

# Detailed survey methodology

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## Survey coordination

This Comprehensive Food Security and Vulnerability Analysis (CFSVA) 2018 is a joint initiative between the Rwandan National Institute of Statistics and the Ministry of Agriculture and Animal Resources.

It was possible thanks to funding from the Swiss Agency for Development and Cooperation (SDC), The Department of United Kingdom Department for International Development (DFID), The United Nations in Rwanda through World Food Programme (WFP) and the Ministry of Agriculture and Animal Resources (MINAGRI). It was coordinated by the CFSVA technical committee composed of and chaired by MINAGRI who coordinates other Government ministries, the National Institute of Statistics of Rwanda (NISR), and WFP.

An agreement between the Government of Rwanda and development partners specified the distribution of responsibilities between partners; all partners agreed to nominate a focal point to regularly participate to the 'CFSVA and Nutrition Survey 2018 Technical Committee' (TC) meetings. Focal points collaborated to:

- Develop a detailed survey implementation and logistical plan
- Develop indicators to be included in the data collection instruments
- Develop the sampling strategy and procedures
- Participate in the training and supervision of survey data collection and management
- Participate in data analysis and reporting
- Facilitate required survey authorizations and clearances
- Disseminate the final report

NISR was technically responsible for all statistical related components of the assessment.

MINAGRI was responsible for all food security related components of the assessment.

WFP was in charge of technical, logistical and financial project coordination through the 'CFSVA and Nutrition Survey technical committee'

## Sampling procedures

Rwanda is administratively divided into four provinces (Northern Province, Southern Province, Eastern Province and Western Province) plus Kigali City and a total of 30 districts. Districts are further divided in sectors and cells.

To facilitate comparison with existing studies, the CFSVA 2018 was designed to provide statistically representative and precise information at the district level. In addition, it was decided to include both urban and rural households and not to exclude the capital province Kigali. The sampling frame was organized according to the 30 districts. Subsequently, a two-stage cluster sample procedure was applied.

In the first stage, 30 villages per district were randomly selected with probability to be selected proportional to the population size. In the second stage, ten households in each of the 30 villages in the 30 provinces were selected for participation in the survey. A systematic random sampling technique was chosen for this stage. The team leader, together with the village head, listed all households in the village. Based on this list, a systematic random sample was utilized to pick ten households to be interviewed and three reserve households should any of the first ten households be missing at the time of the interview or not agree to participate. Households were eligible for participation in the assessment if living in one of the selected villages at the time of the interviews.

Thus, ten households, from 30 villages, from 30 provinces were chosen to participate in the survey, amounting up to 9000 households.

## Survey Instruments

Three instruments were used for primary data collection: a community survey administered to key informants, a household survey administered to randomly selected households and a mother and child questionnaire administered to women of reproductive age in the households.

The instruments were first developed in English and subsequently translated into Kinyarwanda. Tablets programmed with the questionnaires using the Open Data Kit (ODK) were used for the data collection.

### Village questionnaire

For each visited village, key informants were gathered in a group and interviewed with a structured questionnaire. The participants normally consisted of village leaders, members of local government, teachers, health workers and farmers. In total, 749 village interviews were conducted. Topics covered included community infrastructure, market information, agricultural crop calendar, shocks and received assistance. This information was used to contextualize the results from the household questionnaire.

### Household questionnaire

The study gathered information through household questionnaires that included sections on demographics, housing and facilities, assets and access to credit, agriculture, livelihoods, expenditures, food consumption and sources, shocks, coping strategies and assistance.

In total, 9000 households participated in the survey.

### Women and child questionnaire

A questionnaire was administered to women of reproductive age (15-49 years old) including questions regarding pregnancy, health, hygiene and food consumption.

Questions asked regarding children under 5 years covered the topics of breastfeeding, health and supplements. In addition, for children between 6 and 24 months a section on infant and young child feeding practices (IYCF) was included.

### Anthropometric measurements

The anthropometric measurements, height, weight, mid-upper arm circumference (MUAC) were taken for children between 6 and 59 months old and women between 15 and 49 years old. This information was used to calculate nutritional indices based on Z-scores, and women's body mass index (BMI).

## Data collection

Primary data collection took place over six weeks from end-February to mid-March 2018 which coincide with the season A post-harvest season.

## Data analysis

Statistical analysis was conducted by WFP in Rwanda, under the supervision of the CFSVA technical committee. Z-scores for wasting, stunting and underweight were calculated using ENA. All other analyses were done using SPSS.

Confidence intervals for food security and nutrition indicators were computed using the complex samples module in SPSS.

## Weights

Taking into consideration the two-stage cluster sampling methodology described above, adjustment weights were computed to provide results representative at country level. The household probability of being selected in the sample is equal to the product of a household's probability of being selected in a village by the probability of the village of being sampled. The inverse of this probability is the design weight. The design weight was adjusted for the expected and actual number of households in the surveyed villages and was used in the complex sample calculations. The design weight was divided by the product of the total number of households in the population divided by the number of sampled households. The resulting weight was used in all non-complex sample analyses.

## Nutrition

Z-scores for wasting (WHZ), stunting (HAZ) and underweight (WAZ) were computed using ENA and were imported into SPSS for the analysis. Z-scores are based on the 2006 WHO Child Growth Standards. Plausibility checks were conducted on the data. Children whose age, height or weight were not properly recorded or flagged for invalid entries (who-flags) were excluded from the analysis.

## Survey Quality assurance

Quality assurance measures were taken at all steps, from the selection of the enumerators until the data cleaning and analysis.

**Survey preparation:** The survey protocol was cleared by the National Ethics Committee, and a visa request was approved by the National Institute of Statistics.

**Selection of enumerators and team leaders:** Survey team members all had previous experience in similar food security and nutrition surveys. The training included 20-30% more personnel than finally recruited for the actual data collection, this allowed the coordination team to select the best enumerators based on their performance during the training. Also reserve enumerators could be called upon if any selected enumerators defaulted.

The training consisted of 6 full days of classroom instruction and practice and 1 day of pre-testing of all survey procedures. The assessment managers ensured that all enumerators were fully aware of the enrolment and consent process as well as of inclusion and exclusion criteria for households.

**During data collection:** For each selected village, Team leaders recorded the following information, 1) number of households in the village, reasons (if any) for skipping the households, contact details of village authorities and number of women/children measured in each household. These data will allow calculation of response rates and the determination of reasons for non-response.

A mobile phone communication system was put in place between each team leader, survey supervisor and the survey coordination team. Tips and revised procedures were communicated immediately to all survey teams by sms.

**Data cleaning and analysis:** Data was downloaded directly from the tablet to an access database and exported to SPSS for analysis. Data cleaning consisted of examining frequency distributions for all variables in order to detect those values which are not logical or possible. Each participating household, child, and woman had a unique identification number made up of the cluster number and household number and, for individuals, an individual

number. For some variables, specifically anthropometric z-scores, standard criteria were applied to delete z-scores which were judged to be impossible and most likely due to error in measurement.