

Rwanda - Integrated Household Living Conditions Survey, Wave 2, 2005-2006.

National Institute of Statistics, Rwanda

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Overview

Identification

ID NUMBER

RWA_2005-2006_EICV-W2_v01_EN_M_v01_A_OCS

Overview

ABSTRACT

The objectives of the EICV 2005 are to provide information on poverty and living conditions in Rwanda and to monitor changes over time as part of the ongoing monitoring of the Poverty Reduction Strategy and other Government policies. The results of the EICV 2005 will be compared with the results of the EICV 2001 and the content of the questionnaire will be broadly similar to that of the previous survey. In addition the survey will provide data on household income and expenditures which can be used for updating the weights and market basket for the Consumer Price Index (CPI) and components of the national accounts. Survey data on agricultural activities have also proved to be important for national accounts and will complement information provided by future agricultural and rural sector surveys.

KIND OF DATA

Sample survey data [ssd]

UNITS OF ANALYSIS

Households

Scope

NOTES

The information gathered during the survey will be used primarily to provide information on assorted household and personal level characteristics which can be analyzed vis a vis the household's consumption. The primary household and person characteristics that are gathered in this survey in order to provide relevant indicators are:

- School attendance and literacy: This includes information to compute net and gross enrollment rates.
- Health and fertility: Some indicators such as maternal mortality are outside the scope of the survey. In this case, a more appropriate survey like the DHS may be recommended
- Migration.
- Employment and economic activity.
- Land ownership and other agricultural based indicators.

The survey is also designed to provide important information for the computation of National Accounts and rebasing the Consumer Price Index.

Coverage

GEOGRAPHIC COVERAGE

National coverage.

UNIVERSE

Household members (institutional and itinerant populations excluded).

Producers and Sponsors

PRIMARY INVESTIGATOR(S)

Name	Affiliation
National Institute of Statistics, Rwanda	Government of Rwanda

FUNDING

Name	Abbreviation	Role
The Government of Rwanda	GOR	Government funding
Department for International Development	DIFD	Bilateral funding assistance

OTHER ACKNOWLEDGEMENTS

Name	Affiliation	Role
Oxford Policy Management	DFID	International Technical Assistance
MINECOFIN	Government of Rwanda	Primary user of data (EDPRS)

Metadata Production

METADATA PRODUCED BY

Name	Abbreviation	Affiliation	Role
Office of Chief Statistician	OCS	Food and Agriculture Organization	Metadata adapted for FAM
National Institute of Statistics of Rwanda	NISR	Ministry of Finance and economic Planning	Data and metadata producer and deposit
Oxford Policy Management	OPM	DFID	Provided technical assistance for archiving the data set
PARIS 21 (Accelerated Data Program)		PARIS 21 (Accelerated Data Program)	Provided funding to send an expert to assist and train in archiving
Ruben MUHAYITETO		NISR	Revised the metadata

DDI DOCUMENT VERSION

RWA_2005-2006_EICV-W2_v01_EN_M_v01_A_OCS_v01

DDI DOCUMENT ID

DDI_RWA_2005-2006_EICV-W2_v01_EN_M_v01_A_OCS_FAO

Sampling

Sampling Procedure

The sampling frame for the EICV1 was based on the data and cartographic materials from the 1991 Rwanda Census of Population and Housing, while the EICV2 was based on the 2002 Rwanda Census frame. There were significant changes in the areas considered urban between the two censuses, but these geographic changes are taken into account in the comparative analysis between the EICV1 and EICV2 data. The sample design for EICV1 is described in the report on *Enquête Intégrale sur les Conditions de Vie des Ménages (Avec Volet Budget - Consommation) - Plan de Sondage*" (Scott, July 1997). A detailed description of the EICV2 sample design is found in the report on *Recommendations on Sample Design and Estimation Methodology for the Rwanda Enquête Intégrale sur les Conditions de Vie des Ménages 2005*. (Megill, June 2004).

A stratified two-stage sample design was used for both the EICV1 and EICV2. The primary sampling units (PSUs) were the enumeration areas or zones de dénombrement (ZDs) defined for the census. The sample of ZDs in each stratum was selected with probability proportional to size, where the measure of size was based on the number of households from the census frame. A new listing of households was conducted in each ZD, and a sample of households was selected at the second sampling stage. The units of analysis are the households and the individual members of the household.

One of the objectives of EICV1 and EICV2 was to provide reliable estimates of household consumption and other characteristics at the level of the 12 old provinces, as well as at the national level, City of Kigali, other urban and rural. Later the country was divided into five new provinces; given the larger size of the new provinces, the corresponding estimates will have better precision than those at the old provincial level.

The stratification of the sampling frame for both EICV1 and EICV2 was designed to improve the efficiency of the sample design and ensure a sufficient sample size for the major geographic domains of analysis. The sampling frame for these surveys was stratified by the 12 old provinces, as well as by urban and rural areas. At the national level three residential strata were defined: (1) City of Kigali, (2) other urban, and (3) rural. In the case of EICV1, the ZDs in the urban and rural strata for each province were ordered geographically to provide a corresponding implicit stratification.

In the case of the City of Kigali, there is a higher variability in socioeconomic characteristics compared to the other domains. Therefore a socioeconomic stratification was defined for the ZDs in the EICV2 sampling frame for the City of Kigali, using an indicator of bien-être (well-being) based on housing characteristics in the 2002 Rwanda Census data. The ZDs were coded by four socioeconomic quartiles, and this was used as a sorting variable to provide a corresponding implicit stratification. A new stratification code for "semi-rural" was introduced into the sampling frame for EICV2 to identify urban ZDs with at least 70 percent of households with agricultural operations (based on the 2002 Rwanda Census data). This "semi-rural" code was used as one of the sorting criteria for the sampling frame of the City of Kigali and the other urban stratum in each province. Within each stratum, the ZDs in the sampling frame were further sorted geographically to provide an additional level of implicit stratification.

Given that the rural economy is primarily agricultural, the socioeconomic characteristics of the rural households are generally correlated with the crop and livestock activities found in the different bio-climatic zones. Therefore the EICV2 sampling frame for rural strata was sorted by the ten bio-climatic zones as well as geographic codes to provide an effective implicit stratification.

The sample size for EICV1 and EICV2 was determined by the precision required for the survey estimates for each domain, as well as by the resource and operational constraints. The total sample size for EICV1 was 570 ZDs and 6,450 households. For EICV2 this sample size was increased to 620 ZDs and 6,900 households, in order to provide a larger sample for the urban strata. One reason for increasing the urban sample for EICV2 was because of the expansion of urban areas following the 2002 Rwanda Census. The effective sample size for EICV1 was actually 6,420 households, since 30 non-interviews were not replaced for this survey.

Given that one of the objectives of these surveys was to produce reliable estimates for each of the 12 old provinces, a total of 40 sample rural ZDs was allocated to each province. A larger sample was allocated to the City of Kigali because of the larger variability of socioeconomic characteristics; 80 sample ZDs were selected in this domain for EICV1 and 100 ZDs for EICV2. In the case of the other urban strata, a sample of 50 ZDs for EICV1 and 80 ZDs for EICV2 were allocated to the 11 other provinces proportionately to their urban population.

For EICV1 the number of households selected per sample ZD was 9 for the City of Kigali and the other urban stratum, and 12 for the rural stratum. This was an effective sampling strategy given that the urban strata generally have more variability between ZDs and homogeneity of households within ZDs. This approach also provided a reasonable workload for the enumerators in the urban and rural ZDs based on the data collection procedures each cycle. Therefore this same sampling strategy was used for

EICV2.

For both EICV1 and EICV2 the ZDs within each stratum were selected systematically with probability proportional to size, where the measure of size was based on the number of households in the ZD from the corresponding census frame (1991 for EICV1 and 2002 for EICV2). Following a new listing of households in the sample ZDs, at the second stage 9 sample households were selected systematically in each sample urban ZD and 12 sample households were selected in each rural ZD. This sampling strategy provided an approximately self-weighting sample (that is, the sampling weights were similar) within each stratum. A sample of possible replacement households was also selected systematically within each sample ZD. Whenever an original sample household could not be interviewed for any reason, it was substituted by one of the random replacement households.

Deviations from Sample Design

As indicated, any household that was not interviewed as per the original listing and selection was replaced with a reserve household. Each EA had 4 households on reserve. A total of 522 households were replaced over the course of the survey. In addition, several EAs were swapped from their scheduled cyclic visit due to seasonal accessibility problems.

Response Rate

Out of the 6900 household sample, 92.4% responded. All 7.6% of households that were not interviewed, were replaced. The City of Kigali and the old province of Butare had the highest refusal rates with about 14% of the original selected households being replaced. The primary reason given for replacement was the inability to positively identify the dwelling (or the selected dwelling was found uninhabited).

Weighting

In order for the estimates from each survey to be representative at the national level, it is necessary to apply sampling weights to the survey data. The weights for the sample households were calculated as the inverse of the overall probability of selection, taking into account each sampling stage. Given the nature of the sample design and the new listing of households, the weights vary by sample ZD. An Excel spreadsheet with all the sampling frame information for the sample ZDs was used for calculating the weights, which were then attached to the corresponding records in the survey data files.

Questionnaires

Overview

The questionnaires that were used for the survey were largely adapted from the EICV-1. However there were some substantial changes in structure particularly for the employment section. The questionnaire was subject to revision through a series of consultative meetings held in October 2004. The questionnaires remain predominantly structured with pre-coded responses. It should be noted that some of the response categories have changed between the EICV-1 and EICV-2 requiring a series of recodes for comparability.

PART A: General

- Section 0: Introductory Section
- Section 1: Demographics (eng_eicv2_s1_demo).
- Section 2: Education (eng_eicv2_s2_education).
- Section 3: Health (eng_eicv2_s3_health).
- Section 4: Migration (eng_eicv2_s4_migration).
- Section 5: Household characteristic (eng_eicv2_s5_housing).
- Section 5E: Access to services (eng_eicv2_s5e_services).
- Section 6ABC: Employment Parts A,B,C (eng_eicv2_s6abc_employment).
- Section 6D: Employment listing (eng_eicv2_s6d_employ_roster).
- Section 6E: Salaried employment (eng_eicv2_s6e_employ_wages).
- Section 6F: Non-remunerated work (eng_eicv2_s6f_noremuner).
- Section 7: Non-farm Enterprise (eng_eicv2_s7_enterprise).

PART B: Agriculture and Expenditure

- Section 8A1: Livestock ownership (eng_eicv2_s8a1_livestock).
- Section 8A2: Livestock products (eng_eicv2_s8a2_livestock_products).
- Section 8A3: Expenditures related to livestock ownership (eng_eicv2_s8a3_livestock_expenditures).
- Section 8B: Assets related to agriculture activity (eng_eicv2_s8b_ag_assets).
- Section 8C: Individual plots of land (eng_eicv2_s8c_ag_plots).
- Section 8D: Large scale or bulk agricultural production (eng_eicv2_s8d_ag_production1).
- Section 8E: Small scale or piecemeal agricultural production (eng_eicv2_s8e_ag_production2).
- Section 8F: Other agricultural products (eng_eicv2_s8f_ag_other).
- Section 8G: Inputs related to agricultural production (eng_eicv2_s8g_ag_expense).
- Section 8H: Agricultural processing (eng_eicv2_s8h_ag_process).
- Section 9A1: Annual (infrequent) non food expenditure (eng_eicv2_s9a1_nfood_annual).
- Section 9A2: Monthly (infrequent) non food expenditure (eng_eicv2_s9a2_nfood_month).
- Section 9A3: Frequent non food expenditure (eng_eicv2_s9a3_nfood_freq).
- Section 9B: Frequent food expenditure (eng_eicv2_s9b_food).
- Section 9C: Availability of key items (eng_eicv2_s9c_availability).
- Section 9D: Own consumption (eng_eicv2_s9d_ex_owncons):
- Section 10A: Transfers out of the household (eng_eicv2_s10a_transfer_out).
- Section 10B: Transfers into the household (eng_eicv2_s10b_transfer_in).
- Section 10C: Miscellaneous income and expenditure (eng_eicv2_s10c_misc).
- Section 11A: Household Credit (eng_eicv2_s11a_credit).
- Section 11B: Durable good ownership (eng_eicv2_s11b_durables).
- Section 11C: Household Savings (eng_eicv2_s11c_savings).

PART C: Community Questionnaire

- Section 0: Introduction (eng_eicv2_com0_intro).
- Section 1: Migration patterns (eng_eicv2_com1_migration).
- Section 2: Economic activity (eng_eicv2_com2_econactivity).
- Section 3: Access to school (eng_eicv2_com3_education).
- Section 4: Health (eng_eicv2_com4_health).
- Section 5: Agriculture (eng_eicv2_com5_agri) (eng_eicv2_com6_ivestock) (eng_eicv2_com7_ag_extension).
- Section 6: Community Services (eng_eicv2_com8_comm_service).
- Section 9: Market survey (eng_eicv2_com9_market).

NOTE: All codes are sequential for all the precoded sections. No standard coding scheme is provided. The questionnaire is provided in the documentation section.

Data Collection

Data Collection Dates

Start	End	Cycle
2005-10-12	2005-11-13	1
2005-11-17	2005-12-19	2
2005-12-23	2006-01-24	3
2006-01-28	2006-03-01	4
2006-03-05	2006-04-06	5
2006-04-10	2006-05-12	6
2006-05-16	2006-06-17	7
2006-06-21	2006-07-23	8
2006-07-27	2006-08-28	9
2006-09-01	2006-10-03	10

Data Collection Mode

Face-to-face paper [f2f]

Data Collection Notes

- A listing of households was undertaken of the selected EAs in the sample. This exercise began in June 2005. Three months were required to list the households in the EAs.
- Vehicles were provided by DFID. They were transferred from another DFID project for use on the EICV.
- A four week training of enumerators was held in Ruhengeri. Of 114 applicants 94 were selected. This included the 16 controllers and 78 enumerators.
- Controllers were provided with a list of replacement households in the event of non-response. Four replacements were drawn for each cluster. These are identifiable in the data set as the end in multiples of 4. Households 4-8-12-16 indicate replacement households.

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- Section 4: Health (eng_eicv2_com4_health).
- Section 5: Agriculture (eng_eicv2_com5_agri) (eng_eicv2_com6_ivestock) (eng_eicv2_com7_ag_extension).
- Section 6: Community Services (eng_eicv2_com8_comm_service).
- Section 9: Market survey (eng_eicv2_com9_market).

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Data Collectors

Name	Abbreviation	Affiliation
National Institute of Statistics, Rwanda	NISR	Government of Rwanda

Data Processing

Data Editing

Questionnaires were reviewed by the controller in the field before they were dispatched for data entry. A control sheet was provided to the controllers to assist in the process of manually editing the questionnaires. Questionnaire structures were verified when the questionnaires were checked in prior to data entry. Three contracted persons reviewed the questionnaire and filled in a form that served as a primary data control sheet. Automated data editing was largely done during the data entry phase. Some batch edit programs were used to identify inconsistent data.

Data imputation was largely done during the analysis phase by analysts. However, a "structural" imputation on the microdata was required for the own consumption data. This was done to adjust for erroneous pricing when the unit for measuring own consumption was buckets. For more information, please refer to the SPSS syntax files or the data processing report.

Coding of products was based on sequential codes for each section. Sequential coding was used to correlate the indexed position of the item for locating the record in the data processing system with the actual row number or sequence. For the poverty study, a recode was done to expenditures to the EICV-1 codes. The recodes are available in the syntax files. However, a general recode to standardize commodities to a standard (such as COICOP) was not done.

Data Appraisal

Estimates of Sampling Error

Given that the survey estimates are subject to sampling variability, it is important to calculate the sampling errors for the most important estimates from each survey. The sampling error is measured by the standard error, or square root of the variance of the estimate. The CENVAR software, a component of the Integrated Microcomputer Processing System (IMPS) developed by the U.S. Census Bureau, was used for tabulating the standard errors and other measures of precision, taking into account the stratification and clustering in the sample design. The CENVAR output tables show the value of the estimates, standard errors, coefficients of variation, 95 percent confidence intervals, design effects and number of observations. Given that the confidence intervals provide a user-friendly interpretation of the sampling variability, an annex was produced with tables showing the 95 percent confidence intervals for the most important estimates from the EICV1 and EICV2 data appearing in the preliminary report. These tables provide a quick conservative test to determine whether any difference between the EICV1 and EICV2 estimates is statistically significant.

The INSR was also provided with tables showing the full CENVAR results. The design effect is defined as the variance of an estimate based on the actual sample design divided by the corresponding variance based on a simple random sample of the same size; it is a measure of the relative efficiency of the sample design. In comparing the CENVAR results from EICV1 and EICV2, it was found that the design effects are generally lower for EICV2, indicating that the stratification used for this survey was very effective. Given that the EICV1 was based on an older sampling frame from the 1991 Rwanda Census, this also contributed to the higher design effects for the EICV1 estimates.

Other forms of Data Appraisal

New systems and techniques were used to capture and edit the data for the EICV-2. Many improvements were implemented to the data entry system for the EICV-2. The EICV-1 used the DOS based software called IMPS for both data entry and data editing (CENTRY and CONCOR modules respectively). In addition, EICV-1 used various short term and intermittent consultant inputs for the design and implementation of the data processing system. The first five months of the data entry process during the EICV-1 suffered greatly from a lack of quality control. This lack of cohesive support during both the design phase and initiation of the data processing system likely impacted the quality of the data despite attempts made to correct the system during mid-survey.

For the EICV-2, long-term and continuous technical support was provided by the OPM consulting firm and better trained and more committed local supervisors followed through in implementing and maintaining the system. In addition and more importantly, the EICV-2 data processing activities followed quickly behind the processing of the DHS (Demographic and Health Survey). It was clearly advantageous to simply adapt the DHS data processing system for the EICV-2. The DHS data processing system is a broadly used and dynamic system designed for use with the data processing software CPro (Census and Survey Processing System). In fact, CPro is designed with the DHS as its model survey. Furthermore, this system of managing the data processing activities is also being used by UNICEF to process the MICS. Applying a robust system and modifying it for use during the EICV-2 saved a great deal of time and effort in training and development. The staff was already familiar with the DHS data processing and editing system and porting the system to the EICV-2 over the long term and through the extent of the survey proved very useful. Some of the specifications that are used by the DHS, MICS and the EICV are:

- a. An integrated sample design control sheet used to check in questionnaires.
- b. A data entry system designed as "system control". A system controlled application is a very tight control system where the path of data entry cannot be circumvented by the data entry clerk. The path is fully programmed and must include: skips and pre-defined keys for: missing, other or incoherent data.
- c. Full double-entry for independent verification.
- d. A systematic control of data files from: primary-verified-raw-edit-final data files.
- e. Full reconstruction of the consolidated data file with the primary cluster file.
- f. All corrections done on the lowest ASCII cluster level.

The data entry was done centrally in the NISR headquarters. Activity was initiated in the old Census building in Remera on October 20. On December 16, 2006, the NISR consolidated its offices and moved the Census activities to its current location in the old MINIPLAN building. The move required the establishment of the new data entry operations in the new building and the transfer of all machinery to the building. This operation did not adversely affect the keying operations. The remainder of the survey was keyed in the MINIPLAN building.

All computers were set up in a LAN with data being copied and written to the supervisor machines and backed up daily.

The questionnaires were received and checked into a central repository. Data was entered by the cluster (9 urban questionnaires or 12 rural questionnaires). Two archivists managed the check-in and distribution of questionnaires to the data entry supervisors. A sample of the check-in forms is provided in Annex 1.

Once the questionnaires were received and logged on a control sheet, the control sheet was entered in an automated control system by the data entry supervisors prior to being assigned to the data entry clerk. This system maintained by the supervisors assured that the sample design was strictly adhered to and that the coding and tracking of the questionnaires was properly initiated and followed. This system was built on the DHS control system and used CPro to manage the flow and assignment of the questionnaires.

There was a 100% full independent double data entry of the questionnaires. This assured virtual certainty that inconsistencies found in the data were mostly due to errors and misreported items from the field.

Average data processing time to process all three questionnaires related to a cluster was 21.3 days.