PROJECT DOCUMENT

2014 POPULATION AND HOUSING CENSUS
Republic of South Sudan

National Bureau of Statistics

August 2012

FOREWORD

The Government of the Republic of South Sudan intends to undertake a Population and Housing Census in February 2014. This is the first population census to be undertaken since independence in July 2011. This project document presents a summary of key activities that will be implemented in order to achieve a successful census. The Government recognizes that population censuses are the single most important source of demographic and socio-economic data for the preparation of development policies, in monitoring the improvement in the quality of life of the population and system of sustainable development. The up-to-date information base will also support the implementation process of the country's development programme.

Therefore, the main goal of the 2014 Population and Housing Census is to contribute to the improvement of quality of life of South Sudanese through the provision of current and reliable data for development planning, policy formulation and services delivery as well as for monitoring and evaluating population programmes. It will also form the basis for the demarcation of electoral constituencies in preparation for the 2015 general elections.

However, the census is a massive operation that requires an attentive and anticipated planning of sufficient technical, financial and human resources, and a comprehensive training of field personnel. It is also one of the most expensive undertakings in a country.

Being a massive exercise, the conduct of the census, therefore, requires support from key organizations and individuals so as to produce the most reliable, relevant and timely data. The South Sudan Government is committed to undertake the census. However, the need for assistance, technical or otherwise, from our development partners is a key factor. Therefore, I am appealing to our development partners, both multilateral and bilateral, for support in order to successfully implement the whole census programme.

A Census Office Secretariat will be established in the National Bureau of Statistics to spearhead the process of planning and tracking the implementation of the various activities as articulated in this Census Project document. Various committees, at national and state levels, will be put in place to guide and support the implementation of the whole exercise. These committees, together with the Census Office Secretariat and the National Bureau of Statistics, will provide avenues to appraise various stakeholders on progress towards implementation of the various activities.

I am appealing to all stakeholders, including the general public on the ground, to support and participate in this project in order to achieve a successful census undertaking.

Dr. Riek Machar Teny

Vice President

The Republic of South Sudan

August 2012

PREFACE

The Council of Ministers in its Regular Meeting No. 09/2011 directed the then Southern Sudan Center for Census, Statistics and Evaluation (SSCCSE) to start planning and preparing for a new population census for South Sudan. Under the Transitional Constitution of the Republic of South Sudan, Part Fourteen, on Census, Referenda and Elections, Chapter I, Article 193, the SSCCSE has now become the National Bureau of Statistics (NBS). One of its mandates is to "conduct all censuses and surveys that are carried out throughout South Sudan." Article 194, under the same chapter, states that: "The National Government shall during the Transitional Period conduct a population census the outcome of which shall, *inter alia*, determine the number of electoral constituencies for the next general elections."

It should be clearly emphasised that the Population and Housing Census which is planned to take place in the first quarter of 2014 is not only for the demarcation of electoral constituencies. The Census will provide updated benchmark data for formulation, implementation, monitoring and evaluation of the country's population programmes and policies. The Government recognizes that population censuses are the single most important source of demographic and socio-economic data for the preparation of development policies, in monitoring the improvement in the quality of life of the population and system of sustainable development.

Population Census undertakings usually require a good lead time for preparation. However, preparations for this census have yet to commence. All the preparatory activities which will lead to the census enumeration must be successfully completed within 18 months. The Government will put extra effort to ensure that this operation is completed successfully.

This Project Document provides the guidelines required to successfully undertake the whole census. The Government will adhere to the timeline for each activity. With the support of our Development Partners, both multilateral and bilateral, the Government will ensure that the Census Project will be completed successfully and on time.

I would like to sincerely thank the United Nations Population Fund (UNFPA) for supporting a team of technical consultants to prepare this Project Document. It is my hope and belief that this collaboration between the Government and UNFPA will continue and that the rest of our Development Partners will join us to ensure that the 2014 Population and Housing Census will be undertaken successfully.

Kosti Manibe Ngai
Minister of Finance and Economic Planning
Government of the Republic of South Sudan

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Acronyms and Abbreviations

AfDB…………………………..African Development Bank

CBS…………………………Central Bureau of Statistics

CCC…………………………County Census Coordinator

CPA…………………………Comprehensive Peace Agreement

DANIDA……………………Danish International Development Agency

DFID………………………..

EA…………………………..Enumeration Area

EEC…………………………European Economic Community

FAO…………………………Food & Agricultural Organisation

GIS………………………….Geographical Information System

GIZ………………………….

GONU………………………Government of National Unity

GPS…………………………Geographical Positioning System

HABITAT…………………..

ICR…………………………Intelligence Character Recognition

ICT…………………………..Information Communication Technology

JICA…………………………

NBS…………………………National Bureau of Statistics

NGO…………………………Non-Governmental Organisation

NPCC………………………..National Population Census Council

NPCTC……………………….National Population Census Technical Committee

OMR………………………...Optical Mark Reader

PES…………………………..Post-Enumeration Survey

RS…………………………...Remote Sensing

SIDA…………………………Swedish International Development Authority

SPCC…………………………State Population Census Committee

SSCCSE……………………...South Sudan Centre for Census Statistics and Evaluation

SSD…………………………..State Statistical Director

UN……………………………United Nations

UNDP……………………… United Nations Development Programme

UNFPA………………………United Nations Population Fund

UNICEF……………………...United Nations Children Fund

UNOCHA……………………United Nations Office for Coordination of Humanitarian Affairs

UNOPS………………………United Nations for Project Services

USAID……………………….United States Agency for International Development

WFP…………………………World Food Programme

WHO………………………..World Health Organisation

Executive Summary

Introduction

A population census is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country. The essential features of a population census are individual enumeration, universality within a defined territory, simultaneity and defined periodicity.

The population census is the largest government undertaking in a country. Not only does it cover the whole country, but it involves every person, from the newly born babies to the oldest person in the country. This is the census project document which will be used as a guideline in the implementation of the population census project.

The Census Process

The Government of the Republic of South Sudan, through the National Bureau of Statistics, is planning to conduct a population and housing census during the first quarter of 2014. The preparations for the census are already underway. The census process involves three main phases:

1. Pre-enumeration

2. Enumeration

3. Post-enumeration

The **pre-enumeration phase** involves the undertaking of various activities which will ensure that the whole population will be covered during the actual census count. Such activities include:

(i)   Having in place a legal basis for undertaking the census;

(ii)   Setting up a census organisation structure, including offices, which will oversee the whole operation;

(iii)   Preparing a comprehensive census work-plan;

(iv)   Preparing a comprehensive budget for the whole census operation;

(v)   Demarcating the whole country into small geographical areas known as Enumeration Areas (EAs) in order to ensure complete coverage and to avoid over coverage during the census count. Each one of these small areas will be assigned to an interviewer during the census count;

(vi)   Preparation and printing of the census tools. These include the questionnaires and all the relevant instructions manuals and guidelines;

(vii)   Putting in place a census advocacy and publicity strategy to ensure that both political and other leaders as well as the general public are well informed about the census in order for them to provide full support and cooperation in the census operation;

(viii)   Having in place a reliable transport network to facilitate both the demarcation exercise and the census count as well as other field operations;

(ix)   Preparing a training programme for all the census field staff; and

(x)   Identification and recruitment of the census staff at various levels.

The **enumeration phase** will include the following activities:

(i)   Training of all field staff on the process of census enumeration. These include principal trainers, trainers, supervisors, interviewers and editors and coders;

(ii)   Transportation of all census materials to the field. These include the questionnaires;

(iii)   Allocation and deployment of all the field staff to their respective areas of enumeration;

(iv)   Actual census enumeration; and

(v)   Collecting and transporting all completed census questionnaires to the place of data entry.

The **post-enumeration phase** will include:

(i)   Manual editing and checking of the completed questionnaires;

(ii)   Computer data capture of the information in the completed questionnaires;

(iii)   Data processing;

(iv)   Analysis and tabulation;

(v)   Report writing; and

(vi)   Release and dissemination of the results.

All the above activities are discussed in detail in this document. The Census Work Plan clearly points out when each of these activities will be undertaken. The whole process will take about 5 years to complete. A summary of the work-plan is given below.

The census operation will requires enormous resources – personnel, materials and equipment, transport, etc. For this reason, Government commitment and support is essential. A comprehensive census budget has been prepared and a summary is presented in this document. The estimated budget for the period 2012 to 2017 amounts to 101.8 million US dollars, which are equivalent to 301.4 million South Sudanese Pounds. The summary budget, in both currencies is also presented below.

Rationale and main uses of census data

The Census provides updated benchmark data for formulation, implementation, monitoring and evaluation of the country's population programmes and policies.

At the planning level, up-to-date and reliable data are essential for the formulation of realistic development plans for socio-economic development of the people. The 2014 census will provide data on important demographic, social and economic characteristics of the population and housing at all levels of planning. In combination with data from other sources, it will form the basis for formulating development policies at the national, state and county levels, and also for establishing programmes at other smaller areas and/or local levels.

Furthermore, the census will provide a foundation for good governance and the consolidation of democracy. Accurate census data are needed for the efficient and equitable demarcation of electoral constituencies and adjustment of administrative boundaries for local government. Reliable census data will assist with the rational allocation of revenues amongst the states.

The census will strengthen the national capacity for data collection, processing, dissemination and utilization, including the use of up-to-date Information Communication Technology (ICT).

Census data will have many uses and varied customers, including Government, private enterprises, social and economic researchers, international organizations, NGOs, and increasingly, politicians. However, it is expected that Government will continue to be the single largest user.

Goal, Outcome and Outputs of the 2014 Population and Housing Census

The main goal of the 2014 Population and Housing Census is to contribute to the improvement of quality of life of South Sudanese through the provision of current and reliable data for

development planning, policy formulation and services delivery as well as for monitoring and evaluating population programmes.

The goal will be attained through four major outputs, which are:

    i. Increased availability and accessibility of accurate, timely and reliable data on demographic and socio-economic characteristics;

    ii. Increased knowledge of stakeholders on socio-economic and demographic characteristics of South Sudanese population as well as patterns and trends of growth;

    iii. Increased utilization of socio-economic and demographic disaggregated data; and

    iv. Strengthened capacity of NBS in carrying out population and housing censuses, particularly in the areas of planning, collecting, processing, analysing, disseminating and utilizing population and housing censuses and other data.

Each of these outputs will be supported by a number of activities which will be undertaken in order to attain the desired goal.

Table1. Census Milestones - 2014 Population and Housing Census

2011

Presidential Decree to prepare for the census (not yet in place)	November

2012

Final budget approved (still in progress)	July
Census project document prepared	July
Procurement of vehicles, GIS and cartographic equipment	August
Census office in place	September
Various census committees formed	September
Field mapping commences	October
Procurement of DP equipment and software	October

2013

Census questionnaire and tools for the pilot printed	January
Pilot survey undertaken	**February**
Finalisation of census tools and instruments	September-December
Final census questionnaire and census tools printed	October-December
EA and SA maps printed	October-December
Census enumeration staff identified and recruited	December

2014

Training of field staff at all levels completed	January
Census enumeration undertaken	**February**
Data processing staff trained	February
Post Enumeration Survey (PES)	March
Data processing commences	April
Preliminary report released	**June**
Tabulations and Analysis commences	July
Preparation and release of final census results by state	**December**

2015 - 2017

Preparation and Printing of Analytical Reports	2015 – 2017
Publication and Dissemination of census results	**2015 – 2017**

Table 2a. Summary Census Budget (In US Dollar)

	ALL AMOUNTS IN US DOLLARS	Years		A number of activities will end in 2017 with the same 2012 - 2014		
#	Census Activities	2012 - 2014	Percentage	2015	2016	2017
1.0	**PLANNING** (*Management and Supervision*)	10,830,800	10.64%			
2.0	**ADMINISTRATIVE COST**	1,697,000	1.67%			
3.0	**GENERAL SECURITY**	7,000,000	6.88%			
4.0	**FUEL AND LUBRICANTS**	1,652,000	1.62%			
5.0	**FLIGHTS**	1,500,000	1.47%			
6.0	**GEOGRAPHIC PREPARATION**	22,215,200	21.83%			
7.0	**ENUMERATION**	39,871,250	39.18%			
8.0	**DATA PROCESSING**	3,936,550	3.87%			
9.0	**PRODUCTION OF FINAL RESULTS**	575,000	0.56%			
10.0	**DISSEMINATION OF THE RESULTS**	230,000	0.23%			
11.0	**ADVOCACY AND BUBLICITY**	620,000	0.61%			
12.0	**PROCUREMENT OF VEHICLES**	5,770,000	5.67%			
13.0	**CAPACITY BUILDING**	1,030,200	1.01%			
	Total	96,928,000				
	5% Contingency	4,846,400	5%			
	Grand Total	101,774,400	100%			

Table 3b. Summary Census Budget (In SOUTH SUDANESE POUNDS)

#	ALL AMOUNTS IN SOUTH SUDANESE POUND	Years	Percentage	A number of activities will end in 2017 with the same 2012 - 2014		
	Census Activities	2011 - 2015		2015	2016	2017
1.0	PLANNING *(Management and Supervision)*	32,073,248	10.64%			
2.0	ADMINISTRATIVE COST	5,025,326	1.67%			
3.0	GENERAL SECURITY	20,729,100	6.88%			
4.0	FUEL AND LUBRICANTS	4,892,068	1.62%			
5.0	FLIGHTS	4,441,950	1.47%			
6.0	GEOGRAPHIC PREPARATION	65,785,872	21.83%			
7.0	ENUMERATION	118,070,733	39.18%			
8.0	DATA PROCESSING	11,657,306	3.87%			
9.0	PRODUCTION OF FINAL RESULTS	1,702,748	0.56%			
10.0	DISSEMINATION OF THE RESULTS	681,099	0.23%			
11.0	ADVOCACY AND BUBLICITY	1,836,006	0.61%			
12.0	PROCUREMENT OF VEHICLES	17,086,701	5.67%			
13.0	CAPACITY BUILDING	3,050,731	1.01%			
	Total	287,032,886				
	5% Contingency	14,351,644	5%			
	Grand Total	301,384,531	100%			

CHAPTER 1

Background and Justification for the 2014 Census

1.1 Introduction

The Government of the Republic of South Sudan is planning to undertake a population and housing census in February 2014. This will be the first population census since independence in July 2011.

A population census is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country. The essential features of a population census are individual enumeration, universality within a defined territory, simultaneity and defined periodicity.

The population census is the largest government undertaking in a country. Not only does it cover the whole country, but it involves every person, from the newly born babies to the oldest person in the country.

The census process involves three main phases:

1. Pre-enumeration

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The **pre-enumeration phase** involves the undertaking of various activities which will ensure that the whole population will be covered during the actual census count. Such activities include:

(i)   Having in place a legal basis for undertaking the census;

(ii)   Setting up a census organisation structure, including offices, which will oversee the whole operation;

(iii)   Preparing a comprehensive census work-plan;

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the census count. Each one of these small areas will be assigned to an interviewer during the census count;

(vi)   Preparation and printing of the census tools. These include the questionnaires and all the relevant instructions manuals and guidelines;

(vii)   Putting in place a census advocacy and publicity strategy to ensure that both political and other leaders as well as the general public are well informed about the census in order for them to provide full support and cooperation in the census operation;

(viii)   Having in place a reliable transport network to facilitate both the demarcation exercise and the census count as well as other field operations;

(ix)   Preparing a training programme for all the census field staff; and

(x)   Identification and recruitment of the census staff at various levels.

The **enumeration phase** will include the following activities:

(i)   Training of all field staff on the process of census enumeration. These include principal trainers, trainers, supervisors, interviewers and editors and coders;

(ii)   Transportation of all census materials to the field. These include the questionnaires;

(iii)   Allocation and deployment of all the field staff to their respective areas of enumeration;

(iv)   Actual census enumeration; and

(v)   Collecting and transporting all completed census questionnaires to the place of data entry.

The **post-enumeration phase** will include:

(i)   Manual editing and checking of the completed questionnaires;

(ii)   Computer data capture of the information in the completed questionnaires;

(iii)   Data processing;

(iv)   Analysis and tabulation;

(v)   Report writing; and

(vi)   Release and dissemination of the results.

The census process will require enormous resources – personnel, materials and equipment, transport, etc. For this reason, Government commitment and support is essential.

Census enumeration is planned for February 2014. This implies that the time remaining for enumeration preparation is less than two years. **This is a very short period of time**. There is a need for quick decisions by the Government and the relevant stakeholders, particularly for the release of funds to meet the costs of the pre-enumeration activities.

This document will focus on some of the main activities outlined above. The document will not only provide guidance in the implementation of the census programme, but will also be used for resource mobilisation.

1.2. Rationale and main uses of census data

1.2.1. Rationale for the 2014 Census

The Census provides updated benchmark data for formulation, implementation, monitoring and evaluation of the country's population programmes and policies.

The Government recognizes that population censuses are the single most important source of demographic and socio-economic data for the preparation of development policies, in monitoring the improvement in the quality of life of the population and system of sustainable development. Censuses also provide a sampling frame to support other data collection systems in the country. The up-to-date information base will also support the implementation process of the country's development programme.

At the planning level, up-to-date and reliable data are essential for the formulation of realistic development plans for socio-economic development of the people. The 2014 census will provide data on important demographic, social and economic characteristics of the population and housing at all levels of planning. In combination with data from other sources, it will form the basis for formulating development policies at the national, state and county levels, and also for establishing programmes at other smaller areas and/or local levels.

The census will also help the Government to obtain data on population growth, population distribution and other indicators, which are vital for environmental management. It is important to determine the relationship between the population growth, its distribution, the resource base and its impact on the environment. In addition, the census provides information on the supply of labour, housing demand and non-income poverty.

Furthermore, the census will provide a foundation for good governance and the consolidation of democracy. Accurate census data are needed for the efficient and equitable demarcation of

electoral constituencies and adjustment of administrative boundaries for local government. Reliable census data will assist with the rational allocation of revenues amongst the states.

Census will strengthen the national capacity for data collection, processing, dissemination and utilization, including the use of up-to-date Information Communication Technology (ICT).

Census data will have many uses and varied customers, including Government, private enterprise, social and economic researchers, international organizations, NGOs, and increasingly, politicians. However, it is expected that Government will continue to be the single largest user.

To sum up, several reasons underlie the conduct of the forthcoming census. These are the following:

- The 2014 Census will enrich the stock of available socio-demographic data in the country in order to allow the planners and the decision-makers to have more basic indicators that are necessary for the elaboration and monitoring of development plans and programmes.

- The 2014 Census will contribute to reinforcing the technical capacity of the NBS in data collection, processing, analysis, dissemination and in the use of the census results and products. The 2014 Census is planned strategically to deliver the expected results and products in order to meet statistical information requirements for the planning, monitoring and evaluation (PM&E) of the economic and social development at the national, state and local levels.

- The 2014 Census data will make it possible to measure the impact of HIV/AIDS on the population structure of South Sudan. The data on paternal and maternal orphanhood of children will provide indicators of the effect of HIV/AIDS on families, and the mortality data by age group will also be useful for this analysis.

- The 2014 Census data will provide the only reliable data on maternal mortality at the national and sub-national levels.

- The 2014 Census data will form the basis for the demarcation of electoral constituencies for the 2015 general elections. **"The National Government shall during the Transitional Period conduct a population census the outcome of which shall, *inter alia,* determine the number of electoral constituencies for the next general elections"** (*The Transitional Constitution of the Republic of South Sudan 2011, Article 192*)

- However, the census is a massive operation that requires an attentive and anticipated planning of sufficient technical, financial and human resources, and a comprehensive training of field personnel. It must be preceded by a sensitization of the population and

authorities. An important effort must be made to ensure that the data and information are really accessible to all users in the private and public sectors.

1.2.2. Main uses of census data
The principal uses of the census data can be classified according to the following groups.

1.2.2.1. Policy Formulation
The first and broadest purpose to be served by a Population Census is to provide a basis for formulation of public policies which will accomplish the goals of national development. In formulating policies for national development, Census data are used to:

· Identify current needs of various sectors of the population for services or opportunities;

· Establish priorities and provide a rational basis for taking action to alleviate needs;

· Create programmes which are maximally effective yet economical;

· Measure progress in attaining goals;

· Study the dynamics of population and social change; and

· Plan for the future on the basis of the present understanding and current action.

1.2.2.2. Public Administration
The demographic, social and economic factors, which shape public policy, influence the size and functions of the Government itself. There is a clear practical relationship between the total number of people to be served, and the number and state distribution of public servants required for the operations of ministries concerned with health, education, labour, housing, etc.

Allocation of funds from national treasury to states for routine administration or development projects maybe largely justified on the basis of the population to be benefited. Thus, the census data for population sub-groups are valuable;

The size of the legislature or other local bodies is likewise directly related to population size, or other characteristics. Following a census, constituencies are delineated on the basis of the population distribution; constituencies may be redrawn after a new census is taken;

1.2.2.3. Age-related needs
Age is one of the most important determinants of needs. Particular events are known to dominate the experience of certain age groups, and result in a need for special services or goods. For instance:

School attendance for specified ages determines the need for schools, teachers and educational equipment;

Marriage, child- bearing and family formation, for the child bearing population, create a demand for housing, household goods, maternal services, infant and child-care facilities, etc.

Economic activity for specified ages requires employment opportunities, vocational education, transportation, etc.

High mortality and vulnerability to diseases for children under 5 years stress the need for maternal and child care services, other public health and immunisation programmes, etc.

1.2.2.4. Sex-related needs
The bias of sex is gradually being eliminated from social and economic life in our society. It still has to be taken into account in any analysis of needs;

Women of child-bearing ages determine the need for maternal and child care services and to a great extent additional household goods;

Persons of employable age have the most critical need for employment opportunities and vocational training, and these needs may differ by sex.

1.2.2.5. Analysis of Trends
Many forms of analysis make use of time series of data. A study of past trends throws light on the present and is a guide to the future. A review of factors which have helped to create current conditions can provide policy makers and planners with a sound basis for choosing which factors should be encouraged or altered, so as to attain national goals:

In computing and projecting past and current rates of performance, utilisation, attainment, change, etc.

In comparing the present social and economic condition of the population with level of living set forth in the goals of the plan;

In assessing future demands for commodities or services; For example, the number of classrooms which will be needed in the future as children reach school age; and

In making critical assessment of human resources available for national development and comparing it with what is actually required for the purpose.

1.3. Lessons learned from 2008 Census
The 2008 Sudan Population and Housing Census was conducted jointly by the two statistical agencies in Khartoum and Juba. Each agency was responsible for its own area. The procedures for conducting the census were agreed upon through the various census joint committees whose

membership was from both North and South. However, due to political reasons, the North was more dominant on some issues. This lead to the then Government of Southern Sudan not to accept the results in total. Nonetheless, these results could be used for planning purposes. The experiences and challenges are summarised (*From the Draft Methodology and Administrative Report of the 2008 Census*) below as these are important for planning and undertaking the 2014 South Sudan Census.

1.3.1. Outcomes of the Census
- The Southern Sudan census results are extremely valuable for governance planning, as well as in planning for social services and private sector development.
- First time Southern Sudan has been comprehensively mapped by Southern Sudanese (99% of Southern Sudan was covered in the mapping exercise).
- Approximately 60,000 geographic points were collected, including place names and facilities.
- First census to cover unknown tribes, i.e. Kichipo, Jie, others…
- First time southerners took part in enumeration in Southern Sudan

  o Mass mobilization of manpower – Central Equatoria enumerators to Pibor, Turkana from Kenya as enumerators in Eastern Equatoria

  o 14,252 staff recruited from their respective areas using panel interviews and skill tests.

- Program development – sampling frame for future surveys.
- Capacity building of SSCCSE staff.

1.3.2. Challenges
Numerous challenges were faced in both North and South Sudan in mapping the entire country; however, the challenges in the South were much greater. As this was the first time the South was mapped, SSCCSE began from scratch and worked against weather conditions, insecurity, and the slow disbursement of funds to complete field mapping. The main challenges that were overcome included the following:

- Staffing: there were very few staff at SSCCSE

- Poor infrastructure and bad road connection

- Poor communication and lack of communication facilities

- Lack of vehicles (land and river)

- Low technical capacity at the SSCCSE

- Lack of office space

- Predetermined funding of various census activities

- Delay in release of funds

- Lack of fully established State Statistical offices

- Lack of land for construction of the State offices

- The Census was politically charged

- Time frame was too short as it was dictated by the CPA

- Many technical advisors with different experiences and expertise

- The slow disbursement of funds resulted in trainings being delayed and the late purchase and arrival of field equipment;

- Limited experience in the area of mapping affected the quality of data received from the field;

- The lack of awareness by locals on the mapping activity made the work of the field mapping teams more difficult as they were not always accepted and given access to local communities;

- The flow of information from field to Rumbek was slow, delaying the transfer of field data to digital maps;

- Weather conditions made some areas inaccessible;

- Insecurity in some areas halted field mapping;

- The unresolved North-South boundary led to confusion as to who (CBS or SSCCSE) was responsible for mapping; and

- The time allotted for field mapping was not realistic.

1.3.3. Achievements

Despite the challenges faced during census activities, this exercise greatly benefitted Southern Sudan. At the completion of census, the following was accomplished:

- A comprehensive list of administrative areas,

- Better defined statistical boundaries related to administrative boundaries,

- Sketch maps and digital maps,

- Experience in cartographic work for over 454 field staff,

- Training provided to SSCCSE/GOSS GIS staff digitizing boundaries and map production,

- Collection and compilation of existing data from external sources in one location, and

- A foundation for post-enumeration map updating and further work on the GIS database, which will improve the quality of field maps in the future.

1.3.4. Lessons Learned and General Recommendations

Being that this was the first time Southern Sudan was mapped, countless lessons were learned and much work remains to be done to improve upon the work that has been started during the Fifth Census. Some of the lessons learned are below:

- Ample time should be given to the preparation period;

- Minimal political interference;

- Commitment and prevalence of political will;

- Timely release of funds;

- Strengthening of local capacity;

- Earlier provision of communication facilities;

- Earlier procurement of vehicles;

- Plan in advance and carry out field work during the dry season to avoid weather related difficulties;

- Ensure that funds are available early on to avoid delays in training and the purchase of field equipment prior to the start of field work;

- Provide strong supervision for field work to improve data quality;

- Create more effective means of transferring field data to the GIS Lab by ensuring transportation (vehicles) and communication (i.e. phones and internet dongles) means are available to field staff;

- Inform local communities of field mapping work before teams are dispatched to avoid any misunderstandings;

- Increase GIS staff as well as their capacity to ensure maps are produced in a timely manner;

- Infrastructure; very little infrastructure existed, a widespread advocacy campaign was needed to inform Southern Sudanese of the census and the importance of being counted;

- Lack of commitment from the government at all levels;

- The lack of funding from the GONU was one of the key challenges which resulted in less visible advocacy campaign;

- The indifference or limited commitment from local authorities also contributed to limited awareness of the census; and

- The various changes in census dates (which also resulted largely from delayed funding from the GONU), from November 2007 to February 2008 to April 2008 led to confusion as the most important census message centred on the census dates. Each time the dates were changed, the SSCCSE advocacy team had to re-double their efforts to make sure that the public was aware of this change.

1.3. Overall Responsibility for the Population Census

Under Article 193 (*Page 76*) of The Transitional Constitution of the Republic of South Sudan, the NBS is authorised to conduct population censuses. The whole Article is presented below.

CENSUS AND STATISTICS

The National Bureau of Statistics

191. (1) There shall be a National Bureau of Statistics.

(2) The National Bureau of Statistics shall be an independent statistics bureau authorized, *inter alia,* to:

(a) Collect, compile, analyze and publish all official statistical information on economic, social, demographic, environmental and general activities and conditions of the people of South Sudan;

(b) Conduct all censuses and surveys that are carried out throughout South Sudan;

(c) Monitor and evaluate social impacts of public policies, projects and programmes; and

(d) Monitor the progress of poverty alleviation and the attainment of the Millennium Development Goals.

(3) The President shall appoint a Board of Directors and the Director-General of the Bureau. The Board shall be the highest policy-making body of the National Bureau of Statistics; it shall formulate policies and set its internal regulations, priorities, standards and criteria for all the censuses and surveys to be carried out in South Sudan.

(4) The organization, structure and powers of the Bureau, and terms and conditions of service of its personnel shall be regulated by law.

Although the NBS is empowered by The Transitional Constitution to conduct censuses, there will be a need for a Presidential Decree to legally allow the 2014 Census to be conducted.

1.4. Census anticipated topics

The items to be investigated during the 2014 census will be geographical identification (*state, county, payam, boma, etc, urban and, rural*); name; relationship to head of household; sex; age; place of birth; nationality; migration (internal and international) ; disability; orphanhood; literacy and education; economic activity; nuptiality; fertility; household characteristics, housing and living conditions; mortality and maternal mortality. Given the shortcomings of civil registration and sample-based methodologies, census measurement is more appropriate for producing acceptably precise, cost-effective estimates of maternal mortality. The large number of observations available from census coverage would be sufficient to support analysis of maternal mortality differentials by population sub-groups.

1.5. Goal, Outcome and Outputs of the 2014 Population and Housing Census

The main goal of the 2014 Population and Housing Census is to **contribute to the improvement of quality of life of South Sudanese through the provision of current and reliable data for development planning, policy formulation and services delivery as well as for monitoring and evaluating population programmes.**

The goal will be attained through **four major outputs**, which are:
   v. Increased availability and accessibility of accurate, timely and reliable data on demographic and socio-economic characteristics;

   vi. Increased knowledge of stakeholders on socio-economic and demographic characteristics of South Sudanese population as well as patterns and trends of growth;

   vii. Increased utilization of socio-economic and demographic disaggregated data; and

   vii. Strengthened capacity of NBS in carrying out population and housing censuses, particularly in the areas of planning, collecting, processing, analysing, disseminating and utilizing population and housing censuses and other data.

1.7. Specific objectives

The main objective of the census is to provide the Government and other stakeholders with essential statistics on the population, in terms of demographic, social and economic characteristics, housing conditions and household amenities.   The specific objectives are to ascertain, among others, the following:

• strengthening the process of monitoring the national and international development framework (e.g. MDGs);

• size, composition and spatial distribution of the population;

• levels of fertility, mortality and migration;

• patterns of urbanisation;

• levels of literacy and education;

• size and deployment of the labour force;

• size, type and distribution of persons with disabilities; and

• housing conditions and availability of household amenities.

CHAPTER 2

Census strategies and linkages between outputs and major activities

2.1. Introduction

The present chapter gives a detailed explanation of the strategies, including linkages between the four major outputs of the 2014 Population and Housing Census and related activities.

2.2. Output A

Increased availability and accessibility of accurate, timely and reliable data on demographic and socio-economic characteristics for policy formulation, monitoring and evaluation of development programmes

Indicator: Number and type of datasets produced

Major activities under this output are:

Pre-enumeration Activities

Activity 1: Initial Census Preparatory Work

2.2.1. Legal Basis for a 2014 Population and Housing Census

The 2014 Population and Housing Census of South Sudan will be carried out in accordance with the Presidential Decree No......./2012. The Decree, *inter alia*, mandates the establishment of a National Population Census Council (NPCC), National Population Census Technical Committee (NPCTC) and the State Population Census Committees (SPCC)

The Chairman of NBS has already communicated with the Office of the President requesting for such a decree.

2.2.2. Administrative Arrangement

The NBS will introduce a new office to be known as The Census Office Secretariat, headed by a Census Manager, and will be responsible for all daily activities of the census. The Census will have six sections, each of which will be headed by a Deputy Census Manager. These are:

• Finance and Administration

• Planning and Analysis

• Advocacy and Publicity

• GIS and Census Mapping

• Monitoring and Evaluation and

• Information Technology and Data Processing.

At state level, the State Statistical Director (SSD), who will be designated as the State Census manager, will be in charge of all census activities. The State Census Manager will be assisted by State Field Operations Manager, who will be designated as the Deputy State Census Manager and a State Census Officer. At County level, census activities will be managed by County Census Coordinators (CCC).

Institutionally, there will be Census Committees from National to state levels which will ensure smooth operations of the census activities in their respective areas. Membership and responsibilities of these Committees are explained in Chapter 3.

2.2.3. Census Work-plan

Preparation of a comprehensive work-plan is one of the most important activities in the pre-enumeration phase. A detailed work-plan is given in Appendix 1. The plan indicates that the planned census activities will be completed by the year 2017.

The work-plan also shows the various activities grouped under the four major outputs of the Census. It indicates the date, responsible party, output and the budget for each activity.

2.2.4. Census Budget
The preparation of a census budget is one of the major keys to a successful undertaking of the census. Each and every activity in the work-plan must be budgeted for. The detailed budget is given in Appendix 2.

Activity 2: Preparation and Production of Census Instruments

2.2.5. The Census Questionnaire

The questionnaire is probably the most important census instrument. The development of the census questionnaire is therefore one of the key activities that will be undertaken before the data

collection exercise. The following activities will be carried out before questionnaires are finalized:

i. Identification of variables to be included in the questionnaire. Criteria for inclusion will be based on last census and current country needs,

ii. Consultation with data users as well as other data producers;

iii. Development of a draft questionnaire;

iv. Pre-testing and piloting the draft questionnaire; and

v. Reviewing and finalization of the questionnaire before printing.

Contents of the questionnaire will also consider recommendations of regional bodies of which South Sudan is a member. These bodies particularly, the United Nations agencies, through the technical committees on 2010 round of censuses, have recommended a set of core questions to be included in census questionnaires so that comparisons can be made among member states.

The questionnaire will be designed taking into consideration the data processing methods to be adopted, e.g. data capturing is likely to be done electronically through scanning.

The final version of the questionnaire will be finalized by September 2013 in order to have adequate time for proper training of census enumeration officials, appropriate and adequate publicity as well as ample time to print the questionnaires and other census materials. This final questionnaire will be based on the experiences from the pilot census which will be conducted in February 2013.

2.2.6. Preparation and Production of Manuals and other Instruments

For the 2014 census, the following manuals will be developed:

- Instructions Manual for enumerators;

- Instructions Manual for supervisors of interviewers;

- Instructions Manual for State and Constituency level supervisors; and

- Training Manual for Trainers;

Other instruments will include:

- Control forms;

- Summary forms; and

- Enumeration and Supervision Area Maps**.**

2.2.7. Tabulation Programme

Once the questionnaires are finalised, the basic tabulation programme will be developed covering all tables to appear in the planned census reports. The tabulation plan will be designed in such a way that final results can be released within a reasonable period of time after enumeration. Tabulation packages will also be introduced. These packages will allow for a relatively inexpensive production of tables for selected subsets of the total database or alternative aggregates.

Activity 3: Delineation of Enumeration Areas (EAs), Map Production and GIS Development

2.2.8. Production of E.A. and Supervision Area Maps

The basic objective of carrying out cartographic work is to provide maps required at various stages of the census. The fundamental feature that makes these maps mandatory for censuses is that, they provide necessary spatial reference for the population eligible for enumeration.

Maps provide the possibility of ensuring total coverage of the population during enumeration as they make it possible to avoid under– or over–enumeration. They also provide the basic frame for sampling as applied to censuses before, during and after the main census enumeration. These maps can also be used as an aid in development planning, particularly at small area level. Specifically, the enumeration and supervision area maps are meant to:

i. ensure total coverage of the population during actual enumeration;

ii. form the basis for allocation of enumerators and supervisors to specific areas during the enumeration period;

iii. provide the basis for proper logistics in terms of supply of materials, route planning, transport needed during enumeration, number of enumerators and supervisors required, budget for enumeration work; and

iv. provide the basis for data processing.

Activity 4. Advocacy and Publicity Activities

The ultimate goal of Advocacy and Publicity is to mobilize resources and facilitate the collection of accurate data and information on demographic and socio-economic characteristics of the population by encouraging all communities and individuals to support and participate in the census process, particularly during the enumeration phase.

A detailed programme on Publicity and Advocacy for the 2014 Census will be prepared and outlined in a separate document.

2.2.9. Specific objectives of advocacy and publicity are:

- To sensitize and mobilize the South Sudan population in order to achieve maximum support, co-operation and participation in the 2014 Population and Housing Census;

- To promote acceptance and extensive use of the census results by various users; and

- To secure continuous support and commitment by the Government at all levels, development partners and the private sector, so that the requisite resources could be assured.

2.2.10. Advocacy and Publicity during Census Stages

Pre Enumeration Stage

The main tasks for the advocacy and publicity programme will be to chart out strategies that will enhance advocacy, at higher levels of policy making, as well as to educate, inform and communicate with the public on the importance of the census.

Specifically, advocacy and publicity activities will focus on obtaining effective collaboration from National and Local Government Authorities and support from the private sector as well as the co-operation of different population groups and the general public. The programme will inform and educate the public on why, how and when they should be enumerated.

During this stage, more efforts will be put on advocacy for funding and social responsibility support from development and social partners. The development partners will be requested to fill the gap after the Government commitment, while social partners such as Media Houses, NGOs, and Civil Society Organisation (CSOs) will be asked for support in their social responsibilities.

Enumeration Stage

This is the stage when enumerators will be collecting information. During this stage, the publicity and advocacy team will take initiatives of sensitizing the respondents well in advance on the need to respond positively to enumerators to ensure cooperation and to enhance data quality. Confidentiality aspects should be clearly addressed to reduce non-response to all the questions.

Post Enumeration Stage

The post-enumeration Publicity and Advocacy programme will have the objective of creating awareness on the range of available census data and promoting effective and

extensive data utilization for decision making, planning, Monitoring and Evaluation of National and International Agenda. Wide and extensive dissemination of the census results using various tools will also be adopted.

2.2.11. Publicity and Advocacy Activities

These include:

- To outsource and strengthen capacity to undertake effective publicity in support of the 2014 census;

- To enhance partnership with the media;

- To ensure continuous commitment and interest by the Government and development agencies;

- To enhance capacity for sensitization by other support groups; and

- To enhance public awareness and popularity of the exercise.

Activity 5: Pilot Census

2.2.11. Planning/Undertaking the Pilot Census

After finalization of the census and PES instruments a pilot census will be conducted to assess the whole process of the census and PES operations. The pilot census will determine the workload of enumeration, logistic support, enumeration procedures, data processing and acceptability by the public in general. Administrative control and management issues will also be tested through the pilot census. In general, the pilot census will aim at replicating at a smaller scale the actual conditions of undertaking the actual census. On the basis of the pilot census, necessary corrections and re-scheduling will be made before the actual census.

The work-plan shows that the pilot census will be conducted in February 2013, exactly one year before the census date. *The pilot test for the PES will be carried out within three months after the pilot census.*

Activity 6: Procurement, Transportation and Distribution of Census Materials

2.2.12. Procurement and other logistics

Census materials should be procured and distributed to the required destinations well in advance before the enumeration date. As such, identification of competent service providers and subsequent distribution routes should be well planned in accordance with Government procurement procedures.

Activity 7. Resource Mobilisation

2.2.13. Promotion and mobilization of resources

The South Sudan population is the primary beneficiary of the Census project. The greatest risk of a Census operation is the inability to obtain adequate funding, both from the Government and from donor organizations, for all Census activities, most importantly the cartographic work and the primary enumeration. These are two phases that absorb the greatest part of the total cost of the Census, and which are, at the same time, crucial to the success of the whole Census operation.

The Government should therefore attribute to the Census the importance it deserves. Giving the Census a high priority will permit the Government to more easily mobilize the support needed in terms of adequate staffing and provision of adequate and reliable transport. It will also ensure enhanced co-operation on the part of national and state authorities, the general population, as well as the international and bilateral communities.

The projected budget for the Census should be submitted to the Cabinet for approval as soon as possible. It will be absolutely necessary to seek sources of financing in addition to the South Sudan Government. In this respect, funding organizations such as the agencies of the United Nations system, the World Bank, the African Development Bank, the European Union, and other development partners, including the bilateral ones, should be approached for assistance.

With the full support of the Government officials, notably the Minister of Finance and Economic Planning, the Chairperson of NBS should take a lead in resource mobilization for the 2014 Census. The UNFPA should be requested to coordinate the mobilization of funds from external sources, but always in very close coordination with the NBS Chairperson.

Enumeration Activities

Activity 8: Census Enumeration

2.2.14. Enumeration Procedure

The main enumeration will involve canvassing all housing units and persons in the country. The exercise will be undertaken by trained enumerators using Census questionnaires and related

forms prepared and tested during the preparatory stage of the Census. All persons who will have spent the Census Reference Night within the territorial boundaries of the country should be enumerated.

The enumeration procedures which were used in the 2008 Census and based on house-to-house canvassing will be repeated. Enumeration Areas (EAs) have been designed so that one enumerator can completely cover all housing units and persons within the time allotted for the enumeration. Each supervisor will, on average, control the work of five enumerators; it is expected that supervisors will monitor closely the work of enumerators in the area for which they are responsible. Procedures will be in place to remove enumerators/supervisors whose work is deficient in any way and to replace them with the reserves. In this way the quality of the field work can be maintained.

Special arrangements will be made for the enumeration of some certain population groups. These include the homeless, transients in hotels, people in cattle camps, or camp sites, people living in institutions or other collective quarters like hostels, military barracks, or prisons, hospital in-patients, and even overnight travelers.

There are two main approaches in population census enumeration. There is the *de facto* method where persons are enumerated at the place where they spent the census reference night. The other method is the *de jure* approach where persons are enumerated at their usual place of residence, irrespective of their whereabouts during the census reference night

The *de facto* approach was adopted in the last census. It will also be used during the forthcoming census. Some of the main points of consideration for using this approach are:

- Possibility of double counting or omissions is much greater when employing the *de jure* enumeration.

- Comparatively, the *de facto* approach costs less than the *de jure* one.

- The reference night for the 2014 census will be the third Sunday of February 2014. Theoretically, data collection is supposed to take one day but in practice, enumeration will continue for at least 14 days. About 90 percent of the population is usually enumerated within one week. February is a relatively dry month (climatically speaking), and therefore convenient for such a large scale field operation.

2.2.15. Staff Recruitment and Training

Recruitment and training of enumerators for the enumeration will be given a special attention as a large number of staff is required. Traditionally, and in many African countries, primary school teachers have been involved as enumerators/supervisors and this arrangement has worked well where this approach was adopted. It is recommended that this approach be used in the forthcoming census. Education authorities should be consulted to facilitate the availability and release of the teachers.

It is estimated that about 27,280 (inclusive of 5% as reserves) field staff (22,000 enumerators and 5,280 supervisors) will be recruited during the enumeration exercise. Most of them will be primary school teachers although others may come from other sectors, including the open labour market. In addition to these, about 1000 staff will be used as trainers at all levels as indicated in table 2.1 below. It should be noted that the trainers will act as supervisors at national, state and county levels during the actual census enumeration.

Table 4. Distribution of Census Enumeration Staff by Training Levels

Training Level	No. of Trainees	No. of Classes	No. of Trainers
Nation (Level I)	40	1	10
State (Level II)	960	24	50
County (Level III)	4400	110	1010
County (Level IV)	22000	550	1010
Total	**27400**	**685**	**1010**

National level training, sometimes referred to as Training Level I, will be for the principal trainers, who will be responsible for the state and county level training. State level training, also known as Training Level II, will be for the trainers who will later train the supervisors, i.e. Training Level III, and the enumerators – Training Level IV - respectively at county level.

2.2.16. Data collection Tools
The following are part of the major tools that will be used in the 2014 Population and Housing Census.

Questionnaires

During the last census two types of questionnaires – short and long/detailed - were used. A short questionnaire with limited number of questions was used to cover the entire population, while a long/detailed questionnaire was utilised to cover about 30 percent of the total enumeration areas. This approach is not useful when there is a need for information relating to rare events which are required at sub-national levels. Such events require full coverage. This will be the case for maternal mortality and disability. It is therefore recommended that one questionnaire, the long/detailed questionnaire, be adopted for this census.

Major variables to be included in the questionnaires will include:

- Demographic characteristics ;
- Household Characteristics;
- Internal Migration
- Fertility and mortality;
- Educational characteristics;
- Economic characteristics;
- Disability characteristics;
- Maternal and child health;
- Information and Communication Technology; and
- Housing characteristics and conditions.

2.2.17. Enumeration Area (EA) Maps
The main purpose of an EA map is to ensure that everyone is enumerated and enumerated only once. EAs are demarcated throughout the whole country and therefore guarantee complete geographical coverage of the country. The estimated number of households in each EA will range between 80 and 120 for both rural and urban areas.

2.2.18. Instructions Manuals
Instruction manuals are documented guidelines which illustrate the procedures for data collection and supervision. The main objective of these manuals is to ensure uniformity and harmonisation during training and data collection. The following manuals will be prepared:

- **Training Manual for Trainers:** This is a document which will be used by all trainers at national, state and lower levels. The main objective of this manual is to ensure harmonisation of the training process at all levels throughout the country.

- **Handbook for state and county Census Coordinators:** This will provide guidance to State and county level Coordinators and supervisors in their day-to-day activities - before, during and after enumeration.

- **Instructions to Supervisors:** This is a manual of instructions for field supervisors containing all quality control checks/procedures in the field during enumeration as well as their roles before, during and after the enumeration.

- **Instructions to Enumerators:** This is an instruction manual to enumerators which will be used as a reference document not only to the enumerators but also to all supervisors in the field. This is the most important census enumeration document and is sometimes referred to as the "Census Bible".

- **Quality Control Handbook and Forms:** The primary purpose of the quality control handbook and forms is to monitor the movement of all census materials from one stage to another and for record keeping purposes. The forms will be designed in such a way that all the documents, which are expected to be used during the 2014 census enumeration, are easily identifiable according to allocation schedule.

Post Enumeration Activities

Activity 9. Post-enumeration field activities
After completion of the enumeration *per se*, all census field documents must be assembled for transmission to the main data processing site, and then close down the field operations. In selected areas, where the Post-Enumeration Survey (PES) will be conducted, field facilities may remain open until the completion of this work.

2.2.19. Physical checking and forwarding of Census documents to the Data Processing site

The questionnaires, completed during the enumeration, and other Census documents and control forms will be collected from the Enumerators and reviewed by the Supervisors. This review will include checking the preliminary totals (housing units, households, persons by sex) previously prepared by the Enumerator. They will then be transmitted to the County Offices, where forms from each Supervision area will be checked and passed to the State Census Office. At this point, all forms, accompanied by appropriate control forms, will be transported to the data processing

site. Proper completion and checking of the summary forms will permit the release of provisional totals in a short period after the completion of enumeration

Activity10. Data Processing

For the Census proper, any activity that takes place during the post-enumeration phase at the data processing site is part of Census data processing. This includes logging questionnaires into the archive control system, manual and computer preparation of data, tabulation and analysis of the data, and generation of final data products. Although fewer people are involved during this phase, carrying out each of the steps in this process requires as much preparation and training of staff as does the actual enumeration. Absolutely critical to the final quality of the data and the success of processing is the existence of, and fidelity to, quality control procedures. Operational control procedures are equally important in guaranteeing that all data are processed and that no data are dropped or duplicated.

All processing, starting with the check-in of forms from the field, will be carried out on a flow basis. Up to the point of consistency editing, a batch will consist of the forms from one EA; consistency editing and tabulation are most effectively carried out using larger data files (county and state level, respectively). This will greatly increase throughput and facilitate operational control. The NBS will establish the priority schedule of states for processing; special procedures must be devised to ensure that the forms from EAs included in the PES are made available without delay for the PES matching operation.

2.2.20. Receipt and check-in of questionnaires and control forms

Proper storage and management of EA containers is critical to efficient post-enumeration activities. Misfiling documents can lead to eventual loss of data. As forms are returned from the states, each container will be vetted for the correct identification and number of forms, per the accompanying control form, and will be logged in to a computerized data base. This control system can be created using CSPro or Access or other programming utility suitable to this function. As each EA is logged in, the system will request the regional control totals as well. When the EA has been logged in, it will immediately be shelved in its proper location in the storage area. Clearly visible signage will be used to indicate the locations within the storage area of each geographic sub-division, to the level of boma. This will make retrieval and storage of documents easier and less prone to error.

2.2.21. Manual editing of questionnaire

Questionnaires must be prepared for the data capture operation. Trained personnel will review the forms for completeness to ensure that each questionnaire has correct and unique identification; that responses in the questionnaires will be easily read by the scanner; that the questionnaire is not damaged or wet; that unnecessary entries and blank pages are clearly marked so they will not be inadvertently captured. In addition, they will review the summary totals for each questionnaire for accuracy and consistency. A work unit will be a single EA; the clerk in charge of the shift operation will make assignments and will update the operational control system when work is assigned or returned. The system will also be used to maintain quality control and productivity records. The work of editors will be verified according to the previously-defined quality control scheme. Editors whose work is consistently sub-standard will be retrained, assigned to other duties, or dismissed, according to the individual circumstances.

2.2.22. Coding of labour force items

Questionnaire items referring to labour force information (occupation and industry) will be captured by the Enumerator in literal form. These words (job descriptions, activity at place of work) must be converted to numeric form before data capture. Persons carrying out this work will receive intensive training in the coding schemes used for each question; their work will be subject to verification according to the quality control procedures established for this task. A work unit will be a single EA; the clerk in charge of the shift operation will make assignments and will update the operational control system when work is assigned or returned. The system will also be used to maintain quality control and productivity records. Coders whose work is consistently sub-standard will be retrained, assigned to other duties, or dismissed, according to the individual circumstances.

2.2.23. Strategies for Data Processing

The data processing strategy for the 2014 Population and Housing Census of the Republic of South Sudan would adopt a technology that would be usable after the census process. Staff of NBS would be able to use the technology to design and print questionnaires, scan and process any surveys or censuses in-house, without referring to the technology provider.

Even though the 2008 Census made use of the scanning technology by employing the Optical Mark Reader (OMR) technology, the huge investment has not benefited NBS after the census. As a result, the 2014 census would deploy the ICR (Intelligent Character Recognition) technology that is scalable, open, portable and useful after the census. The ICR systems interpret hand written, number and letter character responses from electronic images of forms scanned, in predefined specific locations on the form and transforms any responses into output data for a computer system to use.

2.2.23.1. Equipment and Software

Most of the equipment and software used during the 2008 Census data processing, are now outdated and therefore the need to obtain new equipment for the 2014 census is essential. The following new equipment will be required for data processing operations:

Hardware

- Image Scanners (TWAIN or ISIS interface)
- Database Server
- Storage Server – Terabytes (Raid 5, Mirrored, etc.)
- Network system
- Administrator PC's
- Analysis and reporting PC's
- Key correction PC's (Verification)
- Scanner PC's
- Automatic data capture PC's
- Laptops
- Uninterrupted Power Systems (UPS)
- Riso EZ-200 Printers (2)

Software
- Cardiff TeleForm software
- MS-SQL, Oracle or other database
- Data Storage, Archive and Retrieval
- CSPro
- SPSS
- Backup Software
- Microsoft Office Suite
- IHSN (International Household Survey Network) Microdata Management Toolkits
- REDATAM (Integrated Microdata Information System).

2.2.23.2. Preparation of Data Processing Site

Data processing exercise for the census operations requires a spacious and well equipped processing site. The establishment of the data processing centre is planned for the 2014 census. This data processing centre will not only be used for census activities but also for subsequent surveys and other statistical operations as well. NBS authorities have confirmed that the location of the data processing site will be in Rumbek. This was also the site in the 2008 Census.

2.2.23.3. Risk Management

Risks may happen during the data processing exercise that might disrupt the continuity of the data processing activities. Examples of such risks are: Failure of power from, either the town grid or generators and failure of scanning some of the questionnaires.

As a precaution, the NBS will have to put in place an additional stand-by generator to be used when the main power sources break down. NBS will also recruit and train data entrants who will enter manually the questionnaires that, for one reason or another, fail to go through the scanning machines.

2.2.23.4. Recruitment and Training

Permanent and temporary staff will be involved in processing of data for The 2014 Population and Housing Census.

Permanent staff will come from the NBS, and from other Government Ministries and/or Agencies. Most of these will be programmers, supervisors, as well as network and database administrators.

Temporary staff will be recruited from the open labour market to fill in the posts of scanner technicians and operators, data controllers, data entry clerks and other supporting staff. Table 2.2 below indicates the number of staff by categories for data processing activities. The table indicates that a total of ...... staff working in two shifts (..... persons/shift) will be required for the exercise.

Capacity building programmes for permanent staff will be developed. Programmers will be updated on software to be used for data processing. It is expected that the supplier of the hardware and software will carry out this training. The permanent staff will also undertake study tours, whenever possible, to learn from other countries.

2.2.23.5. Scanning of Questionnaires and Archiving

Scanners using ICR (Intelligent Character Recognition) technology attached to computers will be used to capture the census forms. These sets of equipment will be connected in a Local Area Network. The design and development of the census questionnaires, development of the data capture and processing applications will be done in collaboration with the permanent staff of the Data Processing Unit at the NBS and the technology provider.

A separate Batch Registration System will be developed to register and produce batch headers, in specific Enumeration Areas.

During the scanning session, questionnaires that had been accepted by the scanner will be returned to their original boxes and sent back to the warehouses. The rejected or damaged questionnaires will be transcribe onto a blank questionnaire and scan or may be entered manually by specially trained data entry clerks.

2.2.23.6. Computer Editing

The main computer editing will begin before the preparation of the General Report by the end of June 2014. Editing specifications will be developed in collaboration with subject matter specialists. Two types of computer editing namely structural and content (validity and consistency) editing will be carried out.

Structure edits check coverage and relationships between different units: persons, households, housing units, enumeration areas, etc.

 Specifically, they check that:

- all households and collective quarters records within an enumeration area are present and are in the proper order;

- all occupied housing units have person records, but vacant units have no person records;

- households must have neither duplicate person records, nor missing person records;

- enumeration areas must have neither duplicate nor missing housing records.

On the other hand, content editing (validity and consistency checks) look at the following:

- Validity checks are performed to see if the value of individual variables are plausible or lie within a reasonable range

- Consistency checks are performed to ensure that there is coherence between two or more variables.

2.2.23.7. Creation of backup and user data files

At all times during processing, NBS must take care to maintain full back-ups of all versions of the data files. It must always be possible to return to any earlier phase and recover the data as they were before entering that phase. This will ensure consistency in processing. In addition, if NBS plans to offer sample data files to users, there should be a system in place that includes an

algorithm for selection of sample households to be included in such a data file and another for anonymising households, to protect Census confidentiality.

Activity 11: Post Enumeration Survey

2.2.24. Undertaking Post Enumeration Survey
A post-enumeration survey is planned to be conducted within three months after enumeration in May 2014 with the following major objectives:

- To assess the degree of coverage during census enumeration;

- To examine the implications of any coverage and content deficiencies, if any, on the usefulness of the census data;

- To examine the characteristics of persons who might have been missed during enumeration; and

- To obtain information for the design of future censuses and surveys.

2.2.25. Strategies for implementing 2014 PES
The 2014 PES will be part and parcel of the 2014 Population and Housing Census. The PES requires the following independent activities:-

- Establishing a separate PES Organizational Structure;

- Finalization of survey design, questionnaire, manual, control forms, work plan and budget;

- Development of PES analytical plan, including dummy tables;

- Development of computer programmes for editing, data entry, tabulation and weighting of results;

- Recruitment and training of interviewers and undertaking data collection;

- Matching PES and main census personal records;

- Undertaking reconciliation visits;

- Data processing, analysis and report writing, and

- Dissemination of results to stakeholders.

2.3: Output B:
Increased knowledge of stakeholders on socio-economic and demographic characteristics of South Sudan population as well as patterns and trends of growth

Indicator 1: % of stakeholders reached.

Activity 1: Dissemination and Utilization of Census Information

2.3.1. Dissemination Strategy

The dissemination programme will target both the main and occasional users of the census information. The list of users of the census information is long but the specific ones include: Central and Local Government Offices; international organisations; public and private institutions; the media, universities and research institutions; general public; Non-Government Organisations, and Community Based Organisation. Therefore, dissemination strategy will ensure that:

- All users, including the general community, have access to the result in an easily accessible format;

- The disseminated information or data meets quality assurance procedures to ensure data accuracy.

The strategy will focus on:

- Using the existing NBS Information Offices as sources of census information. At the NBS Headquarters the Library will be the main source of information while the State Offices will be responsible for providing census data and information;

- Creating a statistical database for the 2014 Population and Housing Census;

- Defining different methods for promoting the use of statistics (e.g. media, speeches, presentations, training, face-to-face contacts, etc);

- Exploring the chances of producing easy-to-use prospectus and booklets on subjects such as education, demographic characteristics, etc;

- Develop electronic dissemination tools that can play a key role in the census dissemination programme, such as CD-ROMs and an electronic census/social atlas;

- Preparing good use of the Internet to efficiently and cost-effectively disseminate data as well as establishing contacts with users; and

- Creating means and ways of dissemination such as publication, CD, web pages, traditional mail, electronic mail, discussions, workshops, seminars, conferences, bi- or multilateral projects, networks.

2.3.2. Dissemination Activities

The National Bureau of Statistics, in collaboration with a team of analysts, will use different methods for disseminating the 2014 census data based on the nature and type of data. The most appropriate approaches to targeted audience/groups of dissemination will include fact sheets, conferences, workshops/training, electronic media, press releases and publications.

2.3.3. Conferences, Workshops/training and Meetings

Traditionally, conferences and workshops are used for specific target data users and producers. The general or preliminary report will be launched and distributed to all key institutions, development and social partners. The fact documents such as National, State and County profiles will be produced on themes relevant to the interests of various stakeholders and planning requirements of the government and the private sectors.

In increasing the use of census data, training programmes will be introduced at state and county levels together with meetings with state and county administrators, academics, schools, private sector, political parties, NGOs and international organizations.

2.3.4. Press releases

Press releases will inform the public in general and enhance the awareness on the results and their use. These releases will be done by higher level Government officials. Release of the preliminary results will be done by the President of the Republic of South Sudan

2.3.5. Electronic Dissemination

Electronic dissemination will provide the means to deliver more detailed aggregated and disaggregated data to selected users. Electronic form is often cheaper to use, copy and store. Data will be stored in standard formats as well as in common database and spreadsheets for easy retrieval and manipulation. Electronic dissemination will be available both offline and online in order to serve different usage patterns and user needs. Offline electronic dissemination will aim at serving users who frequently need data. A series of regularly updated CD-ROMs containing selected tables will be produced and distributed. On the other hand, online electronic dissemination will serve users with occasional needs for updated information. For these

occasional users, census data will be posted on NBS as well as the Government website. The websites will contain publications for downloading, press releases and other relevant information and constantly updated to reflect the latest available information.

2.3.6. Publications of Results

Utilization of the 2014 Census results, mostly depend on the levels of data analysis, publications and dissemination.

A comprehensive and coordinated programme of data analysis and publications of census results will be planned to be done over a period of three years after completion of data processing. This programme should involve both finance and subject matter specialists, local and international, to ensure policy needs are adequately met, undue publication of analysis efforts is avoided and priorities observed.

Usually, the National Bureau of Statistics publishes census results as soon as they are available. Thereafter, followed by an exhaustive analysis and evaluation exercise. Therefore, the following reports are expected to be published for the 2014 Census:

Volume 1:   Preliminary/General Reports (National and State levels);

Volume 2:   Age and Sex Distribution Report;

Volume 3:   National Census Profile (Statistical Tables);

Volume 4:   South Sudan National Profile Data in Brief;

Volume 5:   State and County Census Profile;

Volume 5:   Basic Demographic and Socio – Economic Characteristics;

Volume 6:   Census Monographic Reports (education, labour, fertility, mortality, migration, households and housing characteristics, etc);

Volume 7:   Evaluation Report – PES (Indirect and Direct Methods);

Volume 9:   Methodology and Administrative Report;

Volume 10:   National Population Projections:

Volume 11:   State Population Projections; and

Volume 12:   Census Atlas.

Tentatively, publications listed above will be produced according to the publication plan.

Special publications may be produced to meet special requests.

Activity 1: In-depth analysis of relevant themes such as poverty, gender dimensions and migration.

2.4.1. Specific detailed Analyses

In order to ensure full utilization of census results by different users, a comprehensive and coordinated programme of analysis and publication over a period of three years after data collection will be prepared. The programme will allocate enough resources in such a way that important policy needs are adequately met, undue duplication of research efforts is avoided and priorities observed as far as possible.

Census analysis will focus on providing results for better planning, implementation, monitoring and evaluation of development plans, sectoral programmes and projects to the benefit of the rich and the poor, including the marginalized populations. This will also include an increased utilization of data by the private sector to enhance its market penetration of products and services.

The analysis of the 2014 Population and Housing Census results, therefore, intends to cover the traditional demographic and emerging issues in the area of population and development and socio-economic data and information at national, state, county and and, where necessary, even lower levels. The main purpose is to ensure availability of data to all cross-section of data users, both local and international.

2.4.2. Strategies and Activities

It is important to ensure that the analysed and published data meet the requirements and needs of the data users. To ensure this, several strategies will be designed and adopted. These strategies include:

- Consultation with potential data producers and users in deciding on which collected variables should be analysed;

- Collaboration with higher learning institutions, other research organisations and individual subject matter specialists (local and international) in order to perform the best and approriate analyses;

- The analysed data shall be able to provide evidence–based policy dialogue, especially, in relation to national poverty reduction strategies. The analysed data must provide quality assurance to data users; and

- Software to be used for data analysis shall be user–friedly and compatible with other word processing software.

2.4.3. Training of Users at Various Levels

Most potential-end-users may not be aware of the availability of the data. In some cases the training for the use of the data is rather weak or not carried out at all. In this context, the identification of various data users and their specific needs is of great importance. To ensure maximum utilization of census data in various levels, users have to be well trained on how to use, analyze and interpret the results for the monitoring and evaluation of various socio-economic development policies and programmes.

2.4.4. Establishment and maintenance of Intranet and Website of data for planning and Development policies and programmes

The use of Intranet and internet in globalized economies has become wide enough to majority of potential data users. Although majority of ordinary citizens do not access such services, the importance of establishing and maintaining the intranet and website is still vital. As mentioned earlier, census information and census data will be posted on NBS as well as the Government websites.

2.5. Output D:
Strengthened capacity of NBS in carrying out population and housing censuses particularly in the areas of planning, collecting, processing, analysing, disseminating and utilizing census and other data.

Indicator 1: Existence of a comprehensive training plan for staff.

Indicator 2: Number of NBS professional staff trained in various skills.

Indicator 3: Existence of a fully functioning Census Office.

The census programme will enhance staff skills by providing appropriate training. The training will be conducted through specialized training courses and workshops.

2.5.1. Short term Training

Several staff from NBS will attend short term training in:

- Digital Cartography

- Evaluation and Quality Control

- Planning and Analysis

- Administration and Finance

- Data Processing (ICR Scanning technology)

- Census Editing and Tabulation (CSPro)

2.5.2. Training, Workshops and Seminars

Seminars and workshops will be conducted for NBS staff, state and even county Planners/Statisticians and other Government and Non-Governmental Organizations. The types of training, workshops and seminars proposed are indicated in the detailed work-plan.

Activity 2: Strengthening Institutional Capacity

2.5.3. Having adequate/satisfactory facilities, equipment, hardware and software

- Office space; and

- Equipment:
  - Vehicles;
  - Computers (desktops and laptops);
  - Relevant and up to date software
  - Generators;
  - Office furniture; and
  - Cartographic equipment – both hardware and software

CHAPTER 3

Census Organisation Structure

3.1. Introduction

Below is a quote from the United Nations Principles and Recommendations for conducting Population and Housing Censuses:

"In planning the organization and administration of a census, it is important to consider the role and relationship of the various executive and advisory organs. National, sub-national and local commissions and committees are frequently useful in the planning and preparation of a census. Such bodies may be composed of representatives of government agencies and of non-governmental users of the census data, particularly those involved in policy-oriented analysis of census results and analytical studies of the social, economic and demographic situation of the country. It is important, however, that their advisory and promotional functions be clearly defined and that the final responsibility for planning rest with the executive agency.

There are definite advantages in having an office continuously responsible for the census work established as an integral part of the statistical system of a country. Such an office assures continuity in census work and is the principal centre for the formulation of the programme and the initiation of preparatory work for the next census. Its permanence permits the development of specialized and experienced personnel and the maintenance of statistical and cartographic information, including cross-cutting issues such as information technology, essential for planning the next census.

At the pre-enumeration stage, the census office will need to be expanded to form the nucleus of the full census organization, which must be capable of directing the field organization during the preparatory work as well as during the enumeration. In order to provide immediate supervision in each area, field offices at various levels are needed for the later part of the preparatory work, including staff recruitment and training, as well as for the enumeration period. Supervisory personnel in such offices should be persons who, being familiar with the particular area and the local language, are able to deal with local problems. This does not mean, however, that all supervisory positions must be filled by persons from the area. Personnel may be transferred from the central office or from other areas as the need arises.

Subsequent to the enumeration, the census organization is usually readjusted to meet the needs involved in compiling, evaluating, analysing and publishing the results and to provide the continuity desirable for promoting the continued use of census materials and the development of improved methods."

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3.2. INSTITUTIONAL FRAMEWORK

3.2.1. Introduction

The 2014 Population and Housing Census of the Republic of South Sudan will be carried out in accordance with the Presidential Decree No. .... of 2012. The Chairperson of the National Bureau of Statistics (NBS) will be responsible for planning, organization and technical administration of the Census. Furthermore, the NBS Chairperson will be the Accounting Officer in charge of all the financial resources.

A census office secretariat will be put in place within the NBS to implement the national census programme. The census office will be managed by a Census Manager who will be accountable

to the NBS Chairperson. The Census Office Secretariat will be made up of six sections to deal with specific subject matter activities. The main sections will be:

• Finance and Administration

• Planning and Analysis

• Advocacy and Publicity

• GIS and Census Mapping

• Monitoring and Evaluation and

• Information Technology and Data Processing.

Each of these sections will be headed by a Deputy Census Manager. The census manager together with the deputies will constitute the Census Management Committee, which will be expected to meet on a weekly basis to monitor the progress of the census programme.

During the census enumeration, the structure will be expanded to accommodate the field teams as indicated in Chart 3.1 under State Field Teams. This is only during the enumeration phase. The actual number of census enumerators and supervisors will be determined after the mapping exercise is completed as one enumerator will be assigned to one enumeration area. Three to five enumerators will be under one supervisor, depending on population density and the geographical terrain on the ground. In addition, special population groups, like the homeless, institutional populations, etc. will be covered by special enumerators.

At state level, the State Statistical Director (SSD) will be designated as the State Census Manager and be in charge of all census activities. The State Field Operations Manager will be the Deputy State Census Manager. At County level, census activities will be managed by County Census Coordinators (CCC). Institutionally, there will be Census Committees from National to state levels which will ensure smooth operations of the census activities in their respective areas. Membership and responsibilities of these Committees are explained below.

Chart 3.1   2014 Population and Housing Census Project Organization Chart

```
                    ┌──────────────────────────────────┐
                    │ National Population Census Council │
                    └──────────────────────────────────┘
                                  │ .............┌──────────────────────┐
                                  │              │ State Population Census│
                                  │              │     Committees         │
                                  │              └──────────────────────┘
                    ┌──────────────────────────────────┐
                    │        National Bureau            │
    ┌──────────────┐└──────────────────────────────────┘
    │ Collaborators│..............│
    └──────────────┘              │
                                  │          ┌──────────────────────────┐
                                  │          │ National Technical Committee│
                                  │          └──────────────────────────┘
                    ┌──────────────────────┐ ┌──────────────────────────┐
                    │    Census Manager     │─│ Chief Census Technical   │
                    └──────────────────────┘ │        Advisor            │
                                  │          └──────────────────────────┘
```

Administration and Finance	Advocacy and Publicity	Planning and Analysis	GIS and Census Mapping	Monitoring and Evaluation	State Field Teams	IT and Data Processing
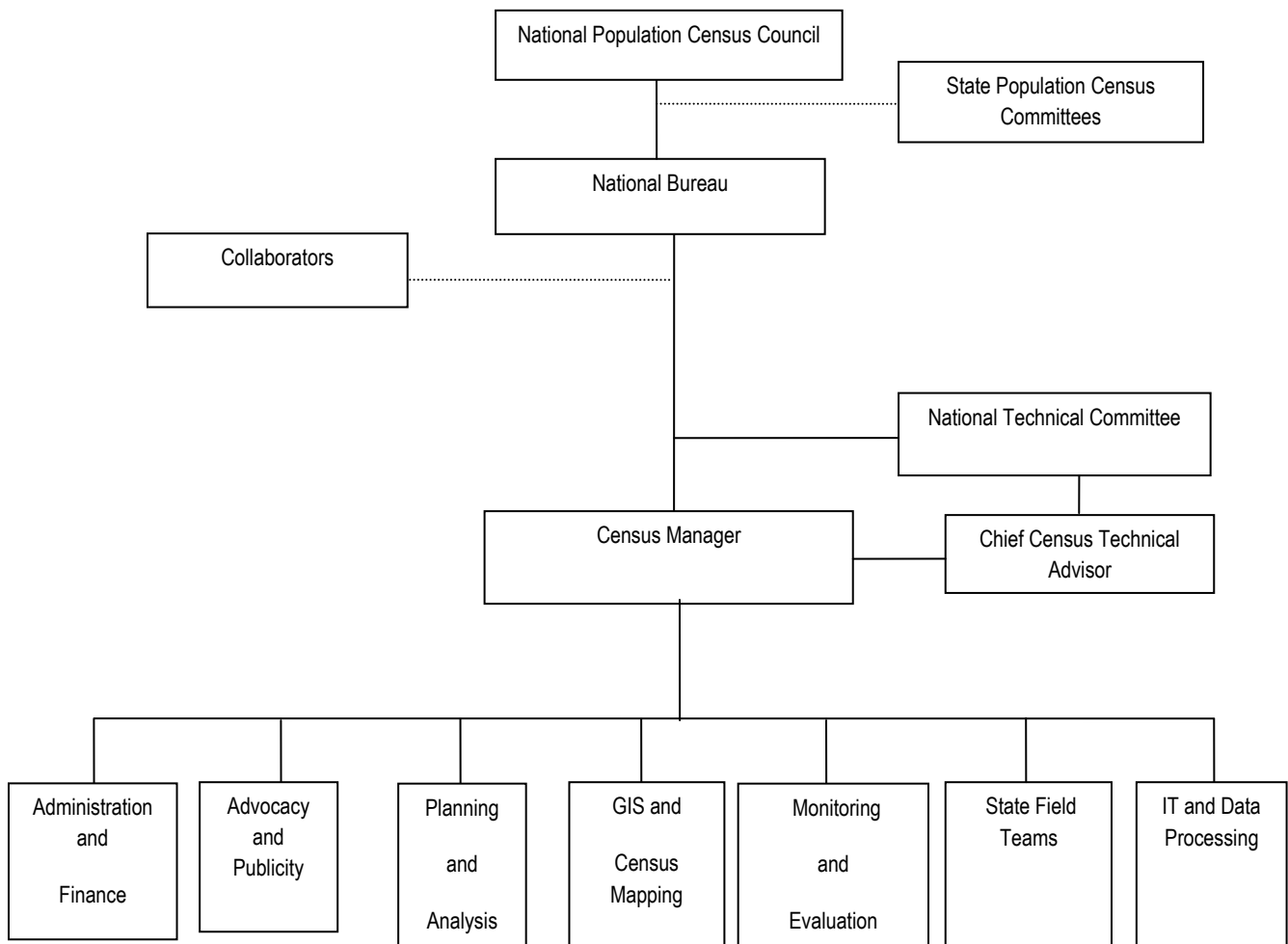
3.2.2. Responsibities

3.2.2.1. NBS Chairperson

The responsibilities of the Chairperson of NBS in regard to the Population Census Project will include:

- To be the Chief Executive and Chief Accounting Officer for all the activities of the Population and Housing Census Project;

- To prepare and present to the Vice President all the reports on the implementation of the Population Census Project;

- To liaise with various organizations including donor agencies, organizations/countries for fundraising purposes and resource mobilization.

3.2.2.1. The Population Census Secretariat

Administration and Finance

- To prepare and administer the overall budget and maintain adequate controls over all the expenditures to be incurred in the census;

- To recruit all census personnel in accordance with Government procedures and regulations

- To process documents and payrolls for temporary staff;

- To procure supplies and ensure delivery of census documents in accordance with Government Procurement Procedures and Regulations;

- To attend day-to-day census administrative issues; and

- To ensure availability of Census Offices and storage facilities in the States and Counties.

Advocacy and Publicity

- To prepare comprehensive advocacy and publicity programme;

- To implement the programme.

Planning and Analysis

- To determine the required census scope;

- To develop enumeration procedures;

- To develop questionnaires and related manuals;

- To develop tabulation plan;

- To prepare editing and coding specifications and instructions;

- To prepare and undertake the training of all census field staff for the enumeration process;

- To develop a sampling frame;

- In collaboration with Monitoring and Evaluation section, to carry out the Post Enumeration Survey; and

- To analyse the census results, prepare reports and disseminate census results.

GIS and Census Mapping

- To prepare a comprehensive census cartographic programme;

- To acquire necessary equipment and materials;

- To develop coding scheme that will provide a unique identification for each area;

- To delineate EA and SA maps and provide census geographic/sampling frame;

- To produce EA and SA maps required for enumeration;

- To undertake post-enumeration cartographic activities including production of census maps and atlas for data dissemination; and

- To produce a census cartographic work report.

Monitoring and Evaluation

- To prepare a comprehensive census evaluation and quality control procedures;

- To implement all activities related to census evaluation and quality control programme;

- To prepare and implement activities related to the post-enumeration survey;

- To produce reports on quality checks and provide recommendations for improvement.

Data Processing

- To prepare a comprehensive census data processing programme;

- To develop editing, data capture, data cleaning and tabulation programmes;

- To produce census tables;

- To ensure that a back-up system is in place;

- To archive census data; and

- To prepare metadata information for all variables generated from the census.

3.3. Composition and Functions of Census Committees at National Level

The following National Committees will be formed as indicated below:

3.3.1. *National Population Census Council (NPCC)*
Composition

1	The Vice President of the Republic of South Sudan	Chairperson
2	Minister, Cabinet Affairs	Member
3	Minister of Finance and Economic Planning	Member
4	Minister of Foreign Affairs and International Cooperation	Member
5	Minister of General Education and Instruction	Member
6	Minister of Agriculture and Forestry	Member
7	Minister, Office of the President	Member
8	Minister of Interior	Member
9	Minister of Health	Member
10	Minister of Transport	Member
11	Minister of Information and Broadcasting	Member
12	Minister of Labour, Public Service and Human Resource Development	Member
13	Minister of Defense and Veteran affairs	Member
14	Minister of Housing and Physical Planning	Member
15	Minister of Gender, Child and Social Welfare	Member

16	Minister of Animal Resources and Fisheries	Member
17	Minister of Higher Education, Science and Technology	Member
18	State Governors from all the 10 states	Members
19	Chairperson, Local Government Board	Member
20	Three technically-oriented persons from South Sudan Public Universities (*Specialists in demography, geography or statistics*)	Members
21	Any other person recommended by the Chairperson (NPCC)	Member
22	Chairperson, National Bureau of Statistics	Secretary

3.3.1.2. Responsibilities (NPCC)

As the highest authority for the conduct of the Population and Housing Census, The National Population Census Council shall:

a) Approve the topics and contents on the Census questionnaires;

b) Approve budgets and plans for implementation of the population Census;

c) Assist in the mobilization of funds for the implementation of the Census;

d) Assist in census advocacy;

e) Ensure adequate transport for the Census Enumeration;

f) Ensure security for the Census Mapping and Enumeration;

g) Receive progress reports from the National Population Census Technical Committee;

h) Report regularly to the president of the Republic on the preparations, implementation and progress of the Census;

i) Release the final Census results;

j) Determine and establish as it may deem appropriate, any other Census committees at the National and sub-National Levels;

k) Determine its own internal regulation and procedures

The NPCC shall meet quarterly. Special meetings may be convened when the need arises.

3.3.2. National Population Census Technical Committee

3.3.2.1. Composition

1	Chairperson – NBS	Chairperson
2	Director-General of Planning, Ministry of Finance and Economic Planning	Member
3	Deputy Chairperson, National Bureau of Statistics	Member
4	Director-General, Ministry of Agriculture and Forestry	Member
5	Director-General, Ministry of Health	Member
6	Director-General, Ministry of Housing and Physical Planning	Member
7	Director-General, Ministry of General Education and Instruction	Member
8	Director-General, Ministry of Labour, Public Service and Human Resource Development	Member
9	Director-General, Ministry of Gender, Child and Social Welfare	Member
	Director-General, Ministry of Higher Education, Science and Technology	
10	Five technically-oriented persons from South Sudan Public Universities (*Specialists in demography, geography or statistics*)	Members
11	Representative from Department of Geography, University of Juba	Member
12	Representative from UNDP	Member
13	UNFPA Representative	Member
14	Representative from UNICEF	Member
15	Representative from WHO	Member
16	Representative from the NGO forum	Member
17	Representative from International Office of Migration	Member
18	All Deputy Census Managers	Members
19	All census technical advisors	Members
20	Any other person recommended by the Chairperson (NPCTC)	Member
21	Census Manager	Secretary

3.3.2.2. Responsibilities (NPCTC)

The National Population Census Technical Committee (NPCTC) shall be the highest technical body for the conduct of the Population and Housing Census in the Republic of South Sudan, and shall perform the following duties and responsibilities:

a) Review census topics and content as developed by the Census Secretariat;

b) Review all census tools and instruments such as the questionnaires, manuals, Enumeration Area maps, etc. which have been developed by the Census Secretariat;

c) Review census technical operation procedures to ensure that they meet UN standards;

d) Submit regular reports and recommendations to the NPCC; and

e) Determine its own internal regulations and procedures.

The National Technical Census Committee (NTCC) shall meet monthly. Special meetings may be convened when the need arises.

3.3.3. Collaborators Forum

3.3.3.1. Composition

Under Secretary, Planning, Ministry of Finance and Economic Planning	Chairperson
Director Generals, Bilateral and Multilateral, Ministry of Foreign Affairs and International Cooperation	Member
GIZ	Member
EEC	Member
DFID	Member
JICA	Member
SIDA	Member
DANIDA	Member
UNOPS	Member
UNDP	Member

UNFPA	Member
UNICEF	Member
FAO	Member
USAID	Member
World Bank	Member
AfDB	Member
WFP	Member
UNMISS	Member
UN Women	Member
HABITAT	Member
UNOCHA	Member
Any other member nominated by the Chairperson	Member
Census manager, NBS	Secretary

3.3.3.2. Responsibilities

i) To mobilize financial resources;

ii) To mobilize expertise for both technical and logistics support; and

iii) To strengthen Government and Development Partners collaboration;

This committee will meet quarterly.

3.4. Management of the 2014 Population and Housing Census at State and County Levels

At state level, the State Statistical Director will be designated as the State Census Manager, while the State Field Operations Manager will be the Deputy State Census Manager. They will be assisted by a State Census Officer. At county level, executive responsibility for the census operations will be vested upon Census County Coordinators. Their functions are outlined below:

3.4.1 Functions of the State Census Manager on Census Activities (Assisted by the State Deputy Census Manager)

i) To coordinate all census activities in the states;

ii) To liaise with the national Census Manager on the work and particularly problems associated with the exercise in the state;

iii) To ensure that adequate resources are received and disbursed as planned;

iv) To update the state authorities on census work and problems experienced in the state; and

v) To be secretary to the State Census Committee.

3.4.2. Functions of the State Census Officer

The State Census Officer is an assistant to the State Statistical Director on issues relating to census in the state.

3.4.3. Functions of the County Census Coordinators

i) To be in-charge of all census activities in the county;

ii) To ensure that, all census activities are conducted according to plan in the county;

iii) To supervise census work in the county;

iv) To facilitate the census project through solving basic problems such as transport, communication with lower levels of Government in the county;

v) To communicate with the State Statistical Director on urgent matters that might affect census operations in the county;

vi) To report to the county authorities, including the County Commissioner, on census issues in the county; and

vii) To sensitize the general public on the importance of the census at lower levels within the county.

3.5. State Population Census Committee (SPCC)

To ensure a successful census, there will be a state census committee in each state as indicated below:

State Population Census Committee

3.5.1. Composition

1	State Governor	Chairperson
2	Deputy Governor	Member
3	Speaker to State Parliament	Member
4	All members of the Council of Ministers in the state	Members
5	Chairpersons of all State Parliamentary Committees	Members
6	All County Commissioners within the state	Members
7	Heads of all organised Forces within the state	Members
8	Secretary- General, State Council of Ministers	Member
9	State Statistical Director	Secretary

3.5.2 Duties and Responsibilities (SPCC)

The State Population Census Committee (SPCC) shall perform the following duties and responsibilities:

  i) Facilitate and guide census implementation at state level;

  ii) Provide adequate security during the whole census operation in the state;

  iii) Ensure that adequate census documents are received and stored safely;

  iv) Closely monitor census activities at state level;

  v) Ensure availability of transport during mapping and enumeration phase; and

  vi) Undertake census advocacy and publicity at the state level.

The State Population Census Committee (SPCC) will meet quarterly and more regularly as the census enumeration gets near.

CHAPTER 4

Geographical Information System (GIS) and Mapping

4.1. Background: South Sudan and the 2008 Census

4.1.1. Population Distribution by Urban and Rural Areas (2008)
South Sudan recorded a population of 8.3 million in the April-May 2008 Census. It is predominantly a rural country with 83% classified as living in rural areas, ranging from a high of 92.3% in Northern Bahr el Ghazal to 57.1% in Western Bahr el Ghazal. This is illustrated below in Table 4.1.

Table 5. Population Distribution by Urban and Rural Areas, 2008 (**Source: NBS)**

Code	Regions / States	Urban Population	% Urban	Rural Population	% Rural	Total Population
Upper Nile Region						
11	Upper Nile	243,976	25.3	720,377	74.7	964,353
12	Jonglei	129,341	9.5	1,229,261	90.5	1,358,602
13	Unity	120,790	20.6	465,011	79.4	585,801
	Total	**494,107**	**17.0**	**2,414,649**	**83.0**	**2,908,756**
Bahr el Ghazal Region						
21	Warrap	84,887	8.7	888,041	91.3	972,928
22	Northern Bahr el Ghazal	55,398	7.7	665,500	92.3	720,898
23	Western Bahr el Ghazal	142,945	42.9	190,486	57.1	333,431
24	Lakes	65,033	9.3	630,697	90.7	695,730
	Total	**348,263**	**12.8**	**2,374,724**	**87.2**	**2,722,987**
Equatoria Region						
31	Western Equatoria	100,034	16.2	518,995	83.8	619,029
32	Central Equatoria	382,362	34.6	721,195	65.4	1,103,557
33	Eastern Equatoria	80,420	8.9	825,741	91.1	906,161
	Total	**562,816**	**21.4**	**2,065,931**	**78.6**	**2,628,747**
	Grand Total	**1,405,186**	**17.0**	**6,855,304**	**83.0**	**8,260,490**

Note: 2008 EAs were either coded as '1' (urban) or '2' (rural) but there was no legal definition of an urban area. The field mapping teams defined the urban areas according to what they perceived as urban, but their criteria varied from state to state.

4.1.2. Area and Population Density by Region and State (2008)

South Sudan has an average population density of 13 persons per square kilometre. The highest density is found in Central Equatoria with 26 persons per sq.km and the lowest in Western Bahr el Ghazal with 4 persons per square kilometre. This is illustrated below in Table 4.2.

Table 6. Area and Population Density by Region and State, 2008 (**Source: NBS)**

1	2	3	4	5
Code	Regions / States	Population (2008)	Area (sq.km)	Population Density (persons per sq.km)
Upper Nile Region				
11	Upper Nile	964,353	77,283	12
12	Jonglei	1,358,602	122,581	11
13	Unity	585,801	37,837	15
	Total	**2,908,756**	**237,701**	**12**
Bahr el Ghazal Region				
21	Warrap	972,928	45,567	21
22	Northern Bahr el Ghazal	720,898	30,543	24
23	Western Bahr el Ghazal	333,431	91,076	4
24	Lakes	695,730	43,595	16
	Total	**2,722,987**	**210,781**	**13**
Equatoria Region				
31	Western Equatoria	619,029	79,343	8
32	Central Equatoria	1,103,557	43,033	26
33	Eastern Equatoria	906,161	73,472	12
	Total	**2,628,747**	**195,848**	**13**
	Grand Total	**8,260,490**	**644,330**	**13**

4.1.3. Summary of Administrative Divisions and EAs (2008)

The Republic of South Sudan has an official area of 644,330 sq.kms and borders Ethiopia, Kenya, Uganda, the Democratic Republic of Congo, the Central African Republic and the Republic of Sudan.

South Sudan has 3 Regions, 10 States, 79 Counties, 521 Payams and about 2,198 Bomas. Cartographic fieldwork for the 2008 census demarcated 10,018 Enumeration Areas (EAs). This is illustrated below in Table 4.3:

Table 7. Summary of Administrative Divisions and EAs, 2008 (**Source: NBS**)

Code	Regions / States	State Capitals	No of Counties	No of Payams (2008)	No of Bomas (2008)	No of EAs (2008)
Upper Nile Region						
11	Upper Nile	Malakal	12	70	301	1,738
12	Jonglei	Bor	11	72	360	1,151
13	Unity	Bentiu	9	73	288	631
	Total		**32**	**215**	**949**	**3,520**
Bahr el Ghazal Region						
21	Warrap	Kuajok	7	52	155	1,374
22	Northern Bahr el Ghazal	Aweil	5	38	174	1,112
23	Western Bahr el Ghazal	Wau	3	15	87	401
24	Lakes	Rumbek	8	49	125	818
	Total		**23**	**154**	**541**	**3,705**
Equatoria Region						
31	Western Equatoria	Yambio	10	47	196	793
32	Central Equatoria	Juba	6	46	226	1,105
33	Eastern Equatoria	Torit	8	59	286	895
	Total		**24**	**152**	**708**	**2,793**
	Grand Total		**79**	**521**	**2,198**	**10,018**

4.1.4. Mapping for the 2008 Census

The 2008 cartographic work was the first census mapping to be completed in South Sudan, so even though the frame was not very accurate, it was a remarkable achievement to provide each of the 10,000 Enumerators and 2,000 Supervisors with a digital map of their areas of responsibility. However, there were numerous challenges to overcome, for example:

- *Mapping for the 2008 Census was completed in 15 months (October 2007-February 2008), but it was rushed and poorly edited as the Census had to keep to the Comprehensive Peace Agreement (CPA) schedule;*
- *The original proposal was to utilize 15 teams in each state, but when vehicles arrived late, only 5 teams were deployed per state, which delayed completion. Later, 5 more teams were added in Jonglei and Western Equatoria. Therefore, 60 teams were used in total;*
- *There were delays in the receipt of funds from the Government of National Unity (GONU), which in turn delayed the cartographic fieldwork. (For example, field teams would not move camp to start demarcating a new Boma until they had been paid);*
- *No satellite imagery or suitable base maps were available to guide the field mapping teams in the rural areas and the imagery provided by UNMIS was only available for nine towns. (Satellite imagery covering the whole country was only received in 2009, ie, after the Census);*
- *The only base maps available for Census mapping in 2007-2008 were the small-scale 1:500,000 (2mm=1km) series of state planning maps prepared by the Centre for the Development of the Environment (CDE), Berne, Switzerland. However, no fieldwork (ground truthing) had been done for these maps, so the names of localities were completely out-of-date;*
- *It took time for UNFPA to recruit a GIS Adviser (who was in post from May 2007-Dec 2009) and establish the GIS Lab in Rumbek with the necessary hardware, software, printers, wide-format plotters and consumables). Generators provided power but fuel supplies were a constant issue;*
- *Everything was built up from scratch, and the recruitment, training and deployment of field and office cartographic staff took time and effort;*
- *The 2008 Plan A was to complete digital EA maps and Plan B was to use GPS sketches. In the end, two persons were brought from each state to Rumbek to augment the GIS Lab staff and this enabled digital maps to be completed and distributed on time. This was fortunate as the GPS sketches were <u>very</u> poor and unusable;*
- *The Local Government Act had not been passed by 2008, so there were no official boundaries for the administrative divisions and urban areas mapped.*

As a result, the 2008 Census EA maps were imprecise and a new EA frame will be needed for the 2014 Census.

4.2. Demarcation of an Accurate EA Frame for the 2014 Census

4.2.1. Introduction
Cartographic fieldwork to develop an accurate Enumeration Area (EA) frame is the key to the success of any Census. However, it is especially important for the 2014 census of South Sudan because the 2008 EA maps were so generalised.

Therefore, a new EA frame is required for 2014, but this means that the cartographic fieldwork will take longer to complete than updating an existing frame. Moreover, South Sudan has difficult terrain and poor infrastructure and communications, so the time and resources needed must not be under-estimated.

The fieldwork will use a mixture of manual and digital methods, but the EA frame must conform to international standards (including the use of GPSs). Apart from the Census, the EA frame must also be suitable for the household-based surveys to be conducted by NBS during the inter-censal period (2015-2024).

4.2.2. Definition of Urban
There is still no official definition of 'urban' in South Sudan. In 2008, field teams usually designated complete Bomas as either urban or rural and coded EAs as either '1' (urban) or '2' (rural), but the criteria varied from state to state. This time, a **definition of urban** must be set out **before** fieldwork begins.

Moreover, the Local Government Board in Juba, and the local government and town planning authorities in each of the states should be consulted beforehand on what they consider as urban, and a report made of the findings.

However, an initial definition for Census purposes may be along the following lines:

> *'Urban areas are those places that either have a city council, municipal council or a town council, plus county headquarters and other settlements that show urban characteristics'.*

In practice, this would mean that the national capital, the state capitals, the Boma(s) containing the county headquarters and other towns that have features such as paved roads, street lighting, blocks / quarters, hospital, senior school, police station, bank, etc, would be coded as urban.

After the census, the definition can be refined. For example, places that have a population of at least 5,000 persons could be termed as urban.

4.2.3. Methodology
The cartographic process consists of initial office preparations, training field personnel, fieldwork to demarcate an EA frame, training office staff in digitizing of field returns for

enumeration, and post-enumeration development and dissemination of GIS maps for reports and an atlas.

Therefore, the quality of the census maps is directly related to the quality of the enumeration. Therefore, close attention will be paid to achieving an accurate EA frame by using the following methods:

4.2.3.1. Using Satellite Imagery
Initial proposals in 2005 for satellite imagery were rejected by a development partner as being too costly. It was also believed that imagery would take too long to obtain, and that using it would delay the 2008 enumeration;

- *Therefore, it was not until <u>after</u> the 2008 enumeration that DFID was able to provide two types of imagery, as follows*

- *SPOT5 2.5metre imagery (covering all of South Sudan); and,*

- *QuickBird 1metre imagery (covering Juba, the state capitals and 10 other towns).*

- *The SPOT5 2.5 metre imagery will be extensively used for 2012-2014 mapping in the rural areas, though new high-resolution QuickBird or Geo-Eye imagery (0.60cm) will be required for the rapidly-expanding national capital (Juba);*
- *New high-resolution imagery will also be needed for the 10 state capitals and other major towns such as Yei, Nimule and Renk.*

4.2.3.2. Preparing Satellite Imagery Base Maps for Field Updating
- *Locating each 2008 Boma on SPOT5 or QuickBird satellite imagery;*
- *Overlaying the geo-referenced imagery with the administrative boundaries (states, counties, payams and bomas) and the 2008 EA boundaries (for updating);*
- *Overlaying the UTM grid (showing coordinates in the margins and grid lines across the maps);*
- *Standard scales (such as 1:25,000, 1:10,000, 1:5,000, 1:2,500) should be used wherever possible or field teams will be unable to calculate their GPS positions in the field;*
- *Printing satellite map copies on A0-size paper for field updating, packing according to states, counties, payams and bomas, and distribution to field teams;*
- *Recruiting and training field teams for urban and rural fieldwork on EA demarcation, map reading, GPS use, administration, publicity, reporting, communications, etc;*

- *__Note__: 'Plan B' will involve updating the satellite imagery maps neatly and legibly so that if digitizing cannot be completed in time, the updated satellite imagery maps can be photocopied for the Census Enumerators;*

- *As far as producing digital maps is concerned, the digitizing of __urban__ area EA maps and SA maps (rather than rural areas) is the priority.*

4.2.3.3. Using GPS Receivers

- *GPS receivers will be used to record and plot the central points of villages, urban blocks / quarters, administrative boundaries (states, counties, payams, bomas and urban boundaries), social facilities (schools, hospitals, clinics, markets, water-points, churches, mosques, etc), roads, tracks, prominent buildings, landmarks and householders' names on urban EA boundaries;*

- *The GPS coordinates will be down-loaded into laptops using GPS Utility software (or similar) and taken to the GIS Lab for digital processing of EA maps. Transporting CDs to the GIS Lab must be done on a regular basis to ensure a back-log does not accumulate.*

4.2.3.4. Making Household Listing / Quick-Counts

- *In order to obtain comparable-sized EAs and verification of coverage between the cartographic fieldwork estimates and the 2014 Census, household listing / quick-counts will be carried out;*

- *__Note__: Although more accurate verification can be obtained by detailed household listing, for example, by recording the 'Names of Heads of Households' and the 'numbers of Usual Household Members' in each EA, this takes longer and preparations for the 2014 are already on a tight schedule. Therefore, household listing will be limited to recording only the names of heads of households.*

4.2.3.5. Demarcating EAs Suitable for the Census and Household Surveys Programme

- *The 2008 census EAs were not accurately demarcated and were too large (100-150 households in rural areas and 150-200 households in urban areas);*

- *The 2008 census used a short questionnaire (SFQ) and a long questionnaire (LFQ) on a sample basis. This time, the proposal is to use a single questionnaire, which will enable more time in the field for mapping as the required list of EAs for sampling purposes would not be required;*

- *Demarcating EAs that will be a suitable size for both the Census and sampling for household-based surveys (about 80-120 households per EA) during the inter-censal period (2015-2024);*

- *Preferably, <u>urban EAs</u> should be from 100-120 households and <u>rural EAs</u> from 80-100 households;*

- *In sparsely populated and difficult-to-reach areas, for example, parts of Upper Nile and Jonglei states, EAs may contain only 40-80 households or less;*

- *However, **it is estimated that if EAs are reduced in size to an average of 100 households each, then about 16,000 EAs will be demarcated for the 2014 census, rather than 10,000 EAs in 2008;***

- *About 3,500 Supervision Areas (SAs) will be developed in the office after the completion of fieldwork. An SA will consist of three to five contiguous EAs, depending on the terrain, the density of population, communications, access, etc.*

4.2.3.6. Preparing EA Boundary Descriptions for Urban Areas

- *Accurate EA boundaries and EA Boundary Descriptions will be required for urban areas, especially for un-planned localities without blocks;*

- *Rural EA boundaries may be imaginary lines separating villages within Bomas, but EA Boundary descriptions will be required for large villages consisting of more than one EA;*

- *The urban EA Boundary Descriptions forms should be photocopied and distributed with the EA maps. They should give directions to the EAs, their contents (the names of the blocks and quarters, etc), and clear descriptions of EA boundaries that follow landmarks and other identifiable features;*

- *Urban EA boundary descriptions should be in terms of the names of householders, house numbers (if any), prominent buildings (schools, etc) and other marker points along the EA boundaries (both inside and outside the EA).*

- *<u>Alternatively</u>, (particularly for unplanned densely populated urban areas, annotation forms will be provided, whereby landmarks are numbered on the satellite imagery and numbered and named on the annotation forms. Either way, this will help inexperienced Enumerators who are not familiar with map-reading.*

4.2.3.7. Completion of Field Control Forms

- *Reporter's notebooks will be used in the field for recording dates, areas worked and the results of household listing / quick-counts (tally-counts with the aid of local guides);*

- *At the team camps, field control forms must be completed accurately so that the names and geo-codes of EAs, villages, quarters and social facilities shown on the satellite imagery <u>match</u> those listed on the forms;*
- *Funds for paying guides are a necessity, and guides payment forms and payment vouchers are needed.*

4.2.3.8. Editing, Digitizing and Printing EA Maps for the Census

- *Quality control (<u>matching</u>) of updated SPOT5 / QuickBird / GeoEyesatellite imagery, topographic maps, and field control forms;*

- *Digitizing of Enumeration Area (EA) maps and Supervision Area (SA) maps, coding villages, blocks, final quality control;*

- *Map production and printing, packing and distribution for the Pilot Census (April 2013), Main Enumeration (March 2014) and Post Enumeration Survey (PES) (April 2014);*

- *Developing relational geo-databases;*

- *Post-enumeration mapping and GIS development for reports, dissemination maps, a national Census atlas, etc.*

4.3. Requirements for Operational Success in 2014

The operational success of cartographic fieldwork to develop an accurate EA frame in time for the 2014 Census will depend on many factors, including the following:

- *Census Funding: The early release of Census funds from Government and development partners for cartographic work, which will enable the Census infrastructure to be timely and permit preparations to proceed at a comfortable speed;*

- *The ready availability of field funds for salaries and field allowances, petty cash for diesel fuel and guides (with payment vouchers);*

- *Personnel: The support of dedicated NBS staff at headquarters in Juba, the Rumbek sub-office, the 10 State Statistical Offices and temporary field mapping personnel;*

- *The support of the State, County, Payam and Boma administrations.*

- *The teams must always be issued with Letters of Authority and photo-ID cards to enable courtesy   calls and meetings with local leaders to go smoothly;*

- *The availability of locally recruited field staff from the states. (In early 2012 NBS interviewed some persons who worked on the 2008 mapping programme and are experienced in fieldwork. Short-listing and follow-up is required);*

- *Monitoring and Evaluation: Constant field monitoring and evaluation by the NBS Directorate of Census as well as the Sections of GIS and Mapping and Monitoring and Evaluation, and by technical advisers and consultants is required;*

- *Communications: High-frequency (HF) communication radios, satellite phones and mobile phones (where the network is available) should be provided to the management staff and the field mapping teams. This is essential if efficiency and <u>control</u> by NBS Headquarters is to be maintained;*

- *Sending the field data, including maps, field control forms and GPS coordinates on CDs, to the GIS Lab on a regular basis.*

- *<u>Vehicles and Logistics</u>: Sufficient vehicles (each field mapping team and each Field Operations Manager must have their own vehicles). Motorcycles and bicycles should also be available for areas without roads and tracks;*

- *Strong logistical support by state statistical offices, particularly the Field Operations Managers, to carry maps, forms, tyres, fuel, food and water to the field teams;*

- *Constant fuel supplies (in drums where necessary), spare parts, and field mechanics for servicing of vehicles and motorcycles;*

- *<u>Publicity and Advocacy</u>: Publicity and advocacy for the Census cartographic fieldwork by NBS, and by the mapping teams themselves (providing them with census T-shirts and caps, and posters and flyers for local distribution), by state publicity officers, radio messages, newspaper articles, etc;*

- *<u>Training</u>: Provision of quality training manuals for cartographic fieldwork, map reading and GPS use. The contents of the manuals must <u>match</u> the methods being implemented in the field;*

- *<u>Satellite Imagery</u>: Printed copies of relatively up-to-date satellite imagery with the UTM grid drawn across the sheets so that the teams can plot and check their own GPS positions in the field, and imagery for updating urban and rural areas (QuickBird1m and SPOT5 2.5m);*

- *The 2008 boundaries of the administrative divisions (states, counties, payams and bomas) and EAs must be printed as overlays for field correction;*

- *<u>Equipment and Supplies</u>: Available funds to purchase GPSs, laptops, printers, plotters, photocopiers, consumables and stationery;*

- *Office Space: There is insufficient space at NBS headquarters in Juba to accommodate the preparation of field maps, the digitization of field returns and the development of GIS. The alternatives include:*

    o *Erect a new building in Juba, and apparently EU/NBS have signed a Memorandum of Understanding (MoU) for this purpose;*
    o *Until the new building is ready, the GIS Lab at the Rumbek Sub-Office could be renovated and used; or alternatively,*
    o *Renting GIS offices in Juba until the new building is ready.*

4.4. Estimated Population, Households and EAs in 2014

The 2008 Census recorded a population of 8.3 million, and the average household size for urban and rural areas was 5.9 persons. With an estimated growth rate of 2.2% from 2008-2014, the country is expected to have a population of at least 9.4 million by 2014. This is illustrated in Table 4.4 below:

Note: This table illustrates that almost 16,000 EAs should be demarcated for the 2014 Census. This figure is based on the population recorded for the 2008 Census, the average household size, the estimated population growth rate of 2.2% per annum, the estimated number of households in 2014, and reducing the average EA size to 100 households. However, it does not take into account other factors such as under-enumeration in 2008 and returnees (2008-2014). For this reason, NBS are budgeting for 20,000 EAs being demarcated for the 2014 Census to avoid any budget shortcomings. The actual number of EAs will only be known after the completion of the mapping exercise.

Table 8. Estimated Population, Households and EAs by State, 2014

Code	States	Census Population (2008)	No of Households (2008)	Average Household Size (2008)	Estimated Population (2014) @2.2% p/a	Estimated No of Households (2014)	Estimated No of EAs (Av. 100 Hhs)
				Upper Nile Region			
11	Upper Nile	964,353	149,267	6.5	1,098,856	169,055	1,690
12	Jonglei	1,358,602	204,352	6.6	1,548,096	234,560	2,346
13	Unity	585,801	91,577	6.4	653,138	102,053	1,020
	Total	**2,908,756**	**445,196**	**6.5**	**3,300,090**	**505,668**	**5,056**
				Bahr el Ghazal Region			
21	Warrap	972,928	177,776	5.5	1,108,627	201,568	2,016
22	Northern Bahr el Ghazal	720,898	139,963	5.1	821,447	161,068	1,611
23	Western Bahr el Ghazal	333,431	62,290	5.3	379,937	71,686	717
24	Lakes	695,730	100,076	6.9	792,768	114,894	1,149
	Total	**2,722,987**	**480,105**	**5.7**	**3,102,779**	**549,216**	**5,493**
				Equatoria Region			
31	Western Equatoria	619,029	120,247	5.1	705,368	138,307	1,383
32	Central Equatoria	1,103,557	189,057	5.8	1,257,476	216,806	2,168
33	Eastern Equatoria	906,161	162,407	5.6	1,032,548	184,384	1,844
	Total	**2,628,747**	**471,711**	**5.5**	**2,995,392**	**539,497**	**5,395**
	Grand Total	**8,260,490**	**1,397,012**	**Av. 5.9**	**9,398,261**	**1,594,381**	**15,944**

4.5. Post-Enumeration Mapping (2009-2012)

4.5.1. Re-alignment of EAs in National / State Capitals and Nine Towns (2009-2010)

As previously indicated, the EA boundaries for the 2008 Census were not accurately defined as satellite imagery was not available at that time. After satellite imagery was obtained in early 2009, efforts to re-align the EA boundaries for some urban areas were carried out intermittently by the office between June 2009 and August 2010 in the following places:

Table 9. Re-alignment of EAs in State Capitals and Other Towns, 2009-2010

Code	Regions / States	National Capital and State Capitals Covered	Other Towns Covered	Towns Programmed but Not Covered
Upper Nile Region				
11	Upper Nile	Malakal		Melut and Renk
12	Jonglei	Bor		Akobo
13	Unity	Bentiu	Rubkona and Leer	
Bahr el Ghazal Region				
21	Warrap	Kuajok	Tonj	
22	Northern Bahr el Ghazal	Aweil	Malualkon	
23	Western Bahr el Ghazal	Wau		Raga
24	Lakes	Rumbek	Yirol	
Equatoria Region				
31	Western Equatoria	Yambio	Mundri	
32	Central Equatoria	Juba	KajoKeji and Yei	
33	Eastern Equatoria	Torit	Kapoeta	

Source: NBS

4.5.2. Challenges Encountered

Many difficulties were apparent during the post-enumeration mapping, including the following:

- *A main challenge was the delay in receipt of funds (and insufficient funds) to cover the whole country before the closure of the 2008 project. Only the national capital and state capitals and nine other towns were covered. No rural areas (which contain an estimated 83% of the population) were included;*
- *The vehicles (and motorcycles) that had been used for the 2008 Census were worn out and required extensive servicing before they could be used in the post-enumeration work. This limited the number of vehicles in use and delayed fieldwork;*

- *Re-aligning the urban Boma boundaries was an important starting point for the 2014 mapping. But the EAs will have to be done again for 2014 as new quick-counts and smaller EAs are required;*
- *Inaccessibility in Upper Nile and Western Bahr el Ghazal meant that the EAs in Melut, Renkand Raga could not be re-aligned. Insecurity in Jonglei meant that Akobo could not be covered;*
- *some of the fieldwork was being carried out at the same time as the national elections, so it was difficult to involve local leaders with the mapping programme;*
- *There were delays in printing maps for the field due to shortages of cartridges. The original field maps and the GPS points are stored but the work was not digitized as funds were unavailable to purchase equipment and supplies.*

4.5.3. Pilot Mapping in Juba and Lainya Counties, Central Equatoria (2012)

In January 2012, NBS advertised the posts of two Mapping Officers, 12 Mapping Assistants (including two reserves) and two Database Managers in each state, with a view to recruiting the personnel and starting fieldwork soon afterwards.

A team of cartographic staff from NBS headquarters were sent to all 10 states to interview and recruit the applicants, who were mainly persons who had worked on the 2008 mapping. However, the austerity measures introduced by Government in early 2012 meant that funds for fieldwork were not available and NBS were unable to begin mapping at that time.

In June 2012, NBS carried out a two-day refresher training course for 2 Field Operations Managers and 24 applicants from Central Equatoria and Eastern Equatoria. The training covered field procedures, map reading and GPS operations, using manuals developed from the 2008 exercise.

Field tests were carried out in two urban Bomas in Juba County and two rural Bomas in Lainya County in Central Equatoria state. Given the challenges with the 2008 mapping, the main purposes were as follows:

- *To determine whether household listing or household quick-counts should be the basis of the new EA frame;*
- *Household listing (of the names of heads of households and the number of usual household members) is more thorough than quick-counts, but it takes longer as the persons have to be identified and the names written down, whereas quick-counts are simple tally-counts in notebooks;*
- *To ascertain an average work-rate for demarcating EAs in urban and rural Bomas. This would assist with formulating a cartographic work plan.*

4.5.4. Results of the Field Tests

Two Mapping Assistants were deployed per village / per quarter, with one doing household listing and the other doing a quick-count. The results are shown in Table 4.6 belo.

Table 10. Results of Field Tests Carried Out in Juba and Lainya Counties (June 2012)

1	2	3	4	5		6		7		8	9	10
S/N	County	Payam	Boma	No of Villages / Quarters		No of EAs		No of Households		% Increase / Decrease	No of Team Days Spent in Field	No of Team Days Required for Work Plan
			Urban	2008	2012	2008	2012	2008	2012	2012	2012	2012-2014
1	Juba	Munuki	Munuki Block A	7	12	6	11	744	1,901	+155%	4	10
2	Juba	Rejaf	Gumbo	7	13	6	31	832	4,902	+489%	6	10
			Rural									
3	Lainya	Kupera	Kupera	15	8	7	7	758	789	+4%	3	7
4	Lainya	Kenyi	Loka West	15	16	7	7	875	830	-5%	3	7

Source: NBS

4.5.5. Household Listing vs. Quick-Counts

Although listing the names of the heads of households (and recording the numbers of usual household members) is more accurate, and especially useful for disputed areas, household quick-counts are quicker and easier to do as the Mapping Assistant only has to record a '1' for every household in his/her notebook instead of writing names and numbers, and the local guide only has to indicate the number of households in each dwelling unit. Moreover, comparisons can still be made between the estimates made during the cartographic fieldwork and the Census enumeration.

Therefore, considering the time and budget constraints, the recommended method for providing a basis for EAs are household quick-counts. However, the Department of GIS, Remote Sensing and Cartography would prefer to adopt the household listing procedure, which worked well during the field testing. This can be re-assessed at a later stage if changes will be required. Note that the household listing procedure will be limited to recording the names of the heads of households only.

4.5.6. Time Needed for Mapping Bomas in Urban and Rural Areas

With regards to the number of days required for demarcating EAs in urban and rural Bomas, it may be noted from the above table that the number of households in the urban bomas of Munuki Block 'A' and Gumbo increased by 155% and 489% respectively.

However, the rural boma of Kupera increased its households by only 4% and in the rural boma of Loka West the number of households actually decreased by 5%.

It should also be noted that whereas three days were sufficient to map the rural bomas in Lainya County (and the number of EAs remained the same as in 2008), an average of five days were needed to demarcate the extra EAs in the urban bomas of Juba County.

Moreover, allowances have to be made for the teams to move from one Boma to another, for courtesy calls and meetings with local leaders, rain delays, the inaccessibility of many hard-to-reach rural areas, and Sundays, when time is spent in camp, etc.

One of the lessons learned from the tests and 2008 is that the time required in the field should not be under-estimated. **For fieldwork planning purposes therefore:**

- o **10 team days should be allocated for each urban Boma;**
- o **7 team days should be allocated for each rural Boma.**

A close watch should be maintained on the starting and finishing dates of fieldwork in each Boma, so that the work programme can be assessed on a monthly basis to ensure timely completion of the EA frame.

4.5.7. Cartographic / GIS Challenges in the Field and Office

A summary of issues that should be considered include the following:

Fieldwork

- • *Preparation of a comprehensive training manual for field mapping;*

- • *Recruitment and training (capacity building) for field mapping;*

- • *Publicity and advocacy campaign for the cartographic fieldwork;*

- *Monitoring and evaluation of cartographic fieldwork*;

Office Work

- *Hardware, software and consumables requirements for the GIS Lab;*

- *Recruitment and training of computer mapping personnel on data capture (digitizing);*

- *Printing, packing and dispatch of final EA maps;*

- *Post-enumeration GIS database development;*

- *Production of thematic maps for reports and a Census Atlas;*

- *Partnerships with other projects and Institutions (e.g. CRMA and FAO).*

4.6. Fieldwork Plan

Based on the above tests and the estimated number of EAs in 2014 (16,000) –and considering that the average EA size should be reduced to 80-120 households - an outline work plan may be set out as follows in Table 4.7.

Table 11. Number of Urban and Rural Bomas in Each State

Code	Regions / States	No of Urban Bomas (2008)	No of Rural Bomas (2008)	Total No of Bomas (2008)	Urban Bomas Est. No of Team Days (x 10)	Rural Bomas Est. No of Team Days (x 7)	Total No of Team Days
1	2	3	4	5	6	7	8
Upper Nile Region							
11	Upper Nile	30	271	301	300	1,897	2,197
12	Jonglei	12	348	360	120	2,436	2,556
13	Unity	7	281	288	70	1,967	2,037
	Total	**49**	**900**	**949**	**490**	**6,300**	**6,790**
Bahr el Ghazal Region							
21	Warrap	5	150	155	50	1,050	1,100
22	Northern Bahr el Ghazal	8	166	174	80	1,162	1,242
23	Western Bahr el Ghazal	28	59	87	280	413	693
24	Lakes	5	120	125	50	840	890
	Total	**46**	**495**	**541**	**460**	**3,465**	**3,925**
Equatoria Region							
31	Western Equatoria	10	186	196	100	1,302	1,402
32	Central Equatoria	52	174	226	520	1,218	1,738
33	Eastern Equatoria	17	269	286	170	1,883	2,053
	Total	**79**	**629**	**708**	**790**	**4,403**	**5,193**
	Grand Total	**174**	**2,024**	**2,198**	**1,740**	**14,168**	**15,908**

Source: NBS

The total number of team days (for urban and rural areas) was estimated by state in Column 8 of Table 4.7 above. This can now be developed further to establish the number of field teams needed in each state in order that fieldwork is completed in 15 months countrywide. This is shown below in Column 8 of Table 4.8.

Table 12. Number of Field Teams Required for each State

1	2	3	4	5	6	7	8
Code	Regions / States	No of Team Days Needed in Each State	No of Days if 5 Field Teams Used (÷5)	No of Months if 5 Field Teams Used (÷30)	No of Days if 10 Field Teams Used (÷10)	No of Months if 10 Field Teams Used (÷30)	No of Field Teams Needed in Each State
				Upper Nile Region			
11	Upper Nile	2,197	439	15	220	7	10
12	Jonglei	2,556	511	17	256	8	10
13	Unity	2,037	407	14	204	7	8
	Total	**6,790**	**1,358**	**46**	**679**	**22**	**28**
				Bahr el Ghazal Region			
21	Warrap	1,100	220	7	110	4	5
22	Northern Bahr el Ghazal	1,242	248	8	124	4	5
23	Western Bahr el Ghazal	693	139	5	69	2	3
24	Lakes	890	178	6	89	3	4
	Total	**3,925**	**785**	**26**	**392**	**13**	**17**
				Equatoria Region			
31	Western Equatoria	1,402	280	9	140	5	5
32	Central Equatoria	1,738	348	12	174	6	5
33	Eastern Equatoria	2,053	411	14	205	7	5
	Total	**5,193**	**1,039**	**35**	**519**	**18**	**15**
	Grand Total	**15,908**	**3,182**	**107**	**1,591**	**53**	**60**

Source: NBS

Table 4.8 (Column 8) illustrates that **a total of 60 field teams will be required to complete EA demarcation for South Sudan in 15 months** (Oct 2012-Dec 2013).

4.7. Field Mapping Personnel

Now that the number of teams needed in each state has been estimated, the number of field personnel required can be set out, as shown below in Table 4. 9.

Table 13. Number of Field Teams, Mapping Officers and Mapping Assistants Needed in Each State

1	2	3	4	5
Code	Regions / States	No of Field Teams Needed in Each State	No of Mapping officers needed in each state (1 per team)	No of Mapping assistants needed in each state (6 per team)
Upper Nile Region				
11	Upper Nile	10	10	60
12	Jonglei	10	10	60
13	Unity	8	8	48
	Total	**28**	**28**	**168**
Bahr el Ghazal Region				
21	Warrap	5	5	30
22	Northern Bahr el Ghazal	5	5	30
23	Western Bahr el Ghazal	3	3	18
24	Lakes	4	4	24
	Total	**17**	**17**	**102**
Equatoria Region				
31	Western Equatoria	5	5	30
32	Central Equatoria	5	5	30
33	Eastern Equatoria	5	5	30
	Total	**15**	**15**	**90**
	Grand Total	**60**	**60**	**360**

Source: NBS

Table 4.9 illustrates that 60 Mapping Officers (1 per team) and 360 Mapping Assistants (6 per team) will be required to complete the cartographic fieldwork in 15 months(Oct 2012-Dec 2013).

Supervision, monitoring and evaluation and database management must also be taken into account. Therefore the following field mapping personnel will be required:

- **3 x Regional Mapping Coordinators**
- **10 x State Mapping Coordinators**
- **10 x State Database Managers**

- **10 x State Field Operations Managers** (for planning and logistics)
- **60 x Mapping Officers**
- **360 x Mapping Assistants**

<u>Note</u>: Field Guides must be recruited on a daily basis as required for villages, quarters, special areas, Bomas, etc. The Guides must be paid and so the field teams should be issued with petty cash and payment voucher books for this purpose. The daily rates should be higher for urban areas than in rural areas.

4.8. Transport Needs

Transport requirements – the number of vehicles, motorcycles, bicycles and motor-boats required for each state are set out below in Table 4.10.

Table 4.10 illustrates the following:

- *That the **60 field teams** will require **60 4WD vehicles** (1 each);*
- *The state **Field Operations Managers** will require **10 4WD vehicles** (1 each);*
- *The **60 field teams** will require **60 field motorcycles** (1 each);*
- *The **60 field teams** will require **120 bicycles** (2 each);*
- *Upper Nile, Bahr el Ghazal and Equatoria regions will require a total of **15 boats with outboard engines** for cartographic fieldwork.*

Table 14. Transport: Vehicles, Motorcycles, Bicycles and Boats Required in Each State

1	2	3	4	5	6	7
Code	Regions / States	No of 4WD Vehicles Needed for Field Teams (1 vehicle for each team)	No of 4WD Vehicles Needed for Field Operations Managers (1 vehicle for each FOM)	No of Field Motorcycles Needed in Each State for Field Teams (1 per team)	No of Bicycles Needed in each State for Field Teams (2 per team)	No of Boats with Outboard Engine Needed per State
	Upper Nile Region					
11	Upper Nile	10	1	10	20	6
12	Jonglei	10	1	10	20	4
13	Unity	8	1	8	16	2
	Total	**28**	**3**	**28**	**56**	**12**
	Bahr el Ghazal Region					
21	Warrap	5	1	5	10	0
22	Northern Bahr el Ghazal	5	1	5	10	0
23	Western Bahr el Ghazal	3	1	3	6	0
24	Lakes	4	1	4	8	2
	Total	**17**	**4**	**17**	**34**	**2**
	Equatoria Region					
31	Western Equatoria	5	1	5	10	0
32	Central Equatoria	5	1	5	10	1
33	Eastern Equatoria	5	1	5	10	0
	Total	**15**	**3**	**15**	**30**	**1**
	Grand Total	**60**	**10**	**60**	**120**	**15**

Source: NBS

4.9. Critical Risk

The above transport estimates assume that fieldwork will be done in 15 months between October 2012 and December 2013. However, if funding and the purchase and deployment of vehicles are delayed, then **more** mapping teams and **more** vehicles will be required in order to catch up. This will add to Census costs and rushing will result in less quality control, which in turn will

decrease the accuracy of the EA frame. Therefore, it is critical that the work plan dates are maintained.

4.10. Fuel Deposits
For urban areas and accessible rural areas, <u>fuel deposits</u> can be made with local petrol stations, but fuel drums will be required for remote areas and the teams should be supplied by trucks; otherwise travel times to dependable points will be long and fuel will be wasted.

4.11. Recommendations for Cartographic Fieldwork
- *The number of teams in each state should **vary** according to the projected number of EAs to be demarcated (for 2008, five teams were allocated to each state);*
- *It would be difficult for NBS headquarters to __control__ more than 60 field teams, but having less than 60 teams would delay completion of the EA frame;*
- *Teams can work in **adjoining states** according to needs;*
- *Fieldwork in most **rural areas will be particularly difficult** due to poor communications and difficult terrain, and the teams should be well-equipped with raincoats, gumboots, boats, full camping gear and Codan HF radios on each vehicle;*
- ***Motorcycles and boats** will particularly be needed in difficult-to-reach areas (for example, Upper Nile and Jonglei);*
- ***All teams must have their own 4WD vehicle** and driver if the demarcation of the EA frame is to be completed in 15 months. (Sharing vehicles will severely slow the work rates down);*
- *Each **Field Operations Manager** should have a vehicle for planning and logistics (e.g. supplying the teams with maps, forms, fuel, spare parts, food and water);*
- *State **Publicity and Advocacy officers** should accompany Field Operations Managers wherever possible in the field;*
- ***Insecurity** may slow down the work in some border areas and **police escorts** may be required;*
- ***Disputed areas** (Abyei, KafiaKingi, etc) will require negotiations and advocacy, i.e. that boundaries are being demarcated **for Census purposes only**;*
- *Given that the schedule for cartographic fieldwork is already tight if the February 2014 date is to be met, the **vehicles, motorcycles, bicycles and motor-boats should be acquired soonest;***
- *The **next dry season** (November 2012-April 2013) **must be fully utilized** in the field if the February 2014 enumeration date is to be met.*

The dates for starting and finishing fieldwork will depend on when funds are received from the Government and development partners to order vehicles, equipment, supplies, consumables, GPSs, recruitment, training and deployment.

However, the preferred calendar will utilize the coming dry season as much as possible, as illustrated below in Table 11:

4.12. Field Calendar

4.12.1. Outline of the Work: Field Teams and Field Operations Managers

Each region should have a Mapping Coordinator, and a state should have a State Mapping Coordinator as per 2008 census.

Each of the 60 field teams should be headed by a Mapping Officer who will manage six Mapping Assistants. The Mapping Assistants should work in pairs, with one updating the satellite imagery and the other operating the GPS and making field notes / completing field forms.

Each team will require a 4WD vehicle and driver, with a Codan HF radio on the vehicle. Depending on the area, a satellite phone or mobile phone (with credit cards) should be supplied to each Mapping Officer.

Each team must also have at least three GPS receivers (one for each pair of Mapping Assistants).

In remote rural areas without lodgings, a full range of camping equipment (tents, mattresses, blankets, cooking utensils, etc) will be required. Camping will help to ensure that a good work rate is achieved; otherwise travel times from towns will be too long and fuel costs will be too high.

In addition, the 10 state Field Operations Managers (and Publicity and Advocacy officers where available) will be needed to publicize the cartographic fieldwork, arrange meetings, courtesy calls, and assist with organizing the schedule (for example, covering the Bomas selected for EAs in the Pilot Census).

Monitoring and evaluating the work, its achievements and progress – and informing NBS headquarters on a regular basis - is very important. Each Field Operations Manager (and Publicity and Advocacy officer) should attend training courses for Mapping Officers and Mapping Assistants and have their own vehicle and driver in the field.

Fortunately, some of the Mapping Officers and Mapping Assistants used in the 2008 Census have applied for posts in the 2014 operation and are familiar with fieldwork and its hardships.

But with regards to work rates, a relatively slow start will be made until the teams learn the work, and the number of teams may have to be gradually be increased according to the availability of vehicles and a planned training schedule and deployment, which could be spread over a few months.

But in order to maintain the February 2014 Census schedule, mapping should be completed in 15 months (October 2012-December 2013), as follows:

Table 15. Field Calendar **(October 2012-December 2013)**

1	2	3	4	5	6
Code	Region / State	No of Team Days Needed in Each State	No of Field Teams Needed in Each State (÷ by no of teams)	Time Needed in Field (Months) (÷25 working days per month)	Approx Fieldwork Dates
Upper Nile Region					
11	Upper Nile	2,197	10	8.8	Dec 12-Sep 13
12	Jonglei	2,556	10	10.2	Dec 12-Nov 13
13	Unity	2,037	8	10.2	Dec 12-Nov 13
	Total	**6,790**	**28**	**Av 9.7**	
Bahr el Ghazal Region					
21	Warrap	1,100	5	8.8	Nov 12-Sep 13
22	Northern Bahr el Ghazal	1,242	5	9.9	Nov 12-Oct 13
23	Western Bahr el Ghazal	693	3	9.2	Nov 12-Oct 13
24	Lakes	890	4	8.9	Nov 12-Sep 13
	Total	**3,925**	**17**	**Av. 9.2**	
Equatoria Region					
31	Western Equatoria	1,402	5	11.2	Oct 12-Sep 13
32	Central Equatoria	1,738	5	13.9	Oct 12-Nov 13
33	Eastern Equatoria	2,053	5	16.4	Oct 12-Dec 13
	Total	**5,193**	**15**	**Av. 13.8**	
	Grand Total	**15,908**	**60**	**10.5**	

Source: NBS

Work Rates: Urban Bomas: 10 days per team

Rural Bomas: 7 days per team

Note
- *It is most unlikely that all (60+10) 70 vehicles, 60 motorcycles, 120 bicycles and 15 boats will arrive in South Sudan at the same time, and the actual deployment of teams will also depend on weather conditions and accessibility;*
- *An extra team may be required in Eastern Equatoria due to high numbers of returnees (as in 2008);*
- *The rainy season is longer in Equatoria region than elsewhere but accessibility is more difficult in the rains in Upper Nile Region.*

For this reason, Table 4.11 shows that fieldwork in the three regions should start at different times, as follows:

- *Equatoria region should begin by October 2012;*
- *Bahr el Ghazal region should begin in November 2012;*
- *Upper Nile region should begin in December 2012.*

The key office activity from August-September 2012 is to prepare satellite imagery maps for the Bomas, starting with Central Equatoria.

Note:

An outline work plan showing key activities and target dates will be developed when the project is established and the timelines are clearer.

4.13. Needs Assessment: Department of GIS / RS and Cartography

4.13.1. Background
The Department of Geographic Information Systems (GIS) / Remote Sensing (RS) and Cartography was established in 2007. It was previously a unit under the Department of Censuses and Surveys.   The department's mandate is the collection, analysis, dissemination and publication of spatial information to support demographic, social, environmental and economic statistics.

It is therefore responsible for the 2014 Census cartographic fieldwork, digitizing the EA and SA maps for the enumeration and post-enumeration development of maps and graphs for Census reports, a gazetteer and an atlas.

4.13.2. Personnel Requirements

Currently there are nine staff members (7 male and 2 female, aged between 32 and 47), of whom five are university graduates in different fields and four are high-school leavers.

All nine participated in the 2008 Census cartographic fieldwork and / or the creation of digital maps for Enumerators and have at least five years' experience.

However, nine staff are insufficient for the massive amount of GIS office work to be completed in a short time-frame for the Census project, and the following is required:

- *Three GIS graduates(or related fields) should be recruited without delay. They will require refresher training in GIS / GPS techniques; A further nine persons with basic computer mapping skills will be needed for the Census period. They will require basic training in preparing satellite imagery maps for updating in the field;*

- *10-20 competent field mapping personnel will be required from each of the states as back-up during the crucial three months before the enumeration (as in 2008).*

4.13.3. Training Requirements

The staff members possess basic skills in the use of satellite imagery, computer mapping, GIS and GPS applications. But they require on-the-job training under the tutelage of an international GIS adviser, study tours and external training with formal GIS qualifications at basic and higher levels.

In this regard, NBS are presently arranging for two members of the department to attend one-month training courses in GIS and Advanced Earth Observation (using satellite imagery) at the Regional Centre for Mapping of Resources for Development (RCMRD) in Nairobi.[1]

The study tours will facilitate exposure to other countries' methods in Census mapping and GIS. This will aid further development of their skills to enable completion of the department's mandate for the Census and beyond. Provision of the following is required:

Study Tours (2012)

- *For 6 persons: two weeks to countries in the region undertaking census GIS activities during the global 2010 round (2005-2014). For example, to Botswana (Census Aug 2011), Zambia (Oct-Nov 2010), Ghana (Sep 2010) and South Africa (Oct-Nov 2011);*

Short-term Courses in GIS (2014-2015)

- *For 6 persons: Certificate-level Courses in GIS Operation, Geo-Informatics and Database Management (1 semester each) at an institute in the region, for example, at the RCMRD, Nairobi or the ITC / Ardhi University, Dar es Salaam;*

For 2 persons: Remote Sensing and GIS (4 semesters) at an institute in the region, for example, the RCMRD, Nairobi or the ITC / Ardhi University, Dar es Salaam.

4.13.4. International Technical Assistance

- An International GIS Adviser with extensive experience in Census computer mapping and GIS is required for about three years to provide on-the-job training and assist with the long-term development of the department;

- An international Census Cartography Consultant with vast experience in field mapping is required for short-term missions to monitor and evaluate the quality and progress of the fieldwork.

4.13.5. Present Equipment

Field mapping and the preparation of digital maps for the 2008 Census was based in the GIS Lab at the NBS Rumbek Sub-Office. But after the Census, cartographic activities were transferred to NBS headquarters in Juba and the GIS Lab in Rumbek was closed.

Some of the furniture, hardware and consumables for immediate needs were transferred to Juba, but due to lack of space at headquarters, many items (including 18 old vehicles now scheduled for disposal) remained in Rumbek.

An assessment was made of the GIS Lab and it was noted that no maintenance has been carried out on the building since 2009. Consequently the roof leaks and it is affected by termites. Moreover, the generator lacked fuel, so it was not possible to test any computers or other electronic items to see if they were operational. The present situation is as follows:

GIS Equipment and Consumables in Rumbek

- 15 x Dell Desk-top Computers1 x Server3 x HP LaserJet 5550dn A3 Printers

- x Canon IPF700 Wide-format Plotters (M07 maintenance cartridges needed)

- 1 x HP DesignJet 5500 Wide-Format Plotter

- 1 x Aficio A045 Black-and-White Printer (out of order)

- 1 x Ricoh Aficio 3045 Copier

- 1 x Epson A3 Scanner

- 6 x HP Cartridges for the A3 LaserJet Printers (black, cyan, yellow, magenta)s

- 16 x Garmin eTrex Vista GPSs (no connecting cables)

- 46 x rolls A0 paper

- 8 x rolls A1 paper

- 22 x Packets of A3 paper

- x Whiteboards

- 2 x Bindmate Binding Machines

- x Field Mattresses

- Assorted GPS cables, file covers, clipboards.

- GIS Equipment in Juba

- 10 x Dell Desk-top Computers (4 working, 6 out-of-order)

- 1 x HP LaserJet 5550dn A3 printers

- x Canon IPF700 Wide-Format Plotters (1 working, 2 out-of-order)

- 1 x HP ScanJet N9120 A3 scanner (software required)

- 2 x HP LaserJet P2015 A4 Printers (cartridges required)

4.13.5. Census Cartography / GIS Equipment Requirements

To execute the pre-enumeration office preparations, fieldwork to demarcate an EA frame, digitizing and post-enumeration GIS development, there is a need for the following:

Table 16. Summary of Census Cartography / GIS Needs

Section	Sections	Est. Total Cost (US$)
1	International Technical Assistance	UN Rates
2	Satellite Imagery	200,000
3	GIS Study Tours and Training	180,000
4	GIS Hardware	325,900
5	GIS Software	48,080
6	GIS Consumables	275,740
7	Camping Equipment	461,770
8	Vehicles, Motorcycles, Bicycles and Boats	6,534,400
9	Communications equipment	580,000
10	GPSs for Field Teams	94,075
	Total	**8,699,965**
	Plus 15% air-freight and contingencies	**1,304,995**
	Grand Total	**10,004,960**

Note:

Table 4.12 above is a summary of the requirements. The full list has been handed over to the relevant authorities in the department. Some of the specifications and <u>approximate costs are shown for guidance purposes only</u>.

<u>GIS Office Space Requirements</u>: Present indications are that 2014 Data Processing activities will be based in Statistics House, the purpose-built DP Centre in Rumbek opened before the 2008 Census.

However, as there is no space for census cartography / GIS at NBS headquarters, GIS will be housed in a new block to be constructed in Juba. Specifications of the new building should be provided in order to assess space requirements for census cartography / GIS development.

4.14. Notes on Computer Mapping
The preparation of digital maps for the 2014 enumeration and the development of GIS to benefit South Sudan in the post-enumeration period is the favoured and long-term approach by NBS.

GIS serves as a support and management tool for mapping data collected during the cartographic activities of the Census. It directly affects preparations by using existing data sources to assist in field data collection planning and the creation of data collection materials - maps. When cartographic data is collected, quality controlled and managed electronically in one system, the support and collaboration between different Census units and the output of products are improved and made easier.

The procedures for office preparations, data collection in the field, digitizing, methods for producing <u>automated</u> urban and rural EA maps, A3-size map creation and quality control may be summarized in an **'Outline of the Computer Mapping Process',** which is has been handed over to the NBS Department of GIS, Remote Sensing and Cartography.

4.15. Recommendations
1. <u>Monitoring and Evaluation</u>

Consistent and continuous field supervision, monitoring and evaluation, including extensive reporting by INE and outside resources (for example, UNFPA) will be required for the main fieldwork programme, particularly after each state refresher training course and initial deployment in the field.

2. <u>State Coordinators</u>

State Coordinators are required to improve mapping data quality and to improve the rate at which field mapping data is received from the field. These were major challenges in 2008.

3. <u>Urban Planning Boundaries</u>

NBS senior management should advise the State Governors and Ministry of Local Government offices in the national capital and the state capitals to begin the process of delineating outline urban planning boundaries for the state capitals and other large towns <u>before</u> the field mapping teams start fieldwork.

Moreover, the Local Government Board in Juba and Town Planning authorities in each of the states should be consulted on what they consider as urban, (for example, some county headquarters) and a report made of their findings for each state. This time there has to be justification for demarcating bomas and EAs as either urban or rural.

4. <u>Advance Funding for Cartographic Preparations Needed</u>

Start-up of the Census project is already late and preparations for the cartographic programme are particularly behind schedule. Fortunately NBS have already begun the process of recruiting, interviewing and short-listing applicants for the posts of Mapping Officers (team leaders) and Mapping Assistants and many candidates participated in the 2008 Census, so are familiar with the work.

However, any slippage on the proposed date for starting EA demarcation (October 2012) will mean that more resources will be required later in order to regain lost ground. Likewise, the EA frame must be completed before Christmas 2013 to allow time for final completion and distribution of EA and SA maps.

All in all, the timeframe for completion of the EA frame for a February 2014 enumeration is already extremely tight. Therefore, provision of **advance funding from Government and development partners** to enable equipment and vehicles to be purchased, base maps to be printed, training to be carried out and cartographic fieldwork to begin, is strongly recommended.

CHAPTER 5

Data Processing

5.1 Introduction

The production of accurate, complete and timely census data and reports in this "*information age*" requires the use of Information and Communication Technologies (ICT). It is not surprising therefore, that the NBS as part of her planning activities for the conduct of the 2014 round of Population & Housing Census in South Sudan wants to take advantage of the great strides made in ICT especially in the automation of Census and Survey Data Processing to produce, timely, accurate and complete census data and reports.

Even though the 2008 Census made use of the scanning technology by employing the Optical Mark Reader (OMR) technology, the huge investment has not benefited NBS after the census process. As a result, the 2014 census would deploy technology that is scalable, open, portable and useful after the census.

Data processing involves various processes, including: Form preparation, Data capture, Data validation, Data cleaning and imputation (Structure Edits and Consistency Checks), Data aggregation, Data tabulation, Data Analysis, and Data dissemination.

Data capture in census is the system used to convert the information obtained from census questionnaires to a format that can be interpreted by a computer. Whilst it is acknowledged that data capture is only one small part of a national census project, it is deemed to be one of the most critical, costly and time consuming activities of a population and housing census. Rapid advances in data-capture technology, especially optical, have greatly increased the speed and reliability of producing census databases in an accurate and timely manner. Nevertheless in the recent past many countries have faced difficulties in mastering these technologies, sometimes by lack of preparation or sufficient knowledge to avoid the numerous pitfalls.

The 2014 Population and Housing Census would deploy the ICR (Intelligent Character Recognition) technology which would be used after the census for other statistical activities.

The proposed data capture system would have a built-in **QUESTIONNIARE** design tool that would allow the National Bureau of Statistics (NBS) to design the census questionnaires and questionnaires for other projects after the census.

Printing of Census or Survey questionnaires cannot be easier than what the proposed system provides. It would allow NBS to design and print questionnaires in the comfort of their own offices using personal computer and laser printer and/or Riso printer. It even accepts photocopy version of a printed questionnaire.

It is recommended that NBS seeks a technology provider who would work with selected NBS staff to design and implement the required solution so that by the end of the census the selected staff would be able to make use of the technology, the hardware and the software and more importantly the skills gained to craft similar solutions for other censuses and surveys.

This chapter considers the course of action in relation to the 2014 Population and Housing Census (PHC) of the Republic of South Sudan, by defining the strategic plan for the processing of the census and making decisions on allocating resources to pursue this strategy.

5.1.1. Project Purpose and Objectives
The purpose of this plan is to provide a management system for data processing activities of the South Sudan 2014 Population and Housing Census.

The data processing activities begin after census forms received from the field have gone through checking and office editing to ensure that all expected questionnaires have been received and have the correct geographical information. The checking also ensures that coverage and relationships between different units: persons, households, housing units, enumeration areas, etc. are in the proper order.

These checks would be followed by questionnaire preparation, scanning, key verification, data conversion, editing and cleaning, tabulations, data and image documentation and archiving.

The objectives of the plan are:

1. Propose to NBS appropriate technologies and IT equipment for the census data capture, processing and dissemination of the results
2. Suggest the most appropriate strategy for census data capture and processing;
3. Develop Data Processing Work Flow
4. Develop Data Processing Work Plan
5. Set up quality assurance standards and disaster recovery plans

5.2. Coverage and Workload

5.2.1. Coverage –Administrative Breakdowns
The 2014 Population and Housing Census (PHC) will cover all ten administrative States of the Republic of South Sudan with 79 Counties, 521 Payams and 2,198 Bomas (towns/villages). The table below gives the State breakdown of the census coverage**:**

Table 17. Administrative Structure of the Republic of South Sudan

STATE CODE	STATES	COUNTIES	PAYAMS	BOMAS	*EAs	REGION
11	Upper Nile	12	70	301	1,738	
12	Jonglei	11	72	360	1,151	Upper Nile Region
13	Unity	9	73	288	631	
21	Warrap	7	52	155	1,374	
22	Northern Bahr el Ghazel	5	38	174	1,112	Bahr el Ghazel Region
23	Western Bahr el Ghazel	3	15	87	401	
24	Lakes	8	49	125	818	
31	Western Equitoria	10	47	196	793	
32	Central Equitoria	6	46	226	1,105	Equatoria Region
33	Eastern Equitoria	8	59	286	895	
	TOTAL	**79**	**521**	**2,198**	**10,018**	

* EA totals from 2008 Census. Actual number of EAs would be known after demarcation

5.2.2. Census Questionnaires

The 2014 Population and Housing Census of the Republic of South Sudan would use four types of questionnaires:

a) PHC-1 Main census questionnaire – Household and non-household level
b) PHC-2 EA Enumeration sheet– EA level
c) PHC-3 Final Summary sheet – Boma level
d) PES (Post-Enumeration Survey) Questionnaire–Household Level

To estimate quantities of these types of questionnaires, the following assumptions are made:

a) Total number of Enumeration Areas (EAs) = 20,000

b) Each EA has an average of 100 households (i.e. 80 for Rural and 120 for Urban)

Then;

Total questionnaires required would be (100 x 20,000) = 2,000,000

Add 25% (to cover large households – supplementary Questionnaires) = 2,500,000.

Add 5% (to cover training Questionnaires) = 2,625,000.

Estimated number of Main Census Questionnaires = **2,625,000**.

For the Pilot Census, three EAs would be selected from each of the 10 States. One EA form Urban area, another EA from Rural area and the third EA would be selected from 'a difficult to reach area'.

Type of Questionnaire	Pilot Census (Quantities)	Main Census (Quantities)	Total Questionnaires
PHC-1	4,000	2,625,000	2,629,000
PHC-2	100	22,000	22,100
PHC-3	100	2,200	2,300
PES	400	26,250	26,650

Using an average household size of 6 and the estimated total number of household as 2,000,000, the expected total population for the 2014 Census of South Sudan would be about **12 million** persons.

The estimated time frame for scanning the about 2.7 million questionnaires would be about 5 months using five Enterprise scanners with six desktop scanners as backups. The remaining DP activities such as data conversion, cleaning and tabulation would take additional two months.

5.3. The Proposed Technology

5.3.1. Technical overview of methods of data capture

There are a variety of methods of capturing data for national census projects. All the main methods have been used in one form or another and in some cases multiple methods have been implemented to complement each other. All methods have been used successfully in the commercial environment and each has its own unique technical challenges when being adopted for use in Census. Countries without such experiences should learn lessons from other countries that may make any technology transition easier. These data capture methods include:

a) Manual entry from paper – Operators type in responses they see on the physical census form into the computer system;

b) Manual entry from image – Operators type in responses they see on an image of the scanned census form presented to them on a computer screen;

c) Optical Mark Reading (OMR) – Using special scanners, data is automatically extracted from the census form at the point of being scanned by the recognition of marks (such as tick boxes or multiple choice lozenges) in specific locations on the form;

d) OCR or Optical Character Recognition is the process of identifying characters from images of printed/handwritten text and converting them to a machine editable format. (For instance, with OCR you can convert JPEG to Word). OCR technology converts these scanned images and PDF files making them editable and searchable in a variety of formats - word, text, and rtf.

e) ICR (Intelligent Character Recognition) technology reads both machine-printed and hand-written responses in specific locations on the form and transforms the responses into output data for a computer system to use. Special software is used that recognizes handwritten text on each census forms' scanned image.

The data processing strategy will consider the ICR (Intelligent Character Recognition) data capture methods for the 2014 PHC, using the Autonomy Cardiff TeleForm System. The ICR systems interpret hand written number and letter character responses from electronic images of forms scanned. ICR technology interprets responses in predefined specific locations on the form and transforms any responses into output data for a computer system to use.

5.3.2 Autonomy Cardiff TeleForm

Autonomy Cardiff TeleForm is a Complete Software Suite that can interpret documents and forms via input from a document scanner, fax server, e-mail or the Internet and convert the alpha/numeric handprint (ICR), machine printed text (OCR), shaded circles/squares (OMR) and Bar codes to all industry standard databases. It enables organizations to quickly extract, verify, process and index large quantities of information from inbound forms. It increases operating efficiency and provides an accurate, timely process for getting existing forms and documents into

your back office, ERP (Enterprise Resource Planning) or ECM (Enterprise Content Management) systems.

5.3.2.1 Modules of TeleForm

TeleForm is a modular system, which can be expanded according to the requirements imposed by the workload. Three main modules – *Designer, Scan Station and Reader* and *Verifier*– make up its architecture.

- **Designer Module -** in this Module you can design a new form using Designer's Intuitive Interface. The look, layout, field attributes, validations and data export requirements are all defined in this module. You can also train TeleForm to recognize data on your current existing forms that were developed outside of TeleForm.

- **Scan Station and Reader Module -** Scan Station is used to load job specific settings such as Form types and batch specific Scanner Settings**.** Reader performs multiple functions such as Image De-skew and Clean-up, Form Identification, Field Interpretation and all First Pass Validations.

- **Verifier Module -** Verifier is used to review all forms that require a Human to review failed Validations and Business Rules (Invalid Date, etc.) or Characters that fall below the User defined Confidence Thresholds.

5.3.3. Benefits of using TeleForm ICR Scanning

- One of the drivers behind recommending TeleForm is that NBS will not be tied to consultancy long term. By developing in-house expertise, NBS would have the flexibility to grow and expand the system themselves to cater for changing business needs.
- The forms are designed and business validation rules defined within TeleForm's Designer module. Once NBS staff had undergone the required training they would be up and running very quickly.
- NBS would be able to design and print questionnaires in-house.
- NBS would be able to use the technology to process other inter-censal surveys.

- TeleForm does not require:

    - o Special paper for printing

    - o Special ink for recognition

    - o Special input reader

    - o Timing tracks which must be aligned

- Images of completed questionnaires are saved automatically as the data is processed. This allows staff instant access to all questionnaires captured for validation and editing.
- The TeleForm technology would provide a substantially more efficient way of processing forms and capturing data.
- The scanning software might also employ export scripts that create a specific export format through which the system can prepare all data for further processing, for example an IMPS/CSPro data format file can be created directly from the scanning application.
- Alternatively, the system can be used to export the data to an enterprise level database such as SQL Server to allow the data to be maintained in a structured DBMS (Data Base Management System) environment which affords systematic means for data maintenance, security, backups and conversion.
- The system can index exported multipage PDFs of the questionnaires from the scanned forms by dynamically creating folders at the level of the Enumeration Areas, Counties and States, and naming these multi-page PDF questionnaires based on household/ID and person numbers to ensure that all images can be tracked for editing, consistency checking and efficient digital storage at a later stage.
- TeleForm runs on all Windows operating systems. The Enterprise edition is a truly Client/Server technology and therefore requires Microsoft Windows Server operating system.
- The National Bureau of Statistics staff can design and implement new questionnaires and associated validation processes quickly and easily
- Streamline form capture and validation processes resulting in the reduction of the amount of staff time required to process questionnaires
- Scalable solution that handles multiple questionnaire types and form volume.

For the successful implementation and use of these methods, staff will be required with the necessary IT skills that are familiar with databases, software configuration/support for set-up, management and maintenance of such deployments.

For NBS that do not have staff with in-depth experience of using ICR scanning systems a learning curve will be required before adoption of the technology and before the main census activity.

A training program in TeleForm is being proposed for key staff of the ICT department to acquire the skills and confidence in using the TeleForm.

It should be noted that the resultant quality of data output for any paper based method chosen will be heavily dependent upon how well the enumerators complete the forms and the condition in which they arrive at the processing center.ICR solutions cannot make bad forms good.

Processing of bad forms will be slow and inaccuracies are more likely. Therefore the most important factors for timely and accurate data capture is to make sure the forms are filled in correctly and are returned in good condition. This means *form design and training of the*

enumerators are both significant factors to consider spending time and effort on to reduce the associated risks as any data capture processes chosen cannot make bad forms good.

5.4. Infrastructure Requirements

To implement an ICR solution and disseminate the census results, the following hardware and software would be required (*detailed list is at 5.9 below*):

5.4.1 Hardware

- Image Scanners (TWAIN or ISIS interface)

- Database Server

- Storage Server – Terabytes (Raid 5, Mirrored, etc.)

- Network system

- Administrator PC's

- Analysis and reporting PC's

- Key correction PC's (Verification)

- Scanner PC's

- Automatic data capture PC's

- Laptops

- Uninterrupted Power Systems (UPS)

- Riso EZ200 Printers (2)

5.4.2 Software

- Cardiff TeleForm software

- MS-SQL, Oracle or other database

- Data Storage, Archive and Retrieval

- CSPro

- SPSS

- Backup Software

- Microsoft Office Suite

- IHSN (International Household Survey Network) Microdata Management Toolkits

- REDATAM (Integrated Microdata Information System)

5.5. Data Processing Operations

5.5.1. Introduction
Operations at the processing centre need to be carefully managed in order to achieve a successful outcome for this phase of the census. The quality of the staff employed at the processing centre will have a large impact on the success or otherwise of the processing operations. In particular, the quality of the staff employed as managers of the processing centre, and the management tools they are provided, are critical to the success of the processing operations. Adequate management structures will need to be put in place in order to coordinate and control all of the activities involved in processing.

Data Processing cycle
The data processing cycle involves many different interdependent activities. The number and nature of these activities will largely depend on the technology used to process the census forms as well as the time frame to release the census results.

Using the ICR scanning technology to capture the census forms, the work flow would be as in Figure 5.1 below.
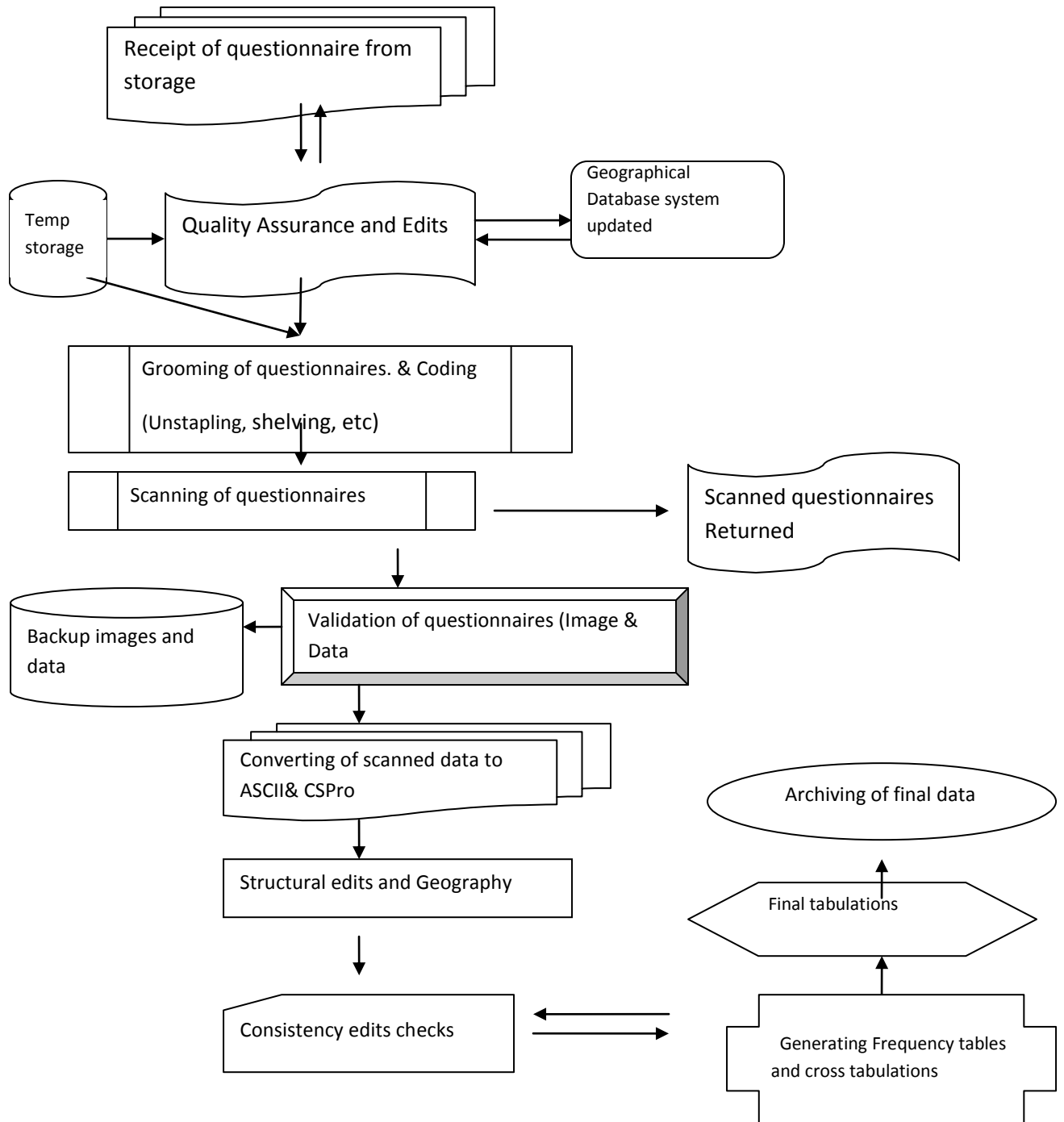
Figure 5.1: Data Processing Work Flow

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The quality of output from each activity in the processing cycle has a direct effect on the success or otherwise of the next activity and other activities downstream. It is also important to note that, all activities interact with one another through on-going quality assurance. This can become evident at any stage. For example, the staff undertaking validation may detect problems that are the result of inadequate procedures and/or training in one of the other activities (e.g., editing and/or grooming).

While data processing can, to a large extent, be regarded as a linear cycle, all activities will usually be concurrent. Initial activities such as receipt and registration will commence first, but the other activities will commence shortly thereafter as soon as sufficient workloads have been completed by the initial activities. It is important that the flow of forms between activities is managed and coordinated carefully to ensure that each activity has sufficient forms for all staff.

A buffer or backlog of forms should be established between each activity (e.g., two weeks of work), which will ensure that staffs do not run out of forms to process. There should be enough prepared questionnaires before scanning starts.

(a) Receipt and registration

As forms are received at the processing centre, they should be registered to ensure that all enumeration areas in the country and all households within each enumeration area are accounted for. The managers of this activity will be required to closely coordinate their works with managers in the field operations phase. They will need to monitor the deliveries from the field to ensure that material flows smoothly, with minimal delays or congestion.

(b) Quality assurance and edits

Quality assurance and edits can be regarded as the core of the processing cycle and are critical to producing high-quality data. They ensure that the output from each activity is of the required quality for the next activity and provides a mechanism whereby appropriate feedback is delivered to all activities.

(c) Grooming/Preliminary checking

Some type of grooming of the forms will be necessary to prepare the forms for scanning. For multiple page questionnaires, the pages have to be separated before scanning. The extent of grooming can very form superficial checks to ensure that the forms are in adequate condition to be read by scanners to transcription of damaged forms and manual editing of responses.

(d) Coding

Coding assigns classification codes to responses on the census forms. For example, questions on Occupation and Industry may have to be coded before scanning. Coding can be an automated system, computer assisted, clerical or a combination of all three.

(e) Data capture

Scanners using ICR (Intelligent Character Recognition) technology and the TeleForm software would be used to capture the census forms in a network environment.Images of completed questionnaires would be saved automatically as the data is processed whiles the data is extracted to a database for further processing.

(f) Balancing

Balancing refers to a system to ensure that a computer record has been created for every household within each enumeration area, and every person within those households.

(g) Validation

Validation is the final check of data to ensure that the quality of the data agrees with the minimum standards.

5.5.2. Controlling work flows

Close attention needs to be paid to monitoring and controlling workflows through the entire processing phase. Each activity depends on the quality and quantity of the output from previous activities. Each activity should meet production targets to ensure that the following activity has sufficient work.

Delays are one activity can lead to costly loss of production in the following activities. If difficulties are being expended in one activity, managers may need to reallocate resources between activities or changes in order to raise production levels. Any proposed changes in production will have to be carefully considered to ensure that the quality of the data is not adversely affect.

5.6. Data Processing Unit- Staffing

There is a need for a Data Processing unit to be created within the census office for data processing operations at the Rumbek Sub-Office. It is required that the unit engages a Data Processing Manager at a director or senior management level. There would be two main teams – (i) Operations and (ii) Systems Support and Administration.

5.6.1 Operations Team

The Operations Team would be responsible for the day-to-day operations of the processing of forms. It includes all of the main processing tasks, including data capture and coordination of workflows. It will also be responsible for ensuring that the timetable is followed.

This team will also be responsible for the monitoring and control of all quality assurance systems and procedures, including edits and validation. They will also be responsible for ensuring that data meet all quality standards.

Tasks and responsibilities of Supervisors include the following:

a) Conduct day-to-day supervision of the processors;
b) Prioritize, coordinate and monitor the work flow;
c) Maintain an effective team environment;
d) Conduct on-the-job training;
e) Ensure that all procedures are being followed;
f) Provide performance feedback to processors;
g) Report to management on issues affecting data quality and any other issues they should be aware of;
h) Co-ordinate with the storage room.

In addition to supervisors, team leaders can also be engaged in the following activities:
a) Provide performance and daily production reports to the supervisor;
b) Assist processors with technical issues;
c) Provide processors with all needed materials and questionnaires;
d) Check-in and check-out of questionnaires with the storage room.

5.6.2 Systems Support and Administration Team

The Systems Support and Administration team will be responsible for all information technology support, including communication networks, hardware and software installation and maintenance. They will also be responsible for maintenance and support of all information technology infrastructures. The Head of the Storage room will submit daily reports to the data processing operation unit on the office editing, coding and final storage activities.

5.6.3 Proposed Census DP Structure
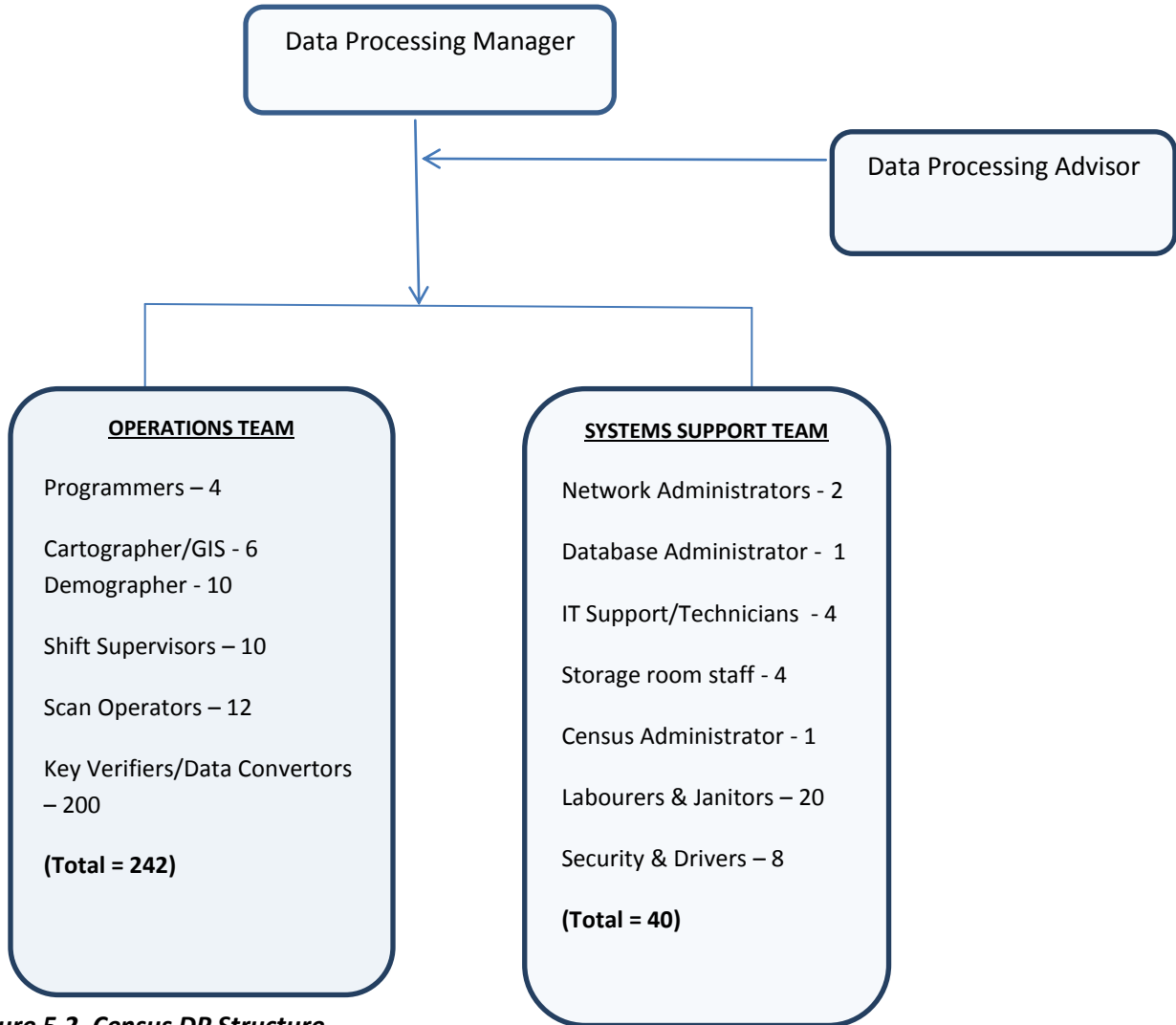
Figure 5.2. Census DP Structure

5.7   Risk Management Plan

Risk is defined as an event that has a probability of occurring, and could have either a positive or negative impact to a project should that risk occur. It is any event that could prevent the census data processing project from progressing as planned, or from successful completion.

Risks can be identified from a number of different sources. Some may be quite obvious and will be identified prior to project kick-off. Others will be identified during the census project lifecycle. Some risk will be inherent to the project itself, while others will be the result of external influences that are completely outside the control of the project team.

All identifiable risks should be entered into a risk register, and documented as a risk statement.

As part of documenting a risk, two other important items need to be addressed.

The first is mitigation steps that can be taken to lessen the probability of the event occurring. The second is a contingency plan, or a series of activities that should take place either prior to, or when the event occurs.

Some obvious risks that can affect the successful completion of the census data processing activities are: - power failures, wet questionnaires, theft, fire outbreak, equipment breakdowns, system malfunctioning and high staff attrition rates.

Identifying and documenting events that pose a risk to the outcome of the project is just the first step. It is equally important to monitor all risks on a scheduled basis by the risk management or quality control team, and reported on in the census data processing project status report.

5.7.1. Power failure
- The Rumbek Data Processing centre should be connected to the national grid

- The solar system should be rehabilitated to serve as a back-up power

- Use of centralized UPS is recommended

- Use of a standby automatic Generator

- 5 drums of fuel and one drum of lubricant to be used as backup fuel for standby Generator

- In case of power failure Shift Supervisor should contact generator operator on duty to take action.

- The generator operators will be responsible for daily fuelling and maintenance of the standby generator.

- There will be one generator operator per shift and in case of absence the next person on schedule should be contacted by absentee to stand in.

5.7.2. Theft
- Data processing centre doors should be electronically secured. Bio-metric and card access systems should be provided to prevent unauthorized access to census information and equipment.

- Computers should be password protected and engraved.

- Security officers should be at post 24/7.

5.7.3. Fire Outbreak
- Fire and smoke detectors should be installed at all places.

- Functional fire extinguishers should be at vantage points.

- NBS data processing staff/personnel should be trained in methods of fire control and the use of the fire extinguishers.

- Team leader should work hand in hand with the Shift Supervisor to take immediate action of the use of fire extinguishers where necessary.

- Shift Supervisor should contact the Fire Service when necessary.

- The contact numbers of the Local Fire Station should be posted at vantage points within the DP centre.

5.7.4. Wet or dirty Questionnaires
- In case of wet or dirty questionnaires which cannot be scanned Questionnaire Administrators should contact the Team leader of Office editors

- The Team leader should ensure that this information is transferred on new questionnaires

- The Team leader should check that the right information has been transcribed without errors.

- The bad questionnaires should be replaced with the new one and sent to Questionnaire Administrators.

- Questionnaire Administrators should keep separately bad questionnaires as well.

5.7.5. Scanners and computers failure
- In case of equipment failure, Team leaders should report immediately to Systems Administrator and the on-site technical support team

- Systems Administrator should immediately analyse the fault and issue a report to the IT Support Manager and Technology provider for replacement and repair.

- If equipment in question cannot function it should be replaced within 30 minutes of fault for work to continue without further delay.

- Arrangements should be made by the IT support unit and Technology provider for the repair of the equipment.

- The equipment, if repaired should be added to the standby machines.

5.7.6. Scanner maintenance
Scanner maintenance should be planned and exercised regularly due to build-up of dirt and paper dust from the forms being scanned. If the scanners' paper transport systems are inefficient, recognition could suffer. Also the condition of the census forms may not be conducive to scanning if they have suffered physical damage or have been exposed to bad environmental conditions. It may be that these forms' data are better being manually entered into the system or should be transcribed onto spare blank forms. Provisions should be made for scanner consumables and spares in the equipment procurement plan.

5.7.7. Technical Support Plan

The Supplier or Technology Provider shall design a technical support plan for products and solution for critical processes and applications. The plan should include the following:

- Direct on-site support of the supplier for the entire project duration.
- Software updates and upgrade as they become available.
- No third party support is required.

Table 18. Proposed Data Processing Work Plan

No	Activity	Start Date	End date	Responsibility	Status	Remarks
D01	Refurbishment of Census DP Centre	01/08/2012	30/11/2012			
D02	Preparation of DP requirements	01/09/2012	31/10/2012			
D03	DP staff trained in scanning technology (abroad)	01/12/2012	31/12/2012			
D04	Identification and engagement of Technology Provider	01/01/2013	31/01/2013			
D05	2014 PHC scannable questionnaire format designed and printed for Trial Census	01/02/2013	28/02/2013			
D06	Training of Supervisors and Enumerators for **Trial Census**	01/02/2013	15/02/2013			
D07	Installation, testing and training of Desktop version of TeleForm	16/02/2013	28/02/2013			
D08	**Trial Census** EA Summary Forms processed	01/03/2013	15/04/2013			
D09	**Trial Census** questionnaires Processed	01/05/2013	31/05/2013			
D10	**Review of Trial Census** results	01/06/2013	30/07/2013			

No	Activity	Start Date	End date	Responsibility	Status	Remarks
D11	**Revision of census instruments after Trial Census**	01/08/2013	30/09/2013			
D12	Subject-matter specialists and DP staff trained in census editing and imputations	01/10/2013	30/10/2013			
D13	Census edit specifications and tabulation plan drafted	01/11/2013	31/12/2013			
D14	Purchase, configuration and networking of equipment	01/10/2013	31/12/2013			
D15	Power Management System (Generator, Industrial UPS, etc.) installed, configured and tested	01/10/2013	31/12/2013			
D16	Training of Supervisors and Enumerators for **Main Census**	15/01/2014	15/02/2014			
D17	Installation and testing of Network	01/03/2014	30/04/2014			
D18	Installation and testing of Database Management System	01/03/2014	30/04/2014			
D19	Installation and Testing of Data Capture and Archiving software	01/03/2014	30/04/2014			
D20	**Main Census** Summary Forms processed	01/04/2014	30/04/2014			
D21	**Release of Provisional Census Results**	**01/06/2014**	**15/06/2014**			
D22	Receiving of questionnaires, counting, sorting and re-packaging	01/04/2014	30/05/2014			

No	Activity	Start Date	End date	Responsibility	Status	Remarks
D23	Manual Verification of questionnaires	01/06/2014	31/07/2014			
D24	Scanning, archiving and key correction of questionnaires	01/06/2014	30/10/2014			
D25	Installation and testing of data conversion Program	01/08/2014	07/08/2014			
D26	Conversion, Structure Edits, Validation and Cleaning of data	15/08/2014	30/10/2014			
D27	Generation of Summary and Analytical tables	01/10/2014	15/12/2014			
D28	**Release of final results**	**15/12/2014**	**30/12/2014**			

Table 19. List of Census Data Processing & IT Equipment

Item No.	Description	Quantity
	HARDWARE	
1	Image Scanners (TWAIN or ISIS interface) {e.g. Fujitsu fi-6670A, duplex ADF (Automatic Document Feeder)} With Post Imprinter (FI-667PR) option	5
2	Desktop Scanners (Fujitsu - fi-6230Z scanner image scanner with dual interface capability (Ultra SCSI and USB 2.0) - ADF (Automatic Document Feeder) + flatbed	6
3	Stable network infrastructure	1
4	Scalable NAS Storage device	1
5	Microsoft SQL Server	1
6	Windows Server 2008	1
7	RAID Server	1
8	Personal Computers	100
9	Laptops	20
10	UPS (standard)	100
11	Industrial UPS	3
12	HP LaserJet Printer (Duplex)	2
13	Riso EZ 230 Printers	3
14	Tally printer (T6212)	1
15	USB External drive - 500 GB	20
16	Scanner consumables and spares (Pick Rollers, Brake Roller, Print Cartridge)	200
17	Scanner cleaning kits	1,000
18	Riso consumables and cartridges	500

Item No.	Description	Quantity
	SOFTWARE	
19	TELEform Elite Enterprise version	1
20	TELEform Verifier workstations (extra)	19
21	TELEform Reader workstations (extra)	9
22	Scan Stations (extra)	4
23	TELEform Elite Desktop Version	6
24	MS-SQL, Oracle or other database	1
25	Data Storage, Archive and Retrieval software	
26	CSPro	1
27	IBM-SPSS (Corporate Licenses)	20
28	Microsoft Office Professional	2
29	STATA	2
30	Microsoft Windows 7 Professional	2
31	IHSN (International Household Survey Network) Microdata Management Toolkits	1
32	REDATAM (Integrated Microdata Information System)	1

Table 20.Estimation of 2014 Census Questionnaires by Type

Assumptions:			
Estimated Total EAs	20,000		
Average Households per EA	100		
Estimated Total Households	2,000,000		
Average Household Size	6.0		
Main Census			
Assume 1 Questionnaire per household			**Estimated Totals**
Total Questionnaires required	(1 x	2,000,000)	2,000,000
Add 25% for Supplementary Quest	(1.25 x	2,000,000)	2,500,000
Add 5% for Training Quest	(1.05 x	2,500,000)	2,625,000
Total Questionnaires required - Main Census			**2,625,000**
PES Questionnaires (1%)	(0.01 x	2,625,000)	**26,250**
Pilot Census			
Three EAs would be selected from each State	(3 x	10)	30
Total Questionnaires	(30 x	100)	3,000
Estimated Questionnaires required	(1 x	3,000)	3,000
Add 25% for Supplementary Questionnaires	(1.25 x	3,000)	3,750
Add 5% for Training Questionnaires	(1.05 x	3,750)	3,938
Total Questionnaires required - Pilot Census			3,938
Approximated			**4,000**

CHAPTER 6

MONITORING AND EVALUATION

6.1 Introduction

Monitoring and evaluation of the implementation of the census programme is a critical endeavour to ensure that the timeframes and outputs planned to be achieved are met. Therefore, monitoring and evaluation activities are extremely important and should be instituted at all stages of census implementation, i.e. during pre-enumeration, enumeration and post enumeration phases.

Monitoring through quality control during 2014 Population and Housing Census will be an effective mechanism for error minimization, prevention of causes of error and timely interventions. Since complete elimination of errors is not possible, it is important to take precautionary measures to minimize them. These include, among others:

· proper planning of the census project, preparing and using good EA and Supervision Area maps,

· using well designed questionnaires,

· adopting simple enumeration procedures,

· conducting effective training for all enumeration staff,

· better collection of information from respondents,

· removing inconsistencies in data, and

· maintaining quality of data through manual and computer editing.

Without such a programme, the census data when finally produced, may contain many errors which can severely diminish the usefulness and credibility of the results. If data are of poor quality, decisions based on these data can lead to costly mistakes.

It is therefore important to be able to measure how well each census operation is proceeding by building in quality control procedures throughout the census process. The major objective of any quality control programme is to detect errors so that remedial actions can be taken even as the census operations continue.

This Chapter explains the detailed monitoring and evaluation procedures to be undertaken in order to minimize and eliminate causes of errors. The procedures will ensure that the system of quality control has been established at all phases of census operations.

6.2   Monitoring

The monitoring of the census operation will cover the technical and administrative/organizational aspects as well as the financial management of the programme. The exercise will be done at all phases of census implementation. Funding agencies will monitor the progress of activities through monthly Collaborators Forum Meetings (CFMs), field-monitoring visits, reviews of implementation reports, etc.

However, project implementation review meetings will be held regularly to monitor the whole process. An independent mid-term evaluation will be carried out in 2012 and at the end of project evaluation in 2015 to determine the extent of which the objectives would have been achieved and also make recommendations for further enhancement of utilization of the census results.

6.3   Precaution Procedures

These procedures are mainly for prevention or minimization of errors. These procedures will be taken during all stages of operations, especially cartographic work, questionnaire design and printing; planning for enumeration; training and recruiting of staff, transport of materials, enumeration, data processing, etc.

6.3.1 Immediate Follow-up of Enumerators' Work

The immediate follow-up of enumerators' work has two main objectives, namely: to minimize human error and to remove any possible source of error as soon as it is discovered.

6.3.2 Remedial Procedures

These are operations that will be conducted to improve completed questionnaires, reduce inconsistencies and other defects. This will be attained through field manual and computer edits of all questionnaires. Nevertheless, manual editing shall be necessary for preparing questionnaires for data entry which will be carried out in the field while computer editing will be used to check data against field level errors and data entry errors.

6.3.3   Protective Procedures

These will prevent loss of data quality during processing through verification of data entry operations. Controlling manual editing is classified under proactive procedures because editors may add mistakes while trying to correct original errors.

6.3.4 Control Forms

All Census project documents are important. Therefore their movements to and from the field has to be monitored. To do this, the use of control forms is highly recommended. These forms have a variety of functions, but they are used primarily in connection with record keeping and recording of movement of materials. The forms will also indicate the responsible party at each stage of the movement. Also, use of control forms reminds officials about the type and quantity of materials sent to the field and what is to be collected.

6.4 Evaluation

Statistical inquiries, whether using a sample or complete coverage, are subject to human errors. These include, among others, poor design of survey instruments, data capturing software and poor cartographic work that may affect accuracy of data. Although, quality control measures will be instituted at all stages of census implementation, data can never be error free. Therefore, an evaluation exercise needs to be conducted shortly after the census enumeration to measure the quality of census data.

Both direct and indirect mechanisms will be undertaken in the 2014 census to assess the quality of data and hence provide quality assurance to data users. A direct method is a way of assessing the quality of the census data by undertaking a replicate sample survey, called, Post Enumeration Survey (PES), in which the census results are matched with those from PES on a sample basis. Experience has shown that the direct method is a more precise approach for evaluating data quality of statistical products.

The role of the PES is to evaluate census results by providing necessary information for accurately determining type, size and direction of non-sampling errors. Implementing PES within the context of 2014 Population and Housing Census will achieve the following:

- o Quantitatively evaluate the accuracy content of census results in terms of coverage and information collected;

- o Provide concrete statistical basis for adjustments in demographic analysis (if any);

- o Evaluate quality of Enumeration Areas as sampling units for inter-censal surveys;

- o Identify procedural and conceptual improvements needed for future censuses;

- o Furnish information on sources and causes of errors;

- o Enhance credibility of census organizers; and

- o Provide the development partners and other stakeholders with vital information required for evaluating the census programme/project.

An indirect method is an alternative way of evaluating the quality of the census data by comparing census results either at aggregate or individual record level with information available from other enquires or sources. This method uses techniques of demographic analysis to evaluate data by checking for internal consistency, comparing the data with reliable data from other sources, including previous population census or other large-scale samples or surveys. The most common demographic techniques used to evaluate census data in this category include equality tests, ratio tests, range tests, inequality tests, reasonableness tests and use of indices.

CHAPTER 7

Census Work Plan

7.1. Introduction

Below, is an extract from United Nations Principles and Recommendations for Population and Housing Censuses.

"The census calendar or work plan is an efficient instrument not only in the timing control of each census operation but also in the control of the complex of all census operations that are interdependent. Therefore, when modifications in the census timetable are necessary, all related operations should be taken into consideration in order to avoid disruptions in the whole census programme. Obviously, the time schedule will differ for each national census depending upon the general census plan and the resources that are available.

The census calendar usually shows the various operations grouped into three broad sectors: (a) pre-enumeration, (b) enumeration and (c) post-enumeration. The last-named sector includes evaluation and analysis as well as processing and dissemination. The basic date on which the census calendar and the scheduling of all other operations hinge is the starting date for the general enumeration of the population. For purposes of control, many operations that in fact overlap are shown separately in the calendar. Census calendars sometimes take the form of a chart or graph, in addition to a detailed checklist of operations. Project management software may help in the preparation of the census calendar.

In establishing the census calendar, it is necessary to consider the relationship of the population and housing censuses to one another as well as to other statistical projects or other large-scale national activities. Although a joint population and housing census operation is likely to constitute, for the period of its duration, the major statistical undertaking of the Government, care should be taken that it does not interfere unduly with the other regular statistical activities that may be going on at the same time. A balanced statistical programme should avoid having too many simultaneous competing inquiries which might place too heavy a burden on the statistical services and on the public, with a possible resultant loss of both administrative efficiency and public cooperation."

The census work plan is given in the Appendix Table 1. However, the major census milestones are presented in Table 7.1 below.

Table 21. Milestones - 2014 Population and Housing Census

2011

Cabinet submission to prepare for the census	November

2012

Final budget approved	July
Census project document prepared	July
Procurement of vehicles, GIS and cartographic equipment	August
Census office in place	September
Various census committees formed	September
Field mapping commences	October
Procurement of DP equipment and software	October

2013

Census questionnaire and tools for the pilot printed	January
Pilot survey undertaken	**February**
Finalisation of census tools and instruments	September-December
Final census questionnaire and census tools printed	October-December
EA and SA maps printed	October-December
Census enumeration staff identified and recruited	December

2014

Training at all levels completed	January
Census enumeration undertaken	**February**
Data processing staff trained	February
Post Enumeration Survey (PES)	March
Data processing commences	April
Preliminary report released	**June**
Tabulations and Analysis commences	September
Preparation and release of final census results by state	**December**

2015 - 2017

Preparation and Printing of Analytical Reports	2015 – 2017
Publication and Dissemination of census results	**2015 – 2017**

CHAPTER 8

2014 Census Budget

8.1 Introduction

Below is an extract from the United Nations Principles for undertaking population and housing censuses:

"A census is the primary source of data about the size and characteristics of the population; it provides a demographic profile of a country and is the basis for developing area sampling frames for use in surveys. Censuses, however, are one of the largest and most costly statistical activities that governments and/or their national statistical offices undertake, and costs are on the rise. As a result, countries have been forced to delay or even cancel a census owing to funding constraints. Countries that have been able to secure partial funds or secure funds but at a late stage of their census preparation have been forced to compromise their data collection, data processing and dissemination of census results. It is therefore recommended that all census operations including planning, enumeration, analysis and dissemination, be budgeted from the beginning and efforts made to mobilize the required funds. Inflation should be taken into account, keeping in mind that duration has an impact on cost.

Given the above, there is growing pressure to look into the solutions to census funding, taking into account the role of key stakeholders, namely, Governments and their statistical agencies, and the greater involvement of international donors and the private sector. Concurrently, cost-effective strategies need to be put in place that would reduce census costs without compromising the quality of census data.

It should be emphasized, however, that censuses cannot be carried out merely by national statistical offices alone. Rather, conducting a census should be seen as a national task involving all stakeholders. Thus, government departments, non-government organizations and the private sector end-users should be consulted (in all stages) to ensure the legitimacy and need for conducting the census and, at the same time, to improve the advocacy for sufficient funding. Although the conducting of a census is in principle financed by the Government, the census must be designed in partnership with all stakeholders, so as to obtain their involvement in the census process.

National statistical offices need to advocate the importance of investing in censuses within their own Governments. The possibility of cost sharing with other government departments, such as education and health ministries, should be further explored. These institutions could be supportive in providing logistics arrangements for the census, such as the use of existing infrastructure, transportation, communications facilities and the sharing of employees of other government departments."

8.2. Budget for the 2014 Population Census

The detailed census budget is given in Appendix Table 2. However, a summary of this table is presented below. It can be observed that the total cost for the 2014 Census is currently estimated to be about US$ 101.8 million. This is equivalent to 301.4 Million Sudanese Pounds. It should be emphasised that this is a project budget and should be honoured until the end. Such budgets are not interrupted during the time of execution.

Table 22. Summary Census Budget (In US Dollars)

#	ALL AMOUNTS IN US DOLLARS Census Activities	Years 2012 - 2014	 Percentage	A number of activities will end in 2017 with the same 2012 - 2014		
				2015	2016	2017
1.0	**PLANNING** *(Management and Supervision)*	10,830,800	10.64%			
2.0	ADMINISTRATIVE COST	1,697,000	1.67%			
3.0	GENERAL SECURITY	7,000,000	6.88%			
4.0	FUEL AND LUBRICANTS	1,652,000	1.62%			
5.0	FLIGHTS	1,500,000	1.47%			
6.0	GEOGRAPHIC PREPARATION	22,215,200	21.83%			
7.0	ENUMERATION	39,871,250	39.18%			
8.0	DATA PROCESSING	3,936,550	3.87%			
9.0	PRODUCTION OF FINAL RESULTS	575,000	0.56%			
10.0	DISSEMINATION OF THE RESULTS	230,000	0.23%			
11.0	ADVOCACY AND BUBLICITY	620,000	0.61%			
12.0	PROCUREMENT OF VEHICLES	5,770,000	5.67%			
13.0	CAPACITY BUILDING	1,030,200	1.01%			
	Total	96,928,000				
	5% Contingency	4,846,400	5%			
	Grand Total	101,774,400	100%			

Table 23. Summary Census Budget (In Sudanese Pounds)

#	ALL AMOUNTS IN SOUTH SUDANESE POUND	Years	Percentage	A number of activities will end in 2017 with the same 2012 - 2014		
#	Census Activities	2011 - 2015		2015	2016	2017
1.0	**PLANNING** *(Management and Supervision)*	32,073,248	10.64%			
2.0	ADMINISTRATIVE COST	5,025,326	1.67%			
3.0	GENERAL SECURITY	20,729,100	6.88%			
4.0	FUEL AND LUBRICANTS	4,892,068	1.62%			
5.0	FLIGHTS	4,441,950	1.47%			
6.0	GEOGRAPHIC PREPARATION	65,785,872	21.83%			
7.0	ENUMERATION	118,070,733	39.18%			
8.0	DATA PROCESSING	11,657,306	3.87%			
9.0	PRODUCTION OF FINAL RESULTS	1,702,748	0.56%			
10.0	DISSEMINATION OF THE RESULTS	681,099	0.23%			
11.0	ADVOCACY AND BUBLICITY	1,836,006	0.61%			
12.0	PROCUREMENT OF VEHICLES	17,086,701	5.67%			
13.0	CAPACITY BUILDING	3,050,731	1.01%			
	Total	287,032,886				
	5% Contingency	14,351,644	5%			
	Grand Total	301,384,531	100%			

CHAPTER 9

Recommendations, Training and Technical Assistance

9.1. Summary of Recommendations

The NBS will attempt to develop a good capability for planning and implementing the 2014 Population and Housing Census, based on the experience from the 2008 Census. Many of the recommendations are already part of the Census plan. The key recommendations for the planning and execution of main census operations are outlined here:

- Under the Transitional Constitution the 2014 Census is a prerequisite for the 2015 elections as it will facilitate the demarcation of the electoral constituencies.

- NBS should work to establish the national budget for the 2014 Census as soon as possible. This will convince the development partners that the Government of South Sudan is making a strong commitment to conducting the census, making it easier to obtain support from the donor community.

- It is important for NBS to develop a detailed 2014 Census work-plan and schedule of activities to ensure that the preparatory stage of each activity begins on time. The dependency of the different operations should be reflected in this schedule.

- NBS should ensure that the pre-census cartographic operation is completed in time. Areas affected by floods due to heavy rains should be revisited due to the relocation of the population in the affected areas. Strong efforts should be made to mobilize national and donor resources to implement and finalise the census cartography programme.

- The demarcation of EAs will not have been completed by the time of conducting the Pilot Census. It is therefore recommended that the areas identified for the pilot survey in each state be given priority during the mapping operation.

- In order to effectively design, test, and implement all the census forms, procedures, manuals, training, and processing activities, NBS will need to ensure that adequate numbers of subject-matter technical staff are available, and working full-time, from the preparatory stage through the publication and dissemination of the census results.

- The Post-Enumeration Survey (PES) methodology for evaluating the Census coverage and content errors should include a matching operation and dual system estimation in order to obtain more accurate estimates of the Census coverage rates. This methodology should be tested in a Pilot PES to be conducted within three months following the Pilot Census.

- The census enumeration is planned for February 2014. This is only 18 months from now. The cartographic activities have yet to commence on the ground. The preparation and production of the Enumeration and Supervision Area maps form a crucial input to the census enumeration as they guarantee complete area coverage of the whole country. It should be noted that each of the Enumeration Areas (EAs) is assigned one enumerator, while 4-5 EAs are assigned to a supervisor. Enumeration logistics will therefore heavily depend on the number of EAs for each Boma, Payam, County and finally state. There is therefore an urgent need to embark on the cartographic activity now, otherwise the proposed census enumeration period may have to be changed to a later time.

9.2. Training

Training needs for the NBS and the Census operation can be examined in light of the competency requirements of staff involved in the three main phases of the Census itself: pre-enumeration preparation, enumeration, and post-enumeration processing, always keeping in mind that the training must be accomplished before the phase is initiated or completed.

9.2.1. Pre-enumeration preparation

The major activities will be preparation of overall plans, preparation of maps, questionnaire design and testing, preparation of documents for use in training and enumeration, enumerator recruitment, selection, and training, sensitization of the public to the Census, and establishment of control systems to monitor all activities through all phases of the process.

Much of this training will be carried out "in-house," using NBS staff and other local experts. However, the Census process and Census personnel would benefit by exposure to formal and informal training from sources outside the NBS, to ensure that, when more than one course of action seems possible, the best of available options is chosen on its merits and not for reasons of tradition or custom.

- The person(s) who will be responsible for designing and implementing the Census plan would benefit from study tours to countries in the region, with a recent census undertaking exercise;

- The control systems that will operate during the post-enumeration phase must be designed   and implemented before enumeration begins. The most appropriate software with which will be used to design these systems must be identified and made available on time. The persons assigned to this task will benefit from outside technical assistance as they develop the various control systems.

- Training of NBS staff in the use of the control system (particularly that to be used for receipt and check-in of forms from the field operation) should be carried out as close to the period of enumeration as possible.

- The field supervisory staff and the enumerators will need intensive and timely training. This task should be the domain of the NBS, which has some experience from the last census. The same may be said of the manuals and documents related to training and enumeration. However, it would be useful to have the opinion of an outside expert, whose observations might lead to improvements in the content of materials or in the techniques used.

- The specifications for editing and correction of keyed data must be designed by the NBS subject-matter specialists in close conjunction with the computer technicians who will be responsible for translating the specifications into one or more programmes. This task is best accomplished by means of a workshop, in which the principles of data editing are presented to the participants, and illustrated using the questionnaire. The output of this workshop-cum-technical-assistance will be a set of usable edit specifications that may be implemented in a later programming workshop or via on–the-job training. This output-oriented workshop, to be held at NBS, may require the support of a technical advisor/consultant.

- The computer programmes that will carry out the data capture and verification of the data, the editing and correction of the captured data, and the tabulation of edited data, will require some months to prepare and test. An in-house workshop will permit all interested NBS staff to learn procedures, which can then be used for statistical data processing tasks related to other census and survey operations carried out by NBS. NBS may also choose to invite participants from other Ministries that might benefit from knowledge of this software. This will require the support of a technical advisor/consultant.

- A full workshop should be scheduled for NBS staff, but it would be beneficial for one or two top-level staff to attend the regional workshops, where they will meet, and exchange ideas and experiences with persons at a similar level from other national statistical offices in Africa and elsewhere.

- The NBS staff responsible for the post-processing dissemination of the data should begin to think about methodologies and media well before the data become available. They should also become aware of the needs of the user community, in terms of the way in which data are made available. NBS should organise a workshop which could serve as a catalyst for the creation of a definitive dissemination programme, including the definition of specific products and techniques to be used for making Census data available to the public. This workshop should be scheduled for a time period when the affected personnel will not be distracted by other activities. It does not necessarily have to be scheduled before the Pilot Census, but should certainly be presented in time to allow for development of the products before Census processing is completed.

9.2.2. Enumeration phase

During enumeration, the efforts of all NBS staff (plus that of tens of thousands of contracted persons) will be directed to the field exercise of collecting information from the general population. Training will not be considered during this period.

9.2.3. Post-enumeration phase

There will be some training needs during this period, but for the most part they will be handled by NBS staff or other local resources. Some post-enumeration tasks may benefit from outside technical assistance.

- The task of training the clerical staff who will perform the manual editing and coding of the questionnaires prior to data capture can be carried out by NBS staff during the immediate post-enumeration period, while the questionnaires are still being returned from the field. This task will depend on manuals for editing and coding which will have been prepared before the enumeration of the Pilot Census and updated as a result of the Pilot Census processing.

- Training the scanning staff should be carried out by NBS data processors with the support of a technical advisor/consultant. By then there should already exist a manual that will have been used during the Pilot Census scanning. It should be updated to reflect any changes in the scanning application that may have occurred as a result of the Pilot Census.

9.3. Technical Assistance

During the 2008 Census, technical assistance was provided by both long-term and short-term advisors in census planning and data processing. Since then, the NBS has not developed enough experience for the planning and execution of the comprehensive national census programme. For the 2014 Census, the technical assistance and training should be provided through both long term advisors and short-term missions by different types of experts at critical periods, from the census preparatory phase through the final analysis, publication and dissemination of the Census results. Some of these missions will have a short duration of two to three weeks, while a few census operations will require a longer technical assistance mission of up to two months during the full census implementation. However, four long term technical advisors should be in place to provide continuous advice and support the census operation. These are: Chief Technical Advisor, GIS/Mapping Advisor, Data Processing Advisor and Advocacy and Publicity Advisor. An urgent need for a chief technical census advisor to assist and support the implementation of the whole census undertaking is critical. Urgent consideration for recruiting a mapping/cartographic technical advisor is necessary as time is running out. It is also recommended to have a data processing technical advisor in place before the undertaking of the Pilot Census. The in-house NBS staff are not yet that familiar with the new technologies in these two areas.

APPENDIX

Appendix 1. Detailed 2014 South Sudan Census Work-Plan

STAGES	CENSUS ACTIVITIES	November, 2011 - December, 2015		Responsible Party
		DATES		
		START	END	Responsible Party
1.0	**PREPARATORY PHASE**	*All days are working days*		
1.1	Census Legal basis, Organizational Structure & Funding Mobilisation	November 2011	December 2012	NBS
1.2	Establishment of Census offices & Hiring office space for NBS HQs	September 2012	December 2012	NBS
1.3	Geographic Preparations and Demarcation of Enumeration Areas	October 2012	November 2013	GIS & Mapping Section
1.4	Advocacy and Publicity	July 2012	December 2017	Advocacy and Publicity Section
1.5	Procurement of Census Vehicles	August 2012	August 2013	Administration and Finance Section
1.6	Preparation and Printing of Census Tools	November 2012	December 2013	Census Secretariat
1.7	Production and Printing of Enumeration Area Maps	December 2012	December 2013	GIS & Mapping Section

STAGES	CENSUS ACTIVITIES	November, 2011 - December, 2015		Responsible Party
		DATES		
		START	END	Responsible Party
1.0	**PREPARATORY PHASE**	*All days are working days*		
1.8	**Pilot Census**	**February 2013**	**March 2013**	Census Secretariat
1.9	Finalization and Printing of Census Tools	June 2013	December 2013	Census Secretariat
1.10	Procurement of Census Equipment and Materials	August 2012	December 2013	Administration and Finance Section
1.11	Finalization of Census Enumeration Plans	July 2013	December 2013	Census Secretariat
1.12	Procurement of Enumeration materials & Supplies	July 2013	November 2013	Administration and Finance Section
1.13	Identification and Recruitment of Census Field staff	September 2012	December 2013	Census Secretariat
1.14	Distribution of Enumeration materials & Supplies	October 2013	January 2014	Census Secretariat
1.15	Identification of transportation means in various States	October 2013	January 2014	Administration and Finance Section
1.16	Identification and listing of training sites	October 2013	January 2014	Census Secretariat
1.17	Equipping of Data Processing offices	December 2012	January 2014	Data Processing Section

		November, 2011 - December, 2015		Responsible Party
	CENSUS ACTIVITIES	**DATES**		
STAGES		**START**	**END**	**Responsible Party**
1.0	**PREPARATORY PHASE**	*All days are working days*		
2.0	**ENUMERATION PHASE**			
2.1	Identification and Recruitment of Resource persons for training	October 2013	November 2013	Census Secretariat
2.2	Training of principal trainers in Juba	December 2013	December 2013	Census Secretariat
2.3	Training of County Coordinators and Field Officers at State HQs	January 2014	January 2014	Census Secretariat
2.4	Training of Supervisors at county levels	January 2014	January 2014	Census Secretariat
2.5	Training of Enumerators at county level	January 2014	February 2014	Census Secretariat
2.7	Assignment of Tasks	February 2014	February 2014	Census Secretariat
2.8	Deployment of Field Staff	February 2014	February 2014	Census Secretariat
2.9	Household Listing	February 2014	February 2014	Census Secretariat
2.10	**Census Reference Night**	**Sunday Mid-night, 16 February 2014**		Census Secretariat
2.11	**Census Field Enumeration**	**February 16, 2014**	**March 2014**	Census Secretariat

| STAGES | CENSUS ACTIVITIES | November, 2011 - December, 2015 | | Responsible Party |
| | | DATES | | |
		START	END	Responsible Party
1.0	PREPARATORY PHASE	*All days are working days*		
2.12	Retrieval and Storage of Census Materials to data processing site	March 2014	March 2014	Census Secretariat
2.13	Post Enumeration Survey (PES)	March 2014	April 2014	Census Secretariat
3.0	DATA PROCESSING PHASE			
3.1	Identification & Recruitment of Data Processing Staff	December 2014	January 2014	Data Processing Section
3.2	Training of Data Processing Staff	February 2014	March 2014	Data Processing Section
3.3	Data Processing	April 2014	October 2014	Data Processing Section
3.4	Release of Preliminary Results	June 2014	June 2014	NBS
3.5	Analysis of PES & coverage evaluation of the main census	October 2014	November 2014	Census Secretariat
3.6	Tabulation, Analysis & Release of Final Results	June 2014	December 2014	Census Secretariat
3.7	Preparation and Printing of Analytical Reports	January 2015	December 2017	Census Secretariat

STAGES	CENSUS ACTIVITIES	November, 2011 - December, 2015		Responsible Party
		DATES		
		START	END	Responsible Party
1.0	**PREPARATORY PHASE**	*All days are working days*		
3.8	Publication and Dissemination of Census Results	January 2015	December 2017	Census Secretariat

Appendix 2. South Sudan 2014 Population Census Detailed Budget

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
	CENSUS PRE- ENUMERATION ACTIVITIES						
1.0	**PLANNING**						
1.1	**Census Committees**						
1.1.1	Preparatory committee				37,500		111,049
1.1.2	National Population Census Council				450,000		1,332,585
1.1.3	States Committees (State, Counties and Payams)				1,800,000		5,330,340
1.1.4	Advocacy and publicity committee				180,000		533,034
1.1.5	Financial Committee				108,000		319,820
1.1.6	Technical Committee (TWG)				840,000		2,487,492
1.1.7	Logistics Committee				90,000		266,517
1.1.8	Data Processing Committee				60,000		177,678
					3,565,500		**10,558,515**
1.2	**Establishment of Census Offices**						

#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
1.2.1	Construction of 7 State offices	7	1	Offices	200,000	1,400,000	592,260	4,145,820
1.2.2	Hiring of office space for NBS HQs	1	60	Months	25,000	1,500,000	74,033	4,441,950
1.2.3	Hiring of Stores for storing Census materials	1	9	Months	30,000	270,000	88,839	799,551
1.2.4	Rehabilitation of Rumbek (DP offices and Stores)	1	1	Office	300,000	300,000	888,390	888,390
1.2.5	Renovation of 3 state offices (Malakal, Bor and Bentiu)	3	1	Office	150,000	450,000	444,195	1,332,585
						3,920,000		**11,608,296**
1.3	**Equipment**							
1.3.1	Video Cameras	2	1	Pc	10,000	20,000	29,613	59,226
1.3.2	Projectors	13	1	Pc	600	7,800	1,777	23,098
1.3.3	Mobile Phones	20	1	Pc	1,000	20,000	2,961	59,226
1.3.4	iPad 64-GB	25	1	Pc	1,500	37,500	4,442	111,049
1.3.5	Intranet (Phone Headso, Cable, Switchs)					15,000		44,420
1.3.6	Repairs and Accessories					5,000		14,807
						105,300		**311,825**

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#	Line Item	No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					US Dollars		**South Sudanese Pounds**	
					2012 - 2017		**2012 - 2017**	
					$	USD	SSP	SSP
1.4	**Consultancy Fees**							
1.4.1	Chief Technical Advisor	1	36	Months	20,000	720,000	59,226	2,132,136
1.4.2	Cartography and GIS Advisors	2	24	Months	20,000	960,000	59,226	2,842,848
1.4.3	Data Processing Advisor	1	24	Months	20,000	480,000	59,226	1,421,424
1.4.4	Advocacy and Publicity Advisor	1	24	Months	20,000	480,000	59,226	1,421,424
1.4.5	Short term Advisors in Subject matter areas	10	3	Months	20,000	600,000	59,226	1,776,780
						3,240,000		**9,594,612**
	Subtotal					**10,830,800**		**32,073,248**
2.0	**ADMINISTRATIVE COST**							
2.1	Comprehensive Insurance for Vehicles					200,000		592,260
2.2	First Aid Kits					300,000		888,390
2.3	Financial Institutional Management (Bank Charges)					750,000		2,220,975
2.4	Communication (Airtime, Internet Connectivity)					360,000		1,066,068
2.5	Electricity					72,000		213,214

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#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
2.6	Postal Service				15,000		44,420
	Subtotal				**1,697,000**		**5,025,326**
3.0	**GENERAL SECURITY**						
3.1	Field Mapping				3,250,000		9,624,225
3.2	Field Enumeration				2,250,000		6,662,925
3.3	Census Facilities				1,500,000		4,441,950
	Subtotal				**7,000,000**		**20,729,100**
4.0	**FUEL AND LUBRICANTS**				**1,652,000**		**4,892,068**
5.0	**FLIGHTS**				**1,500,000**		**4,441,950**
6.0	**GEOGRAPHIC PREPARATION**						
6.1	**Staffing**						
6.1.1	Mapping Coordinators	10	24	Months	240,000	2,961	710,712
				1,000			
6.1.2	Database Officers	20	24	Months	900	432,000	

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
						2,665	1,279,282
6.1.3	Supervisors	100	24	Months	800	1,920,000	2,369	5,685,696
6.1.4	Geographical Assistants	500	24	Months	700	8,400,000	2,073	24,874,920
6.1.5	GIS Officers (Lab work in Rumbek)	20	12	Months	700	168,000	2,073	497,498
6.1.6	Field Guides	500	21	Months	600	6,300,000	1,777	18,656,190
6.1.7	Drivers and Boat operators	160	21	Months	600	2,016,000	1,777	5,969,981
						19,476,000		**57,674,279**
6.2	**GIS Equipment**					**550,000**		**1,628,715**
6.3	**Mapping Consumables**							
6.3.1	Stationery					1,034,000	-	3,061,984
6.3.2	Tents and Field Equipment					200,000		592,260
						1,234,000		**3,654,244**
6.4	**Recruitment & Training**							
6.4.1	Recruitment					30,000		

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#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit	Unit cost	Total cost		Unit cost	Total cost
				$	USD		SSP	SSP
								88,839
6.4.2	Training				50,000			148,065
					80,000			**236,904**
6.5	**Communication Facilities (Radios, Motorolas)**				**875,200**			**2,591,730**
	Subtotal				**22,215,200**			**65,785,872**
	CENSUS ENUMERATION ACTIVITIES							
7.0	**ENUMERATION**							
7.1	**Pre-Test and Pilot Census**				**500,000**			**1,480,650**
7.2	**Printing of Final Census Documents**							
7.2.1	**Printing of Manuals**							
7.2.1.1	Training Manual	880	1	Manual	25	22,000	74	65,149
7.2.1.2	Field Officers Manual	880	1	Manual	25	22,000	74	65,149
7.2.1.3	Supervisors Manual	4,400	1	Manual	25	110,000	74	325,743
7.2.1.4	Enumerators Manual (+10%)	22,000	1	Manual	25	550,000	74	1,628,715

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
7.2.2	**Printing of Forms**					-	
7.2.2.1	Household Listing Form (+10%)	22,000	1	Booklet	5.00	110,000	15	325,743
7.2.2.2	Interview Verification Card	2,000,000	1	card	0.25	500,000	1	1,480,650
7.2.2.3	Household Call Back Card	1,000,000	1	card	0.25	250,000	1	740,325
7.2.2.4	State Historical Calendar	22,000	1	sheet	1.00	22,000	3	65,149
7.2.2.5	Enumeration Codes Summary (Code list)	22,000	1	sheet	1.50	33,000	4	97,723
7.2.2.6	Teaching Aids Posters	5,000	1	sheet	10.00	50,000	30	148,065
7.2.3	**Printing of Census Questionnaire**					500,000		1,480,650
						2,169,000		**6,423,060**
7.3	**Production and Distribution of final census materials**							
7.3.1	**Procurement of Enumeration Items**							
7.3.1.1	Census Jackets (20,000 +10%)	22,000	1	Jacket	30	660,000	89	1,954,458
7.3.1.2	Census Caps	22,000	1	Cap	10	220,000	30	651,486
7.3.1.3	Census Satchels	22,000	1	Satchel	5	110,000	15	325,743
7.3.1.4	Census ID Cards		1	Card	5	110,000	15	

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
		22,000					325,743
7.3.1.5	Enumeration Stationery (Assorted items)	22,000	5	Pcs	3	330,000	9	977,229
7.3.1.6	Flashlight and Battery	22,000	1	Pc	10	220,000	30	651,486
7.3.2	**Un-Packaging and Re-Packaging of Enumeration Items**					100,000		296,130
7.3.3	**Distribution of Census Materials (States & Counties)**					520,000		1,539,876
7.3.4	**Recruitment of Census Enumeration Personnel**					100,000		296,130
						2,370,000		**7,018,281**
7.4	**Training of Principal Trainers (Centrally in Juba HQs)**							
7.4.1	Resource Persons	10	15	Days	75	11,250	222	33,315
7.4.2	Principal Trainers (From States)	20	20	Days	250	100,000	740	296,130
7.4.3	State Census Directors	10	20	Days	250	50,000	740	148,065
7.4.4	State Field Operation Managers	10	20	Days	250	50,000	740	148,065
						211,250		**625,575**
7.5	**Training of State Trainers**							
7.5.1	Resource Persons	10	15	Days	250	37,500	740	

#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
								111,049
7.5.2	Principal Trainers	20	10	Days	150	30,000	444	88,839
7.5.3	State Census Directors	10	10	Days	50	5,000	148	14,807
7.5.4	State Field operation managers	10	10	Days	40	4,000	118	11,845
7.5.5	County Coordinators	80	10	Days	100	80,000	296	236,904
7.5.6	Field Officers	880	10	Days	75	660,000	222	1,954,458
7.5.7	Drivers and Boat Operators	170	15	Days	30	76,500	89	226,539
						893,000		**2,644,441**
7.6	**Training of Supervisors (State HQs)**							
7.6.1	Resource Persons	10	15	Days	250	37,500	740	111,049
7.6.2	Principal Trainers	20	10	Days	150	30,000	444	88,839
7.6.3	County Coordinators	80	10	Days	100	80,000	296	236,904
7.6.4	Field Officers	880	10	Days	75	660,000	222	1,954,458
7.6.5	Supervisors	4,400	10	Days	50	2,200,000	148	6,514,860

#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
7.6.6	Hall Rental and Other Costs	50	10	Days	200	100,000	592	296,130
7.6.7	Drivers and Boat Operators	170	15	days	30	76,500	89	226,539
						3,184,000		**9,428,779**
7.7	**Training of Enumerators (County training)**							
7.7.1	Resource Persons	10	15	Days	250	37,500	740	111,049
7.7.2	Principal Trainers	20	15	Days	150	45,000	444	133,259
7.7.3	County Coordinators	80	15	Days	100	120,000	296	355,356
7.7.4	Field Officers	880	15	Days	75	990,000	222	2,931,687
7.7.5	Supervisors	4,400	15	Days	50	3,300,000	148	9,772,290
7.7.6	Enumerators	22,000	10	Days	40	8,800,000	118	26,059,440
7.7.7	Drivers and Boat Operators	170	15	Days	30	76,500	89	226,539
		27,280				**13,369,000**		**39,589,620**
7.8	**Census Field Enumeration**							
7.8.1	Resource Persons	10	30	Days	250	75,000	740	222,098

#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
7.8.2	County Coordinators	80	30	Days	45	108,000	133	319,820
7.8.3	Field Officers	880	25	Days	40	880,000	118	2,605,944
7.8.4	Supervisors	4,400	20	Days	35	3,080,000	104	9,120,804
7.8.5	Household Listing (Enumeration Areas)	20,000	3	Days	30	1,800,000	89	5,330,340
7.8.6	Enumerators +10% (Census Field Enumeration)	22,000	15	Days	30	9,900,000	89	29,316,870
7.8.7	Field Guides	20,000	1	Day	30	600,000	89	1,776,780
7.8.8	Drivers and Boat Operators	170	20	Days	30	102,000	89	302,053
7.8.9	Seconded Drivers	75	20	Days	30	45,000	89	133,259
7.8.10	Supervision and Quality Control					85,000		251,711
7.8.11	**Census PES**					500,000		1,480,650
						17,175,000		50,860,328
	Subtotal					39,871,250		118,070,733
	CENSUS POST- ENUMERATION ACTIVITIES							

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#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
7.9	**RETRIEVAL AND STORAGE OF CENSUS MATERIALS**				**150,000**		**444,195**
	(Archiving)						
8.0	**DATA PROCESSING**						
8.1	**Equiping DP offices**						
8.1.1	Furniture for Data Processing office				50,000		148,065
8.1.2	Local Area Networking of DP office				20,000		59,226
8.1.3	VSAT Installation & maintenance				25,000		74,033
8.1.4	Generators (Rumbek)				300,000		888,390
8.1.5	Operation and Maintenance of Equipment				10,000		29,613
					405,000		**1,199,327**
8.2	**Hardwares and Softwares**						
8.2.1	Desktop Computers	100	1	Pcs 1,500	150,000	4,442	444,195
8.2.2	Servers	2	1	Pcs 5,000	10,000	14,807	29,613
8.2.3	Laptops	100	1	Pcs 2,500	250,000	7,403	740,325
8.2.4	Desk Scanners (Commercial)	20	1	Pcs 1,000	20,000	2,961	59,226

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
8.2.5	Printers	30	1	Pcs	3,000	90,000	8,884	266,517
8.2.6	Softwares					10,000		29,613
8.2.7	Acessories					50,000		148,065
8.2.8	Consumables					25,000		74,033
8.2.9	Operation and Maintenance					60,000		177,678
						665,000		**1,969,265**
8.3	**Scanning Equipment**							
8.3.1	Scanners (High-speed heavy duty scanners)	3	1	Pcs	70,000	210,000	207,291	621,873
8.3.2	Lable printer	1	1	Pc	20,000	20,000	59,226	59,226
8.3.3	Bar code reader	15	1	Pcs	1,000	15,000	2,961	44,420
8.3.4	Softwares					50,000		148,065
						295,000		**873,584**
8.4	**Recruitment of Data Processing Personnel**	20	9	Days	250	**45,000**	740	**133,259**

#	Line Item	US Dollars					South Sudanese Pounds	
		2012 - 2017					2012 - 2017	
		No.	Unit		Unit cost	Total cost	Unit cost	Total cost
					$	USD	SSP	SSP
8.5	**Training of Data Processing Personnel**	205	9	Days	150	**276,750**	444	**819,540**
8.6	**Data Entry**							
8.6.1	Store Managers	2	100	Days	150	30,000	444	88,839
8.6.2	Supervisors	12	100	Days	120	144,000	355	426,427
8.6.3	Coding/Editing Clerks	20	100	Days	100	200,000	296	592,260
8.6.4	Programmers and System Analysts	5	100	Days	100	50,000	296	148,065
8.6.5	Team Leaders	18	100	Days	90	162,000	267	479,731
8.6.6	Store Clerks	16	100	Days	75	120,000	222	355,356
8.6.7	Scanner Operators	20	100	Days	75	150,000	222	444,195
8.6.8	Manual verification Clerks	100	100	Days	75	750,000	222	2,220,975
8.6.9	Key Correction Clerks	50	100	Days	75	375,000	222	1,110,488
8.6.10	Suport staff	30	100	Days	30	90,000	89	266,517
8.6.11	Generator Operators	4	120	Days	30	14,400	89	

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
							42,643
8.6.12	Drivers	4	120	Days	30	14,400	89	42,643
					2,099,800		6,218,138
	Subtotal				3,936,550		11,657,306
9.0	PRODUCTION OF FINAL RESULTS						
9.1	Tabulation				150,000		444,195
9.2	Fact sheets and Flyers				85,000		251,711
9.3	Analytical Volumes				170,000		503,421
9.4	Census Atlas				95,000		281,324
9.5	Census Administrative Report				75,000		222,098
					575,000		1,702,748
10.0	DISSEMINATION OF THE RESULTS						
10.1	National Launching of Results				30,000		88,839
10.2	State Launching of Results (10 States)				200,000		592,260
	Subtotal				230,000		681,099

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
	CENSUS CROSS CUTTING ACTIVITIES						
11.0	**ADVOCACY AND BUBLICITY**						
11.1	Launching of Census Mapping				30,000		88,839
11.2	Launching of Pilot Census				30,000		88,839
11.3	Launching of Field Enumeration				35,000		103,646
11.4	Sensitization and Publicity				275,000		814,358
11.5	Production and Publication of IEC materials				250,000		740,325
	Subtotal				**620,000**		**1,836,006**
12.0	**PROCUREMENT OF VEHICLES**						
12.1	Trucks	2	1	Truck 75,000	150,000	222,098	444,195
12.2	Toyota Hilux (meant for Advocacy and Publicity work)	2	1	Pickup 50,000	100,000	148,065	296,130
12.3	Toyota Hardtops	60	1	Toyota 75,000	4,500,000	222,098	13,325,850
12.4	Motorcycles	10	1	Motor 3,000	30,000	8,884	88,839
12.5	Speed Boats	40	1	Boat 18,000	720,000	53,303	2,132,136
12.6	Outboard Motors (Engine)	40	1	Motor 3,000	120,000	8,884	355,356

#	Line Item	US Dollars				South Sudanese Pounds	
		2012 - 2017				2012 - 2017	
		No.	Unit	Unit cost	Total cost	Unit cost	Total cost
				$	USD	SSP	SSP
12.7	Spare Parts for Outboard Motors				150,000		444,195
	Subtotal				**5,770,000**		**17,086,701**
13.0	**CAPACITY BUILDING**						
13.1	Study Tours and Missions				485,200		1,436,823
13.2	Training and Workshops				545,000		1,613,909
	Subtotal				**1,030,200**		**3,050,731**
	TOTAL				**96,928,000**		**287,032,886**
	5% CONTINGENCY				**4,846,400**		**14,351,644**
	GRAND TOTAL				**101,774,400**		**301,384,531**

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