sept 2019) Y/N …………

8b. If yes, state the total number of cattle sold by your household in the past 6 months (April to Aug/Sept 2019) ………………..

8c. State the number and value of cattle sold by your household at the various markets in the past 6 months (April to Aug/Sept 2019) in the table below

|  |  |  |
| --- | --- | --- |
| Market | Number of cattle sold | Value of cattle sold (state currency |
| Local sales pens |  |  |
| Abattoirs |  |  |
| [[12]](#footnote-12)Informal markets |  |  |

**Enumerator please note**: *Sum of cattle sold at the 3 markets must equal to the total number of cattle sold in 8b*.

8d. What was the main reason for selling the cattle (Circle all relevant)?

|  |  |  |
| --- | --- | --- |
| 1. School/tertiary fees | 2. Family health related expenses | 3. Buying stock feed |
| 4. Buying livestock medicine | 5. Buying assets (machinery, livestock etc.) | 6. Settling debt |
| 7. Financing family function (wedding, funeral etc.) | 8. Financing business venture | 9. Other (specify) …………………… |
|  |  |  |

8e. Did your household sell any goats and/or sheep in the past 6 months? (April to Aug/Sept 2019) (Y/N)…………

8f. If yes, state the total number of goats and/or sheep sold by your household in the past 6 months? (April to Aug/Sept 2019) ………………..

8g. State the number and value of goats and/or sheep sold by your household at the various markets in the past 6 months? (April to Aug/Sept 2019) in the table below

|  |  |  |
| --- | --- | --- |
| Market | Number of goats and/or sheep sold | Value of goats and/or sheep sold (state currency) |
| Local sales pens |  |  |
| Abattoirs |  |  |
| Informal markets |  |  |

**Enumerator please note**: *Sum of goats and/or sheep sold at the 3 markets must equal to the total number of goats and/or sheep sold in 8f*.

8h. What was the main reason for selling the goat(s)/sheep (Circle all relevant)?

|  |  |  |
| --- | --- | --- |
| 1. School/tertiary fees | 2. Family health related expenses | 3. buying stock feed |
| 4. Buying livestock medicine | 5. Buying assets (machinery, livestock etc.) | 6. Settling debt |
| 7. Financing family function (wedding, funeral etc.) | 8. Financing business venture | 9. Other (specify) …………… |
|  |  |  |

1. Adoption of improved technology or management practices on livestock

Livestock husbandry practices

|  |  |  |
| --- | --- | --- |
| Technology | Did you apply the technology this year, over the period April to Aug/Sept 2019? (Y/N) | Were you applying the technology before participating in Amalima training? (Y/N) |
| Use of roofed shelters to house calves, sheep and/or goats |  |  |
| Vaccinating livestock |  |  |
| Dosing cattle |  |  |
| Dosing goats |  |  |
| Dipping cattle (plunge or spray, pour-on, spot dressing) |  |  |
| Dipping goats or sheep (plunge or spray, pour-on, spot dressing) |  |  |
| Castrating cattle |  |  |
| Castrating goats or sheep |  |  |
| Dehorning cattle |  |  |
| Weighing livestock |  |  |
| Use of artificial insemination |  |  |
| Replacing bulls, rams or roosters |  |  |
| Supplementary feeding of cattle |  |  |
| Use of bought stock feed |  |  |

1. Adoption of improved technology or management practices on livestock

Marketing and Distribution

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period April to Aug/Sept 2019 | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Contract farming technologies and practices |  |  |
| Aggregation of livestock for the market |  |  |
| Improved market information systems, technologies and practices |  |  |
| Formal markets (auction floors and or abattoirs) for livestock sales |  |  |

1. **Adoption of improved post-harvest handling technologies and value-added processing**

|  |  |  |
| --- | --- | --- |
| Technology | Did you apply the technology or management practice this year, over the period April to Aug/Sept 2019? (Y/N) | Were you applying the technology or management practice before participating in Amalima training (Y/N) |
| Storing consumption eggs in a cool dry place |  |  |
| Storing consumption eggs in a reed woven basket |  |  |
| Drying meat (of cattle/goat) in the sun |  |  |
| Storing dried meat in well ventilated container |  |  |
| Storing dried meat in a cool room |  |  |
| Boiling fresh cattle milk to kill germs |  |  |
| Storing boiled milk in a cool place |  |  |
| Pouring fresh milk into a gourd/*igula* through a clean cloth to remove contaminants |  |  |
| Placing the milk in a warm place for at least 3 days to allow for fermentation |  |  |
| Storing the sour milk/*amasi* in clean plastic or metal container without signs of rust |  |  |
| Storing sour milk/*amasi* in a cool place to reduce further fermentation. |  |  |
| Pen fattening livestock |  |  |

12a. Did you receive any credit from a formal financial institution for your livestock activities in the past 6 months (April to Aug/Sept 2019)? Y/N ……..……….

|  |  |  |  |
| --- | --- | --- | --- |
| 12b. If yes, state value of livestock credit | ------------------- | 12c. Source of livestock credit | ---------------------------- |

12d. Who contributed most to the decision on accessing the credit? (Circle one response from the list)

|  |  |  |
| --- | --- | --- |
| 1. self | 2. partner/spouse | 3. self and partner/spouse jointly |
| 4. other household member | 5. self and other household member(s) | 6. partner/spouse and other household member(s) |
| 7. someone (or group of people) outside the household | 8. self and other outside people | 9. partner/spouse and other outside people |
| 10. self, partner/spouse and other outside people |  |  |

**1.3a Irrigated Crops –Adoption of Practices (March 2019)**

Date of questionnaire administration (day, month, year) ….………..……………..……………………

Name of data recorder ……………………………………………………………………………..……

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district ……………………………… Ward (number & name) ….…….…………….………

Village ……………………..…..…… Name of farmer ……………..……………………………

Sex of farmer (M/F) ……….…… Farmer’s contact cell number ………….……………………….…

**Current Gendered Household Type (Tick appropriate response)**

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (below 18 years) (CNA) |  |

Unique Identifier (Amalima code) ………………………………………………………………………

1. **Value chain activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period Oct 2018 to now | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages in the past 6 months (Oct 2018 to now) | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management, aggregation) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Irrigated maize |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

1. Name of irrigation scheme or garden ………………………………………………………
2. Irrigation/ garden area cropped over the period Oct 2018 to now …………………..
3. Irrigation/ garden crops that reached maturity and were harvested in the past six months (Oct 2018 to now)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Crop | Did you produce [*crop*] during period Oct 2018 to now (Y/N) | Area under [*crop*] during period Oct 2018 to now | Quantity of [*crop*] sold during period Oct 2018 to now | Value of [*crop*] sold during period Oct 2018 to now (state currency) | Quantity of [*crop*] consumed or given to others (Oct 2018 to now) | Quantity of [*crop*] stored period Oct 2018 to now |
| Irrigated maize (fresh) |  | ha | cobs |  | cobs |  |
| Irrigated maize (dry) |  |  | kg |  | kg | kg |
| Tomato |  | ha | kg |  | kg | kg |
| Leafy vegetables |  | ha | kg |  | kg | kg |
| Butternut |  | ha | kg |  | kg | kg |
| Carrots |  | ha | kg |  | kg | kg |
| Sugar beans |  | ha | kg |  | kg | kg |

1. Purchased input cost for irrigation/ garden crops produced in the past six months (Oct 2018 to now)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Crop | Cost of item (state currency) | | | | |
| Seed (state currency) | Fertilizer (state currency) | Chemicals (state currency) | Transport of inputs and/ or produce (state currency) | Casual labor (for planting, weeding, harvesting etc.) (state currency) |
| Irrigated maize |  |  |  |  |  |
| Tomato |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |

1. Adoption of improved technologies or management practices on irrigation/garden crop

Post-harvest handling and storage

|  |  |  |
| --- | --- | --- |
| Technology or management practice | Did you use the technology or management practice over the period Oct 2018 to now (Y/N) | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Improved pack house technologies and practices |  |  |
| Improved transportation |  |  |
| Decay and insect control (indigenous and or chemical pest control, hermetic bags etc.) |  |  |
| Temperature and humidity control e.g. use of jute bags, raised and aerated platform |  |  |
| Sorting, grading, selection |  |  |
| Improved quality control technologies and practices –washing, wiping etc. |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Value-added processing

|  |  |  |
| --- | --- | --- |
| Technology or management practice | Did you use the technology or management practice over the period Oct 2018 to now | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Improved packaging practices and materials |  |  |
| Food and chemical safety technologies and practices |  |  |
| Use of improved preservation technologies and practices |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Marketing and distribution

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period Oct 2018 to now | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Contract farming technologies and practices |  |  |
| Aggregating produce for the market |  |  |
| Improved market information system technologies and practices |  |  |
| Formal markets for produce sale |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Soil fertility, moisture and pest management

|  |  |  |  |
| --- | --- | --- | --- |
| a. Technology | b. Did you apply the technology in your garden/ in the past six months (Oct 2018 to now) (Y/N) | c. If yes to ‘b’, please state garden/irrigation **area (ha)** under the technology in the past six months | d. Were you applying the technology **before** participating in Amalima? (Y/N) |
| Manure, compost and/or fertilizer |  |  |  |
| Mulching |  |  |  |
| Crop rotation |  |  |  |
| Weed control (2-3 times) |  |  |  |
| Intercropping |  |  |  |
| Conservation of natural predators |  |  |  |
| Use of green or amber label chemicals in pest management |  |  |  |
| Use of locally available plant and animal products in pest management |  |  |  |
| Planting of improved seed |  |  |  |

1. Please state the total area under one or more of the technologies discussed in Q9, over the past 6 months (Oct 2018 to now) …………………………….. ha

11a. Did you receive any credit from a formal financial institution for your irrigation/garden activities this year, over the period Oct 2018 to now? (Y/N) ………………

|  |  |  |  |
| --- | --- | --- | --- |
| 11b. If yes, state value of credit | --------------- | 11c. Source of credit | -------------------- |

11d. Who contributed most to the decision on accessing the credit? (Circle one response from the list below)

|  |  |  |
| --- | --- | --- |
| 1. self | 2. partner/spouse | 3. self and partner/spouse jointly |
| 4. other household member | 5. self and other household member(s) | 6. partner/spouse and other household member(s) |
| 7. someone (or group of people) outside the household | 8. self and other outside people | 9. partner/spouse and other outside people |
| 10. self, partner/spouse and other outside people |  |  |

**1.3b Irrigated Crops –Adoption of Practices (Aug/Sept 2019)**

Date of questionnaire administration (day, month, year) ….………..……………..……………………

Name of data recorder ……………………………………………………………………………..……

Geo-reference of location

Longitude ………………………………… Latitude ………….……………………………

Name of district ……………………………… Ward (number & name) ….…….…………….………

Village ……………………..…..…… Name of farmer ……………..……………………………

Sex of farmer (M/F) ……….…… Farmer’s contact cell number ………….……………………….…

**Current Gendered Household Type (Tick appropriate response)**

|  |  |  |  |
| --- | --- | --- | --- |
| Household has both male & female adults (Over 18 years) resident (M&F) |  | Household has female adult(s) (over 18 years) & no male adult(s) resident (FNM) |  |
| Household has male adult(s) (over 18 years) and no female adults’ resident (MNF) |  | Resident members of the household are all children (below 18 years) (CNA) |  |

Unique Identifier (Amalima code) ………………………………………………………………………

1. **Value chain activities**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Which of the listed commodities did you produce mainly for the market this year over the period April to September 2019 | | For the ticked (√) enterprises, please answer ‘Yes’ or ‘No’ depending on whether you participated in each of the following value chain stages in the past 6 months (April to September 2019) | | | |
| Please answer by putting a tick (√) on the market enterprises | | Use of improved inputs (joint purchase of inputs, use of quality seeds, fertilizer; use of purchased stock feed etc.) | Post-harvest handling (bulk transporting, storage including pest management, aggregation) | Value-added processing (sorting, grading, processing (drying, packaging, pen feeding etc.)) | Trading/ marketing (contract farming, selling through formal markets, selling as a group or through association) |
| Irrigated maize |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |
| Tomatoes |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Cattle |  |  |  |  |  |
| Goats |  |  |  |  |  |
| Sheep |  |  |  |  |  |
| Indigenous chickens |  |  |  |  |  |
| Broilers |  |  |  |  |  |

1. Name of irrigation scheme or garden ………………………………………………………
2. Irrigation/ garden area cropped over the period April to Aug/Sept 2019 …………………..
3. Irrigation/ garden crops that reached maturity and were harvested in the past six months (April to Aug/Sept 2019)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Crop | Did you produce [*crop*] during period April to Aug/Sept 2019 (Y/N) | Area under [*crop*] during period April to Aug/Sept 2019 | Quantity of [*crop*] sold during period April to Aug/Sept 2019 | Value of [*crop*] sold during period April to Aug/Sept 2019 (state currency) | Quantity of [*crop*] consumed or given to others (April to Aug/Sept 2019) | Quantity of [*crop*] stored period April to Aug/Sept 2019 |
| Irrigated maize (fresh) |  | ha | cobs |  | cobs |  |
| Irrigated maize (dry) |  |  | kg |  | kg | kg |
| Tomato |  | ha | kg |  | kg | kg |
| Leafy vegetables |  | ha | kg |  | kg | kg |
| Butternut |  | ha | kg |  | kg | kg |
| Carrots |  | ha | kg |  | kg | kg |
| Sugar beans |  | ha | kg |  | kg | kg |

1. Purchased input cost for irrigation/ garden crops produced in the past six months (April to Aug/Sept 2019)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Crop | Cost of item (state currency) | | | | |
| Seed (state currency) | Fertilizer (state currency) | Chemicals (state currency) | Transport of inputs and/ or produce (state currency) | Casual labor (for planting, weeding, harvesting etc.) (state currency) |
| Irrigated maize |  |  |  |  |  |
| Tomato |  |  |  |  |  |
| Leafy vegetables |  |  |  |  |  |
| Butternut |  |  |  |  |  |
| Carrots |  |  |  |  |  |
| Sugar beans |  |  |  |  |  |

1. Adoption of improved technologies or management practices on irrigation/garden crop

Post-harvest handling and storage

|  |  |  |
| --- | --- | --- |
| Technology or management practice | Did you use the technology or management practice over the period April to Aug/Sept 2019 (Y/N) | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Improved pack house technologies and practices |  |  |
| Improved transportation |  |  |
| Decay and insect control (indigenous and or chemical pest control, hermetic bags etc.) |  |  |
| Temperature and humidity control e.g. use of jute bags, raised and aerated platform |  |  |
| Sorting, grading |  |  |
| Improved quality control technologies and practices –washing, wiping etc. |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Value-added processing

|  |  |  |
| --- | --- | --- |
| Technology or management practice | Did you use the technology or management practice over the period April to Aug/Sept 2019 | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Improved packaging practices and materials |  |  |
| Food and chemical safety technologies and practices |  |  |
| Use of improved preservation technologies and practices |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Marketing and distribution

|  |  |  |
| --- | --- | --- |
| Technology or management practices | Did you use the technology or management practice over the period April to Aug/Sept 2019 | Were you using the technology or management practice before participating in Amalima? (Y/N) |
| Contract farming technologies and practices |  |  |
| Aggregating produce for the market |  |  |
| Improved market information system technologies and practices |  |  |
| Formal markets for produce sale |  |  |

1. Adoption of improved technology or management practices on irrigation/garden crop

Soil fertility, moisture and pest management

|  |  |  |  |
| --- | --- | --- | --- |
| a. Technology | b. Did you apply the technology in your garden/ in the past six months (April to Aug/Sept 2019) (Y/N) | c. If yes to ‘b’, please state garden/irrigation **area (ha)** under the technology in the past six months | d. Were you applying the technology **before** participating in Amalima? (Y/N) |
| Manure, compost and/or fertilizer |  |  |  |
| Mulching |  |  |  |
| Crop rotation |  |  |  |
| Weed control (2-3 times) |  |  |  |
| Intercropping |  |  |  |
| Conservation of natural predators |  |  |  |
| Use of green or amber label chemicals in pest management |  |  |  |
| Use of locally available plant and animal products in pest management |  |  |  |
| Planting of improved seed |  |  |  |

1. Please state the total area under one or more of the technologies discussed in Q9, over the past 6 months (April to Aug/Sept 2019) …………………………….. ha

11a. Did you receive any credit from a formal financial institution for your irrigation/garden activities this year, over the period April to Aug/Sept 2019? (Y/N) ………………

|  |  |  |  |
| --- | --- | --- | --- |
| 11b. If yes, state value of credit | --------------- | 11c. Source of credit | -------------------- |

11d. Who contributed most to the decision on accessing the credit? (Circle one response from the list below)

|  |  |  |
| --- | --- | --- |
| 1. self | 2. partner/spouse | 3. self and partner/spouse jointly |
| 4. other household member | 5. self and other household member(s) | 6. partner/spouse and other household member(s) |
| 7. someone (or group of people) outside the household | 8. self and other outside people | 9. partner/spouse and other outside people |
| 10. self, partner/spouse and other outside people |  |  |

1. See Table 1 [↑](#footnote-ref-1)
2. Indicator 11 [↑](#footnote-ref-2)
3. Indicator 10 [↑](#footnote-ref-3)
4. Indicator 11 [↑](#footnote-ref-4)
5. Indicator 29 [↑](#footnote-ref-5)
6. Indicator 23 [↑](#footnote-ref-6)
7. tomato, onion, leafy vegetables, butternut, carrots etc. [↑](#footnote-ref-7)
8. Must be max 3rd generation seed [↑](#footnote-ref-8)
9. Enumerator: where the (paid) herd boy tends other livestock and/or does other work at the home, please proportionate his cost to cattle and small livestock, based on time allocated to the enterprise [↑](#footnote-ref-9)
10. Informal sales include sales to private individuals, local butchery, local school, hospital or other institution [↑](#footnote-ref-10)
11. Enumerator: where the (paid) herd boy tends other livestock and/or does other work at the home, please proportionate his cost to cattle and small livestock, based on time allocated to the enterprise [↑](#footnote-ref-11)
12. Informal sales include sales to private individuals, local butchery, local school, hospital or other institution [↑](#footnote-ref-12)