Federal Republic of Somalia

Data for a Better Tomorrow
PESS 2014

UNFPA

POPULATION ESTIMATION SURVEY 2014

FOR THE 18 PRE-WAR REGIONS OF SOMALIA

OCTOBER 2014

Data for a Better Tomorrow

PESS 2014

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The survey covered regions as they were defined prior to 1986.

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We could not have conducted the Population Estimation Survey without the contribution of several individuals and institutions, many of whom are not named here. We remain indebted to each one of you.

CONTENTS

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7-8

List of tables

List of figures

Acronyms

AfDB	Africa Development Bank
AMISOM	Africa Union Mission in Somalia
CSPro	Census and Survey Processing System
DANIDA	Danish International Development Agency
EA	Enumeration Areas
EU	European Union
FAO	Food and Agricultural Organization
GIS	Geographical Information System
IDPs	Internally Displaced Persons
NRC	Norwegian Refugee Council
OCHA	Office for the Coordination of Humanitarian Affairs
PESS	Population Estimation Survey (of the 18 pre-war regions) of Somalia
PSUs	Primary Sampling Units
UKAID	United Kingdom AID
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UN-HABITAT	United Nations Human Settlements Programme
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
UNSOA	United Nations Support Office for Africa Union Mission in Somalia
UNSOM	United Nations Assistance Mission in Somalia
USAID	United States Agency for International Development
WFP	World Food Programme

"UNFPA recognises that quality and disaggregated data is critical for development planning, monitoring and accountability."

Dr. Babatunde Osotimehin
UNFPA Executive Director

PHOTO: ©UN/RYAN BROWN

Foreword

On behalf of the UN Country Team, it is my great pleasure to present the results of the Population Estimation Survey, a groundbreaking initiative by the Somali authorities and the international community to produce the first comprehensive estimates on the Somali population in over four decades. This nationwide survey conducted from late 2013 to early 2014 collected information from Somali women and men residing in 250,000 households in urban, rural, nomadic settings and camps for the internally displaced people (IDPs).

Until now, the absence of basic data had made it very challenging for policymakers and their partners to design and implement programmes. The last decade had often seen authorities and partners depend on guesstimates and varying sets of data for planning purposes. The Population Estimation Survey is a response to this gap.

This first batch of basic information presented in this report includes the estimated size of the Somali population by region for the urban, rural, nomadic populations and Somalis living ininternally displaced camps.

Among other findings, this unprecedented report indicates that about three-quarters of Somalis are below 30 years, and around 46 percent of the population is below the age of 15. These numbers further highlight the urgency on the part of the authorities and partners to seize the opportunity by providing for the well-being and productivity of these young Somali girls and boys.

This report constitutes an important first step. In the near term, data that has been collected but still needs to be analyzed will also tell us more about a range of socioeconomic realities, including the use of basic social services such as education, water and sanitation, occupation, mobility and migration patterns. With additional support, there is potential to expand the analysis and come up with much-awaited estimations for lower administrative levels and develop a better understanding

Behind each figure presented, there is a story, and a human face with specific needs and unique living conditions.

of where the most vulnerable people reside, social and economic characteristics by region or district, including school attendance, the labour force and occurrence of general and maternal mortality. The detailed analysis will also highlight locations that are in need of better services, thus strengthening our collective ability to prioritize activities and invest resources equitably.

I would like to express my special gratitude to the UNFPA Somalia team under the leadership of the Country Representative for taking the lead along with the in-house technical team that provided support to the entire survey exercise in different regions. My greatest thanks must go to the Somali people for sharing information about themselves and their lives, and cooperating with field teams during the survey. We should never forget that behind each figure presented, there is a story, and a human face with specific needs and unique living conditions.

I am therefore confident that this initiative will pave the way for future surveys, particularly the proposed population census. It is my sincere hope that the information contained in this report and the analyses that follow will be used to plan and deliver effective humanitarian and development interventions that improve the lives of the Somali people.

Philippe Lazzarini,

United Nations Resident Coordinator for Somalia

PHOTO: ©UNFPA SOMALIA

Preface

There is something special happening for the Somali people. In most parts of the country, Somalis are enjoying relative peace and stability compared to previous years. In addition, we have now reached a key milestone in the country's history: through the Population Estimation Survey we now have a rich source of information on Somalis that will support the formulation of humanitarian and development plans.

After a long spell of absence of data, the Somalis took on the initiative to collect information about themselves to have a better understanding of who they are, and where and how they live as communities, in order to improve their own lives. These ideas were turned into reality by forging strong partnerships that provided different skill sets and experience culminating in a survey that conformed to international standards. Building on a clear assessment of their technical capacity, we invested in developing the capacity of individuals and national institutions, which further empowered Somalis to lead the process. This forms part of the legacy credited to the Population Estimation Survey.

This publication is the first in a series of reports to be produced. It highlights the population size, distribution by region, household sizes and provides a breakdown of the population by sex and age. Forthcoming reports will present information on the utilisation of social services, such as education enrolment and status, water and sanitation, details on the labour force, mobility and migration patterns, maternal mortality and durable assets owned.

A comprehesive questionnaire was used to collect data on the number of households and persons living in the selected areas, including at water points for the nomadic population. The data gathered was coded, cleaned and keyed into a database – a set of processes that involved more than 4,500 Somalis.

The extensive survey estimated that the total population of Somalis was 12,316,895. An estimated 2,806,787 Somalis were living in rural areas, and 5,216,392 (or about 42 percent of the total population) lived in urban areas. Around a quarter of the population – 3,186,965 – comprised nomads. Estimates from the UN's Refugee Agency, UNHCR, stated that there were 1,106,751

internally displaced persons in all the regions. Results of the survey show that men made up 51 percent (6,244,765) of the total population, while 49 percent (6,072,130) of the population were women.

The Population Estimation Survey unveils a new era for the Somali people.

About half of the total female population comprised women of child-bearing age (15-49 years). This large pool of mothers and potential mothers is a wake-up call for the Somali authorities and development partners to invest in maternal health care and health education in order to minimise the risks of mothers losing their lives during pregnancy or while delivering babies. The participation of these young women in substantive income generating activities could spiral the growth of the Somali economy, while improving their families' quality of life.

An unprecedented survey of this scale was conducted with the support of several partners. I would like to take this opportunity to extend my sincere gratitude to the Somali authorities, in particular the Planning Ministers, their team leaders and the survey's Zonal Directors for their spirited leadership and grit at every stage of the exercise. I am also grateful to the Somali communities who are the heroes of the process. We would like to acknowledge our donors and UN partners for extending their financial, material and technical support at different stages of the Population Estimation Survey, which shows that this is truly a joint achievement. A special word of thanks goes to the UNFPA Technical Support Unit and the UNFPA Regional Office for their tireless efforts, dedication and enthusiasm.

It would not have been possible to carry out a survey of this scale without the support of Philippe Lazzarini (Deputy Special Representative for the UN Secretary General, UN Humanitarian and Resident Coordinator for Somalia/UNDP Somalia Resident Representative), Mark Bowden (former UN Humanitarian and Resident Coordinator for Somalia/UNDP Somalia Resident Representative and Humanitarian Coordinator), the United Nations Coordination Team (UNCT), and the UN Statistical Working Group.

By presenting the most basic, yet essential and much-awaited information, the Population Estimation Survey unveils a new era for the Somali people. Our hope is to harness this data for a better tomorrow.

Cheikh Tidiane Cisse,

UNFPA Representative for Somalia

Executive summary

The Population Estimation Survey (PESS) is the first extensive household sample survey to be carried out among the Somali population in decades. This report provides reliable and comprehensive population estimates by region and important demographic characteristics. Prior to this, Somalis have had to endure a long spell of absence of information on the numbers of people in each region and important characteristics of the Somali people. The last information available on population is from a census conducted in 1975, which published limited results; the results from another population census conducted from 1985 to 1986 were never released into the public domain. Since then, even though development agencies made several attempts to compile reliable data on population and socioeconomic statistics, such efforts collected data limited to thematic data sets. To fill this crippling gap, the Somali authorities decided to carry out a survey to collect information on the Somali population among other details. The United Nations Population Fund (UNFPA) partnered with donors and other UN agencies and took up the lead role to support the Somali authorities in undertaking the Population Estimation Survey.

The survey is a rich reservoir of information that will help authorities, development partners and humanitarian agencies to understand the realities and characteristics of the Somali population. They will be able to tap into this information to improve planning, decision-making, and monitoring and evaluation at all levels. The information will also assist in determining progress being made towards attaining development goals.

This first report provides crucial information on the size, sex and age of Somali citizens, as well as how they are distributed among the 1986 pre-war regions. Detailed characteristics such as levels of education, household characteristics, assets owned by households, who makes up the labour force, and patterns of migration, mobility and maternal mortality will be produced after further analysis.

During the survey more than 4,500 men and women were trained in mapping, validation, data collection, data entry and analysis. At every stage, Somali authorities, local leaders and their communities, as well as international partners played different roles to facilitate the processes.

PESS gathered basic critical information on the Somalis living in urban, rural and nomadic areas (interviewed at water points during the peak of the long, dry season), and in settlements for internally displaced persons. One standard questionnaire was used in selected enumeration areas or pre-identified areas.

Data was collected in three main phases:

cartographic field mapping, household listing in the sampled areas, and the interviewing of households using the standard questionnaire.

An exercise of this scale encounters challenges in any environment. Some of the main challenges faced were insecurity and inaccessibility in various locations. In these areas, high-resolution satellite imagery was used to count the number of structures in sampled or pre-identified areas that were inaccessible. These accurate images also doubled up as a tool for validation and quality control of information collected.

Some of the key findings of the report are:

At the time the Population Estimation Survey was conducted, the total population in the 18 pre-war regions was about 12.3 million. Out of the total population, just under half (42 percent) were living in urban areas and almost a quarter (23 percent) were living in rural areas. The nomadic population constituted 26 percent and the internally displaced persons accounted for 9 percent of the population. Compared to many African countries, the proportion of the urban population is relatively high. This can be attributed to the definitions of urban-dwellers used, which are in line with what was used prior to the civil war.

Information collected on age shows a young Somali population with about 46 percent of the population below the age of 15. The mean age for males is consistently higher than that for females by a year in the nomadic, rural and IDP populations.

The estimated number of households in the 18 pre-war regions at the time the survey was conducted was over two million. The average size of a household was 5.9 members. It is anticipated that the in-depth analysis phase will be conducted with the support of the international community, and will further develop institutional capacity through on-the-job training as well as provide a pool of information that will pave the way for Somali authorities to conduct large sample surveys, as well as a population census in the near future.

Somali population at a glance

POPULATION	Number	Percentage
Estimated Population	**12,316,895**	
Urban	5,216,392	42.4
Rural	2,806,787	22.8
Nomadic	3,186,965	25.9
IDPs	1,106,751	9.0
POPULATION DISTRIBUTION		
Male	6,244,765	50.7
Female	6,072,130	49.3
Urban - Male	2,598,926	49.8
Urban - Female	2,617,466	50.2
Rural - Male	1,439,176	51.3
Rural - Female	1,367,611	48.7
Nomadic - Male	1,663,775	52.2
Nomadic - Female	1,523,190	47.8
IDPs - Male	542,888	49.1
IDPs - Female	563,863	50.9

AGE DISTRIBUTION	Male		Female	
Age groups in years	Number	Percentage	Number	Percentage
0 – 4	815, 629	13.1	864,734	14.2
5 – 9	1,085,531	17.4	1,022,833	16.8
10 – 14	980,123	15.7	852,642	14.0
15 – 64	3,219,425	51.4	3,226,432	53.1
65 +	144,056	2.3	105,490	1.7

HOUSEHOLDS	Number	Percentage
Estimated households:	**2,076,677**	
Urban	782,354	38.6
Rural	482,674	23.8
Nomadic	465,718	22.9
IDPs	298,493	14.7

MEAN AND MEDIAN AGES						
	Male		Female		Total	
	Mean	Median	Mean	Median	Mean	Median
Nomadic	21	17	20	17	21	17
Rural	20	15	19	16	20	16
Urban	21	17	21	18	21	17
IDPs	19	13	18	14	18	13

PHOTO: ©UNICEF

1 Introduction

This chapter provides a background of the survey, describing what its objectives and achievements are. It also offers a glimpse of how an extensive survey of this scale was conducted.

1.1. ABOUT THE SURVEY

Somalis have endured a long spell of absence of comprehensive information on themselves: on population and important social and economic characteristics. The last available information is from a census conducted in 1975, which published limited results; the findings from another population census conducted from 1985 to 1986 were not published officially. Since then, even though development agencies have made several attempts to compile reliable data on the size and distribution of the population, and social and economic details, such efforts did not gain sufficient support and recognition.

To fill this crippling gap, and support Somali authorities and their partners to design policies and plans based on the realities of Somalis on the ground, in consultation with the UN Country Team, the United Nations Population Fund took on the lead role in coordinating the Population Estimation Survey.

The survey was carried out by the Somali authorities from October 2013 to March 2014. The exercise used the 1986 pre-war boundaries.

PESS is the first extensive household sample survey to be held in decades that provides reliable population estimates and information by geographical areas, among other details.

A first in a series of reports, this document provides crucial information on the size, sex and age of Somali citizens, as well as how they are distributed. It also determines how many Somalis live in urban and rural areas and camps for the internally displaced, and how many live nomadic lifestyles. On further in-depth analysis, the information from PESS can be used to understand characteristics of the Somali population including marital status, births, child and maternal mortality, what their levels of education are and type of occupation. It can also offer an insight into migration patterns, as well as seasonal movement patterns of nomads, household assets and amenities, and livestock watering patterns and ownership.

Data for a better tomorrow

Using the population data from this survey, the Somali authorities, international community, and other stakeholders can significantly improve planning, decision-making, monitoring and evaluation at all levels. Humanitarian agencies will be able to use the most recent and credible information on population size and distribution to assess and respond to critical needs in the event of crises. To help build the resilience of communities, provide basic services such as education and health, and boost economic growth, it is essential to know how many people

you need to serve and where, and in what conditions they live. The information from the survey will be helpful in determining progress being made towards attaining development goals.

1.2 PESS: A BRIDGE IN THE DATA GAP

The civil war wiped out the statistical infrastructure and systems that were in place; and the protracted conflict that followed seriously constrained the collection, compilation and dissemination of key statistics.

The institutional and statistical vacuum created left the Somali authorities and humanitarian and development agencies in dire need of reliable statistics for effective and informed decision-making, establishing statistical benchmarks, measuring and monitoring social and economic progress, and accurate reporting on development outcomes at local, national and international levels. For years, Somalis have not been represented in international comparisons of indicators of development such as global Common Country Assessments.

The information from the survey will be helpful in determining progress being made towards attaining development goals.

Even basic information on population has not been available, and there have been no sturdy systems in place to facilitate nation-wide data collection processes. Consequently, Somali authorities have been using information from publications, research reports and web-based sources. This lack of credible data has hindered development planning and humanitarian responses, affecting the lives of many Somalis in need. It has also impeded the country's move from humanitarian to a medium- and long-term sustainable development mode.

For Somali regions recovering from many years of war, it was extremely challenging to plan and carry out a survey of the nature and scale of PESS. This was mainly due to a capacity gap coupled with insecurity and lack of access to some areas.

In an ideal situation, a census would have been conducted. However, a census (which is a complete survey of every person living in a specific area) would have been very costly and required safe access to all areas of the country. It would also have required a great deal of institutional capacity and specialised skills. Conducting a population estimation survey was therefore the best and most feasible way forward because it reduced the requirements to a scale that was less costly and more manageable than a census. All the same, PESS coverage was

extensive and represented a wide range of the population.

PESS presents a bird's eye view on a variety of topics, particularly population dynamics and social and economic fields, which will serve as benchmarks against which future progress can be measured.

1.3 OBJECTIVES OF THE SURVEY

PESS was designed with the aim of estimating the size of the population, and gathering information on the Somali people's geographic distribution and their social and economic characteristics. PESS is a first milestone reached towards implementing a full and comprehensive population and housing census.

The specific objectives of PESS include:

a. Establishing reliable estimates of the size, age and sex of the Somali population living in urban areas, camps for internally displaced persons, rural areas, and nomadic communities.

b. Developing the capacity and foundation of government institutions responsible for compiling and storing statistics, while empowering individuals in these institutions.

c. Providing estimates of the number of households and information on the geographic distribution of households, the description of the structure of households, along with other demographic and socioeconomic data. For example, information on health and education which would be essential inputs in the preparation of humanitarian and development plans.

d. Setting an integrated baseline for basic and crucial information, and supplying tools such as sampling frames for future surveys and a potential population census.

This report presents the methodology used to carry out the survey, and the key findings on the population's size and geographical distribution.

1.4 PLANNING AND ORGANIZATION OF THE SURVEY

To respond to the socioeconomic needs of their communities more effectively, the Somali authorities decided to compile reliable and specific information on the Somali population. They requested the United Nations Resident Coordinator's Office for support in carrying out a nation wide survey. Following a consensus among the members of the United Nations Country Team and with support from donors and other partners, UNFPA was charged with a lead role of organizing the survey and bringing together all the partners to ensure the survey was conducted using a scientific approach. This decision was made in recognition of UNFPA's comparative advantage, technical expertise and extensive experience in compiling information on population such as population and housing censuses and large-scale household demographic surveys.

UNFPA's role included mobilising financial and logistical resources, coordinating and providing technical assistance, as well as oversight for quality assurance jointly with the Somali authorities. UNFPA worked together with Somali technical experts, communities and other UN entities, donors and partners to ensure the survey was conducted in line with international standards in all 18 regions covered.

Technical support rendered included the recruitment of international consultants. Somali authorities identified key Somali experts and support staff to carry out the survey. Numerous training sessions were conducted, even in the most remote areas, for example the training of over 3,500 data collectors (known as enumerators) that enabled the enumerators to communicate with respondents respectfully and gather and record information in the best ways possible.

Experienced experts in the fields of survey design, implementation, sampling and analysis, as well as demographers, data processors, cartographic and Geographic Information Systems (GIS) experts, translators, and three national survey directors and other key support staff worked as a strong team to ensure Somalis finally have access to crucial information about themselves.

This effort has helped to strengthen the statistical capacity of the Somali authorities at various levels from the design to implementation of extensive surveys.



PHOTO: ©UNFPA SOMALIA

2. The findings of the Population Estimation Survey

This section of the report presents the main findings of the Population Estimation Survey from the first phase. It provides information on the size, age, sex and distribution of the population.

2.1 POPULATION SIZE AND DISTRIBUTION

The findings of the Population Estimation Survey are that the estimated total population in urban, rural, nomadic areas and camps for IDPs in the 18 pre-war regions was **12,316,895**.

Table 2.1: Urban, rural, nomadic and IDPs population by region

Region	Urban	Rural	Nomads	IDPs *	Total
Awdal	287,821	143,743	233,709	7,990	673,263
Woqooyi Galbeed	802,740	138,912	255,761	44,590	1,242,003
Togdheer	483,724	57,356	154,523	25,760	721,363
Sool	120,993	13,983	187,632	4,820	327,428
Sanaag	159,717	30,804	352,692	910	544,123
Bari	471,785	65,483	133,234	49,010	719,512
Nugaal	138,929	31,047	213,227	9,495	392,698
Mudug	381,493	79,752	185,736	70,882	717,863
Galgaduud	183,553	52,089	214,024	119,768	569,434
Hiraan	81,379	135,537	252,609	51,160	520,685
Middle Shabelle	114,348	249,326	100,402	51,960	516,036
Banadir	1,280,939			369,288	1,650,227
Lower Shabelle	215,752	723,682	159,815	102,970	1,202,219
Bay	93,046	463,330	195,986	39,820	792,182
Bakool	61,928	134,050	147,248	24,000	367,226
Gedo	109,142	177,742	144,793	76,728	508,405
Middle Juba	56,242	148,439	131,240	27,000	362,921
Lower Juba	172,861	161,512	124,334	30,600	489,307
All Regions	**5,216,392**	**2,806,787**	**3,186,965**	**1,106,751**	**12,316,895**

**Source: UNHCR 2014*

Figure 2.1: Urban, rural, nomadic and internally displaced population by region

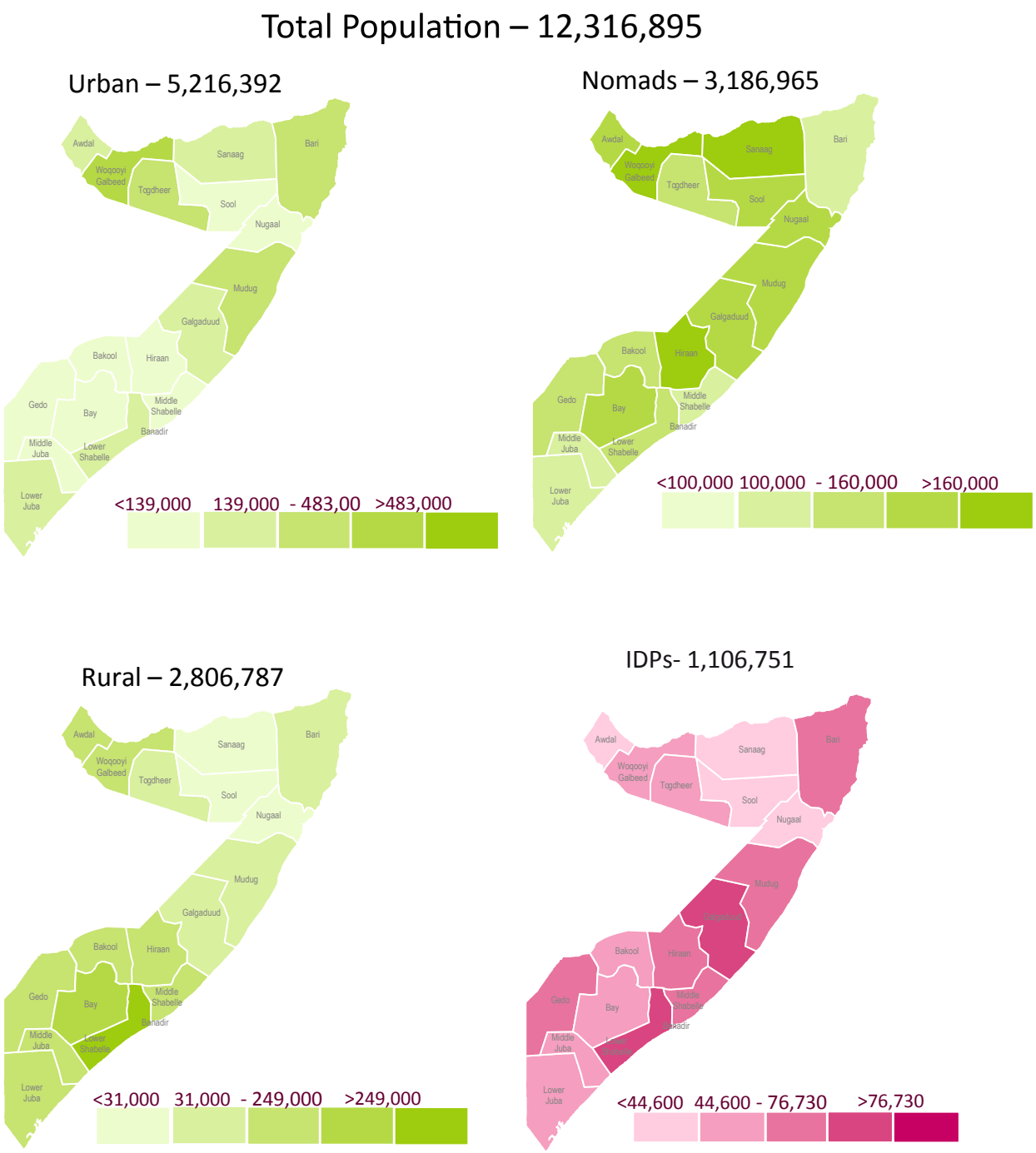
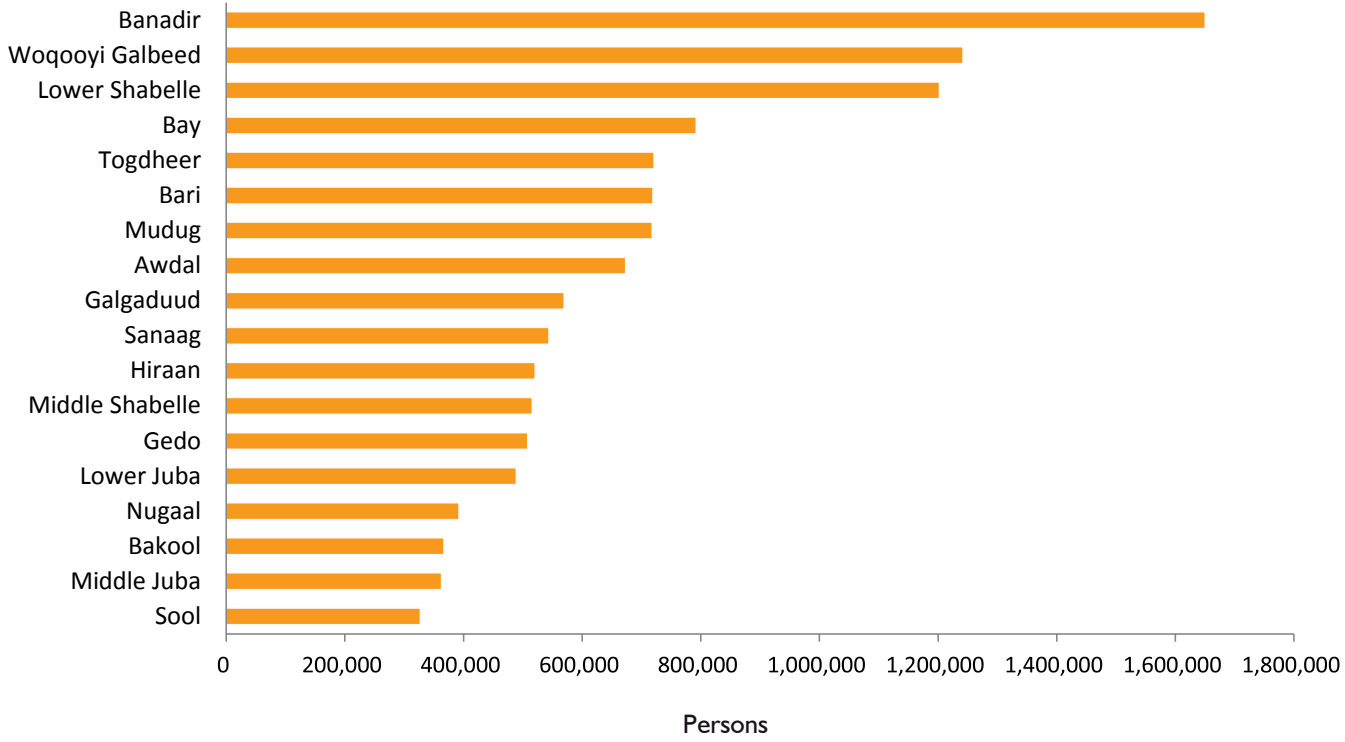


Figure 2.1 displays the number of people living in urban and rural areas, the nomadic population and internally displaced persons. Out of the total population, 42 percent (5,216,392) were living in urban areas and 23 percent (2,806,787) were living in rural areas. The nomadic population constituted 26 percent (3,186,965) and the internally displaced persons made up 9 percent (1,106,751) of the population.

Compared to many African countries, the number of people living in urban areas was relatively high.

Compared to many African countries, the number of people living in urban areas was relatively high. This may be explained by the definition of urban areas, which included all administrative districts and regional headquarters regardless of population size and availability of basic common amenities associated with urban areas in other countries. It is also important to note that the nomadic population is essentially a rural population but treated in a separate subgroup because of its size and uniqueness. From Table 2.1 and Figure 2.2, it can be

Figure 2.2: Total population by region



seen that Banadir region had the largest population of about 13.4 percent (1,650,227) of the total population, followed by Woqooyi Galbeed with 10.1 percent (1,242,003), and Lower Shabelle at 9.8 percent (1,202,219). Sool was one of the least populous regions, with 2.7 percent (327,428) of the total population.

The total population has increased significantly compared to previous estimates. It can be noted that the population of Middle Juba was significantly lower compared to previous estimates, while the population increase in Bay is insignificant. This could be due to the limited access to both regions, insecurity and the famine that affected communities living in these regions from 2011 to 2012, among other factors.

DISTRIBUTION OF THE URBAN, RURAL, NOMADIC AND INTERNALLY DISPLACED POPULATION

Figures 2.3 and 2.4 show the distribution of the total population by region for urban, rural, nomadic and internally displaced population in each region. Table A1 in Annex A shows the distribution in percentages. Banadir had the highest number of people living in urban areas at 24.6 percent, followed by Woqooyi Galbeed with 15.4 percent, Togdheer with 9.3 percent, Bari with 9.0 percent and Mudug with 7.3 percent. The urban population in these five regions accounted for more than 65 percent of the total population living in urban areas. Middle Juba region had the lowest share of the urban population at only 1.1 percent. The urban population in Banadir, Woqooyi Galbeed, Toghdeer, Bari and Mudug made up more than 65 percent of the total urban population.

The urban population in Banadir, Woqooyi Galbeed, Toghdeer, Bari and Mudug made up more than 65 percent of the total urban population.

Figure 2.3: Urban population by region in percentages

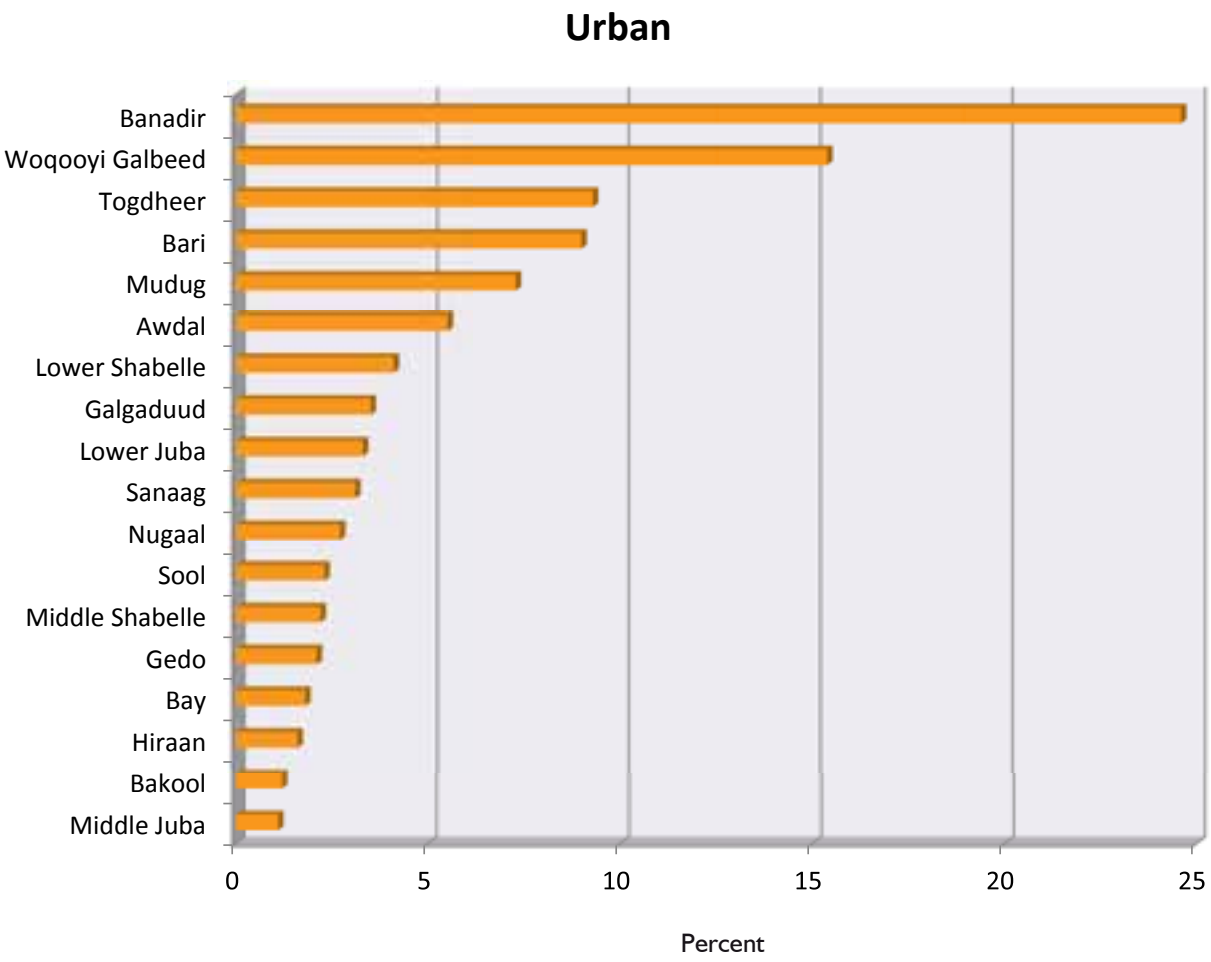
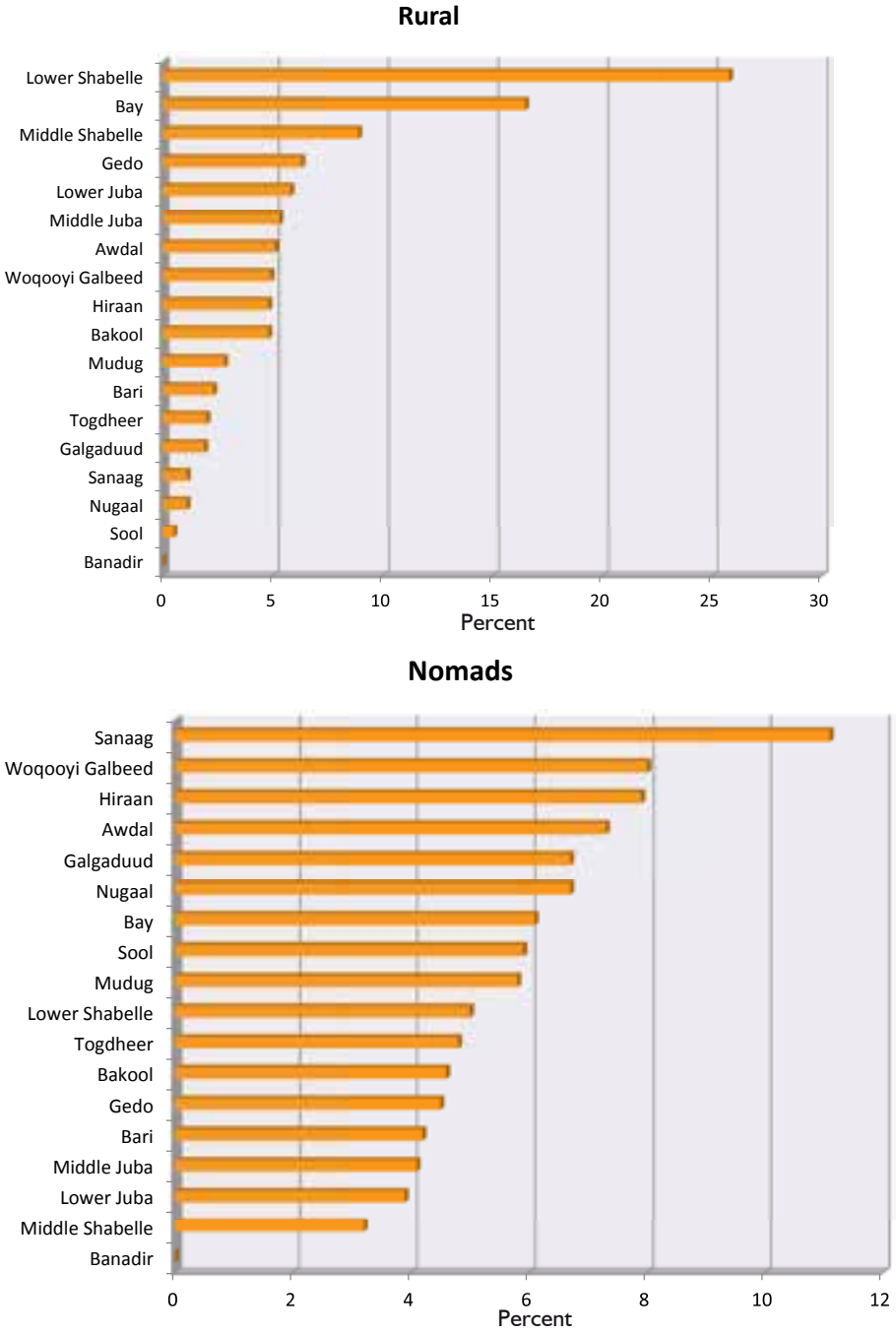
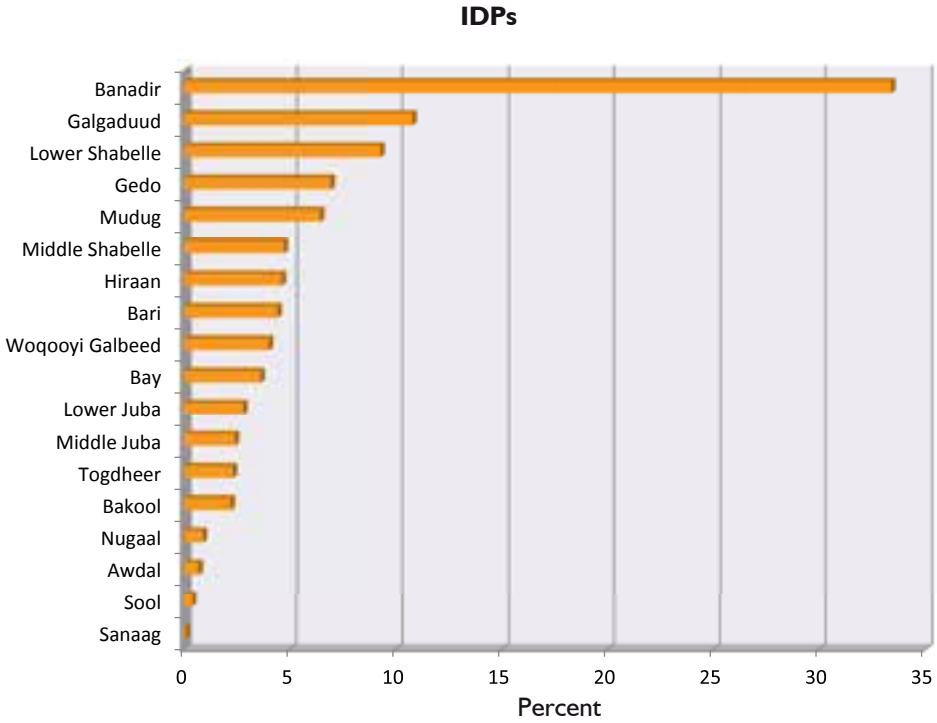


Figure 2.4: Rural, nomadic and internally displaced population by region





As depicted in Table A1 (Annex A), Banadir hosted the highest number of internally displaced persons at 33.4 percent. This can be attributed to the fact that many Somalis from South and Central regions fled to the city of Mogadishu in their search for security and other services when they faced challenges like war and natural calamities. Galgaduud followed, hosting 10.8 percent, and Lower Shabelle had 9.3 percent of all internally displaced Somalis while Sanaag was home to the least internally displaced persons with only 0.1 percent of the total number.

Sanaag had the largest number of nomads at 11.1 percent of the total nomadic population, while Middle Shabelle had the lowest number of nomads at 3.2 percent.

Lower Shabelle was home to the most Somalis living in rural areas, at 25.8 percent of the total population, followed by Bay with 16.5 percent and Middle Shabelle with 8.9 percent. Together, these three regions accounted for more than half of the total population living within the rural settlements.

Figure 2.5: Urban, rural, nomadic and internally displaced population within regions

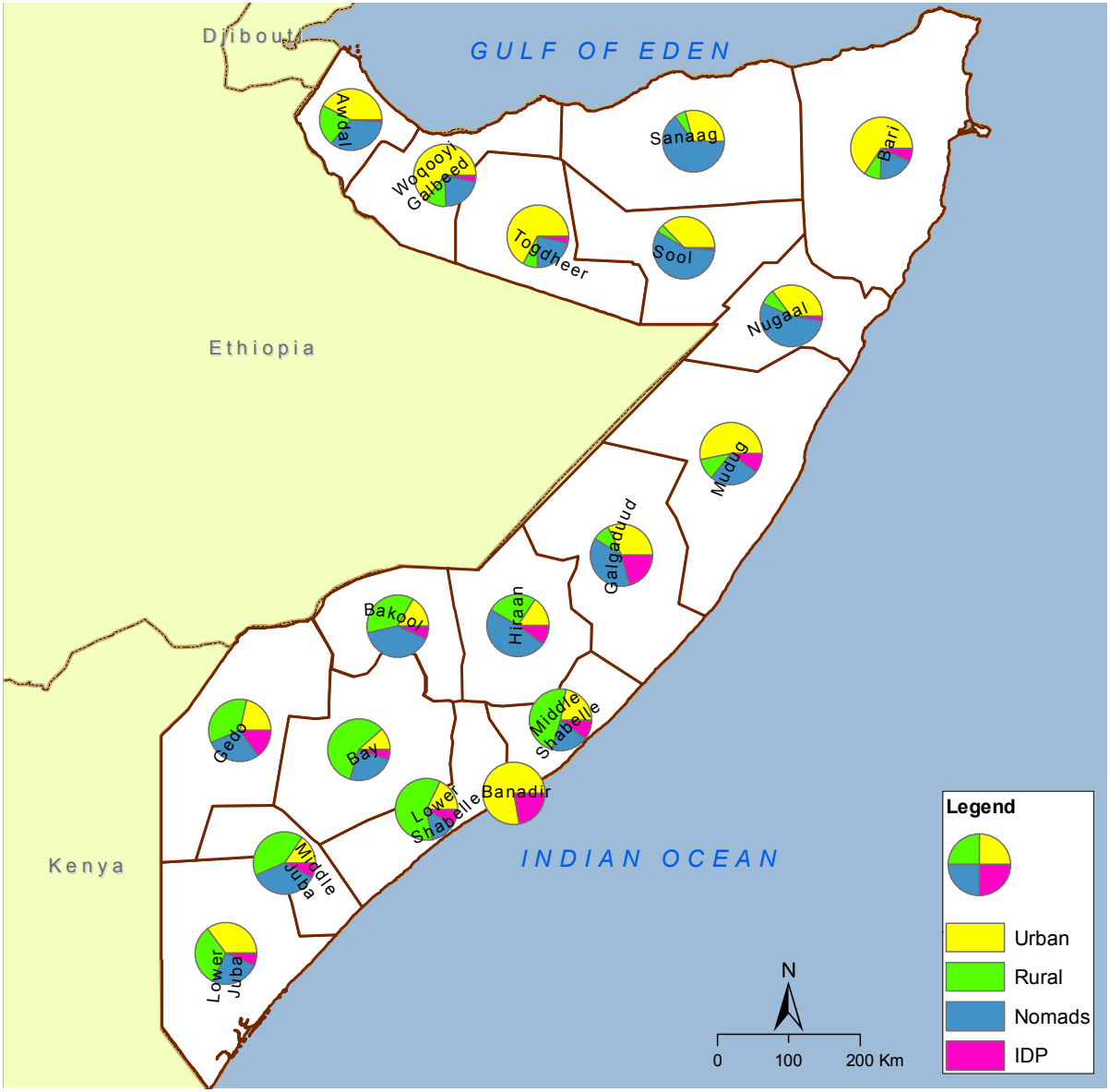


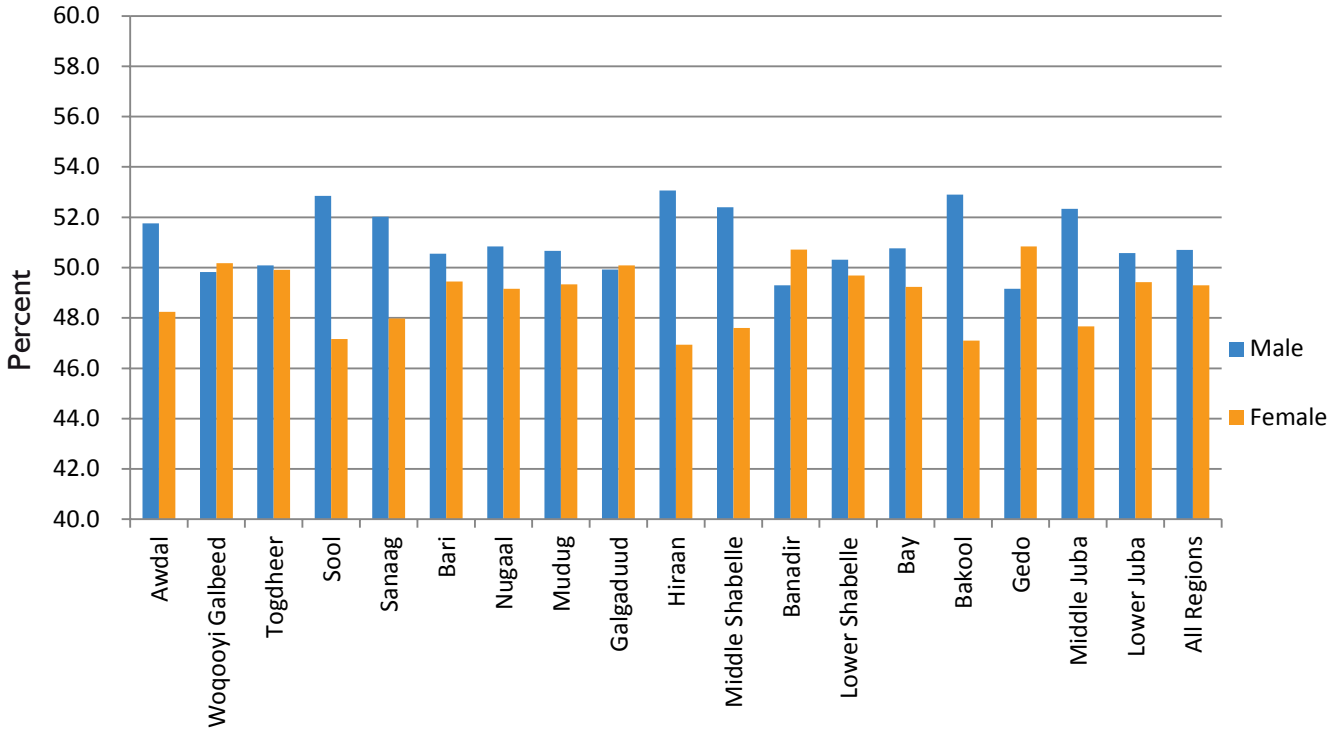
Figure 2.5 (Table A2 in Annex A) shows the distribution of urban, rural, nomadic and internally displaced population within each region. The survey shows that 77.6 percent of Banadir's population lived in urban areas and 22.4 percent in camps for the internally displaced. Bay was the least urbanised with 11.7 percent, and 5 percent in camps for the internally displaced. These results will help the authorities and their partners to plan delivery of social services and amenities to communities who need them most.

2.2 POPULATION DISTRIBUTION BY SEX AND AGE

2.2.1 POPULATION DISTRIBUTION BY SEX

By determining and analysing information on how many men and women make up a population, it is possible to draw conclusions on gender-related differencesamong other details.

Figure 2.6: Population in all regions by sex in percentages



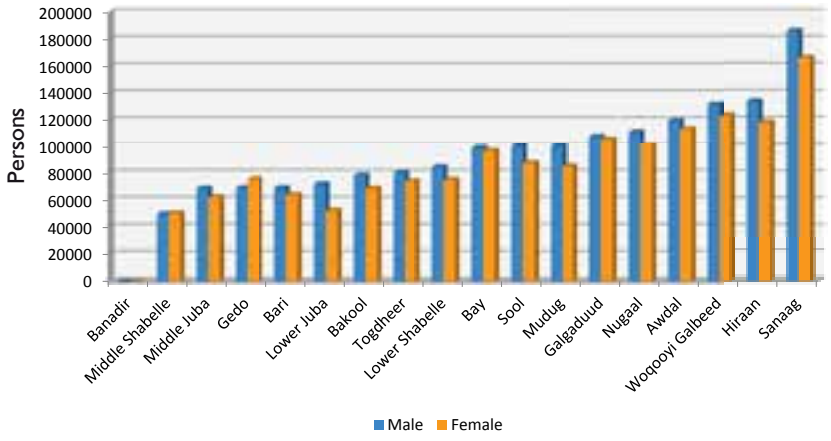
50.7 percent of the total population comprised males and 49.3 percent were female

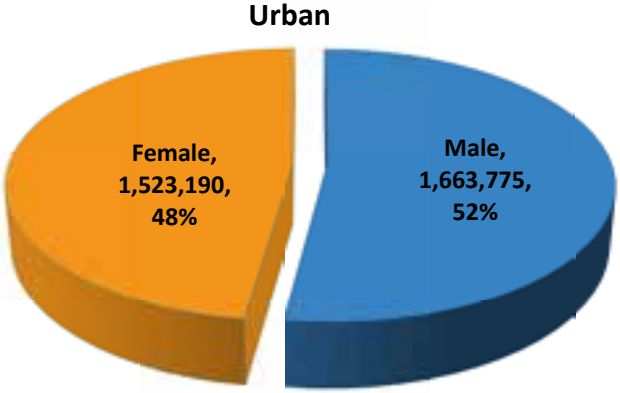
Although detailed information on women and men will be provided in the forthcoming analytical reports, a summary of population distribution by sex is presented below.

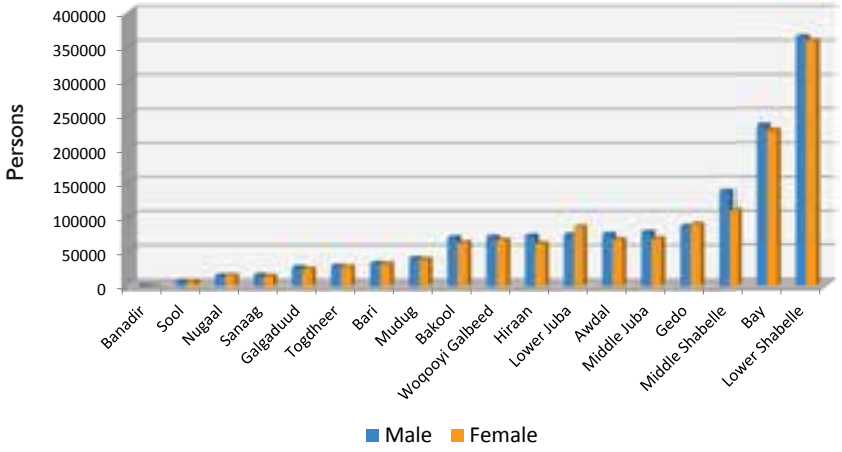
Figure 2.6 shows that 50.7 percent (6,244,765) of the total population comprised males and 49.3 percent (6,072,130) were female (Table A3 in Annex A). A similar pattern of more men than women was observed in rural areas (Table A5 in Annex A). In urban areas, the number of females was slightly higher than that of males (Table A4 in Annex A). In the nomadic population, there were more males at 52.2 percent in comparison to women at 47.8 percent.

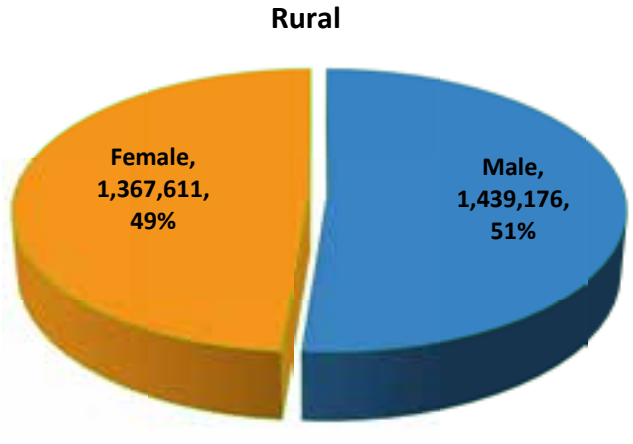
As seen in Figure 2.7 (and Table A5 in Annex A), the male population in the rural areas of Middle Shabelle and Hiraan was significantly high compared to the female population. However, in the rural areas of Nugaal, Gedo and Lower Juba, there were more women than men. It can be noted that in some developing countries men leave their families behind in rural areas to seek employment in urban areas. This is a trend observed in several countries with similar contexts. In the urban areas of Awdal, Sool, Hiraan, Bakool, Gedo and Middle Juba, men outnumber women.

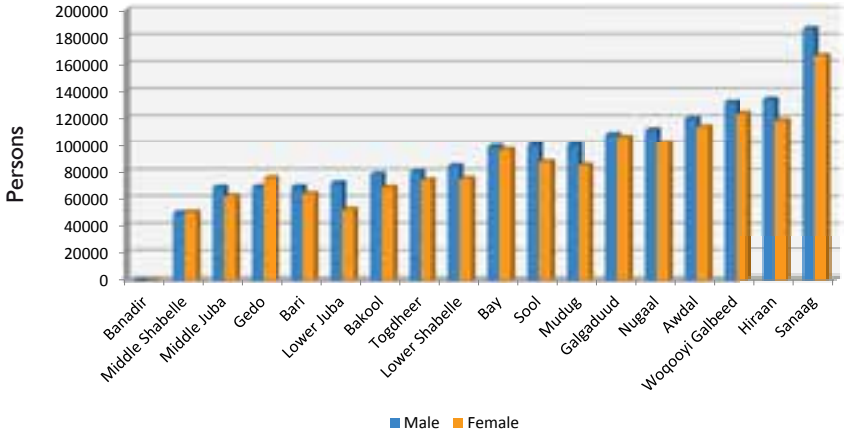
Figure 2.7: Urban, rural, nomadic and internally displaced population by region and sex

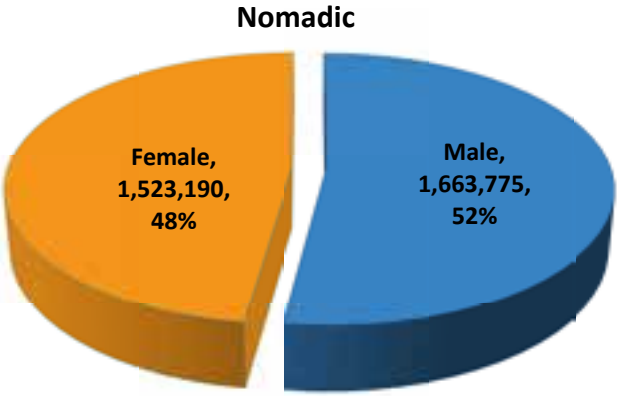


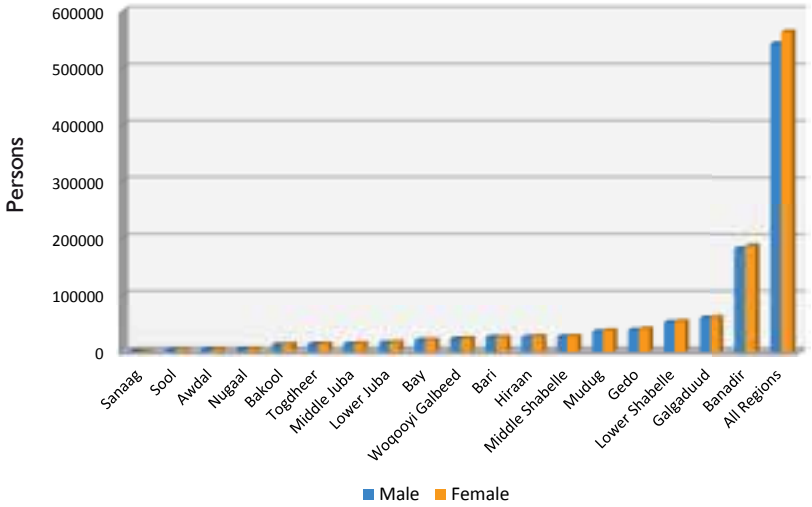


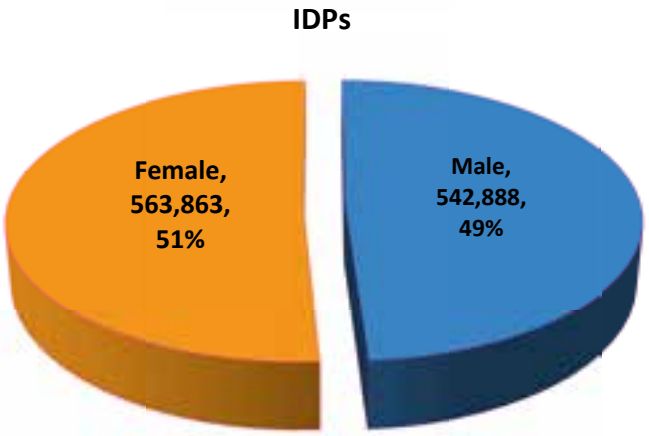

Persons
400000
350000
300000
250000
200000
150000
100000
50000
0
Banadir
Sool
Nugaal
Sanaag
Galgaduud
Togdheer
Bari
Mudug
Bakool
Woqooyi Galbeed
Hiraan
Lower Juba
Awdal
Middle Juba
Gedo
Middle Shabelle
Bay
Lower Shabelle
Male
Female


Rural
Female, 1,367,611, 49%
Male, 1,439,176, 51%


Persons
200000
180000
160000
140000
120000
100000
80000
60000
40000
20000
0
Banadir
Middle Shabelle
Middle Juba
Gedo
Bari
Lower Juba
Bakool
Togdheer
Lower Shabelle
Bay
Sool
Mudug
Galgaduud
Nugaal
Awdal
Woqooyi Galbeed
Hiraan
Sanaag
Male
Female


Nomadic
Female, 1,523,190, 48%
Male, 1,663,775, 52%


Persons
600000
500000
400000
300000
200000
100000
0
Sanaag
Sool
Awdal
Nugaal
Bakool
Togdheer
Middle Juba
Lower Juba
Bay
Woqooyi Galbeed
Bari
Hiraan
Middle Shabelle
Mudug
Gedo
Lower Shabelle
Galgaduud
Banadir
All Regions
Male
Female


IDPs
Female, 563,863, 51%
Male, 542,888, 49%

2.2.2 AGE AND SEX DISTRIBUTION

By studying the trends of ageing in a population and making comparisons in characteristics between various age brackets in the regions, the Somali authorities and humanitarian and development agencies can make decisions, shape programmes and deliver social services to suit Somalis of different age groups.

The age-sex structure of a population is usually depicted graphically in the form of a 'population pyramid' (shown in Figure 2.8). It is determined by the effects of past fertility and mortality rates and migration.

Just under half of the population is between 10 and 29 years old

Although data on age is very useful, it is usually a challenge to obtain reliable data on age in developing countries – and Somali communities are not an exception. This is mainly due to high illiteracy, which limits individuals' awareness and capacity to record their children's and their own ages. Moreover, the lack of a complete and vital registration system has a negative impact on the quality of information on age. To address this problem, the PESS team used a 'calendar of historical events and milestones' to assist respondents and enumerators in estimating people's ages where necessary. This report was therefore in a position to focus on the age and sex composition of the population.

Figure 2.8 (and Table A8 in Annex A) presents the age breakdown by sex for the total population. Most of the Somali population is young according to the information gathered. Just under half (45.6 percent) of the population is less than 15 years old, and three-quarters (75 percent) of the population is under 30 years. Various assumptions can be made according to these findings. For example, when a country's population is young, the authorities and their partners should tap into this cohort of the population to avoid missed opportunities.

Figure 2.8: Total population by age group and sex

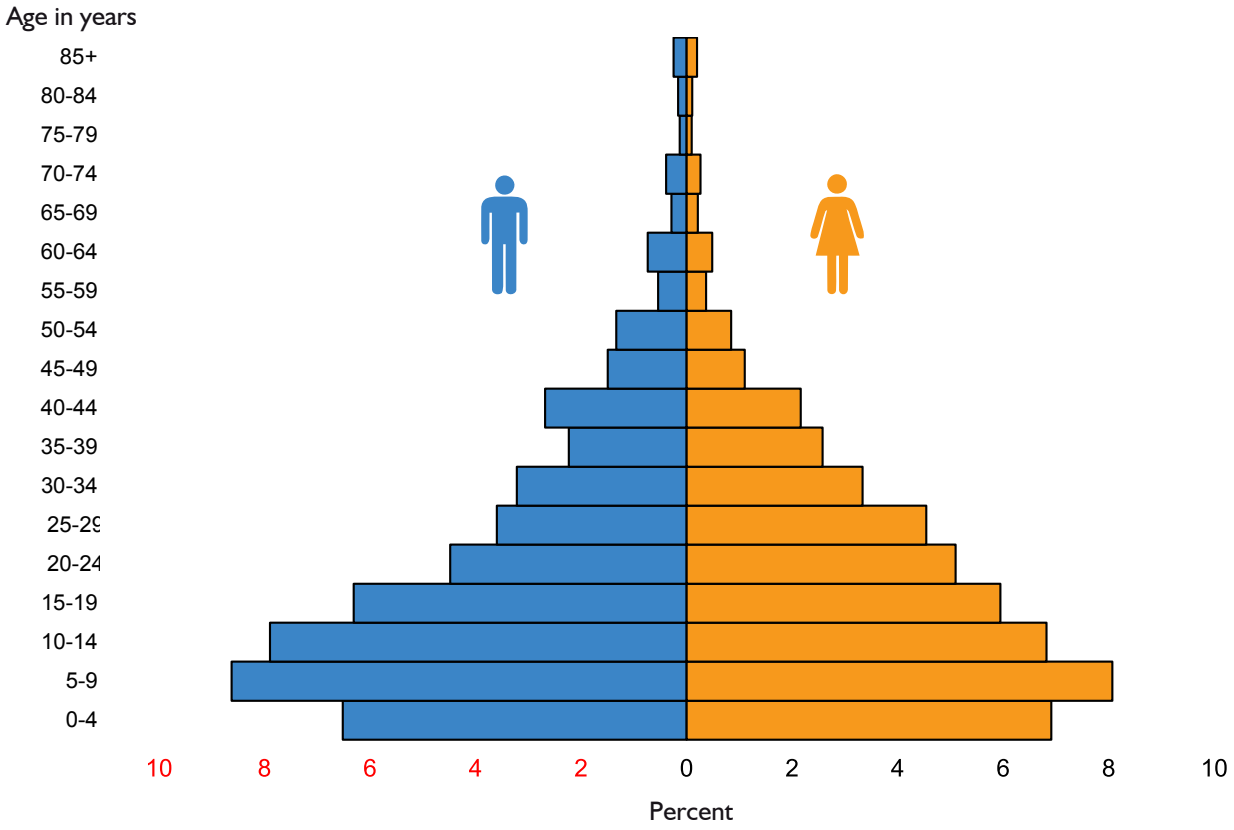
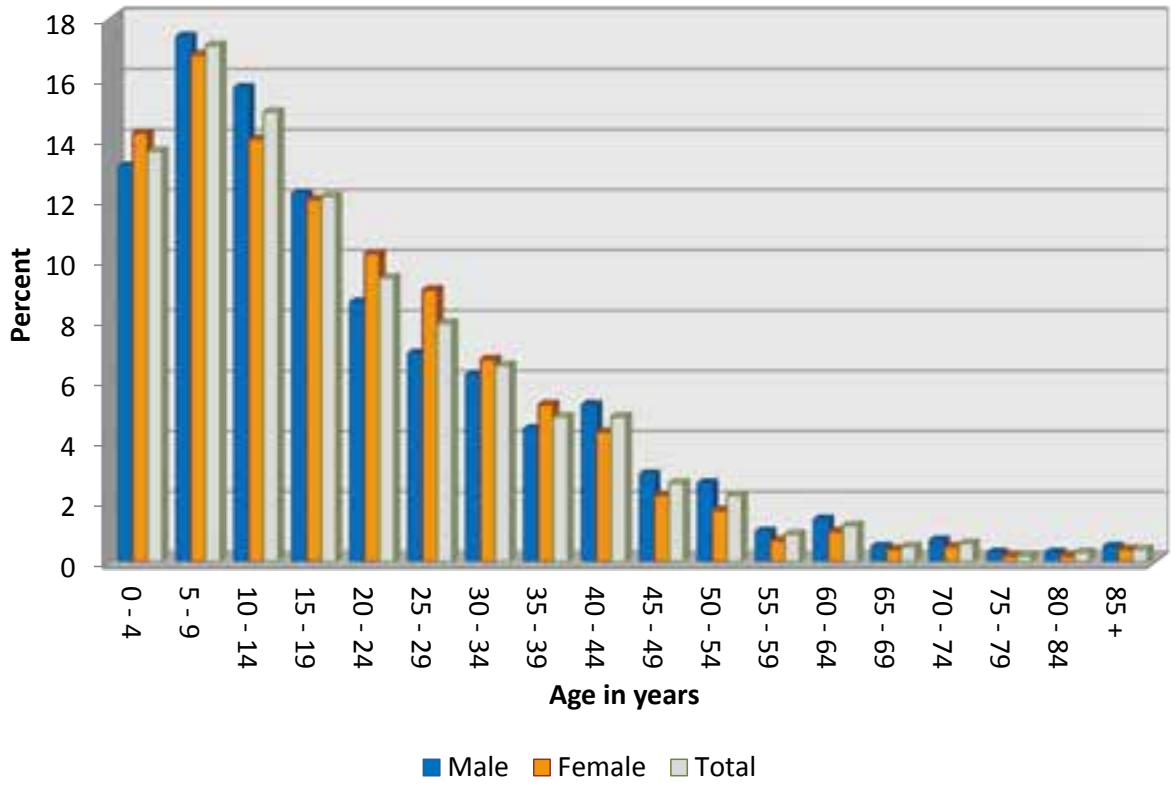


Figure 2.9 presents the distribution of age group by sex in percentages. The distribution shows high percentages in the younger ages. As the population gets older, a decrease in percentage is seen. Due to the high number of deaths in the older ages, the number of people tends to decrease fast. In general, there was a decline in population as Somalis aged, with the exception of the population covering under-fours, which is lower than the 5-9 and 10-14 range. This could be attributed to under-reporting of the population within the age group 0-4 years.

Figure 2.9: Age distribution by sex in percentages



As the population gets older, in general, a decrease in percentage is seen

As is the case in other developing countries, the Somali population is experiencing a youth bulge because the population is growing relatively fast; the growth rate can currently be estimated at around 2.8 percent. This implies that women in the reproductive age are contributing to the high percentage of the young population. This explains why despite the assumed low reporting of the numbers of children in the 0-4 age group, they are still high compared to numbers in the 20-24 age groups. Nevertheless, Figures 2.8 and 2.9 show a relatively lower proportion of children under the age of of five.

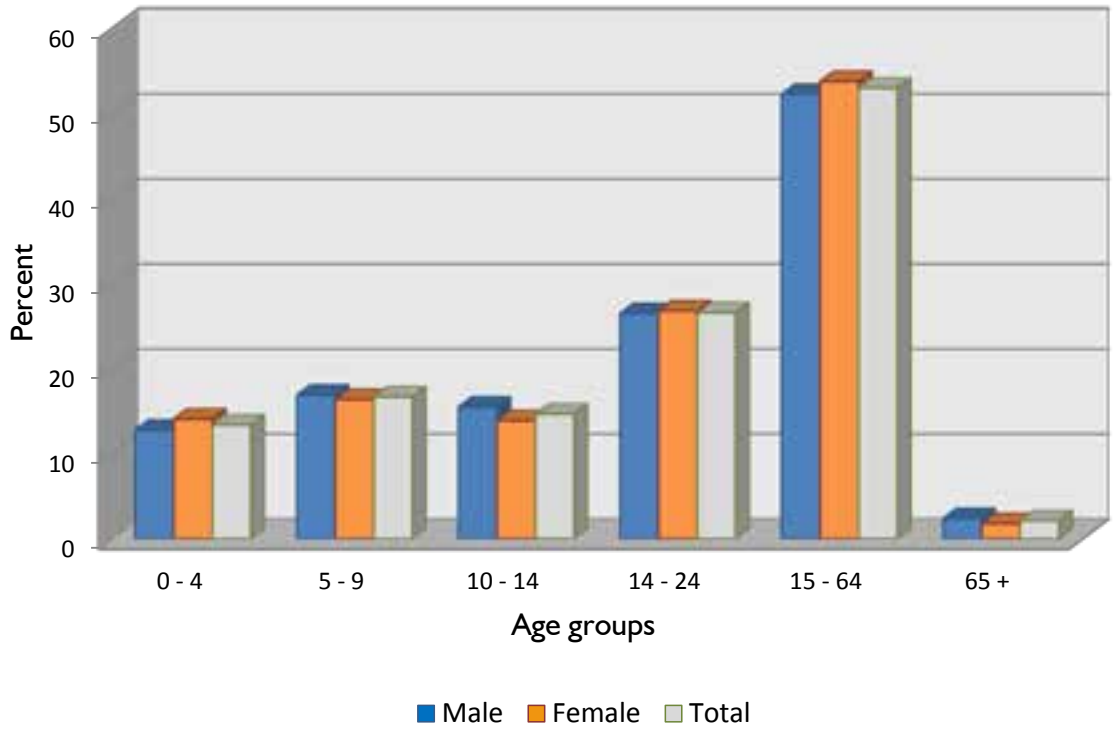
2.2.3 POPULATION DISTRIBUTION BY BROAD AGE GROUPS

Figure 2.10 (Table A9 in Annex A) shows that 45.6 percent (5,618,784) of the population was below the age of 15 years, which indicates a young population. The population aged 15-64 years comprised just above half (52.3 percent) of the total population. Somalis aged 65 and above made up only about 2 percent of the population.

A comparison between males and females shows minimal differences with the exception of the age groups 0-4 years, which had more females (14.2 percent) than males (13.1 percent) and 15-64 years with 53.1 percent females and 51.5 percent males. In the remaining age groups, there were relatively more males than females.

45.6 percent of the population was below the age of 15 years

Figure 2.10: Population by broad age groups and sex in percentages



2.2.4 MEAN AND MEDIAN AGES OF THE POPULATION

The mean and median ages of the Somali population confirm the youthfulness of the population, as observed in the age distribution. Generally, there are no significant differences between the mean ages of the males and females. However, the mean age for the males is consistently higher than that for females by a year in the nomadic, rural and IDP populations. The youngest mean ages are observed in both males and females in IDP camps. The mean ages of the nomadic, rural and urban populations are almost identical at 21, 20, and 21 years, respectively. On the other hand, the IDP population is the youngest, with a mean age of 18 years. Likewise, the median age for the IDPs is lowest at 13 years. Among the nomadic and urban populations, the median ages are 17, while in the rural areas, the median age is 16.

Table 2.2: Mean and median ages

	Male		Female		Total	
	Mean	Median	Mean	Median	Mean	Median
Nomadic	21	17	20	17	21	17
Rural	20	15	19	16	20	16
Urban	21	17	21	18	21	17
IDPs	19	13	18	14	18	13

2.2.5 PERCENTAGE OF POPULATION IN SELECTED AGE GROUPS FOR SELECTED COUNTRIES

The population aged 0 to 14 years accounts for 45.6 percent of the total population of Somalia in 2014 according to the Population Estimation Survey. From 1985 to date, there has been a minimum change in trend of the population of this age group.

Table 2.3: Percentage of population aged 0-14 years by selected countries

	Year							
Country	***1980**	***1985**	***1990**	***1995**	***2000**	***2005**	***2010**	**2014**
Central African Republic	42.25	42.36	43.28	42.77	42.29	41.86	40.65	
Democratic Republic of the Congo	44.6	44.99	45.53	46.28	46.45	46.23	45.46	
Djibouti	46.51	44.92	44.96	43.46	41.38	37.26	34.14	
Eritrea	46.28	46.16	46.54	49.54	47.02	43.52	43.02	
Ethiopia	45.09	46.13	46.3	46.6	46.57	46.21	44.43	
Kenya	49.97	49.97	48.97	46.4	44.16	42.77	42.57	
Liberia	44.92	45.38	45.06	44.03	43.23	43.32	43.35	
Rwanda	48.01	49.63	49.78	43.25	46.56	44.24	44.69	
Somalia	**43.72**	**44.07**	**44.88**	**45.87**	**47.17**	**47.72**	**47.69**	**45.6**
South Sudan	44.49	44.17	44.23	44.51	44.7	44.04	42.84	
Sudan	46.96	46.5	45.46	44.47	43.73	43.21	42.05	
Uganda	47.42	47.57	47.96	48.73	49.25	49.35	48.86	
Tanzania	46.54	46.37	45.99	45.31	44.78	44.63	44.84	
Zambia	47.4	46.64	45.9	45.51	45.73	46.72	46.91	
Zimbabwe	48.93	47.92	46.09	44.38	42.16	41.48	41.23	

**Source: https://data.un.org*

The population aged 15 to 64 years, which falls under the global definition of the labour force, accounts for 52.3 percent of the total population of Somalia. However, the findings of the Population Estimation Survey show that the current estimates for this age group are similar to the pre-war estimates of 1990.

Table 2.4: Percentage of population aged15-64 years by selected countries

	Year							
Country	***1980**	***1985**	***1990**	***1995**	***2000**	***2005**	***2010**	**2014**
Central African Republic	53.62	53.61	52.67	53.2	53.72	54.17	55.46	
Democratic Republic of the Congo	52.51	52.1	51.57	50.84	50.72	50.95	51.7	
Djibouti	51.14	52.56	52.45	53.77	55.59	59.39	62.17	
Eritrea	52.09	52.24	51.86	48.79	51.16	54.52	54.86	
Ethiopia	51.72	50.86	50.55	50.32	50.34	50.68	52.27	
Kenya	47	47.19	48.32	50.9	53.08	54.51	54.82	
Liberia	52.44	51.84	51.99	52.95	53.67	53.66	53.58	
Rwanda	49.64	48.22	48.01	54.52	50.48	53.25	53.02	
Somalia	**52.99**	**52.64**	**51.91**	**51.07**	**49.89**	**49.38**	**49.49**	**52.3**
South Sudan	52.92	53.17	53.03	52.62	52.26	52.75	53.76	
Sudan	50.09	50.57	51.6	52.58	53.29	53.76	54.8	
Uganda	49.95	49.78	49.37	48.58	48.06	48.15	48.69	
Tanzania	50.84	50.96	51.29	51.9	52.34	52.37	52.05	
Zambia	49.86	50.59	51.31	51.7	51.53	50.56	50.43	
Zimbabwe	48.1	49.08	50.93	52.45	54.46	54.84	54.78	

*Source: https://data.un.org

2.3 NUMBER OF HOUSEHOLDS AND HOUSEHOLD SIZES

At the time of the survey, there were an estimated 2,076,677 households in the 18 pre-war regions. When mapped against the population figures, it can be estimated that the overall size of a household was about 5.9 persons per household.

Figure 2.11: Household distribution by region

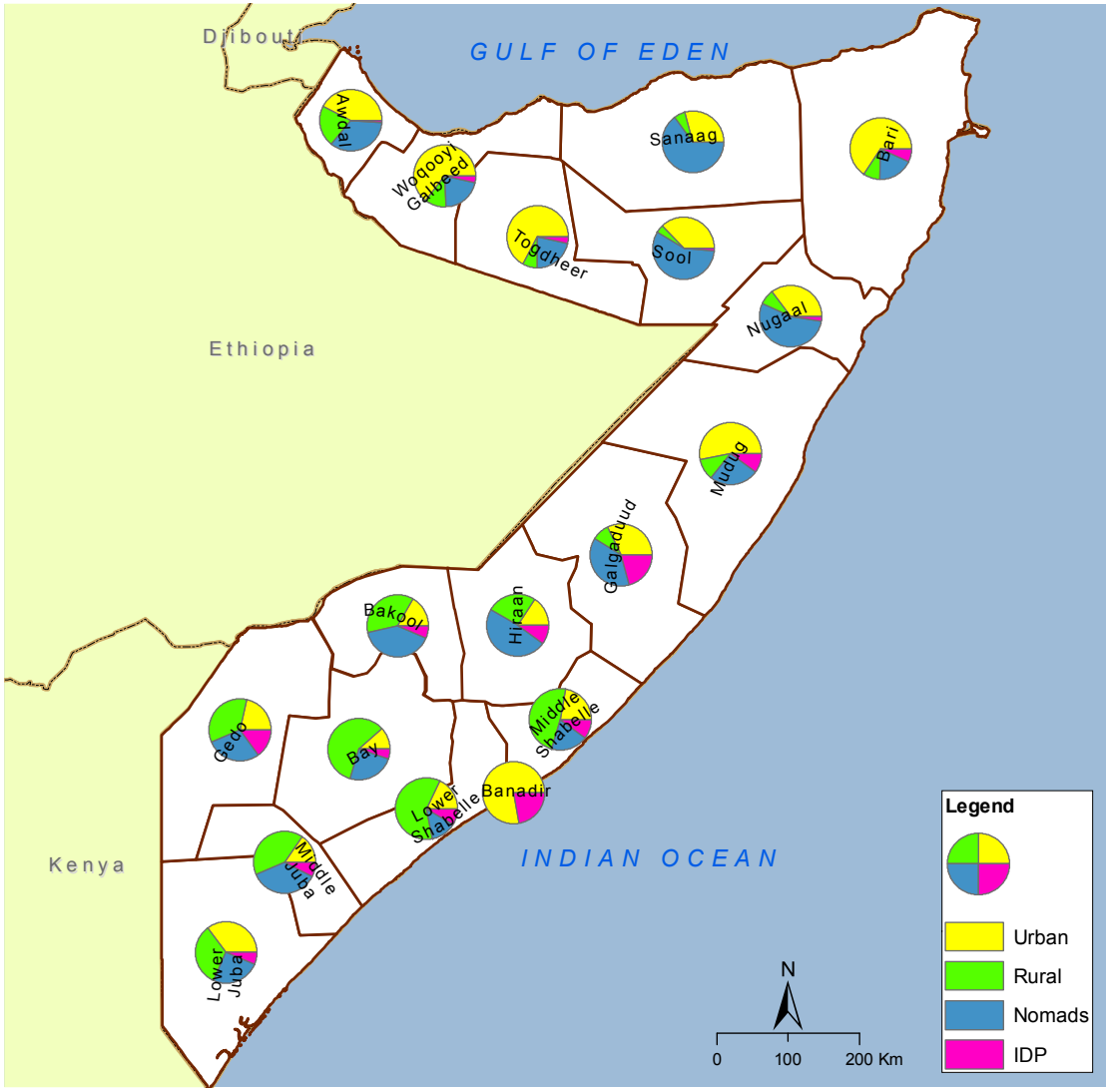
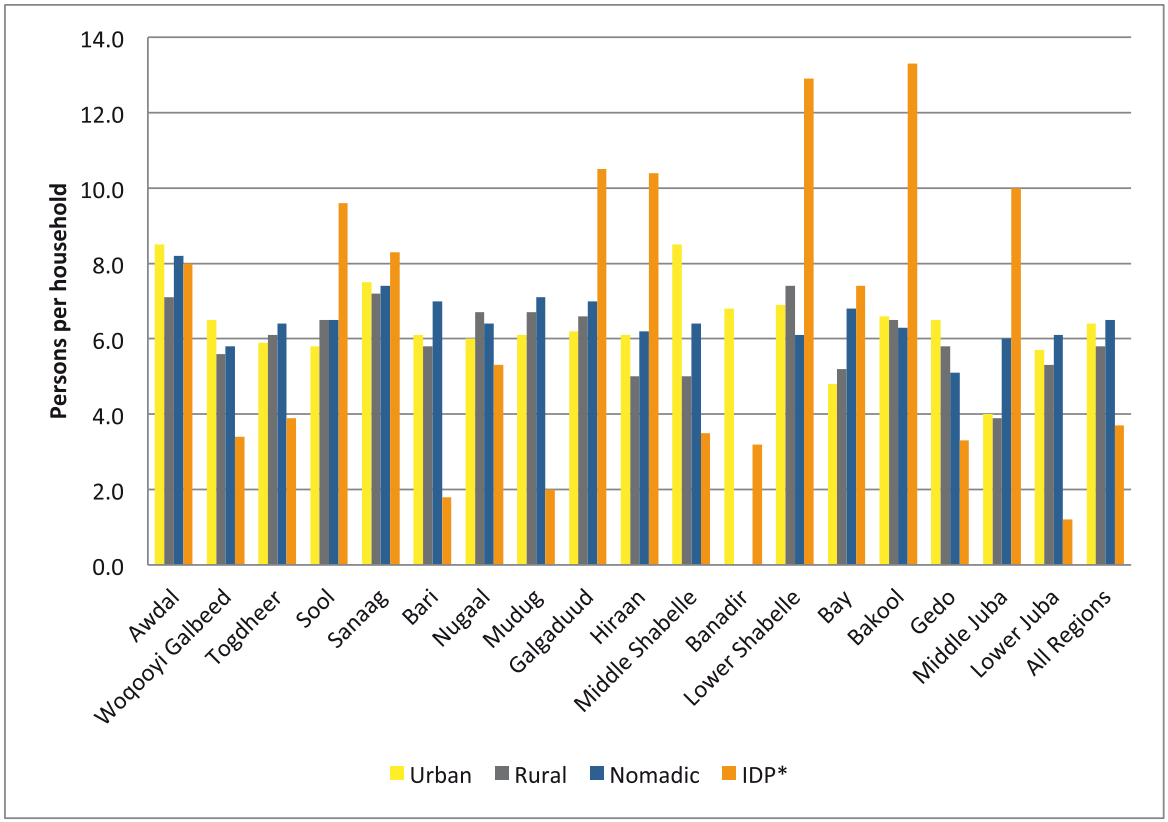


Figure 2.11 and Table A10 in Annex A present the number of households by region for the urban, rural, nomadic and internally displaced population. The highest number of households was recorded in Banadir (303,021) followed by Woqooyi Galbeed (205,026).

Figure 2.12 and Table A11 in Annex A show the variations in average household sizes by region for the rural, urban, nomadic. Excluding IDPs the largest average household size of 8.5 persons in urban areas was observed in Middle Shabelle and Awdal, with the smallest being in Middle Juba where the average household size was 4 persons. In the rural areas, Lower Shabelle had the largest household size of 7.4 persons, while Middle Juba had the smallest average household size at 3.9 members. The average houshold size for IDPs as depicited in the figure below is subject for further analysis.

Figure 2.12: Household size by region for urban, rural and nomadic population



Source: Based on data from UNHCR 2014

2.4 SAMPLING ERRORS

This section explains what the sampling errors of the survey are and how they were calculated.

Sampling errors give an indication of the reliability of the survey results. In calculating the sampling/standard errors, a software package called 'WESVAR' was used. WESVAR uses the replication method of 'Jack-knife technique'. A set of replicate weights were computed for each selected replicate so that each one represented the same population of the full sample.

The calculation of standard errors took into account the complexity of the sample design that generated the data.

The calculation of standard errors took into account the complexity of the sample design that generated the data. In this case it was a cluster-stratified sample design. The sampling error information presented in Tables 2.5, 2.6 and 2.7 are in three different forms, namely:

i. Absolute value standard errors

ii. Confidence intervals

iii. Relative standard errors (coefficient of variations)

Absolute standard errors relate to the PESS estimates of population size. In this preliminary report, the most important characteristic is the population size; therefore the column with the title 'Estimate' in Tables 2.5, 2.6 and 2.7 contains estimates pertaining to the population size. With regard to confidence intervals, the confidence level of 95 percent implies a margin of error of 5 percent. It is worth mentioning that this is a common level used in interpreting the reliability of the results from large-scale household surveys.

Tables 2.5, 2.6 and 2.7 show the sampling errors for the urban, rural and nomadic population. The internally displaced population data from UNHCR was based on a complete count therefore the data has no need for sampling errors.

2.4.1 ESTIMATED POPULATION IN URBAN AREAS

Table 2.5 shows standard errors of the population estimates for the urban domain. The estimated

total population of the urban areas was 5,216,392, the standard error being 60,401; the confidence interval ranged between 5,097,838 and 5,334,945.The overall coefficient of variation is relatively low at 1.158 percent. In general, the urban population estimates are reliable, considering the low levels of standard errors such as the coefficient of variation.

The range of coefficient of variation values among regions is from 1.776 to 13. 439 which is relatively low, below 20 percent.

Table 2.5: Sampling errors for the urban population

REGION	SEX	ESTIMATE	STDERROR	LOWER95 (%)	UPPER95 (%)	CV (%)
Awdal	Male	149,030	15,847	117,926	180,134	10.633
Awdal	Female	138,791	12,721	113,823	163,759	9.165
Awdal	Total	287,821	28,446	231,988	343,654	9.883
Woqooyi Galbeed	Male	393,042	6,982	379,337	406,746	1.776
Woqooyi Galbeed	Female	409,698	7,573	394,834	424,563	1.849
Woqooyi Galbeed	Total	802,740	14,277	774,717	830,763	1.779
Togdheer	Male	239,100	7,655	224,076	254,125	3.201
Togdheer	Female	244,624	7,980	228,962	260,286	3.262
Togdheer	Total	483,724	15,371	453,555	513,893	3.178
Sool	Male	63,628	3,361	57,031	70,224	5.282
Sool	Female	57,365	2,660	52,145	62,586	4.637
Sool	Total	120,993	5,910	109,394	132,592	4.884
Sanaag	Male	80,286	8,491	63,620	96,952	10.576
Sanaag	Female	79,431	7,511	64,688	94,174	9.456
Sanaag	Total	159,717	15,814	128,678	190,756	9.901
Bari	Male	236,829	7,713	221,691	251,967	3.257
Bari	Female	234,956	7,747	219,750	250,162	3.297
Bari	Total	471,785	15,020	442,304	501,266	3.184
Nugaal	Male	68,300	2,499	63,396	73,204	3.658
Nugaal	Female	70,629	2,626	65,475	75,783	3.718
Nugaal	Total	138,929	4,829	129,451	148,407	3.476
Mudug	Male	188,481	5,123	178,427	198,535	2.718
Mudug	Female	193,012	5,249	182,710	203,314	2.719
Mudug	Total	381,493	10,047	361,774	401,212	2.633
Galgaduud	Male	90,894	3,191	84,631	97,158	3.511
Galgaduud	Female	92,659	3,130	86,516	98,802	3.378
Galgaduud	Total	183,553	5,989	171,798	195,308	3.263

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Hiraan	Male	44,045	2,882	38,389	49,701	6.543
Hiraan	Female	37,334	1,380	34,626	40,042	3.695
Hiraan	Total	81,379	3,810	73,901	88,857	4.682
Middle Shabelle	Male	56,104	3,824	48,598	63,610	6.816
Middle Shabelle	Female	58,244	3,645	51,091	65,398	6.257
Middle Shabelle	Total	114,348	7,408	99,808	128,888	6.478
Banadir	Male	631,565	17,098	598,005	665,125	2.707
Banadir	Female	649,374	17,467	615,090	683,658	2.69
Banadir	Total	1,280,939	34,321	1,213,575	1,348,303	2.679
Lower Shabelle	Male	104,904	9,161	86,922	122,885	8.733
Lower Shabelle	Female	110,848	8,561	94,045	127,652	7.723
Lower Shabelle	Total	215,752	17,606	181,195	250,309	8.161
Bay	Male	47,971	2,012	44,022	51,920	4.194
Bay	Female	45,075	1,635	41,866	48,283	3.627
Bay	Total	93,046	3,508	86,160	99,932	3.771
Bakool	Male	33,477	2,057	29,440	37,514	6.144
Bakool	Female	28,451	1,536	25,437	31,466	5.398
Bakool	Total	61,928	3,421	55,213	68,643	5.524
Gedo	Male	56,261	4,273	47,874	64,649	7.595
Gedo	Female	52,881	3,886	45,254	60,507	7.348
Gedo	Total	109,142	8,033	93,376	124,908	7.36
Middle Juba	Male	29,397	3,961	21,623	37,171	13.473
Middle Juba	Female	26,845	2,954	21,047	32,643	11.004
Middle Juba	Total	56,242	6,866	42,766	69,718	12.208
Lower Juba	Male	85,612	2,950	79,822	91,402	3.445
Lower Juba	Female	87,249	3,260	80,849	93,649	3.737
Lower Juba	Total	172,861	5,944	161,194	184,528	3.439
Total	Male	2,598,926	31,530	2,537,039	2,660,812	1.213
Total	Female	2,617,466	29,727	2,559,120	2,675,812	1.136
Grand total	**Total**	**5,216,392**	**60,401**	**5,097,838**	**5,334,945**	**1.158**

2.4.2 ESTIMATED POPULATION IN RURAL AREAS

Table 2.6 shows the grand total of the rural population is estimated as 2,806,787 with a standard error of 99,781. The lower limit of the confidence interval is 2,610,802 and the upper limit 3,002,777, and the coefficient of variation of 3.555 percent. The latter, although being higher than the coefficient of the estimated population of the urban areas, points to the fact that rural results are reliable. The coefficient of variation of 3.555 percent is relatively low.

Table 2.6: Sampling errors for the rural population

REGION	SEX	ESTIMATE	STDERROR	LOWER95 (%)	UPPER95 (%)	CV(%)
Awdal	Male	75,748	5,335	65,270	86,226	7.043
Awdal	Female	67,995	5,026	58,123	77,867	7.392
Awdal	Total	143,743	10,093	123,919	163,567	7.021
Woqooyi Galbeed	Male	71,700	7,613	56,747	86,653	10.618
Woqooyi Galbeed	Female	67,212	7,151	53,167	81,257	10.639
Woqooyi Galbeed	Total	138,912	14,663	110,113	167,711	10.555
Togdheer	Male	29,247	4,042	21,307	37,186	13.821
Togdheer	Female	28,109	4,059	20,137	36,081	14.439
Togdheer	Total	57,356	8,068	41,510	73,202	14.066
Sool	Male	7,021	1,176	4,711	9,331	16.753
Sool	Female	6,962	1,115	4,773	9,151	16.009
Sool	Total	13,983	2,282	9,500	18,466	16.323
Sanaag	Male	15,892	2,091	11,785	19,998	13.157
Sanaag	Female	14,912	1,793	11,391	18,434	12.023
Sanaag	Total	30,804	3,870	23,202	38,406	12.565
Bari	Male	33,162	2,586	28,083	38,242	7.798
Bari	Female	32,321	2,312	27,779	36,862	7.154
Bari	Total	65,483	4,854	55,949	75,017	7.413
Nugaal	Male	15,249	2,569	10,204	20,294	16.844
Nugaal	Female	15,798	2,948	10,008	21,588	18.659
Nugaal	Total	31,047	5,493	20,258	41,836	17.692
Mudug	Male	40,430	4,174	32,231	48,629	10.325

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Mudug	Female	39,322	3,920	31,622	47,022	9.97
Mudug	Total	79,752	8,057	63,927	95,577	10.103
Galgaduud	Male	27,211	4,296	18,774	35,648	15.786
Galgaduud	Female	24,878	3,718	17,575	32,181	14.946
Galgaduud	Total	52,089	7,986	36,403	67,775	15.332
Hiraan	Male	73,338	5,163	63,197	83,478	7.04
Hiraan	Female	62,199	4,417	53,524	70,874	7.101
Hiraan	Total	135,537	9,422	117,032	154,042	6.951
Middle Shabelle	Male	138,698	9,200	120,627	156,768	6.633
Middle Shabelle	Female	110,628	6,850	97,174	124,082	6.192
Middle Shabelle	Total	249,326	15,678	218,533	280,119	6.288
Lower Shabelle	Male	364,551	26,208	313,076	416,027	7.189
Lower Shabelle	Female	359,131	23,053	313,852	404,409	6.419
Lower Shabelle	Total	723,682	48,470	628,480	818,884	6.698
Bay	Male	235,354	9,135	217,411	253,297	3.881
Bay	Female	227,976	9,013	210,273	245,679	3.954
Bay	Total	463,330	17,680	428,603	498,057	3.816
Bakool	Male	70,614	2,519	65,666	75,561	3.567
Bakool	Female	63,436	2,939	57,665	69,208	4.632
Bakool	Total	134,050	5,105	124,023	144,077	3.808
Gedo	Male	87,295	35,285	17,990	156,600	40.421
Gedo	Female	90,447	41,530	8,877	172,017	45.916
Gedo	Total	177,742	76,808	26,880	328,604	43.213
Middle Juba	Male	78,644	9,378	60,225	97,063	11.924
Middle Juba	Female	69,795	9,783	50,581	89,009	14.016
Middle Juba	Total	148,439	19,086	110,953	185,926	12.857
Lower Juba	Male	75,021	5,199	64,810	85,233	6.93
Lower Juba	Female	86,490	5,132	76,409	96,571	5.934
Lower Juba	Total	161,511	9,242	143,359	179,663	5.722
Total	Male	1,439,174	49,047	1,342,839	1,535,509	3.408
Total	Female	1,367,612	51,721	1,266,026	1,469,199	3.782
Grand total	**Total**	**2,806,787**	**99,781**	**2,610,802**	**3,002,770**	**3.555**

2.4.3 ESTIMATED POPULATION OF NOMADS

Table 2.7 shows the grand total of the nomadic population to be 3,186,965. The standard error is 198,911; the confidence interval ranges from 2,795,982 to 3,577,946 and the coefficient of variation of 6.241 percent. Overall, the results are therefore reliable. However, standard errors are high compared to the standard errors for overall population of rural and urban domains. Similarly, the coefficient of variations in a number of regions is above 20 percent. These regions include Bari, Nugaal, Mudug, Hiraan, Middle Shabelle, and Gedo. High levels of standard errors in some of these regions may be due to the relatively small water point samples. Notwithstanding the above, it can be noted that the overall standard errors are within acceptable standard errors, for example, the overall coefficient of variation is 6.123 percent, well below the 20 percent threshold.

Table 2.7 Sampling errors for the nomadic population

REGION	SEX	ESTIMATE	STDERROR	LOWER95 (%)	UPPER95 (%)	CV (%)
Awdal	Male	119,757	17,795	84,778	154,736	14.86
Awdal	Female	113,952	16,555	81,411	146,493	14.528
Awdal	Total	233,709	34,231	166,425	300,993	14.647
Woqooyi Galbeed	Male	132,074	10,473	111,488	152,661	7.93
Woqooyi Galbeed	Female	123,686	10,092	103,849	143,524	8.159
Woqooyi Galbeed	Total	255,761	20,395	215,673	295,849	7.974
Togdheer	Male	80,253	7,858	64,806	95,699	9.792
Togdheer	Female	74,271	7,266	59,989	88,552	9.783
Togdheer	Total	154,523	15,053	124,934	184,113	9.742
Sool	Male	100,005	7,558	85,149	114,860	7.557
Sool	Female	87,627	6,676	74,505	100,750	7.619
Sool	Total	187,632	14,150	159,819	215,444	7.541
Sanaag	Male	186,401	30,213	127,013	245,788	16.209
Sanaag	Female	166,291	28,385	110,496	222,086	17.07
Sanaag	Total	352,692	58,380	237,939	467,445	16.553
Bari	Male	69,128	23,503	22,930	115,326	33.999

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Bari	Female	64,107	21,287	22,266	105,948	33.205
Bari	Total	133,235	44,585	45,597	220,872	33.464
Nugaal	Male	111,469	23,168	65,929	157,009	20.785
Nugaal	Female	101,758	21,843	58,823	144,692	21.465
Nugaal	Total	213,227	44,789	125,188	301,265	21.005
Mudug	Male	100,423	20,648	59,837	141,009	20.561
Mudug	Female	85,313	18,050	49,835	120,792	21.157
Mudug	Total	185,736	38,460	110,138	261,334	20.707
Galgaduud	Male	108,020	15,623	77,311	138,730	14.463
Galgaduud	Female	106,004	17,028	72,533	139,475	16.064
Galgaduud	Total	214,024	32,614	149,918	278,130	15.238
Hiraan	Male	134,102	36,245	62,858	205,345	27.028
Hiraan	Female	118,508	33,509	52,643	184,373	28.275
Hiraan	Total	252,609	69,674	115,657	389,562	27.582
Middle Shabelle	Male	50,000	27,347	-3,754	103,753	54.694
Middle Shabelle	Female	50,402	27,297	-3,255	104,058	54.16
Middle Shabelle	Total	100,401	54,634	-6,989	207,792	54.416
Lower Shabelle	Male	84,679	6,458	71,986	97,372	7.626
Lower Shabelle	Female	75,136	5,539	64,248	86,024	7.372
Lower Shabelle	Total	159,815	11,850	136,522	183,108	7.415
Bay	Male	99,072	6,066	87,149	110,995	6.123
Bay	Female	96,914	6,241	84,646	109,182	6.44
Bay	Total	195,986	12,211	171,983	219,989	6.231
Bakool	Male	78,515	6,168	66,392	90,638	7.855
Bakool	Female	68,733	5,729	57,471	79,994	8.336
Bakool	Total	147,248	11,505	124,634	169,862	7.813
Gedo	Male	69,095	65,876	-60,391	198,582	95.34
Gedo	Female	75,697	72,421	-66,654	218,049	95.672

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Gedo	Total	144,793	138,296	-127,045	416,630	95.514
Middle Juba	Male	68,798	-	.	.	0
Middle Juba	Female	62,442	-	62,442	62,442	0
Middle Juba	Total	131,240	-	.	.	0
Lower Juba	Male	71,993	8,741	54,811	89,174	12.142
Lower Juba	Female	52,342	6,231	40,094	64,590	11.905
Lower Juba	Total	124,335	14,791	95,260	153,409	11.896
Total	Male	1,663,783	99,054	1,469,080	1,858,486	5.954
Total	Female	1,523,182	100,394	1,325,845	1,720,518	6.591
Grand total	**Total**	**3,186,965**	**198,911**	**2,795,982**	**3,577,946**	**6.241**



PHOTO: ©FAO

3 Survey methodology

This chapter describes the processes used to carry out the survey.

A census is the complete canvassing of the entire population in a country. The accuracy of a census depends on a very high proposition of the population, almost 95% within the targeted area, being surveyed. This is currently not feasible on a national scale because it requires a massive operation and is more costly than a sample survey. Additionally, the prevailing security conditions in some areas makes it difficult to undertake a census. Under the prevailing circumstances, the Population Estimation Survey followed the 'sample survey methodology' and ensured the representation of all categories of sizes for settlements, camps and water points to avoid under-representation.

3.1 SAMPLING FRAMES

Within the 18 pre-war regions, different areas—including urban and rural areas, camps for internally displaced persons, and water points visited by nomads—were randomly selected to be included in the survey. Survey areas, or groups of households within these regions, were then randomly selected to represent the entire population. All households in selected survey areas were interviewed. This method ensured that respondents accurately represented the entire population.

The sampling frames comprised defined clusters of households, for the population in the rural and urban areas, as well as for IDPs.

In scientific terms, these survey areas are called sampling frames. Sampling frames are large sets of source materials from which a sample is selected. It was clear from the beginning of the project that well-selected frames would go a long way to ensure accurate coverage of the population. The sampling frames comprised defined clusters of households, also known as primary sampling units (PSUs), for the population in the rural and urban areas, as well as for IDPs. The clusters were either demarcated or identified in the field with the help of maps and Global Positioning System technology where possible, and with easily recognisable boundaries such as roads, rivers and mountains. In the case of the nomadic populations, water points formed the frames.

3.1.1 URBAN FRAME

To map the urban areas, towns were delineated into primary sampling units, or clearly demarcated town blocks, which coincided with a known administrative subdivision or part of a town where possible. The average size of such a town block was 100 households, but throughout this study these ranged between 50 to 149 households.

To identify the administrative boundaries in urban areas, maps and satellite images were used. The results of the mapping exercise were validated to ensure their accuracy.

3.1.2 RURAL FRAME

In rural areas, the clusters used were usually settlements and the same measure of size was adopted as in the urban areas, that is, between 50 to 149 households. Settlements with 150 or more households were split into segments of approximately equal size. See section 3.2.6 on the procedures followed for segmenting.

The sampling frame for the rural areas were based on the updated master list of settlements/ primary sampling units available from the 2005/2006 UNDP settlement census. The list was verified through field visits. The number of households in each settlement in the accessible areas was established through ground counts. Due to the lack of access resulting from a challenging security situation in the south and central regions, PESS relied heavily on information obtained from clan elders who hold the institutional memory for these areas, and validated this information using satellite imagery. This helped identify the number of households in the settlements.

To capture the nomadic population, all water points used by the nomads during the dry season were listed

3.1.3 INTERNALLY DISPLACED PERSONS' FRAME

The number of internally displaced persons consists of: (i) displaced people living in households among the sedentary and nomadic population, and (ii) those who live in IDP camps. The substantive frame for the internally displaced people staying in IDP camps was a list of 107 IDP camps obtained from UNHCR. Almost all IDP camps on this list consisted of 150 households or more. To establish survey areas within these IDP camps, the same methodology for rural areas was used.

3.1.4 WATER POINTS FRAME

To capture the nomadic population, all water points used by the nomads during the dry season were listed. The baseline used for this exercise goes back to the lists of water points prepared by UNDP in 2005 and 2006 in preparation for a settlement census, and an updated list of water points prepared by the UN Food and Agriculture Organization/Somalia Water and Land Information Management (FAO SWALIM). The final updated list was then taken as the sampling frame for the nomadic population. In order to avoid double counting settled agro-pastoralists at

the water points, the survey team verified that all water points on the list were used by at least some pure nomadic households. The lists of water points were also reviewed and validated to eliminate non-functional water points. The sampling frame for the nomadic population in each region was also stratified by the type of water point such as dug wells, boreholes, or dams prior to sample selection.

3.2 STRATIFICATION, SAMPLE DESIGN AND SELECTION

3.2.1 STRATIFICATION

Stratification describes the process of grouping members of the population into relatively homogeneous or similar subgroups before creating samples to use for interviews. It is common to adopt some form of stratification in order to improve efficiency of the sample design when designing household or other kinds of surveys. Strata are subgroups within the entire population that are thought to be relatively homogeneous or have common traits. The differences within a stratum are relatively small compared to the variation between the entire strata (in this case, the variation within regions, for instance, is relatively small compared to variation across all the sampled households). The first level of stratification was the geographic areas of the 18 pre-war regions. These regions became the sampling domain. This had great advantages because the regions as they were defined prior to the war were used as administrative entities, which made it easier to implement the PESS survey. Within each region, a second level of four substrata was created, namely: urban, rural, nomadic (water points) and IDP settlements. Finally, only for the nomadic population, a third level of stratification or grouping was carried out on the basis of the type of water point such as dug wells, which are shallow holes dug down into a water table usually using a shovel or backhoe, natural reservoirs, or boreholes amongst others (see Figure 3.3). This was done because of the different types of water features used by the nomadic population.

The first level of stratification was the geographic areas of the 18 pre-war regions.

3.2.2 SAMPLE DESIGN

An area stratified-cluster sample design was adopted for PESS. This means that the population was divided into groups according to the area they live in, as stated in section 3.2.1. The main strata, or groups, were the 18 pre-war regions. Stratification and sub-stratification facilitated efficient sample selection. This approach had the following advantages, among others:

a. Clustering reduces travel and other costs pertaining to data collection compared to the application of simple random sampling of households.

b. Enumeration of households only took place in selected primary sampling units, as opposed to covering all units in the sampling frame which would have been very expensive and difficult to manage in the field.

c. Stratification by regions was operationally convenient and economical.

d. Stratification made it possible to have crucial information on subgroups such as rural, urban, nomadic and internally displaced population estimates.

During the first stage, urban enumeration areas (EAs), IDP and rural settlements, and water points were selected. The overall samples were allocated to the regions proportionate to the size of the strata vis-a-vis the total observations in the frame. For the urban enumeration areas, the selection was based on probability proportional to size (PPS) taking into account the measures of size; in this case, the number of households listed during the field mapping phase before the main household survey was conducted.

For the water points it was not possible to establish fairly accurate measures of size, that is, the estimated number of nomadic households that would be using a given water point during the dry seasons. Therefore the selection of water points was based on Simple Random Sampling (SRS) with equal probability of selection of each of the sampling units, namely, the water points.

At the second stage, within each selected primary sampling unit (urban enumeration areas, IDP and rural settlements, including water points), all households and persons were enumerated. In the selected primary sampling units, all households were supposed to be enumerated. Thus, PESS adopted a one-stage cluster sample design because the random selection only occurred with respect to primary sampling units.

3.2.3 SAMPLE ALLOCATION TO REGIONS AND SUBSTRATA

The allocation of the sample sizes for the rural, urban, nomadic and IDP strata were proportionate to the number of primary sampling units (PSUs) in the respective frames, which are urban enumeration areas, IDP and rural settlements including water points. The sample was initially fixed at 2,500 PSUs. The total number of PSUs in the frames was 18,708. Sample

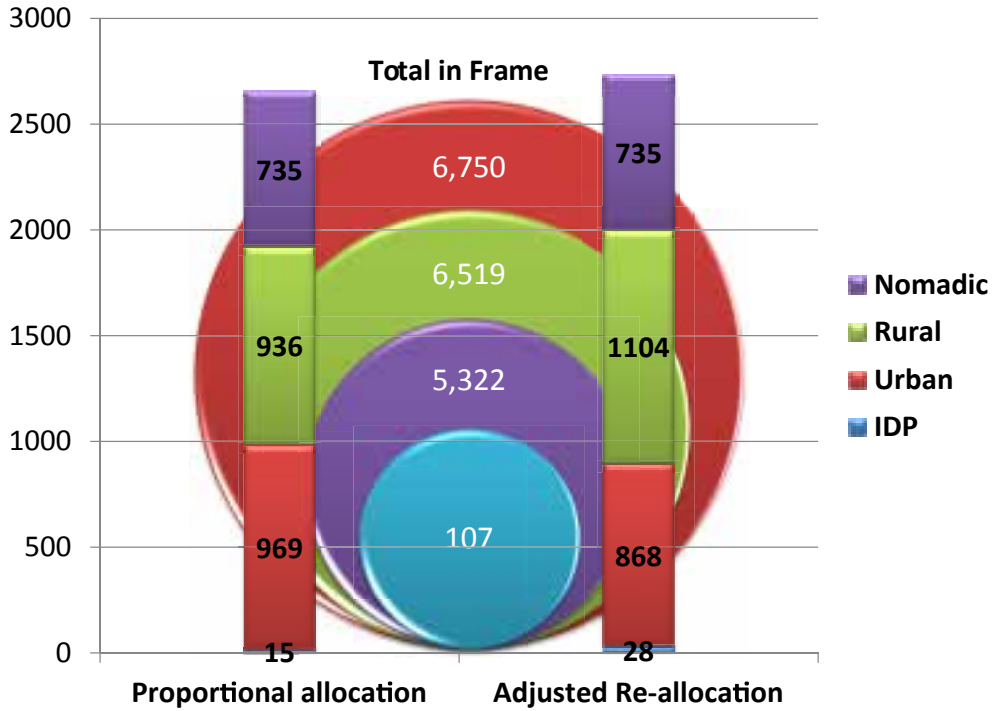
sizes were re-adjusted, however, to boost representation for regions that had a few PSUs in the initial allocation. Consequently, the allocation to the urban was adjusted to 868, the rural sedentary substrata was adjusted to 1,104, the nomadic to 735 and the IDPs to 28, resulting in 2,735 PSUs.

The size of the frame and the allocation of PSUs for the nomadic sample went through several stages. The frame originally consisted of 4,043 water points but after the inclusion of several hilos (riverbanks) and wars (natural reservoirs) in the south and central regions, the size of the frame became 5,332 water points out of which a simple random sample of about 14 percent was drawn.

Sample sizes were re-adjusted to boost representation for regions that had a few PSUs in the allocation

The distribution of the samples is provided in Figure 3.1. A more detailed final distribution of the sample by region and strata is provided in Annex B.

Figure 3.1: Final allocation of primary sampling units by the four strata



3.2.4 SAMPLE SELECTION OF PSUS IN RURAL, URBAN AND IDP AREAS: THE PROBABILITY PROPORTIONAL TO SIZE METHOD

As mentioned earlier, the selection of PSUs in the rural, urban and IDP strata was based on Probability Proportional to Size (PPS) using a systematic random selection procedure. The sample was drawn from a frame of urban EAs, rural and IDP settlements for each region and for each of the PSUs in the frame an estimated number of households was obtained. The number of households for each PSU was taken into account in a way that gave a lower probability of PSUs with fewer households of being included in the sample, and vice versa, as per the following formula for selecting settlements:

$$p_{hi} = \frac{n_h \times M_{hi}}{M_h}$$

Where:

p_{hi} = Probability of selection for the i^{th} sample settlement in stratum h

n_h = Number of sample settlements selected in stratum h

M_{hi} = Total number of households for the i^{th} sample settlement in stratum h

M_h = Total number of households in the frame for stratum h

The stratum h in the case of PESS could be the region, rural or urban area.

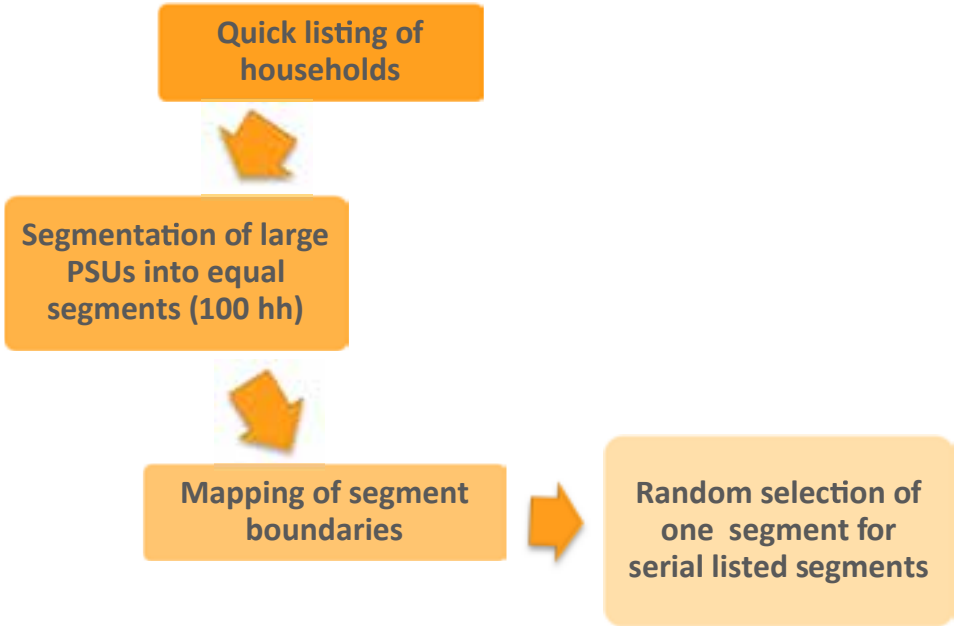
The essence of the above formula was that each settlement had its own probability of selection. Smaller PSUs had a lower probability of selection, but a larger sampling weight if selected because the weight is the reciprocal of the selection probability. This implies that the weighting, to the largest extent possible, ensured unbiased results since the sample values in each selected settlement were multiplied by their respective weights.

3.2.5 PROCEDURES FOLLOWED IN SELECTING SEGMENTS FROM LARGE SETTLEMENTS

Special procedures had to be followed for oversized or large settlements. These are settlements whose number of households exceeded 149 households. The problem of large settlements was formally solved through proper weighting after segmentation and selection of a segment.

Segmentation was only necessary in rural areas and in IDP settlements. In urban areas, towns were already divided into EAs of approximately 100 households before sample selection.

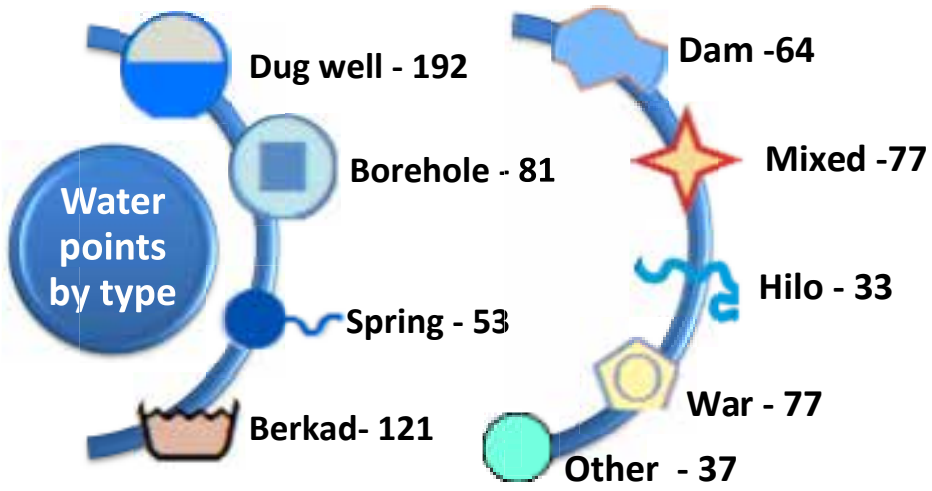
Figure 3.2: Steps followed in segmenting large rural settlements



3.2.6 STRATIFICATION OF NOMADIC WATER POINTS

Nine types of water points were identified for the sampling frame for nomadic communities. These are dug wells, boreholes, springs, berkads (man-made traditional water basins), dams, mixed-type water points, hilos (riverbanks), wars (natural reservoir) and 'others'. Each of these types of water points was treated as a substratum. This was based on the assumption that the water points of a particular type are more homogeneous than water points of another type, and would cater for the watering needs of nomads in a similar manner. For example, boreholes would not be expected to dry up during severe drought and hence would cater for a large proportion of the nomads compared to dug wells. Hence it was logical to stratify the water points to take advantage of their similarities to improve precision.

Figure 3.3: Types of water points



The distribution of the allocation of the sample to the nine substrata out of the entire water point frame for each of the regions is provided in Annex C.

3.2.7 SAMPLE SELECTION OF WATER POINTS

A 12-day interviewing period was used for each water point .

Within each region and substratum of the water points, the allocated number of water points were selected using the simple random sampling method (SRS). All the water points within a given type were numbered from the first (1st) to the last (nth) and a sample drawn using a systematic random approach. It is worth noting that each water point had the same probability of being selected, and by implication, also the same sampling weight, thus the inverse of the probability of selection.

As the Single Day Model was applied in the survey, the date for coverage of each sample water point was determined randomly using an Excel spreadsheet within an interval of 12 days. The essence of taking the 12-day period was to give all the nomads with different types of animals an equal chance of selection into the sample.

The animal with the longest predominating watering period is the camel which takes 12 days on average to water, which is why a 12-day interviewing period was used for each water point .

Figure 3.4: Livestock watering intervals

Livestock	Watering interval
	3-4 days
	2 Days
	12 Days

PHOTO: ©UNFPA/ROSE MAYIENDA

4 Data collection

This chapter describes how data was collected by the Population Estimation Survey. It briefly describes how survey staff were trained and the various stages of data collection.

The data collection covered the population living in urban, rural and nomadic areas (interviewed at water points during the peak of the long dry season), and in IDP settlements.

Households were primary observation units during the Population Estimation Survey. This means that data on the number of persons and each household's characteristics were collected at that level. Households and persons living in institutions such as hospitals, hotels, boarding school hostels, and guesthouses were not covered. Other persons excluded from the survey included those living in army and police barracks.

In most instances the head of a household responded to questions, and in his or her absence, the oldest family member from a household assisted with information. The questionnaire had a special section for the nomadic population. At water points, while gathering information from the nomadic population, the survey team took family members who came to draw water as household representatives.

In each area, the field organization was composed of the following cadre of personnel: Director, Director of Statistics, Deputy Director, Regional Coordinators, District Coordinators, Supervisors, supported by a Somali technical team composed of Statistical Director and experts from different fields to oversee that the work was implemented as planned in a smooth operational manner.

In most instances the head of a household responded to questions,

The field work was organized in the same hierarchical manner in all areas. The PESS Survey Director worked very closely with the Deputy Survey Director and the Director of a Government Statistical Department in implementing the survey operations including advocacy. Regional Coordinators were appointed for each of the 18 regions (see list of the PESS task force members in Annex D). For the larger regions, Assistant Regional Coordinators were appointed. Regional Coordinators were in charge of the Field Supervisors working in the region. Supervisors led survey teams consisting of household listing personnel, field editors and enumerators.

The survey teams always moved as a team from one enumeration area to another. In sedentary EAs, the listing and interviewing of households was carried out almost simultaneously with a supervisor assigning households to enumerators shortly after the listing personnel had completed the listing of households.

4.1 TRAINING OF THE FIELD STAFF

All the field staff who participated in the household survey were trained, as were the mapping teams. Firstly, the Training of Trainers took place: two people from each region were trained for four days by members of the UNFPA Technical Support Unit. These trainings covered survey design and how to organize logistics. The questionnaires were explained in great detail. The training also included a field exercise. The trainers then trained interviewers and supervisors who were also recruited locally from respective regions. In total, 4,500 Somali men and women were trained in basic mapping skills, data collection and data entry.

Additionally, several documents, including manuals, were produced to guide the training.

4,500 Somali men and women were trained in basic mapping skills, data collection and data entry.

Due to the unforeseen delay in conducting the nomadic survey to March 2014, a refresher training of trainers was conducted shortly before the survey teams went into the field to interview the nomadic population at the water points. During this training, the focus lay on the listing and screening of households visiting the water points. This is due to the fact that the main household survey questionnaire did not differ much for nomadic and sedentary populations. The staff for the nomadic survey were recruited from those who performed well in the survey in sedentary areas in November 2013, as far as possible.

4.2 PHASES OF DATA COLLECTION

The following were the main phases of data collection during the survey:

a. Cartographic field mapping.

b. Household listing prior to the interviewing of households in the sampled areas.

c. Administering of the questionnaire by enlisting information pertaining to each of the households and household members in the selected areas.

The field mapping phase began early in 2013 with the recruitment of a GIS-analyst and cartographer who trained trainers of field mapping teams.

Information collected during the mapping phase was (i) assigning a name and code to the

delineated area or settlement; (ii) indicating the number of households collected either via ground count in urban and in some rural areas, or information obtained from local authorities, or administrative records of internally displaced persons; and (iii) identifying the geo-coordinates (latitude/longitude) for the central point of the areas visited. Information was also collected about the type of rural settlement, and the type of and access to the water points and their relative location to the nearest settlement. Such information was intended to guide the subsequent survey design and preparations.

The mapping field exercise was meant to:

a. Produce the frame from which the sample would be drawn.

b. Assist in the planning for the main PESS household survey.

c. Collect information that could be used in combination with data from the sampled areas at a later stage to produce estimates of lower-level administrative domains such as districts.

d. Collect baseline information for geo-referenced population data.

During the listing phase of the survey, all households from clusters or enumeration areas that were included in the sample were listed. This exercise involved (i) identifying the exact boundaries of the primary sampling units; (ii) listing all housing structures; (iii) identifying dwelling units within the housing structure; and finally (iv) listing households within the dwelling units. For each household, initial information was collected such as the name of the head of household and the number of males and females who belonged to the household. The listing was undertaken shortly before the actual interviews took place.

Interview teams asked questions following structured questionnaires that were translated from English into Somali

The aim of the household interviewing phase was to interview all households in the selected EAs, settlements and those reported at the water points. The interview teams asked questions following structured questionnaires that were translated from English into Somali.

The survey in urban, rural and IDP areas took place in November 2013. Due to the onset of the rains, the survey among the nomadic population had to be postponed until the peak of the dry season. The survey at the water points was conducted in all zones for a period of 12 days

in March 2014. Survey teams were assigned to each selected water point to interview pure nomads only. The teams moved from one water point to another.

4.3 THE HOUSEHOLD SURVEY QUESTIONNAIRE

The survey used one questionnaire to collect information from sample households in urban and rural areas and IDP settlements, as well as the nomadic population. The questionnaire included many questions commonly asked in population and housing censuses. Following analysis, the following indicators can be generated from the data collected:

a. The size and geographical distribution of the population.

b. A description of basic socio-demographic and socioeconomic characteristics of the population (age-sex distribution, marital status, mortality, literacy, education, economic activity, etc.).

c. Estimation of the number and geographical distribution of households by their heads, size and composition.

d. A description of the structure and living conditions of the households (living arrangements, access to water, energy and telecommunication) and the characteristics of their heads (age, sex, literacy, education and economic activity).

5

Data processing

Raw data from any survey undergoes several processes before it becomes useful. This chapter describes the processes used for PESS data, including cleaning, validation and tabulation.

The filled-in household questionnaires and accompanying listing forms were sent to processing centres in Hargeisa, Garowe and Mogadishu, and divided into folders according to survey areas. These batches of documents were stored and maintained well throughout the exercise as the documents also reflected the work of the interviewers. Each record had a unique identification code. The data processing included checking data for completeness, coding, capture, editing and tabulation. The various steps are described below.

5.1 DATA CODING

Data coding refers to the process in which entries were assigned numerical values. The process involved assigning numerical codes to responses recorded in words or in another form requiring modification before data entry. Additionally, numerical codes which had already been assigned and recorded were transferred.

Responses were pre-coded with numeric codes from completed household questionnaires and listing forms. A few questions on 'occupation' and 'countries of origin' required the interviewers to carry additional pages of pre-coded responses because of the wide variety of options.

5.2 DATA ENTRY

The process of converting the information obtained in the survey to a format that can be interpreted by a computer is referred to as data capture. A keyboard data entry approach was adopted as the most appropriate means of data capture for the PESS data. To implement this approach, a data entry programme was designed using the Census and Survey Processing System (CSPro).

5.3 DATA EDITING

To obtain useful survey results, data must be free from errors and inconsistencies to the greatest extent possible, especially after the data processing stage. Data editing is the process of detecting errors made during and after data collection and capture, and then adjusting individual items to improve data quality.

It is expected that editing makes the data as accurate as possible while being as close as possible to the respondents' answers. Predetermined rules for inspection and corrections were in place such as rules for editing syntax which speeded up the process of editing.

Data was edited to ensure the validity and consistency of individual records and relationships among records in a household

In summary, data was edited to ensure the validity and consistency of individual records and relationships among records in a household (micro-editing), and to check the reasonableness of the aggregated data (macro-editing). At a micro-level, for example, unedited data may contain records that are highly unlikely or impossible such as a one-year-old child being shown as married or a male who reported giving birth in the last year. Editing of the data, therefore, reduced distorted estimates.

5.4 TABULATION

In preparing a tabulation plan, reference was made to the household survey questionnaire and to the standard tabulations given in the United Nations Principles and Recommendation on Population and Housing Censuses Vol.2. Detailed and unambiguous specification of each table and its layout were compiled before the use of the SPSS software package to produce tabulations.

Elaborate tabulations will be generated for later stages of PESS on all questions detailing socio-economic characteristics of households and household members.

Editing of the data reduced distorted estimates.

For this first report on population distribution by sex and age, only data needed as inputs to complete the estimation of the population for each of the strata were tabulated. The tables produced were meant to assess the quality of age reporting and to detect potential sources of under- or over-estimation.

The key tables produced for this first report are:

a. Urban, rural, IDP and nomadic population distribution by region, age and sex.

b. Population distribution in broad age groups by sex.

c. Population and urban, rural and nomadic household distribution by region.

d. Urban, rural and nomadic household size by region.



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6 Estimation

This chapter presents the estimation procedures of the sample results.

6.1 ESTIMATION

The estimation of population values based on the sample results, in the case of the sedentary samples, was carried out by substratum; namely urban, rural, and nomadic strata. For IDPs, UNHCR estimates were adopted and calibrated by PESS information with regard to sex distributions. This implies that the estimation domains were the strata and substrata. In this case, the sample values were multiplied by the sampling weights.

The weight is the reciprocal of the selection probability (see also section 3.2.5):

Thus $\frac{1}{p_{hi}} = \frac{M_k}{n_h * M_{hi}} = w_{hi}$

Where:

p_{hi} = Probability of selection for the $i-th$ sample EA in stratum h

n_h = Number of sample EAs or settlements selected in stratum h

M_{hi} = Total number of households for the $i-th$ sample EA/settlement in stratum h

M_h = Total number of households in the frame for stratum h

The stratum h in the case of PESS could be the region, rural or urban area.

Where the selection was done in stages, like computing the weight for a sampled segment of a large settlement, the weight was the reciprocal of the product of the selection probabilities.

6.2 ADJUSTMENT FOR NON-RESPONSE

The weights for population estimates were adjusted for non-response and, in some cases, to credible population distributions, for example:

a. Correction for households in sampled EAs that should have been interviewed, but were either not interviewed (household non-response), or

b. Correction for EAs that were selected to be covered, but that could not be visited generally due to insecurity in the field.

Weights for population estimates were adjusted for non-response and, in some cases, to credible population distributions

c. The corrections described above were made by computing adjustment factors that were applied to the base weights to yield the adjusted sampling weights.

6.3 ESTIMATION OF HOUSEHOLDS AND POPULATION IN THE INACCESSIBLE AREAS

High-resolution satellite images of structures and estimated average household sizes in the neighbouring accessible areas were used to estimate households and population.

In the case of inaccessible areas, high-resolution satellite images of structures and estimated average household sizes in the neighbouring accessible areas were used to estimate households and population. This involved manually tallying all residential structures visible on the images and falling within the settlement/EA boundaries. Subsequently, the tally was multiplied by the estimate of the average structural/household occupancy.

The average household size in the inaccessible areas was computed by dividing the number of people in sampled EAs in a region by the number of households in the same EAs in the same region.

By multiplying the number of households in the non-sampled EAs (computed by taking the listed number of households into account) with the average household size, the total population in the non-sampled EAs was estimated. The devolved small area estimates resulted in generating population and household estimates for each and all of the EAs in the region.



PHOTO: ©UNFPA/MARIAM ALWI

7 Challenges

A survey of the scale of the Population Estimation Survey, conducted in regions recovering from war, would inevitably face challenges. This chapter lists the main challenges faced and the measures taken by the survey teams to overcome them.

7.1 MAPPING

In order to carry out an area probability survey, it was necessary to map out the first stage primary sampling units into enumeration areas and settlements. This entailed the delineation of enumeration areas into clusters averaging 100 households in urban areas, identification of settlements in rural areas, and water points for the nomadic population.

The late procurement of the Global Positioning System equipment resulted in the late training of mappers and delayed the start of the mapping exercise. However, in some areas in the south and central regions, for example, UNFPA borrowed Global Positioning System equipment to facilitate the start of the training and subsequent field work.

7.2 SEGMENTATION OF PRIMARY SAMPLING UNITS

Primary sampling units such as settlements were originally meant to comprise an average of 100 households. However, in reality some of the settlements were very large, with about 300 or more households, implying that segmentation would be done. The segmentation was carried out in the field, and in some cases stipulated guidelines for segmentation were not strictly followed. This implied a distortion of some of the base weights of selected settlements. However, these were rare cases.

PESS managed to bring together Somali task forces, which worked to agree on planning, sample design, and implementation of the survey

7.3 SUPPORTING SURVEY OPERATIONS IN ALL REGIONS SIMULTANEOUSLY

Working in 18 regions with different authorities, the survey team faced some planning and administrative challenges. For example, in any action taken, a consensus had to be reached by administrations in all regions. To address this challenge, PESS managed to bring together Somali task forces (Annex E), which worked to agree on planning, sample design, and implementation of the survey. Activities such as a joint training of trainers were carried out smoothly.

7.4 TRANSPORTATION OF SURVEY MATERIALS

It was difficult to send questionnaires in the regions as the only means of transportation was by air in many cases. Apart from the high costs, at times there were cancelled flights causing

delays in dispatching survey materials. However, the survey team used the United Nations Humanitarian Air Services and other commercial flights for transporting questionnaires. European Union flights also supported in delivering questionnaires. Survey materials were dispatched on time though.

7.5 DATA COLLECTION

Data for both the sedentary and nomadic population should have been collected during the same period, that is, November to December 2013. However, the survey of nomads was delayed because of unpredictable weather conditions. The rains began during the interviews in the sedentary areas and so nomads could not be enumerated as the best time to find them at the water points is during the very dry season. Therefore interviewing of nomads was deferred to March 2014.

The survey team created a 'calendar of major events' to help respondents associate to specific years

Like in many other developing countries, the field staff faced problems of some of the respondents being unable to recall information such as age. This posed a challenge, particularly in the absence of a birth registration system. To address this issue, the survey team created a 'calendar of major events' to help respondents associate to specific years. In addition, some respondents were also reluctant to disclose information to strangers. To overcome this challenge, interviewers were recruited from the respective communities to build respondents' faith in the objectives of the survey.

7.6 DATA PROCESSING

Different formats and variable names on files from different sources made it difficult to merge and append data. Although this delayed the data processing exercise, the files were eventually merged. Some unique household identifiers were missing for the sedentary file. These were therefore reconstructed to correct household composition.

There were also various duplicates in the data file involving records of individuals in the households. Within one household, there would be an individual having records duplicated. Such anomalies were detected by scrutinising and flagging records at the household level. These were cleaned out by deleting one of the duplicates whenever identified.

Working with data for the nomadic communities was difficult. The estimation was based on the

weights, which were based on the number of water points allocated to a given region and the mean number of watering episodes. Further adjustments were made in consideration of the duration of the watering episodes. One observation made was that the mean watering time did not conform to the expected or documented time for the types of animals. For example, it was noted that camels watered at closer intervals of time contrary to the 12-day period assumed in the study. This meant that within the 12-day period there would be more camels appearing at the water points than expected. Thus, if the watering interval was earlier understood to be 12 days and yet in the interviewing period it was found to be 4 days, then there would be more camels at the water points during the interviewing period than expected in the theoretical formulation. Where this was observed, an adjustment based on the ratio of the number of days was used.

7.7 INACCESSIBLE AREAS

A major challenge faced in carrying out this survey was inaccessible selected areas and settlements due to insecurity. In some areas, as many as four separate teams had to be trained and organized to carry out work that could have been undertaken by a single team under normal conditions. The same applied to some disputed regions where more than one team had to be trained. In such situations the main issues appeared to be conflicting claims of control, the prominence of factions and the need to negotiate with multiple authorities in order to have access to a region. In some regions, insecurity was a major impediment to the survey team's work. In one case, an interviewer lost his life while at work. In other cases, questionnaires were burnt, and members of the field staff were harassed by disgruntled community members.

In some parts of the regions, a lack of roads resulted in the survey teams having to use camels and donkeys for transport

In some parts of the regions, especially the coastal areas, lack of roads resulted in the survey teams having to use camels and donkeys for transport. In other regions, roads were inaccessible as a result of extreme weather conditions such as floods and cyclones. As a result, targeted settlements could not be reached during the interviewing period. To address this problem, non-response factors were calculated to adjust base weights to improve the reliability of the survey results.

Satellite images were used to count the number of structures in the boundaries of each of the inaccessible areas. The information on mean sizes of structures, dwelling units and households was key in the application of the technique. From the listed information and the mapping

exercise, the expected number of dwelling units per structure was established. In addition, the average number of dwelling units in the structures was determined. Using the mean household size of six, the population for areas that could not be accessed was estimated. The use of this data was based on the fact that the averages for the variables under consideration did not vary widely, particularly in the rural areas.

High-resolution satellite imagery was used as a method of obtaining population estimates for inaccessible sampled areas and as a tool for validation and quality control.

A 1x1 km grid was over-laid with high-resolution satellite imagery and rooftops were manually identified and counted.

In rural settlements, one rooftop was considered equivalent to one household. In urban areas, enumeration areas were validated against the geo-file and sparsely populated EAs identified and necessary corrective measures taken.

Example of manual counting of rooftops (in yellow) in a rural settlement using satellite imagery

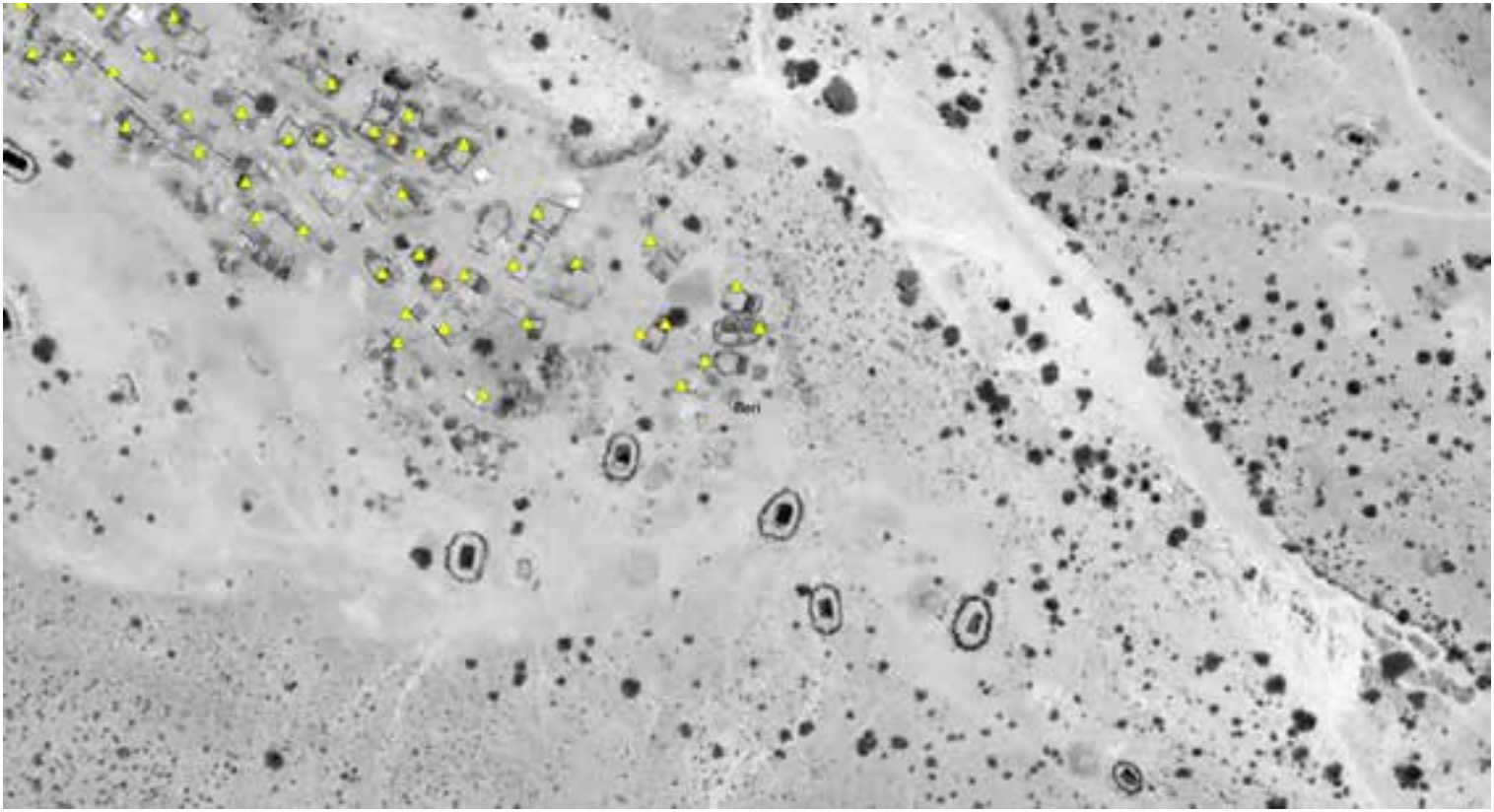


PHOTO: ©US STATE DEPARTMENT

Some of the key findings included:

Finding 1: Generally in urban areas, there was convergence among the ground count data, survey data and satellite imagery.

Case of the town of Beletweyne – Hiraan region

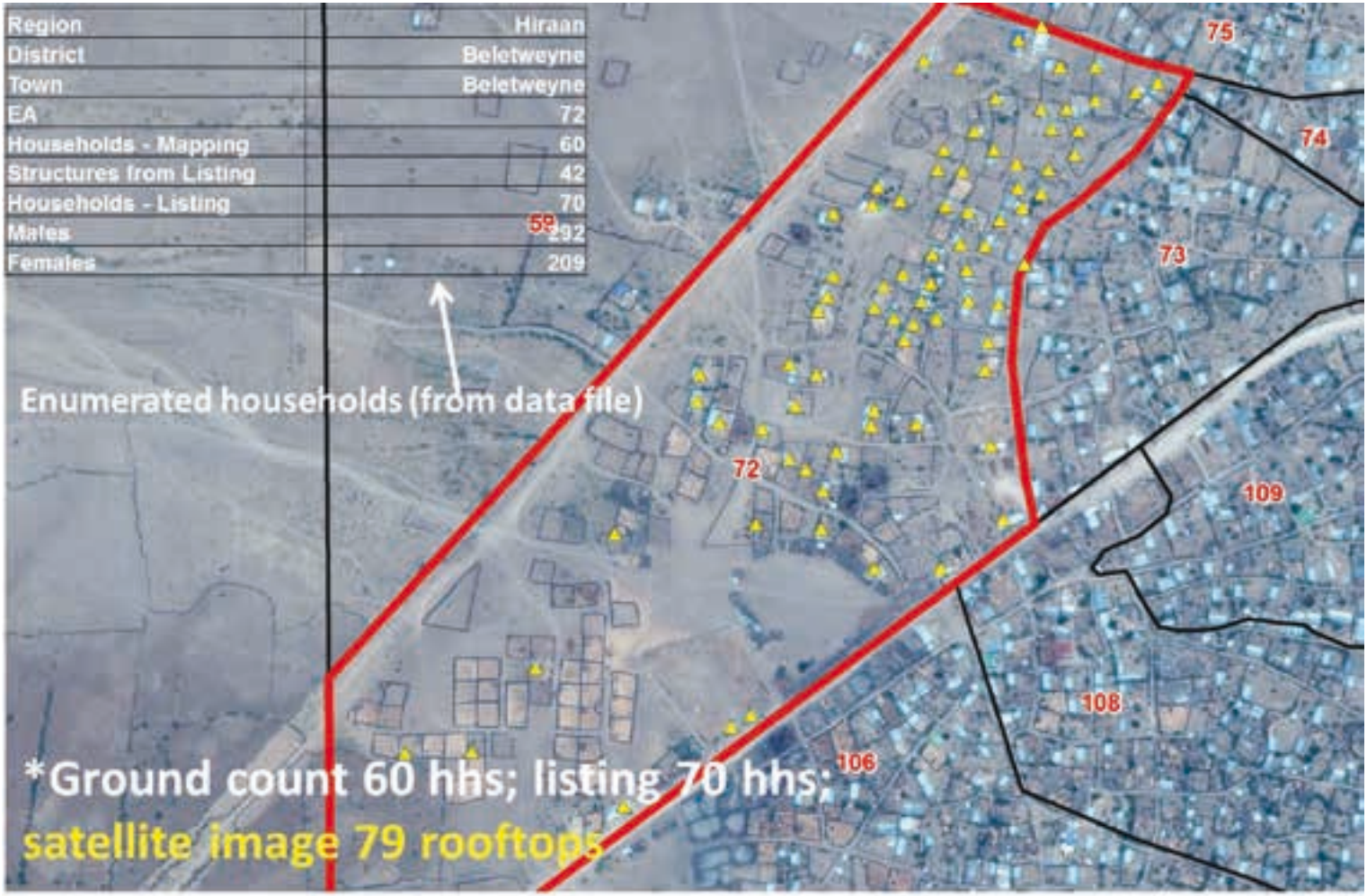


PHOTO: ©US STATE DEPARTMENT

Finding 2: In rural areas, ground counts were over-estimated compared to satellite images.

Case of the town of Ximistiyo – Bari region

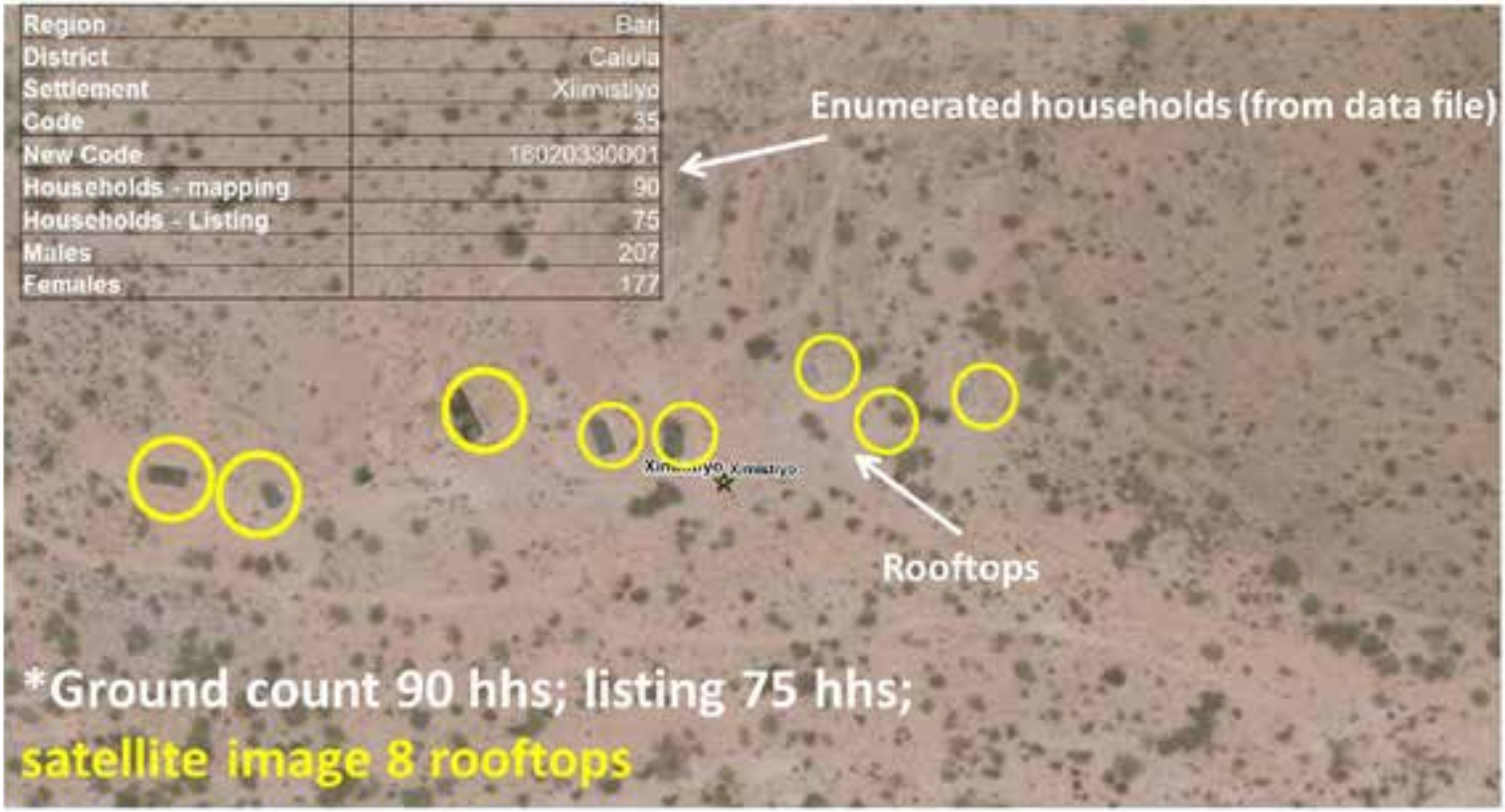


PHOTO: ©US STATE DEPARTMENT

Case of the town of Baliga Cas – Wooqoyi Galbeed region

Region	Wooqoyi Galbeed
District	Hargeysa
Settlement	Baliga Cas
Code	29
New Code	120102800001
Structures from Listing	6
Households - Listing	72
Males	208
Females	187

PHOTO: ©US STATE DEPARTMENT

Finding 3: Observed changes in nomadic living patterns. There was visible evidence of nomadic homesteads no longer in use.

Case of the town of Hananley – Gedo region

PHOTO: ©US STATE DEPARTMENT

Case of the town of God Lagodei – Bari region

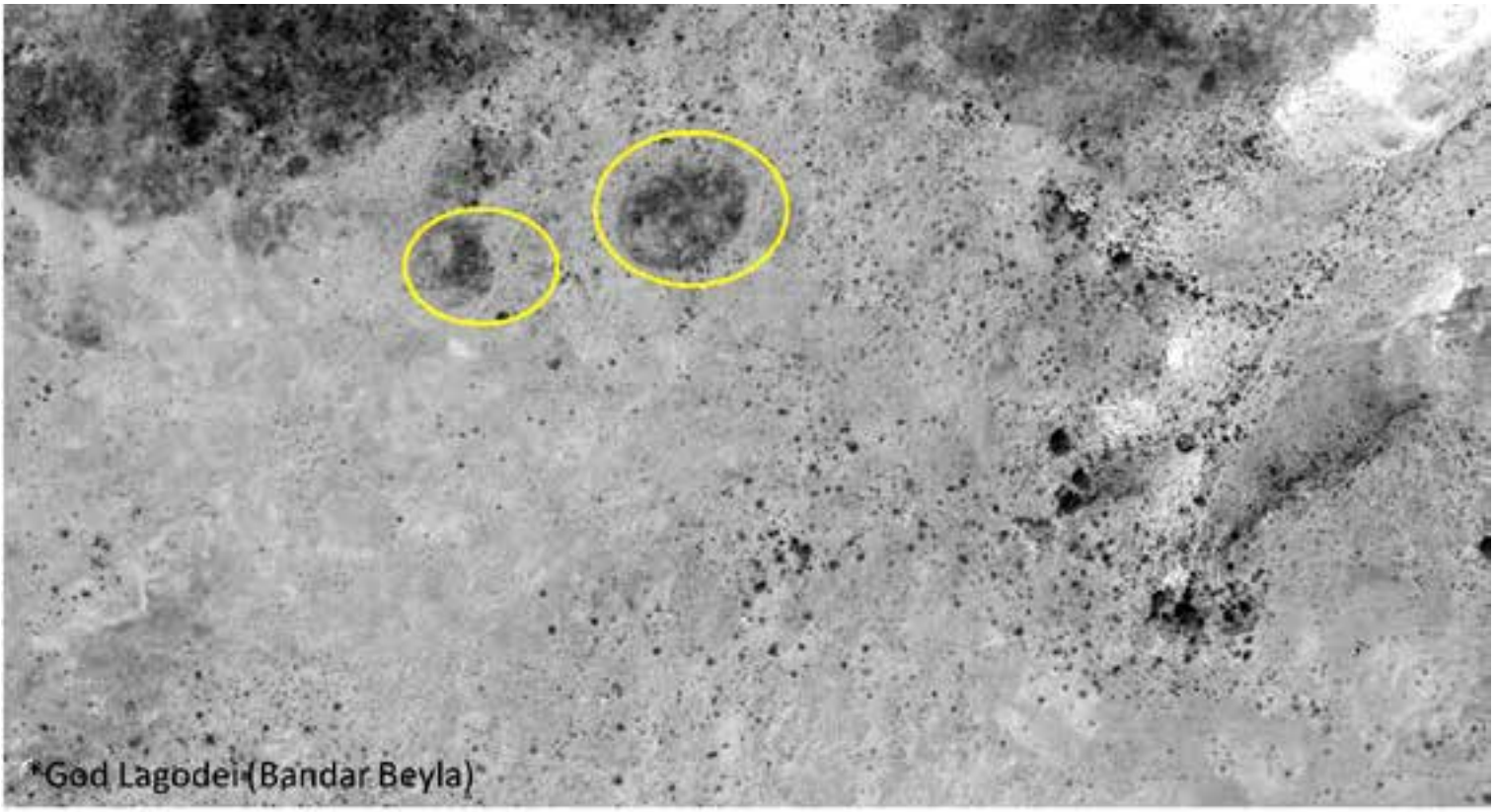


PHOTO: ©US STATE DEPARTMENT

Clusters of settlements with man-made water points were found.

Case of the town of Camaan – Bari region

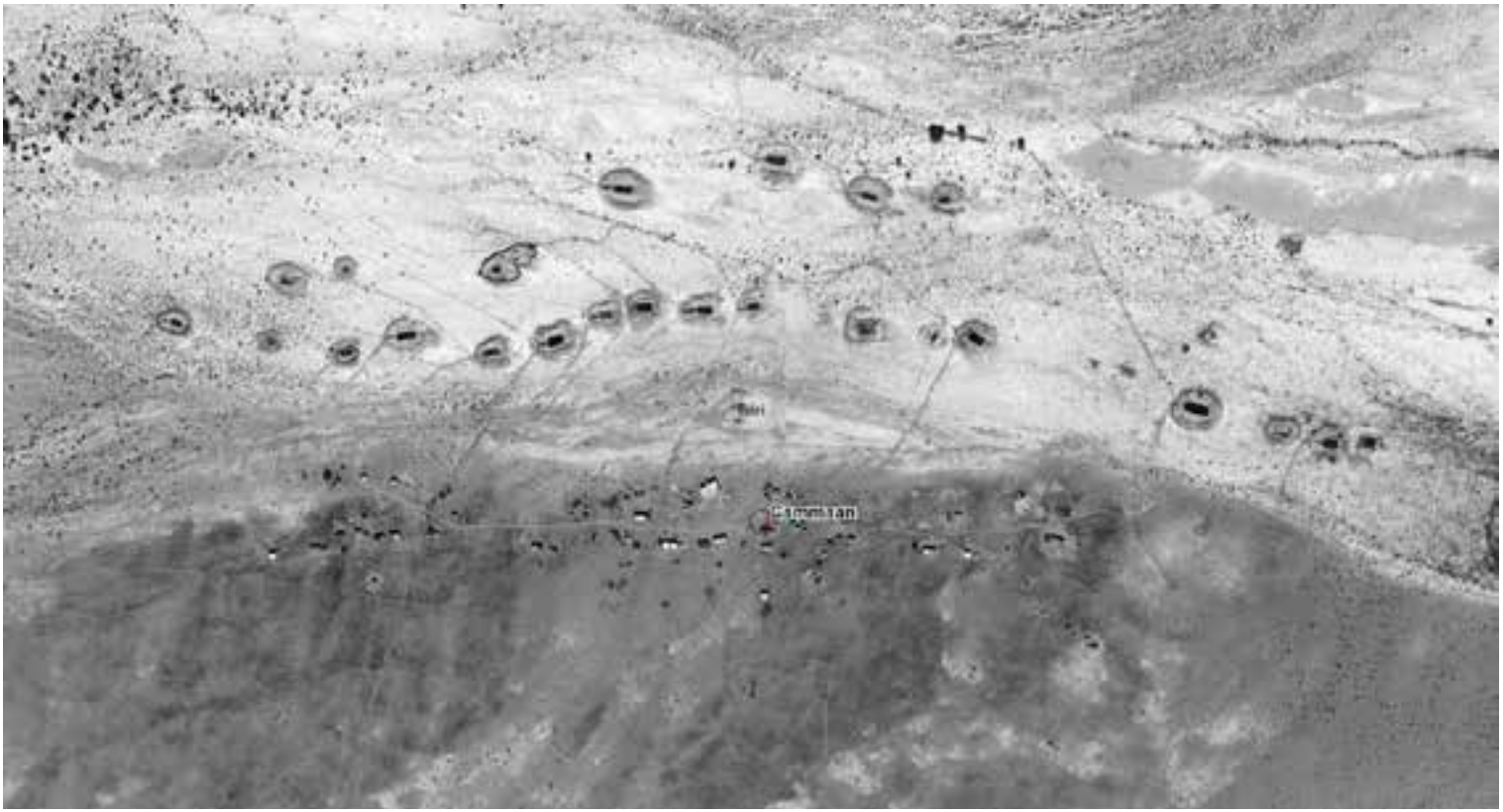


PHOTO: ©US STATE DEPARTMENT

Finding 4: In areas where the same population was counted by different teams, there were huge variations which required the use of the satellite images for validation.

Case of the town of Taleex – Sool region

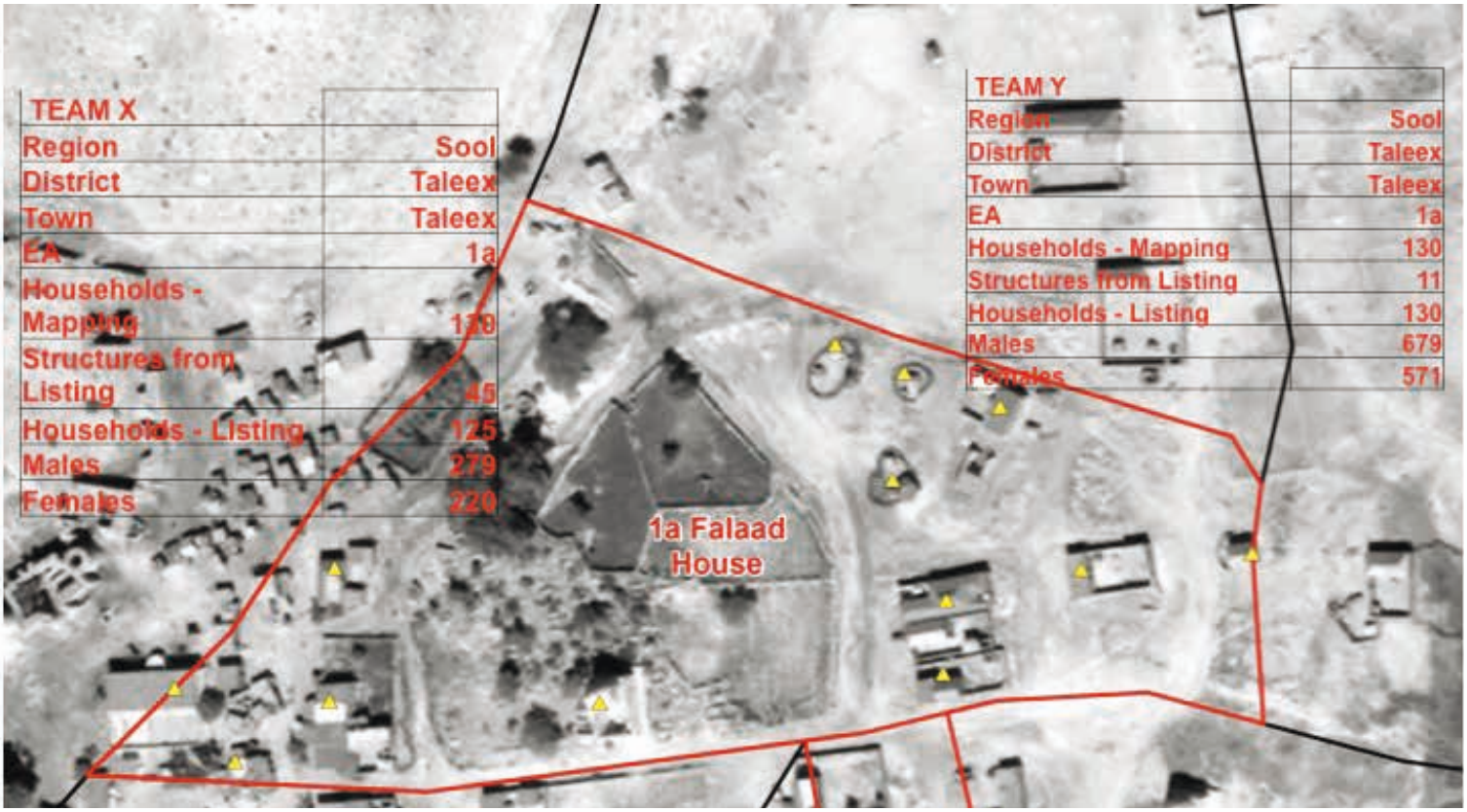


PHOTO: ©US STATE DEPARTMENT

Case of the town of Badhan – Sanaag region

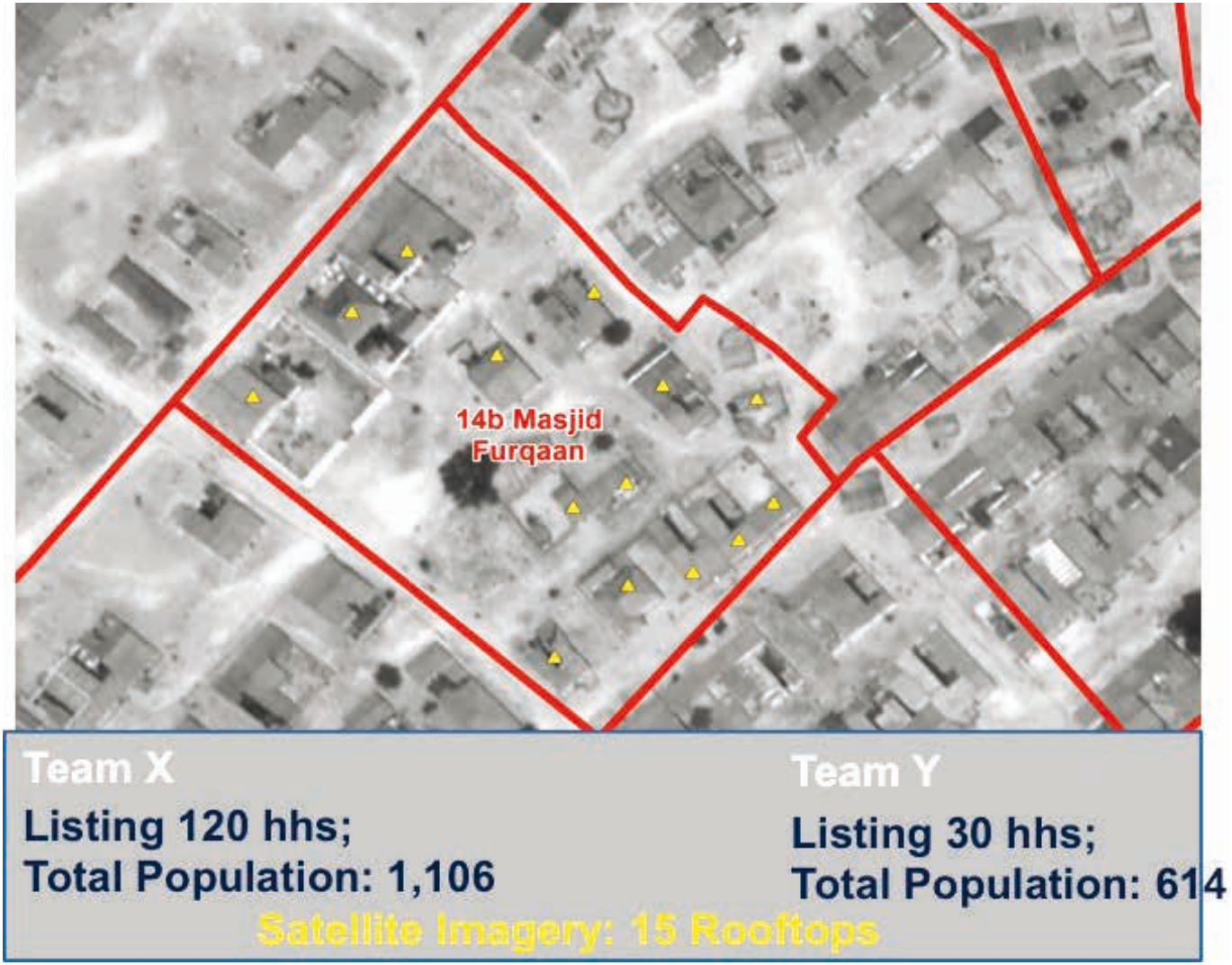


PHOTO: ©US STATE DEPARTMENT

Finding 5: While digitising the rooftops, some settlements as reported by the respondents were found to be located outside the district and regional boundaries and did not tally with the shapefiles for the pre-war regional boundaries.

PHOTO: ©UN/STUART PRICE

8 Conclusion

This section highlights the next PESS steps geared to provide a rich source of information to support the implementation of interventions for the well-being of every Somali.

The Population Estimation Survey, which was implemented following international statistical norms and standards, marks a new milestone in the history of Somalis. It provides much-awaited information on population after more than four decades. The survey sets the foundation for future data collection exercises. The resulting data is crucial for the formulation of policies, drafting effective strategies and can be used to set up targets and ensure integration of population variables into humanitarian and development plans.

In the near future, after further in-depth analysis, the results will go a long way to support socioeconomic planning and informed decision making by Somali authorities and partners. The in-depth analysis will entail analytical and thematic statistical reports on demographic characteristics and events (age, sex, marital status, births), childhood and maternal mortality, literacy and education, labour (activity status and type of occupation), migration (in and out of the country), movement patterns of the nomads, livestock watering patterns and ownership, mobility patterns for the internally displaced persons and household assets and amenities.

UNPFA remains committed to mobilising support and resources for the next post-Population Estimation Survey phase. In the new development agenda where data and knowledge management is critical, UNFPA will seek collaboration with other partners to enhance the Somali statistical capacity for future surveys and censuses.

Annexes

Annex A: Tables

Annex B: Allocation of primary sampling units by region and stratum

Annex C: Water points by region, type and sample status

Annex D: Flow chart for PESS data edits and tabulation

Annex E: Glossary

ANNEX A: TABLES

Table A1: Urban, rural, nomadic and IDP population in percentages

REGION	Urban	Rural	Nomadic population	IDP	Total Population
AWDAL	5.5	5.1	7.3	0.7	5.5
WOQOOYI GALBEED	15.4	4.9	8	4	10.1
TOGDHEER	9.3	2	4.8	2.3	5.9
SOOL	2.3	0.5	5.9	0.4	2.7
SANAAG	3.1	1.1	11.1	0.1	4.4
BARI	9	2.3	4.2	4.4	5.8
NUGAAL	2.7	1.1	6.7	0.9	3.2
MUDUG	7.3	2.8	5.8	6.4	5.8
GALGADUUD	3.5	1.9	6.7	10.8	4.6
HIRAAN	1.6	4.8	7.9	4.6	4.2
MIDDLE SHABELLE	2.2	8.9	3.2	4.7	4.2
BANADIR	24.6			33.4	13.4
LOWER SHABELLE	4.1	25.8	5	9.3	9.8
BAY	1.8	16.5	6.1	3.6	6.4
BAKOOL	1.2	4.8	4.6	2.2	3
GEDO	2.1	6.3	4.5	6.9	4.1
MIDDLE JUBA	1.1	5.3	4.1	2.4	2.9
LOWER JUBA	3.3	5.8	3.9	2.8	4
ALL REGIONS	**100**	**100**	**100**	**100**	**100**

Table A2: Urban, rural, nomadic and IDP population within each region in percentages

Region	Urban	Rural	Nomadic population	IDP	Total
Awdal	42.8	21.4	34.7	1.2	100
Woqooyi Galbeed	64.6	11.2	20.6	3.6	100
Togdheer	67.1	8	21.4	3.6	100
Sool	37	4.3	57.3	1.5	100
Sanaag	29.4	5.7	64.8	0.2	100
Bari	65.6	9.1	18.5	6.8	100
Nugaal	35.4	7.9	54.3	2.4	100
Mudug	53.1	11.1	25.9	9.9	100
Galgaduud	32.2	9.1	37.6	21	100
Hiraan	15.6	26	48.5	9.8	100
Middle Shabelle	22.2	48.3	19.5	10.1	100
Banadir	77.6			22.4	100
Lower Shabelle	17.9	60.2	13.3	8.6	100
Bay	11.7	58.5	24.7	5	100
Bakool	16.9	36.5	40.1	6.5	100
Gedo	21.5	35	28.5	15.1	100
Middle Juba	15.5	40.9	36.2	7.4	100
Lower Juba	35.3	33	25.4	6.3	100
All regions	**42.4**	**22.8**	**25.9**	**9**	**100**

Table A3: Population of all regions by sex

Region	Male		Female		Total
	Number	Percentage	Number	Percentage	
Awdal	348,479	51.8	324,784	48.2	673,263
Woqooyi Galbeed	618,827	49.8	623,176	50.2	1,242,003
Togdheer	361,315	50.1	360,048	49.9	721,363
Sool	173,026	52.8	154,402	47.2	327,428
Sanaag	283,035	52	261,088	48	544,123
Bari	363,698	50.5	355,814	49.5	719,512
Nugaal	199,671	50.8	193,027	49.2	392,697
Mudug	363,737	50.7	354,127	49.3	717,863
Galgaduud	284,255	49.9	285,179	50.1	569,434
Hiraan	276,315	53.1	244,370	46.9	520,685
Middle Shabelle	270,386	52.4	245,650	47.6	516,036
Banadir	813,399	49.3	836,828	50.7	1,650,227
Lower Shabelle	604,835	50.3	597,384	49.7	1,202,219
Bay	402,182	50.8	389,999	49.2	792,182
Bakool	194,261	52.9	172,965	47.1	367,226
Gedo	249,900	49.2	258,505	50.8	508,405
Middle Juba	189,952	52.3	172,969	47.7	362,921
Lower Juba	247,492	50.6	241,815	49.4	489,307
All Regions	**6,244,765**	**50.7**	**6,072,130**	**49.3**	**12,316,895**

Table A4: Urban population by region and sex

Region	Male		Female		Total
	Number	Percentage	Number	Percentage	
Awdal	149,030	51.8	138,791	48.2	287,821
Woqooyi Galbeed	393,042	49	409,698	51	802,740
Togdheer	239,100	49.4	244,624	50.6	483,724
Sool	63,628	52.6	57,365	47.4	120,993
Sanaag	80,286	50.3	79,431	49.7	159,717
Bari	236,829	50.2	234,956	49.8	471,785
Nugaal	68,300	49.2	70,629	50.8	138,929
Mudug	188,481	49.4	193,012	50.6	381,493
Galgaduud	90,894	49.5	92,659	50.5	183,553
Hiraan	44,045	54.1	37,334	45.9	81,379
Middle Shabelle	56,104	49.1	58,244	50.9	114,348
Banadir	631,565	49.3	649,374	50.7	1,280,939
Lower Shabelle	104,904	48.6	110,848	51.4	215,752
Bay	47,971	51.6	45,075	48.4	93,046
Bakool	33,477	54.1	28,451	45.9	61,928
Gedo	56,261	51.5	52,881	48.5	109,142
Middle Juba	29,397	52.3	26,845	47.7	56,242
Lower Juba	85,612	49.5	87,249	50.5	172,861
All Regions	**2,598,926**	**49.8**	**2,617,466**	**50.2**	**5,216,392**

Table A5: Rural population by region and sex

Region	Male		Female		Total
	Number	Percentage	Number	Percentage	
Awdal	75,748	52.7	67,995	47.3	143,743
Woqooyi Galbeed	71,700	51.6	67,212	48.4	138,912
Togdheer	29,247	51	28,109	49	57,356
Sool	7,021	50.2	6,962	49.8	13,983
Sanaag	15,892	51.6	14,912	48.4	30,804
Bari	33,162	50.6	32,321	49.4	65,483
Nugaal	15,249	49.1	15,798	50.9	31,047
Mudug	40,430	50.7	39,322	49.3	79,752
Galgaduud	27,211	52.2	24,878	47.8	52,089
Hiraan	73,338	54.1	62,199	45.9	135,537
Middle Shabelle	138,698	55.6	110,628	44.4	249,326
Banadir	-				-
Lower Shabelle	364,551	50.4	359,131	49.6	723,682
Bay	235,354	50.8	227,976	49.2	463,330
Bakool	70,614	52.7	63,436	47.3	134,050
Gedo	87,295	49.1	90,447	50.9	177,742
Middle Juba	78,644	53	69,795	47	148,439
Lower Juba	75,022	46.4	86,490	53.6	161,512
All Regions	**1,439,176**	**51.3**	**1,367,611**	**48.7**	**2,806,787**

Table A6: Nomadic population by region and sex

Region	Male		Female		Total
	Number	Percentage	Number	Percentage	
Awdal	119,757	51.2	113,952	48.8	233,709
Woqooyi Galbeed	132,074	51.6	123,687	48.4	255,761
Togdheer	80,252	51.9	74,271	48.1	154,523
Sool	100,005	53.3	87,627	46.7	187,632
Sanaag	186,401	52.9	166,291	47.1	352,692
Bari	69,128	51.9	64,106	48.1	133,234
Nugaal	111,469	52.3	101,758	47.7	213,227
Mudug	100,423	54.1	85,313	45.9	185,736
Galgaduud	108,020	50.5	106,004	49.5	214,024
Hiraan	134,101	53.1	118,508	46.9	252,609
Middle Shabelle	50,000	49.8	50,402	50.2	100,402
Banadir	-				-
Lower Shabelle	84,679	53	75,136	47	159,815
Bay	99,072	50.6	96,914	49.4	195,986
Bakool	78,515	53.3	68,733	46.7	147,248
Gedo	69,083	47.7	75,710	52.3	144,793
Middle Juba	68,798	52.4	62,442	47.6	131,240
Lower Juba	71,998	57.9	52,336	42.1	124,335
All Regions	**1,663,775**	**52.2**	**1,523,190**	**47.8**	**3,186,965**

Table A7: Internally displaced population by region and sex

Region	Male		Female		Total
	Number	Percentage	Number	Percentage	
Awdal	3,944	49.4	4,046	50.6	7,990
Woqooyi Galbeed	22,011	49.4	22,579	50.6	44,590
Togdheer	12,716	49.4	13,044	50.6	25,760
Sool	2,372	49.2	2,448	50.8	4,820
Sanaag	456	50.1	454	49.9	910
Bari	24,579	50.2	24,431	49.8	49,010
Nugaal	4,653	49	4,842	51	9,495
Mudug	34,403	48.5	36,479	51.5	70,882
Galgaduud	58,130	48.5	61,638	51.5	119,768
Hiraan	24,831	48.5	26,329	51.5	51,160
Middle Shabelle	25,584	49.2	26,376	50.8	51,960
Banadir	181,834	49.2	187,454	50.8	369,288
Lower Shabelle	50,701	49.2	52,269	50.8	102,970
Bay	19,785	49.7	20,035	50.3	39,820
Bakool	11,655	48.6	12,345	51.4	24,000
Gedo	37,261	48.6	39,467	51.4	76,728
Middle Juba	13,113	48.6	13,887	51.4	27,000
Lower Juba	14,860	48.6	15,740	51.4	30,600
All Regions	**542,888**	**49.1**	**563,863**	**50.9**	**1,106,751**

Table A8: Population by age group and sex for all regions

Age in Years	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
0 - 4	815,629	13.1	864,734	14.2	1,680,363	13.6
5 - 9	1,085,531	17.4	1,022,833	16.8	2,108,364	17.1
10 - 14	980,123	15.7	852,642	14.0	1,832,765	14.9
15 - 19	763,831	12.2	726,378	12.0	1,490,209	12.1
20 - 24	536,505	8.6	616,758	10.2	1,153,263	9.4
25 - 29	429,989	6.9	549,729	9.1	979,718	8.0
30 - 34	388,496	6.2	408,504	6.7	797,000	6.5
35 - 39	272,814	4.4	318,224	5.2	591,038	4.8
40 - 44	327,507	5.2	263,568	4.3	591,075	4.8
45 - 49	180,461	2.9	135,471	2.2	315,932	2.6
50 - 54	164,062	2.6	102,952	1.7	267,014	2.2
55 - 59	65,249	1.0	44,681	0.7	109,930	0.9
60 - 64	90,511	1.4	60,167	1.0	150,678	1.2
65 - 69	33,922	0.5	25,467	0.4	59,389	0.5
70 - 74	46,486	0.7	32,328	0.5	78,814	0.6
75 - 79	15,892	0.3	11,889	0.2	27,781	0.2
80 - 84	19,162	0.3	12,930	0.2	32,092	0.3
85 +	28,594	0.5	22,876	0.4	51,470	0.4
Total	**6,244,764**	**100**	**6,072,131**	**100**	**12,316,895**	**100**

Table A9: Population by broad age groups

Age group in years	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
0 - 4	815,629	13.1	864,734	14.2	1,680,363	13.6
5 - 9	1,085,531	17.4	1,022,833	16.8	2,108,364	17.1
10 - 14	980,123	15.7	852,642	14.0	1,832,765	14.9
15 - 64	3,219,425	51.4	3,226,432	53.1	6,445,857	52.5
65 +	144,056	2.3	105,407	1.7	249,546	2.0

Table A10: Population and household distribution by region

Region	Urban		Rural		Nomads
	Households	Population	Households	Population	Households
Awdal	33,747	287,821	20,384	143,743	28,511
Woqooyi Galbeed	123,390	802,740	24,900	138,912	43,741
Togdheer	82,240	483,724	9,384	57,356	24,285
Sool	21,018	120,993	2,140	13,983	28,985
Sanaag	21,274	159,717	4,278	30,804	47,764
Bari	77,838	471,785	11,209	65,483	19,114
Nugaal	23,110	138,929	4,658	31,047	33,367
Mudug	62,496	381,493	11,817	79,752	26,016
Galgaduud	29,745	183,553	7,855	52,089	30,499
Hiraan	13,254	81,379	27,092	135,537	40,763
Middle Shabelle	13,446	114,348	50,099	249,326	15,635
Banadir	187,246	1,280,939		-	
Lower Shabelle	31,439	215,752	97,619	723,682	26,117
Bay	19,527	93,046	88,847	463,330	28,792
Bakool	9,417	61,928	20,597	134,050	23,338
Gedo	16,881	109,142	30,522	177,742	28,507
Middle Juba	14,174	56,242	38,106	148,439	21,873
Lower Juba	30,520	172,861	30,324	161,511	20,284
All Regions	**810,761**	**5,216,392**	**479,832**	**2,806,787**	**487,591**

	IDP		Total	
Population	Households	Population	Households	Population
233,709	1,000	7,990	83,641	673,263
255,761	12,995	44,590	205,026	1,242,003
154,523	6,688	25,760	122,597	721,363
187,632	500	4,820	52,643	327,428
352,692	110	910	73,426	544,123
133,234	27,068	49,010	135,229	719,512
213,227	1,800	9,495	62,935	392,698
185,736	36,027	70,882	136,355	717,863
214,024	11,413	119,768	79,512	569,434
252,609	4,909	51,160	86,018	520,685
100,402	14,731	51,960	93,911	516,036
-	115,775	369,288	303,021	1,650,227
159,815	8,000	102,970	163,175	1,202,219
195,986	5,400	39,820	142,565	792,182
147,248	1,800	24,000	55,152	367,226
144,793	23,001	76,728	98,911	508,405
131,240	2,700	27,000	76,853	362,921
124,335	24,576	30,600	105,704	489,307
3,186,965	**298,493**	**1,106,751**	**2,076,677**	**12,316,895**

Table A11: Urban, rural and nomadic household size by region

Region	Urban	Rural	Nomadic	IDPs
Awdal	8.5	7.1	8.2	8.0
Woqooyi Galbeed	6.5	5.6	5.8	3.4
Togdheer	5.9	6.1	6.4	3.9
Sool	5.8	6.5	6.5	9.6
Sanaag	7.5	7.2	7.4	8.3
Bari	6.1	5.8	7.0	1.8
Nugaal	6.0	6.7	6.4	5.3
Mudug	6.1	6.7	7.1	2.0
Galgaduud	6.2	6.6	7.0	10.5
Hiraan	6.1	5.0	6.2	10.4
Middle Shabelle	8.5	5.0	6.4	3.5
Banadir	6.8			3.2
Lower Shabelle	6.9	7.4	6.1	12.9
Bay	4.8	5.2	6.8	7.4
Bakool	6.6	6.5	6.3	13.3
Gedo	6.5	5.8	5.1	3.3
Middle Juba	4.0	3.9	6.0	10.0
Lower Juba	5.7	5.3	6.1	1.2
All Regions	**6.4**	**5.8**	**6.5**	**3.7**

**Source: Based on data from UNHCR 2014*

ANNEX B

Table B1: Allocation of primary sampling units by region and stratum

Region	Urban	Rural	Water points	IDPs	Total
Awdal	42	22	38	1	103
Woqooyi Galbeed	173	37	56	3	269
Togdheer	94	27	63	2	186
Sanaag	38	37	72		147
Sool	25	15	62		102
Bari	23	123	28	2	176
Nugaal	27	25	47	1	100
Mudug	77	112	49	3	241
Galgadud	38	48	41	1	128
Hiraan	16	59	24	1	100
Middle Shabelle	8	53	38	1	100
Lower Shabelle	30	136	45	1	212
Banadir	193	0	0	6	199
Bay	17	219	27		263
Bakool	5	67	80	1	153
Gedo	19	72	36	2	129
Middle Juba	8	31	0	1	40
Lower Juba	35	21	29	2	87
Total	**868**	**1,104**	**735**	**28**	**2,735**

ANNEX C

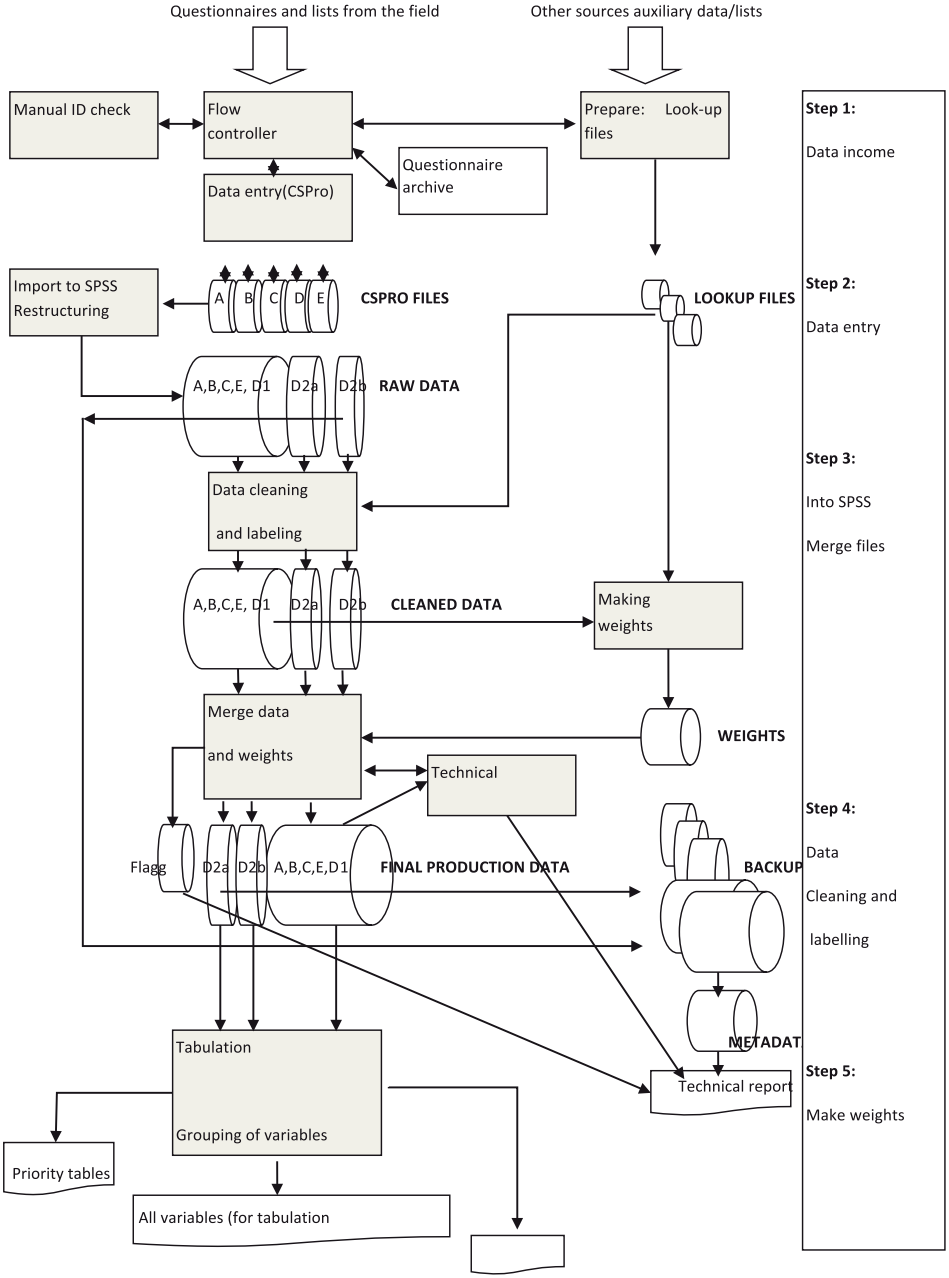
Table C1: Water points by region, type and sample status

Region	Sampled water points by type				
	1	2	3	4	5
	Dug well	Borehole	Spring	Berkad	Dam
Awdal	17	5	5	4	5
Woqooyi Galbeed	13	7	5	13	11
Togdheer	10	6	4	22	7
Sool	30	9	8	15	10
Sanaag	15	3	10	12	7
Bari	6	4	6	7	2
Nugaal	7	5	11	11	1
Mudug	15	10		14	2
Galgaduud	9	8		20	1
Hiraan	5	3		2	1
Middle Shabelle	4	5		1	
Lower Shabelle	8	6			
Bay	4	2			
Bakool	25	3	1		2
Gedo	16	4	2		5
Lower Juba	8	1	1		10
Middle Juba					
Total	**192**	**81**	**53**	**121**	**64**

	6	7	8	9	Total sample	Total water-points
	Mixed	Hilo	War	Other		
	0	0	0	2	38	**268**
	4			3	56	**374**
	9			5	63	**384**
					72	**397**
	12			3	62	**604**
	2			1	28	**403**
	4			8	47	**230**
	6			2	49	**381**
	1		1	1	41	**375**
	3	8		2	24	**134**
	10	5	5	8	38	**256**
	3	18	10		45	**152**
	2		19		27	**261**
	14		35		80	**552**
		2	7		36	**235**
	7			2	29	**90**
					0	**236**
	77	**33**	**77**	**37**	**735**	**5332**

ANNEX D

Figure D1: Flow chart for PESS data edit and tabulation



ANNEX E

Glossary

Term	Definition
Base-weight	The inverse of the probability of selection
Berkad	Man-made cistern sunk into the ground to store run-off water
Borehole	Drilled hole in the ground to extract underground water
Cluster	Naturally occuring group such as a school or a residential block
Dam	Man-made water reservoir
Dug well	Hand excavated well
Dwelling unit	Place of abode or residence occupied by one or more households for the latter, each with a private entrance
Editing	Application of checks to identify missing, invalid or inconsistent data entries that point to records that are potentially in error
Enumeration area	Smallest geographic unit for the collection of survey or census data
Enumerator	Person responsible for collecting information from the sampled household
Geo-file	Master file that lists the names, geographic codes and attributes of all geographic entities that are relevant to survey and census data collection and archiving
Geographic hierarchy	System of nested areas units designed for administrative or data collection purposes
High Resolution Satellite imagery	Imagery collected by a satellite instrument with a ground resolution of less than 1 meter
Hilo	Riverbanks
Household	Person or group of persons who reside in the same homestead/compound
Jack-knife technique	Sampling technique that allows subgroups/replicates to overlap
Mixed waterpoint	Water point consisting of more than one water point type i.e berkad, borehole, dug well

Non-response	When a respondent fails or refuses to respond to survey questions
Population distriblution	Spread of surveyed people with respect to a particular characteristic e.g. age
Primary sampling unit	The first stage area cluster included in a sampling frame
Questionnaires	A set of questions for obtaining statistical or other information from individuals
Respondent	The person who answers survey questions during enumeration
Response	Answer to a question in a survey
Response	An indicator of the variability by choosing a sample instead of enumerating the whole population.
Sampling Frame	Collection of all relevant units e.g. settlements from which a sample is selected
Satellite image	Picture of the earth taken from an earth-orbital satellite
Segmentation	The process of dividing a primary sampling unit into several area segments according to a measure of size
Settlement	A group of dwellings comprising different households in a delineated area with clear boundaries
Spring	Naturally ocurring water that flows from underground through an outlet on the ground
Strata	A collection of seemingly similar/homogeneous units
Stratification	System of dividing an area into homogeneous units
Structure	Building used for purposes of residential, business or any other activity
Substrata	A subdivision within a strata
Tabulations	Tables in the report that are clearly labelled that include actual data dummy tables can also be called tabulations
War	Natural reservoir
Water points	Places where nomads take their animals to drink water

FINANCIAL AND TECHNICAL SUPPORT WAS RECEIVED FROM THE FOLLOWING:

POPULATION ESTIMATION SURVEY 2014

FOR THE 18 PRE-WAR REGIONS OF

SOMALIA

Data for a Better Tomorrow

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