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SMALL HOLDER AGRICULTURE

Volume III: LIVESTOCK SECTOR - NATIONAL REPORT

National Bureau of Statistics, Ministry of Agriculture and Food Security, Ministry of Water and Livestock Development, Ministry of Cooperatives and Marketing, Presidents Office, Regional Administration and Local Government, Ministry of Finance and Economic Affairs - Zanzibar

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ABBREVIATIONS

ASDP	Agricultural Sector Development Programme
CSPro.....	Census and Survey Processing system
SPSS	Statistical Package for Social Sciences
CSTWG	Census and Surveys Technical Working Group
EU	European Union
DADIPS.....	District Agricultural Development and Investment Projects
DFID.....	Department for International Development
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
ICR.....	Intelligent Character Recognition
IEC.....	Information, Education and Communication
JICA.....	Japan International Cooperation Agency
LSU.....	Livestock Unit
MAFS	Ministry of Agriculture and Food Security
NBS	National Bureau of Statistics
NSGRP	National Strategy for Growth and Reduction of Poverty
NGO.....	Non Government Organisations
OCCS	Office of the Chief Government Statistician in Zanzibar
PORALG.....	Presidents Office, Regional Administration and Local Government
SAC	Scotts Agriculture Consultancy Ltd.
UNDP	United Nations Development Programme
ULG	Utek Laurence Gould Consultants

PREFACE

At the end of the 2002/03 agriculture year the National Bureau of Statistics and the Office of the Chief Government Statistician in Zanzibar in collaboration with the Ministries of Agriculture and Food Security; Water and Livestock Development; Cooperatives and Marketing as well as the Presidents Office, Regional Administration and Local Government (PORALG) conducted the Agriculture Sample Census for 2002/2003. This is the third Agriculture Census to be carried out in Tanzania, the first one was conducted in 1971/72, the second in 1993/95 (during 1993/94 data on household characteristics and livestock count was collected and data on crop area and production in 1994/95).

It is considered that this census is one of the largest to be carried out in Africa and indeed in many other countries of the world. For the livestock sub-sector the census collected detailed data on cattle, goats, pigs, sheep, chicken and other livestock. It also collected comprehensive information on livestock products, livestock diseases, access to livestock infrastructure, extension services, fish farming and the contribution of livestock to crop production in the form of farm yard manure and draft power. As a result the reports from this census are much more detailed than previous censuses.

In addition to this, the census was large in its coverage as it provides data that can be disaggregated at district level and thus allow comparisons with the 1998/99 District Integrated Agricultural Survey. The census covered smallholders in rural areas only and large scale farms. This report presents data disaggregated at region level and it focuses on livestock kept by smallholders. For the first time it includes figures for Zanzibar. The analysis in the report includes time series comparisons using data from the previous censuses and surveys.

The extensive nature of the census in relation to its scope and coverage of the livestock sub-sector is a result of the increasing demand for more detailed information to assist in the proper planning of this sub-sector and in the administrative decentralization of planning to district level. It is hoped that this report will provide new insights for planners, policy makers, researchers and others involved in the agricultural sector in order to improve the prevailing conditions faced by livestock producers in the country.

On behalf of the Government of Tanzania, I wish to express my appreciation for the financial support provided by the Development Partners, in particular, the European Union as well as DFID, UNDP, Japanese government, JICA and others who contributed through the pool fund mechanism.

Finally, my appreciation goes to all those who in one-way or the other contributed to the success of the survey. In particular, I would also like to mention the enormous effort made by the Planning Group composed of professionals from the Agriculture Statistics Department of the National Bureau of Statistics, the Office of the Chief Government Statistician in Zanzibar and the Statistics Unit of the Ministry of Agriculture and Food Security with technical assistance provided by Utec Lawrence Gould, Scotts Agriculture Consultancy Ltd and the Food and Agriculture Organisation of the United Nations.

Additionally, I would like to extend my appreciation to all professional staff of the National Bureau of Statistics, the sector Ministries of Agriculture and PORALG, the Consultants as well as Regional and District Supervisors and field enumerators for their commendable work. Certainly without their dedication, the census would not have been such a success.



Cletus P. B. Mkai

The Director General

National Bureau of Statistics

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EXECUTIVE SUMMARY

The analysis and data contained in this document provides a detailed description of the state of the livestock sub-sector in Tanzania for the agriculture year 1st October 2002 to 30th September 2003. Most of the analysis and tabulations are based on smallholder agriculture which permits comparisons between regions and Zanzibar (District comparisons are made in separate Regional reports and with the Agriculture Sample Census Dissemination Application). In some cases the contribution of Large Scale Farms is included to give the overall country estimates.

During the 2002/03 agriculture year there were 1,745,776 livestock keeping households in Tanzania representing 37 percent of the total 4,901,837 Smallholder households.

As of 1st October 2003 there were 33,728,717 head of the major livestock types in the country or 20,353,866 Livestock Units to be more precise. Cattle is the predominant species kept by smallholders with a population of 16,999,793 followed by goats (11,808,181), sheep (3,945,566) and pigs (974,507). The contribution of Zanzibar to the total livestock population is very small. In terms of number of households keeping livestock, goats are as important as cattle with 40 percent keeping goats and 37 percent rearing cattle. Livestock keeping households kept an average of 19 head per household (13 head of cattle, 9 goats, 8 sheep and 4 pigs per household). Southern regions are much less important for rearing livestock than the regions in the north of the country with Shinyanga and Arusha regions having the highest numbers. However, in terms of livestock density Mwanza has the highest number of livestock per square kilometre followed by Arusha, Kilimanjaro, Mara and then Shinyanga. Chickens are the most important poultry in Tanzania. The total number of chickens in Tanzania as of 1st October 2003 was 34,371,037 and these were kept by 62 percent of the total smallholder households. The average number of chickens per household was 11.

Highest numbers of cattle are found in the regions of Shinyanga, Mwanza, Arusha and Tabora, however the highest densities are in Mwanza, Mara and Shinyanga. Arusha, Shinyanga and Manyara have the highest goat population, however the greatest densities are in Arusha, Kilimanjaro and Mwanza. Arusha has the highest number and density of sheep. Pigs are more common in the southern regions of Mbeya and Iringa, however the highest densities are found in Kilimanjaro and Dar es Salaam regions. High numbers of chickens are found in all regions with the exception of Arusha, Manyara, Mtwara, Kigoma and Kagera. Zanzibar and Dar es Salaam have the highest densities of chickens.

Compared to previous census and surveys there has been an increase in the numbers of the all major animal species with cattle showing a growth rate of 0.92 percent per year over the period 1995 to 2003. The growth rate of goats over the same period was 1.2 percent per year, 3.1 percent per year for Sheep, 11 percent per year for pigs and 4.3 percent per year for chickens.

The small holder livestock sub sector is dominated by indigenous species of livestock. Ninety seven percent of the cattle population was indigenous, whilst the figure for goats, sheep and chickens was 98 percent.

Cattle and Goats are the only animals used for milk production in Tanzania; however the production from goats is only 2 percent. Arusha has the highest milk production in the country. Farm gate prices for milk varies between regions from 107 Shillings per litre in Mara to 243 Shillings per litre in Lindi. In general the lowest prices are found in the high cattle producing regions in the country. High prices are encountered in regions close to major urban centres (e.g. Dar es Salaam)

or in regions with low cattle numbers (e.g. Lindi). A high percentage (70%) of the milk produced was sold and most of this was sold to neighbours.

Livestock contributes to crop production in the form of farm yard manure and as a source of draft power for cultivating land. Farm yard manure was applied to 2,334,188 ha which represents 26 percent of the total planted area. Mwanza and Shinyanga has the highest area of applied organic fertiliser, however Kilimanjaro and Mbeya has the highest number of households using organic fertiliser indicating a higher demand in these regions. Shinyanga has the highest number of households using draft animals for cultivation (65%). The area cultivated using draft animals in Shinyanga was 630,546 ha. This is followed by Tabora (226,453 ha), Mwanza (216,575 ha), Singida (190,158 ha) and Rukwa (178,733 ha).

Helmenthiosis is the most prevalent infection and is common to all livestock in Tanzania with 53 percent of total livestock infected. Pleuro pneumonia is the second most common disease followed by foot and mouth, trypanosomiasis and foot rot. Pigs have the highest helmenthiosis infection rate (35%) and cattle have the lowest (11%). The highest helmenthiosis infection rates are in the high populated regions of Dar es Salaam and Kilimanjaro. Pleuro Pneumonia infects sheep and goats more than cattle. The highest infection rate is in Manyara and Arusha which are regions with high numbers of sheep and goats.

Foot and mouth mainly infects cattle and has an infection rate of 5 percent. Mara has the highest foot and mouth infection rate and is three times greater than in other regions. Foot rot disease in sheep and goats has an infection rate of 4 percent and it is highest in Morogoro, Dodoma and Mara regions. Trypanosomiasis is most common in Tabora.

The distance from smallholder households to livestock services (i.e. livestock centres, veterinary clinics, Input suppliers, etc) are higher than the distance to livestock husbandry structures (i.e. Cattle dips, Hand Powered Sprayers, drenchers etc). Over 48 percent of households are 15 km or more from livestock services whilst only between 3 and 9 percent of households are more than 15 km from livestock husbandry structures. Between 33 and 41 percent of households are 15 km or more from the nearest marketing outlet. However, there are regional differences and in general the regions with the highest population of livestock (e.g. Tabora, Manyara, Mwanza and Shinyanga) have poorer access to these facilities than other regions with lower livestock populations (e.g. Kilimanjaro, Dar es Salaam, Pwani and Morogoro). The low livestock producing regions of Rukwa, Mtwara, and Lindi have, in general, poorer access to these facilities.

The main source of extension service is from the government (95%) with large scale farmers providing only 0.5 percent. Disease control was the most common extension advice provided, followed by housing and proper feeding. More households were provided with extension messages in Kilimanjaro and Iringa than in other regions and the high livestock producing regions of Shinyanga, Mwanza, Mara, Manyara and Tabora had moderate to very low extension contact.

Fish Farming in the country is practiced in very few places. Tilapia is the most common fish farmed (92%) followed by Carp (4%). An estimated 2,603,035 fish were produced during the year which is approximately 166 fish per fish farming household. The major fish producing regions in the country are Ruvuma, Mbeya, and Iringa. Most fish farming is practiced in dug out ponds and most fish farmers (60%) used the fish for home consumption. Households that did sell fish mostly sold to neighbours.

1. INTRODUCTION

1.1 Introduction

Agriculture is an important economic sector of the Tanzanian economy in terms of food production, employment generation, production of raw material for industries, and generation of foreign exchange earnings. The agricultural sector produces about 46 percent of GDP (Economic Survey, 2004). Having a diversity of climatic and geographical zones, Tanzania's farmers grow a wide variety of food and cash crops as well as fruit, vegetables and spices. Tanzania Mainland has around 50 million hectares of land fit for grazing and has the third largest livestock population in Africa after Sudan and Ethiopia. In 2004 the contribution of livestock to GDP was 4.1 and the contribution of livestock to the agriculture sector was estimated to be 8.9 percent. The main types of livestock raised in Tanzania are cattle, goats, sheep, pigs and chicken. Besides meat production, other products from livestock include hides and skins, milk and eggs. Livestock also contributes to crop and vegetable production by providing draft animals for cultivation and organic fertiliser.

This report (Volume III) covers the Livestock sector at National and Regional Level and includes Zanzibar estimates. Other Census reports include the Technical Report (Volume I), Crops Report (Volume II), Smallholder Household Socioeconomic Characteristics and Access to Natural Resources (Volume IV), 21 Regional Reports for the Mainland (Volume V), Large Scale Farms Report (Volume VI) and a separate report for Zanzibar (Volume VII). In order to address the specific issue of gender, a separate thematic report on gender has been published (Gender Profile of the Agriculture Sector for Mainland Tanzania). Other thematic reports will be produced depending on the demand and availability of funds. In addition to these reports two dissemination applications have been produced to allow users to create their own tabulations, charts and maps.

This report is in four main sections: Introduction, Results, Conclusions and Appendices. The definitions relating to all aspects of this report can be found in the questionnaire (Appendix I).

1.2 Background Information

In 2003, the Government of Tanzania launched the Agricultural Sample Census as an important part of the Poverty Monitoring Master Plan which supports the production of statistics for advocacy of effective public policy, including poverty reduction, access to services, gender, as well as the standard production data normally collected in an agriculture census. The census is intended to support and fill the information gap necessary for planning and policy formulation by high level decision making bodies. It is also meant to provide critical benchmark data for monitoring ASDP and other agriculture and rural development programs as well as prioritising specific interventions of most agriculture and rural development programs.

Following the decentralisation of the Government's administration and planning functions, there has been a pressing need for agriculture and rural development data disaggregated at regional and district level. The provision of district level estimates will provide essential baseline information on the state of agriculture that support decision making by the Local Government Authorities and in the design of District Agricultural Development and Investment Projects (DADIPS). The increase in investment is an essential element in the national strategy for growth and reduction of poverty.

1.2.1 Census Objectives

The 2003 Agriculture Sample Census was designed to meet the data needs of a wide range of users down to district level including policy makers at local, regional and national levels, rural development agencies, funding institutions, researchers, NGOs, farmer organisations, etc. As a result the dataset is both more numerous in its sample and detailed in its scope

compared to previous censuses and surveys. To date this is the most detailed Agricultural Census carried out in Africa. The census was carried out in order to:

- Identify structural changes if any, in the size of farm household holdings, crop and livestock production, farm input and implement use. It also seeks to determine if there are any improvements in rural infrastructure and the level of agriculture household living conditions;
- Provide benchmark data on productivity, production and agricultural practices in relation to policies and interventions promoted by the Ministry of Agriculture and Food Security and others stake holders.
- Establish baseline data for the measurement of the impact of high level objectives of the Agriculture Sector Development Programme (ASDP), National Strategy for Growth and Reduction of Poverty (NSGRP) and other rural development programs and projects.
- Obtain a benchmark data that will be used to address specific issues such as: food security, rural poverty, gender, agro-processing, marketing, service delivery, etc.

1.2.2 Census Coverage

The census was conducted for both large and small scale farms. This report covers small scale farms in detail with some summary data from Large Scale Farms in order to provide complete national estimates for some variables e.g., total livestock population, etc. Data was collected from a sample of 53,070 of small scale farmers of which 48,315 were from the Mainland and 4,755 from Zanzibar. Data was also collected from 1,217 Large Scale Farms (1,206 on the Mainland and 11 in Zanzibar) on a complete enumeration basis.

1.2.3 Census Scope

The census covered agriculture in detail as well as many other aspects of rural development and was conducted using three different questionnaires:

- Small scale farm questionnaire
- Community level questionnaire
- Large scale farm questionnaire

The small scale farm questionnaire was the main census instrument and it includes questions related to crop and livestock production and practices; population demographics; access to services, resources and infrastructure; and issues on poverty, gender and subsistence versus profit making production units. The main topics covered were:

- Household demographics and activities of the household members
- Land access/ownership/tenure and use
- Crop and livestock production and productivity
- Access to inputs and farming implements
- Access and use of credit
- Access to infrastructure (roads, district and regional headquarters, markets, advisory services, schools, hospitals, veterinary clinics, etc...)
- Crop marketing, storage and agroprocessing
- Tree farming, agro-forestry and fish farming
- Access and use of communal resources (grazing, communal forest, water for humans and livestock, beekeeping etc.)
- Investment activities: Irrigation structures, water harvesting, erosion control, fencing, etc.
- Off farm income and non agriculture related activities
- Households living conditions (housing, sanitary facilities, etc.)

- Labour use, livelihood constraints and subsistence versus non subsistence activities
- Gender issues.

The community level questionnaire was designed to collect village level data such as access and use of common resources, community tree plantation and seasonal farm gate prices.

The Large Scale Farm questionnaire was administered to large farms either privately or corporately managed. Some data from the Large Scale Farm questionnaire is incorporated in this report, however an in depth analysis of Large Scale Farms is presented in a separate report.

1.3 Census Methodology

The main focus at all stages of the census execution was on data quality and this is emphasised in this section. The main activities undertaken include:

- Census organisation
- Tabulation plan preparation
- Sample design
- Design of census questionnaires and other instruments.
- Field pretesting of the census instruments
- Training of trainers, supervisors and enumerators
- Information Education and Communication (IEC) campaign
- Data Collection
- Field supervision and consistency checks
- Data processing:
 - Scanning
 - ICR extraction of data
 - Structure formatting application
 - Batch validation application
 - Manual data entry application
 - Tabulation preparation using SPSS
- Table formatting and charts using Excel, map generation using ArcView and Freehand.
- Report preparation using Word and Excel.

1.3.1 Census Organisation

The Census was conducted by the National Bureau of Statistics (NBS) in collaboration with the sector Ministries of Agriculture, and the Office of the Chief Government Statistician in Zanzibar (OCGS). At the National level the Census was headed by the Director General of the National Bureau of Statistics with assistance from the Director of Economic Statistics. The Planning Group oversaw the operational aspects of the Census and this consisted of staff from the Department of Agriculture Statistics of NBS and three representatives of the Department of Policy and Planning of the Ministry of Agriculture and Food Security (MAFS). At the regional level, implementation of census activities was overseen by the Regional Statistical Office of NBS and the Regional Agriculture Supervisor from the Ministry of Agriculture and Food Security. At the District level the Census activities were managed by two Supervisors from the Presidents Office, Regional Administration and Local Government (PORALG). The supervisors managed the enumerators who also came from PORALG.

The members of the Planning Group had a minimum qualification of a bachelor degree; the Regional Supervisors were Agriculture Economists, Statisticians or Statistical Officers. The District Supervisors and Enumerators had diploma level qualifications in Agriculture.

The Census and Surveys Technical Working Group (CSTWG) provided support in sourcing financing, approving budget allocations and Technical Assistance inputs as well as monitoring the progress of the Census. A Technical Committee for the census was established with members from key stakeholder organisations and its function was to approve the proposed instruments and procedures developed by the Planning Group. It also approved the tabulations and analytical reports prepared from the Census data.

1.3.2 Tabulation Plan Preparation

The tabulation plan was developed following three user group workshops and thus reflects the information needs of the end users. It took into consideration the tabulations from previous census and surveys to allow trend analysis and comparisons.

1.3.3 Sample Design

The Mainland sample consisted of 3,221 villages. These villages were drawn from the National Master Sample (NMS) developed by the National Bureau of Statistics (NBS) to serve as a national framework for the conduct of household based surveys in the country. The National Master Sample was developed from the 2002 Population and Housing Census. The total Mainland sample was 48,315 agricultural households. In Zanzibar a total of 317 EAs were selected and 4,755 agriculture households were covered. Nationwide, all regions and districts were sampled except three urban district (two from Mainland and one from Zanzibar).

In both Mainland and Zanzibar, a stratified two stage sample was used. The number of villages/Enumeration Areas (EAs) were selected for the first stage with a probability proportional to the number of villages in each district. In the second stage, 15 households were selected from a list of farming households in each Village/EA using systematic random sampling. Table 3.1 gives the sample size of households, villages and districts for Tanzania Mainland and Zanzibar.

Table 1.1 Census Sample Size

Number	Mainland	Zanzibar	Total
Households	48,315	4,755	53,070
Villages/EAs	3,221	317	3,539
Districts	117	9	126
Regions	21	5	26

1.3.4 Questionnaire Design and Other Census Instruments

The questionnaires were designed following user meetings to ensure that the questions asked were in line with users data needs. Several features were incorporated into the design of the questionnaires to increase the accuracy of the data:

- Where feasible all variables were extensively coded to reduce post enumeration coding error.
- The definitions for each section were printed on the opposite page so that the enumerator could easily refer to the instructions whilst interviewing the farmer.
- The responses to all questions were placed in boxes printed on the questionnaire, with one box per character. This feature made it possible to use scanning and Intelligent Character Recognition (ICR) technologies for data entry.
- Skip patterns were used to reduce unnecessary and incorrect coding of sections which do not apply to the respondent.
- Each section was clearly numbered, which facilitated the use of skip patterns and provided a reference for data type coding for the programming of CPro, SPSS and the dissemination applications.

Three other instruments were used:

- Village Listing Forms were used for listing households in the village and from this list a systematic sample of 15 agricultural households were selected.
- A Training Manual which was used by the trainers for the cascade/pyramid training of supervisors and enumerators
- Enumerator Instruction Manual which was used as reference material.

1.3.5 Field Pre-testing of the Census Instruments

The Questionnaire was pre-tested in five locations (Arusha, Dodoma, Tanga, Unguja and Pemba). This was done to test the wording, flow and relevance of the questions and to finalise crop lists, questionnaire coding and manuals. In addition to this, several data collection methodologies had to be finalised, namely, livestock numbers in pastoralist communities, cut flower production, mixed cropping, use of percentages in the questionnaire and finalising skip patterns and documenting consistency checks.

1.3.6 Training of Trainers, Supervisors and Enumerators

During training, cascade/pyramid training techniques were employed to maintain statistical standards. The top level of training was provided to 66 national and regional supervisors (3 supervisors per region plus Zanzibar). The trainers were members of the Planning Group from the National Bureau of Statistics and the sector Ministries of Agriculture. In each region, three training sessions were conducted for the district supervisors and enumerators. In addition to training them in field level Census methodology and definitions, emphasis was placed on training the enumerators and supervisors in consistency checking. Tests were given to the supervisors and enumerators and the best 50 percent of the trainees were selected for the enumeration of the smallholder questionnaire and the community level questionnaire. This increased the number of interviews per enumerator but it also released finance to increase the number of supervisors and hence the Supervisor Enumerator Ratio. The household listing exercise was carried out by all trained enumerators.

1.3.7 Information, Education and Communication (IEC) Campaign

Radio, television, newspapers, leaflets, t-shirts and caps were used to publicise the Agriculture Sample Census. This helped in sensitising the public for the field level activities. The t-shirts and caps were given to the field staff and the village chairpersons. The village chairpersons helped to locate the selected households.

1.3.8 Data Collection

Data collection activities for the 2003 Agriculture Sample Census took 3 months from January to March 2004. The data collection methods used during the census was by interview and no physical measurements, e.g., crop cutting and field area measurement were taken. Field work was monitored by a hierarchical system of supervisors at the top of which was the Mobile Response Team followed by the Regional Supervisors and District Supervisors. The Mobile Response Team consisted of 3 Principal Supervisors who provided overall direction to the field operations and responded to queries arising outside the scope of the training exercise. The mobile response team consisted of the Manager of Agriculture Statistics Department, Long-term Consultant and the Desk Officer for the Census. Decisions made on definitions and procedures were then communicated back to all enumerators via the Regional and District Supervisors.

On the Mainland district supervision and enumeration were done by staff from the President's Office, Regional Administration and Local Government (PORALG). Regional and national supervision was provided by senior staff of the National Bureau of Statistics and the sector Ministries of Agriculture. In Zanzibar the enumeration was done by staff from

the Ministry of Agriculture, Natural Resources, Environment and Cooperatives. Supervision was provided by senior officers of the same ministry and the Office of the Chief Government Statistician.

During the household listing exercise, 3,222 extension staff were used on the Mainland and 317 in Zanzibar. For the enumeration of the small holder questionnaire, 1,611 enumerators on Mainland and 158 in Zanzibar were used. An additional 5 percent enumerators were held as reserves in case of drop outs during the enumeration exercise.

1.3.9 Field Supervision and Consistency Checks

Enumerators were trained to probe the respondents until they were satisfied with the response given before they recorded them in the questionnaire. The first check of the questionnaires was done by enumerators in the field during enumeration. The second check was done by the district supervisors followed by Regional and National Supervisors. Supervisory visits at all levels of supervision focused on consistency checking of the questionnaires. Inconsistencies encountered were corrected, and where necessary a return visit to the respondent was made by the enumerator to obtain the correct information. Further quality control checks were made through a major post enumeration checking exercise where all questionnaires were checked for consistencies by supervisors in the district offices.

1.3.10 Data Processing

Data processing consisted of the following processes:

- Data entry
- Data structure formatting
- Batch validation
- Tabulation

Data Entry

Scanning and ICR data capture technology for the small holder questionnaire was used on the Mainland. This not only increased the speed of data entry, it also increased the accuracy due to the reduction of keystroke errors. Interactive validation routines were incorporated into the ICR software to trap errors during the verification process. The scanning operation was so successful that it is highly recommended that the technology be adopted for future censuses/surveys. In Zanzibar all data was entered manually using CSPro.

Prior to scanning, all questionnaires underwent a manual cleaning exercise. This involved checking that the questionnaire had a full set of pages, correct identification and good handwriting. A score was given to each questionnaire based on the legibility and the completeness of enumeration. This score will be used to assess the quality of enumeration and supervision in order to select the best field staff for future censuses/surveys.

CSPro was used for data entry of all Large Scale Farm and community based questionnaires due to the relatively small number of questionnaires. It was also used to enter 2,880 of small holder questionnaires that were rejected by the ICR extraction application.

Data Structure Formatting

A program was developed in visual basic to automatically alter the structure of the output from the scanning/extraction process in order to harmonise it with the manually entered data. The program automatically checked and changed the

number of digits for each variable, the record type code, the number of questionnaires in the village, the consistency of the Village ID Code and saved the data of one village in a file named after the village code.

Batch Validation

A batch validation program was developed in order to identify inconsistencies within a questionnaire. This is in addition to the interactive validation during the ICR extraction process. The procedures varied from simple range checking within each variable to more complex checking between variables. It took 6 months to screen, edit and validate the data from the smallholder questionnaire. After the long process of data cleaning, the tabulations were prepared based on a pre-designed tabulation plan.

Tabulations

Statistical Package for Social Sciences (SPSS) was used to produce the Census tabulations and Microsoft Excel was used to organize the tables and compute additional indicators. Excel was also used to produce charts while ArcView and Freehand were used for the maps.

Analysis and Report Preparation

The analysis in this report focuses on regional comparisons, time series and national production estimates. Microsoft Excel was used to produce charts; ArcView and Freehand were used for maps, whereas Microsoft Word was used to compile the report.

Data Quality

A great deal of emphasis was placed on data quality throughout the whole exercise from planning, questionnaire design, training, supervision, data entry, validation and cleaning/editing. As a result of this, it is believed that the census is highly accurate and representative of what was experienced at field level during the Census year. With very few exceptions, the variables in the questionnaire are within the norms for Tanzania and they follow expected time series trends when compared to historical data. Standard Errors and Coefficients of Variation for the main variables are presented in the Technical Report (Volume I).

1.4 Funding Arrangements

The Agricultural Sample Census was supported mainly by the European Union (EU) who financed most of the operational activities. Other funds for operational activities came from the Government of Tanzania, Government of Japan, and United Nations Development Programme (UNDP) and other partners in the Pool fund of the Vice President's Office (VPO). In addition to this technical assistance funds were provided by the European Union (EU), Department for International Development (DFID) and Japan International Cooperation Agency (JICA). This was managed by Ultek Laurence Gould Consultants (ULG), Scotts Agriculture Consultancy Ltd (SAC) and the Food and Agriculture Organisation (FAO).

2. LIVESTOCK AND POULTRY RESULTS

2.1 Livestock Population and Growth

This section analyses the results in relation to population, growth, husbandry and service provision at National and Regional levels. It also includes data on Zanzibar and some references are made to the contribution of Large Scale Farms. The reference date for livestock population is 1st October 2003. All the other variables collected are for a period of a year prior to the reference date. Population and growth rate trends are presented for the Mainland only due to the lack of comparative historical figures from Zanzibar. However, the contribution of Zanzibar to the total Tanzanian livestock population is relatively very small and the trends would not vary significantly with the incorporation of Zanzibar data where it available. Hence it may be considered that the trends presented for the Mainland are the same as the National Trends.

Out of 4,901,837 smallholder households in Tanzania, 1,745,776 reared livestock as of 1st October 2003 (1,709,331 on the Mainland and 36,445 in Zanzibar). In addition to this, 580 Large Scale Farmers also kept livestock. However 63 percent of these farmers are not fully dependent on livestock production as they also grow crops. Chart 2.1 presents the importance of the different types of livestock that are kept by smallholder households in Tanzania. In relation to population, cattle are the most important type of livestock, followed by goats. Sheep and pigs are much less important. However, in terms of number of households keeping livestock, goats are as important as cattle (Chart 2.2).

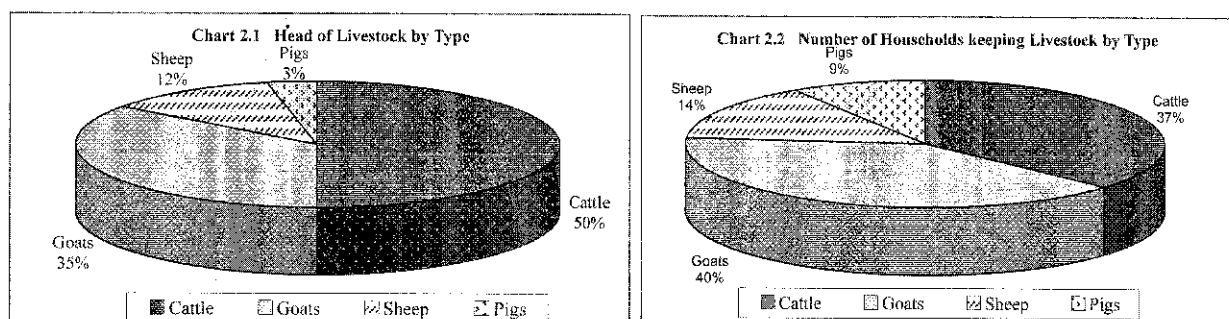


Table 2.1 summarises production data for the different types of livestock and incorporates the data for the mainland, Zanzibar and Large Scale Farms in order to provide total livestock numbers from smallholders and Large Scale Farms in Tanzania. Ducks, Turkeys, Rabbits and Donkeys are of relative minor importance and the remaining analysis in this section concentrates on the major livestock types (Cattle, Goats, Sheep, Pigs and Chickens).

Livestock Type	Mainland			Zanzibar			Total			Number from Large Scale Farms	Grand Total Number
	Number	House - holds	Number/ House -hold	Number	House - holds	Number/ House -hold	Number	House - holds	Number/ house -hold		
Cattle	16,837,150	1,239,087	13.6	162,643	33,288	4.9	16,999,793	1,272,375	13.4	110,394	17,110,387
Goats	11,756,327	1,366,866	8.6	52,324	9,315	5.6	11,808,651	1,376,181	8.6	22,624	11,831,475
Sheep	3,945,266	495,950	7.9	300	72	4.2	3,945,566	496,022	7.9	12,236	3,957,802
Pigs	973,972	342,331	2.8	535	54	9.9	974,507	342,866	3.3	10,186	984,693
Chicken	33,307,246	2,950,268	11.3	1,063,791	66,736	15.9	34,371,037	3,017,004	11.4	456,638	34,827,675
Ducks	1,308,645	165,958	7.9	53,571	2,617	20.5	1,362,216	168,575	8.1	5,000	1,367,216
Turkeys	212,704	5,992	35.5	841	117	7.2	213,545	6,109	35.0	612	214,157
Rabbits	532,921	38,014	14.0	1,231	130	9.5	534,152	38,144	14.0	1,037	535,189
Donkeys	309,749	63,762	3.3	653	423	1.5	310,402	64,187	4.8	538	310,940

