



## **Mission Report**

### **The provision of technical assistance to The Gambia Bureau of Statistics with regard to GIS Training and GIS Infrastructure Assessment**

**Prepared by:**

**Geospace International (Pty.) Ltd.**

**Etienne de Fortier**

**Prepared for:**

**The Gambia Bureau of Statistics and the World Bank,  
General Data Dissemination System, Socio-Demographic  
Statistics Project for Anglophone Africa**

**October/November 2007**

## Table of Contents

<b>1. INTRODUCTION</b>	<b>4</b>
<b>2. IMPLEMENTATION OF THE CONSULTANCY</b>	<b>5</b>
<b>3. ACKNOWLEDGEMENTS</b>	<b>5</b>
<b>4. PROGRAM CONTEXT</b>	<b>5</b>
<b>5. CHALLENGES FACING THE GAMBIA BUREAU OF STATISTICS</b>	<b>5</b>
5.1 The role of the GIS/Cartography Unit in population census activities	6
5.1.1 The Planning phase	6
5.1.2 The Census Mapping revision phase	7
5.1.3 The Enumeration phase	7
5.1.4 The Data Processing phase	7
5.1.5 The Analysis and Dissemination phase	7
5.1.6 GIS Unit	7
<b>6. CHANGE IN SCOPE</b>	<b>8</b>
<b>7. OVERVIEW OF MEETINGS AND DISCUSSIONS</b>	<b>8</b>
<b>8. OVERVIEW OF TECHNICAL ASSISTANCE PROVIDED</b>	<b>9</b>
8.1 Training	9
8.2 GIS Situational analysis, infrastructure assessment and Specifications	10
8.3 Converting existing data received from the Surveys and Mapping Department	10
8.4 Setting up existing HP Plotters	10
8.5 Linking Statistical Poverty data with GIS district boundaries	10
<b>9. OVERVIEW AND ASSESSMENT OF PROBLEMS AND SHORTCOMINGS ENCOUNTERED</b>	<b>11</b>
9.1 Mission administration and schedule	11
9.2 Technical and methodological issues	11
9.2.1 Training and capacity building	11
9.2.2 Implementation of the GIS	11
<b>10. ASSESSMENT OF THE WAY FORWARD</b>	<b>12</b>
<b>11. BUREAU OF STATISTICS COUNTERPART ACTIONS</b>	<b>12</b>

<b>12.</b>	<b>DELIVERABLES</b>	<b>12</b>
12.1	Additional Deliverables	13
<b>13.</b>	<b>ANNEXES</b>	<b>13</b>
13.1	Annexure 1: Original Terms of Reference for Mission 1	14
13.2	Annexure 2: List of Abbreviations and Acronyms	17
13.3	Annexure 3: List of Participants	Error! Bookmark not defined.
13.3.1	Participants from other organizations	<b>Error! Bookmark not defined.</b>
13.4	Annexure 4: GIS Situational Analysis, Infrastructure Assessment and Technical Specification document	18
13.5	Annexure 5: The Gambia Country Report	19

## 1. Introduction

The Gambia Bureau of Statistics (GBOS) is currently involved in the planning for the next Population Census which will be taking place during the earlier part of 2013. They are also busy with spatial data capturing and linking of the 2003 Census Enumeration Area and Statistical Information in digital format for spatial analysis and dissemination.

The Geographic Information System/Cartographic Unit has been afforded the responsibility of the planning and implementation of the Census Mapping phase. Census mapping involves the accurate updating of the current administrative and geographic frame of the country and the systematic demarcation of this frame into small units called Standard Enumeration Areas (SEA) for enumeration, spatial analysis and dissemination purposes.

GBOS needs technical assistance regarding the implementation of modern census methodology using GIS technology, including all the secondary issues, such as staffing, equipment, software and infrastructure.

Moreover technical assistance is needed regarding the sustainability and maintenance of the GIS, specifically with regard to training and skills transfer.

The Gambia attended the GDDS 2 GIS Module launch workshop in Accra, Ghana during the end of May, 2007 where they, in conjunction with the lead consultant, drew up their Country Work Plan regarding the deliverance of three technical assistance missions covering three country identified priorities. The purpose of the work plan is to act as a living document for the duration of the technical assistance and to serve as an information base from which the ToR for every mission can be drawn up.

As noted, the technical assistance has been divided into three missions, this document being the mission report on the first mission.

The specific objectives, activities and deliverables for this mission was detailed in the Terms of Reference which is included in Annexure 1. GBOS general objective regarding GIS is to develop and implement a sustainable GIS which can act as a corporate service provider to the statistical agency in the long term while short term objectives are to implement a successful census mapping and support methodology as well as disseminating the 2003 Statistical data.

The basic objectives and deliverables for this mission are however stated below.

### **Specific issues to be covered during the consultancy were the following:**

- To train staff in basic GIS concepts and definitions
- Assess current status with regards to hardware and software
- User needs assessment regarding hardware and software
- To prepare a functional specification for hardware and software
- Prepare budget
- Prepare technical specification document for hardware and software (required for funding)

### **Specific outputs:**

- Training Manuals and trained staff
- GIS Infrastructure assessment report
- Functional Specification for hardware and software
- Technical Specification for Hardware and Software

## **2. Implementation of the consultancy**

The mission was implemented by Mr. Etienne de Fortier from **GeoSpace International**. As specified in the ToR, the total mission time was 10 days on site at the GBOS with two additional days for preparation and report writing. The first mission ran from the 29<sup>th</sup> of October until the 7<sup>th</sup> of November 2007.

## **3. Acknowledgements**

The consultant would like to thank the Deputy Statistician General, Mr. Alieu Sarr and the GIS Module Coordinator, Mr. Ali Ceesuy Daffeh for their support and cooperation during the consultancy. Special thanks to the staff of the GIS/Cartography Unit, Mr. Alieu Bahoum, Mr Abdoulie Gaye and Mr. Babuvarr for their enthusiasm, assistance and positive attitude during the training and assessment. The consultant would also like to thank the General Data Dissemination Project of the World Bank for sponsoring the consultancy.

## **4. Program context**

With financial support from the Department for International Development (DFID) of the United Kingdom, the World Bank is implementing a project to assist 21 Anglophone Africa countries to participate in the General Data Dissemination System (GDDS). Participating countries are being assisted to participate in the GDDS through two separate, but linked projects both financed by DFID. The IMF is providing project management and technical support in the area of economic and financial statistics. The World Bank is providing technical support in the area of socio-demographic statistics. Both projects run concurrently until February 2010.

Technical assistance is being provided through the World Bank to help countries implement plans for improvement in population, health, agriculture, labor market, justice and security, management of statistical systems, GIS and small area statistics. The GDDS framework developed by the IMF provides the framework for the detailed elaboration of long-term statistical development strategies. Participating countries have already expressed their requests for technical assistance and both the IMF and the World Bank have developed their assistance strategies. The Gambia was one of the countries which asked for technical assistance in the field of GIS and small area statistics.

## **5. Challenges facing The Gambia Bureau of Statistics**

There is an increased demand for developmental socio-demographic statistics that can be analyzed and disseminated utilizing the ability of GIS technology. Developmental issues all have a distinct geographic or spatial component which must be part and parcel of the whole statistics collection and creation process for the statistics to be fully relevant and meaningful. This new increased demand for spatially linked socio-demographic data is seriously exposing existing data capturing, integration, analysis and dissemination techniques used in developing countries.

The GIS/Cartography unit faces a real challenge to establish the GIS section of the unit in order to answer this new demand and to ensure that GIS is used to enhance the way the data is collected, analyzed and disseminated.

The current infrastructure of the GIS unit is not sufficient to operate a successful GIS in a Statistical Department, the staff structure and requirements for the GIS unit has also not been finalized. The role of the unit has not been properly defined and will need to be addressed in order for the GIS unit to become a corporate service provider to the Bureau of Statistics.

The current staff allocated to the GIS/Cartography Unit and their management understands the potential for the use of GIS within the organization and is committed to firmly establish the unit as a corporate service provider for the organization as a whole. They have already created and disseminated data from the 2003 Census by creating a Census Atlas using GIS technology.

The GBOS Directorate Quality and Dissemination is also requesting spatially referenced data from the GIS unit to be used as part of their Data Dissemination reports and projects, such as poverty mapping. The need and understanding of the importance of GIS has thus been established within GBOS and needs to be further developed by implementing an operational and sustainable GIS unit.

**The GIS UNIT in particular, has the following challenges to face:**

- Inadequate staff requirements to operate the GIS/Cartography unit
- Inadequate organizational requirements such as offices and furniture
- Inadequate hardware and software
- Inadequate integrated and properly designed data warehouse and database
- Current lack of institutional support regarding the on going maintenance and sustainability of GIS
- Inadequate geographic base data
- Inadequate equipment
- The current staff allocated to the GIS unit are very able, more skills development and training is needed
- Inadequate funding and operational assistance to make the difference

The Bureau of Statistics is aware of these challenges and has already invested time and money to improve on some of the issues. Unfortunately this must be a sustainable effort which requires time and money, GBOS in particular have problem with the latter. The main challenge now is to move forward in an integrated fashion and overcome the obstacles one by one in order to fulfill the full potential of GIS by realizing their short and long term goals.

The role of the GIS/Cartography Unit within GBOS as well as in relation to the up and coming census activities and the disseminations of the current data were discussed. A brief overview of the findings regarding the Unit's census specific roles is discussed in the next section.

### **5.1 The role of the GIS/Cartography Unit in population census activities**

A functional and properly implemented GIS/Cartography unit will play a major part in all the facets of the Census. Any Census can be divided into **5 main phases**. The role of the Unit in each of these phases will be discussed. The phases are:

- The Planning phase
- The Census Mapping revision phase
- The Enumeration phase
- The Data Processing phase
- The Analysis and Dissemination phase

#### **5.1.1 The Planning phase**

This is the most important phase, since the basic methodology, operations and logistics for the Census is determined. These three factors determine the amount of money and resources needed to implement the Census. Care should be taken to include the different roles to be played by the Unit in the budgetary planning so that enough resources will be available for it to fulfill its role.

**The role of the GIS Unit during the planning phase will be the following:**

- To provide accurate information with regard to the existing census cartography, specifically concerning:
  - The state of the cartography (currency, maintenance, accuracy)

- Problems identified, such as EA coding structure, EA size structure, EA parameters, administrative boundary problems
- New raster and vector data needed to implement the revision
- To provide suggestions for addressing these issues as well as possible methodologies
- To provide suggestions on questionnaire content which would enhance spatial analysis possibilities
- To provide suggestions with regard to database design and development

The GIS Unit will therefore form an integral part of the planning team. The resources needed will be dealt with according to its role during each of the phases.

### 5.1.2 The Census Mapping revision phase

The GIS/Cartography Unit will play a leading role during this phase since it will be its **responsibility**. A weak and inaccurate cartographic base, especially where the revision and demarcation of EA boundaries are concerned, leads to ineffective and inaccurate field data collection (enumeration) as well as poor analysis and dissemination. It is therefore the **foundation of all census operations**.

Accurate and current base maps and digital imagery will be a pre-requisite for the completion of this phase.

### 5.1.3 The Enumeration phase

The main responsibilities of the GIS/Cartography Unit will be three-fold:

- To create and print the **SEA Fieldwork maps** for the enumerators with the necessary EA boundary, imagery backdrop and locational features such as Place Name and Landmark information depicted.
- To plan certain **logistics activities**, such as the number of enumerators needed per District or Ward, number of questionnaires needed per area, types of vehicles needed etc. The rollout of materials can also be monitored using the GIS. **Progress maps** can be printed.
- The **progress of enumeration** itself can be monitored at an EA level with regular progress **thematic maps** printed to show enumeration progress. Problematic areas can therefore easily be identified.

### 5.1.4 The Data Processing phase

- The flow of materials back to the data processing center can be monitored at EA level and the GIS used to print progress maps

### 5.1.5 The Analysis and Dissemination phase

- The relevant census data can be populated into the **GIS database** and **various types of analysis** can be done in conjunction with the Social Statistics division.
- The results of the spatial analysis can then be **disseminated** with the database analysis in the form of **maps, tables and graphs**. A new **Census Atlas** can also be created.
- Due to accurate imagery base map and accurate census mapping, analysis and dissemination and product possibilities are increased and also delivers more relevant statistics. Dissemination can also be done using GIS web based techniques and systems.

The GIS Unit will therefore form an integral part of the whole Census process.

### 5.1.6 GIS Unit

Although a total Institutional Assessment was not part of the Terms of Reference for this assignment it is obvious that an **institutional shift** will have to take place with regard to the

GIS Unit and its functions within GBOS. As mentioned, the role of the unit has not been properly defined, this will need to be addressed in order for the GIS unit to become a corporate service provider to the Bureau of Statistics with the following services in mind:

- Spatial data and digital map provider to all departments and external users
- Spatial database custodian responsible for new data creation and maintenance
- Custodian of the Master Sample frame responsible for its maintenance, Secondary Sampling Unit creation according to relevant survey needs and updating
- Responsible for all spatial analysis according to the GBOS departmental and external user needs (for economic and socio-demographic data). Analysis to be done in conjunction with relevant unit expertise.
- Responsible for Census Mapping revision and maintenance
- Responsible for GIS attribute data integration, updating and maintenance
- Responsible for spatial analysis and graphic dissemination of the Census Atlas
- Responsible to host the spatially enabled web application spatial database.

## **6. Change in Scope**

Mr. Alieu Sarr, Deputy Statistician General and GDDS coordinator of the Gambia Bureau of Statistics (GBOS) requested the consultant to include a basic situational analysis as part of his current assignment. GBOS is currently busy with a Statistical Strategy Document aimed at the next five years. The consultant was therefore asked to add to his current scope to include the necessary assessment and recommendations necessary for the GBOS Statistical Strategy with specific reference to the GIS/Cartography Unit

## **7. Overview of meetings and discussions**

The following meetings and discussions took place:

### **Monday, 29 October**

- Two separate introductory meetings were held, one with Mr. Alieu Sarr, Deputy Statistician General and GDDS coordinator and the other with Mr. Ali Ceesay, Coordinator for the GDDS/GIS Module
- Informal discussions were held with Mr. Alieu Bahoum, Mr. Abdoulie Gaye and Mr. Babuvarr Daffeh where the current status of the GIS UNIT was discussed. The terms of reference was reevaluated and a question and answer session followed where the consultant asked specific questions relating to the GIS Unit. A basic schedule for the rest of the mission was also determined.

### **Thursday, 01 November**

- The consultant held a meeting with the staff of the GIS/Cartography unit to assess the current situation regarding hardware and software and to assess the exact needs of the Unit.
- A separate meeting with Mr. Alieu Sarr, Deputy Statistician General took place where it was agreed that the assignment should incorporate not only the hardware and software assessment but also the required institutional arrangements of the GIS/Cartography unit and to make to also include them in my recommendations or specification

### **Friday, 02 November**

- The consultant held 3 separate meeting with private IT companies in order to discuss the required hardware and software and to obtain quotations.

## **Monday, 06 November**

- A meeting was held with Mr. Phillipe Gafishi a private consultant from Oxford Policy Management tasked to draw up an Implementation Strategy for GBOS that includes the required Institutional arrangements of the GIS/Cartography Unit. Mr. Mr. Alieu Bahoum, Mr. Abdoulie Gaye and Mr. Babuvarr Daffeh also attended the meeting.
- A separate meeting was held with the IT representative to obtain information regarding the current IT policy, planned IT expansion in the organization as well as existing support and maintenance agreements with private companies. The informative meeting should ensure no duplication in the acquisition of hardware and software takes place.

## **Tuesday, 07 November**

- The Gambia Country report was discussed with Mr. Abdolie Gaye after which the consultant assisted Mr. Gaye in creating a draft report. The final report can be found in annexure 5.

## **Wednesday, 08 November**

- Meeting with Mr. Alieu S. Jobe, Principal Cartographer at the Department of Lands and Surveys to discuss the current situation regarding data creation as well as future plans.
- The first draft of the GIS Situational Analysis, Infrastructure assessment and technical Specification document was submitted to the GIS UNIT and discussed
- Debriefing meeting with the GBOS Management and the GIS/Cartography Unit
- Debriefing meeting with the GBOS Statistician General

## **8. Overview of technical assistance provided**

### **8.1 Training**

The Introduction to GIS, concepts and definitions training was held, other relevant topics was also covered. The first day of training took place in the GBOS Boardroom and on the second day the computer room was used. Other Government Departments was also invited. The training was performed over two days namely Tuesday, 30<sup>th</sup> of October and Wednesday 31<sup>st</sup> of October.

The following training was provided:

- BASIC INTRODUCTION TO GIS CONCEPTS AND DEFINITIONS
- ORGANIZATIONAL ASSESSMENT
- GIS IMPLEMENTATION
- THE IMPLEMENTATION OF GIS FOR STATISTICS AGENCIES IN DEVELOPING COUNTRIES
- GIS IN CENSUSES AND SURVEYS
- CENSUS MAPPING AND SURVEY METHODOLOGIES
- GIS ANALYSIS AND THE CREATION OF SMALL AREA STATISTICS
- BASIC INTRODUCTION TO GPS AND REMOTE SENSING

## **8.2 GIS Situational analysis, infrastructure assessment and Specifications**

A basic situational analysis and detailed infrastructure assessment was done on the current status of GIS in the GIS/Cartography Unit. A document discussing the findings and recommendations were drawn up by the consultant, the document can be found in Annexure 4. The document includes the following sections: Analysis and infrastructure assessment, which forms part of the findings and the Functional and Technical Specification which forms part of the recommendations.

### **Findings and recommendations were discussed along the following topics:**

- Short term goals
- Long term goals
- Hardware requirements
- Software requirements
- Data requirements
- Human resource requirements
- Administrative requirements
- Institutional context
- Management requirements
- External assistance and training
- Maintenance and Support
- Inter-governmental Coordination
- Risks

## **8.3 Converting existing data received from the Surveys and Mapping Department**

The Bureau of Statistics is currently in possession of digital vector mapping data of villages in The Gambia. The data was derived through mapping techniques by a private company called City Scope using existing Aerial Photography. The data was supplied in Bentley Microstation DGN format. The data was therefore in Computer Aided Drawing (CAD) format based on layers or levels. No metadata, explaining the individual feature layers or coordinate systems that were used, existed for the data.

No standard for the features in the different drawings existed and these had to be first standardized in each separate Drawing File before it could be imported to the GIS.

The data was supplied in various different coordinate systems which had to be identified and transformed to the correct coordinate systems.

The consultant used Intergraph GeoMedia to access, import and convert to the correct format and coordinate system. The data was imported to a Microsoft Access Database and exported to ESRI Shp file format for use in the existing Arcview 3.3 GIS software package.

Other similar mapped data of villages were received in ArcGIS Geodatabase format which can not be opened using the existing Arcview 3.3 GIS software utilized by the GIS Unit. The last mentioned data was first exported to Arcview Shp file format using ArcGIS 9.1.

## **8.4 Setting up existing HP Plotters**

The GIS/Cartography unit is in possession of two HP plotters. The plotters were delivered over a year ago but were never properly installed. The consultant provided assistance with the installation and setup of the plotters. Only one plotter is operational as a memory problem made it impossible to correctly install the other plotter.

## **8.5 Linking Statistical Poverty data with GIS district boundaries**

The consultant assisted Mr. Abu Camara, Director of the Coordination, Quality and Dissemination Directorate to link the current statistical data with the GIS district Boundaries.

This was done to produce very basic poverty maps. Intergraph GeoMedia was used and the final dataset was exported to ESRI shp file format. The linking exercise immediately identified problems with the GIS dataset as the District Names in the dataset did not correspond with the Statistical District Names. The consultant was requested to assist the Directorate with other Poverty Map creation, it was agreed that this will be done once the consultant return to South Africa.

## **9. Overview and assessment of problems and shortcomings encountered**

### **9.1 Mission administration and schedule**

Very few problematic issues were encountered during the mission itself. The Gambia Bureau of Statistics and GIS Unit staff was well prepared and was always available when the consultant needed them. They are well aware of the importance of GIS and Census Mapping for the success of the census as a whole and therefore provided assistance freely and participated enthusiastically and with skill. The following two shortcomings can be identified:

- A one on one meeting with a representative from the Department of Lands and Surveys office was held on the last day of the consultancy. In The Gambia's case, the Department of Lands and Surveys is not on the critical path of the establishment of the GIS Unit. However the future involvement of the Department of Lands and Surveys is critical for the GIS Unit especially for the Census Mapping for the 2013 Census. The following factors need to be taken into consideration:
  - GBOS will need to obtain the entire vector line mapping dataset, derived from the existing Aerial Photography from the Department of Lands and Surveys to accurately digitize and update each of the 2003 Census Enumeration Areas. GBOS must do everything in its power to obtain all the information. The Department of Lands and Surveys indicated that would be willing to give the data to GBOS free of charge but the request and approval will have to come from top management.
  - Other base data such as the 1: 50 000 Topo maps must also still be acquired.
  - Close liaison with the Department of Lands and Surveys is necessary as new acquisition of Aerial Photography or Satellite Imagery will be necessary for the updating of the EA's for the 2013 census during the Census Mapping Phase. Up to date backdrop imagery forms an integral part of new Census Mapping Methodology and are therefore on the GIS/Cartography Unit's critical path. The Surveys Department does not have any future plans to update or acquire new Aerial Photography or Satellite imagery. They did indicate that they will also benefit should GBOS obtain new Aerial Photography and Satellite imagery for the Gambia.

### **9.2 Technical and methodological issues**

The GIS Situational Analysis, Infrastructure Assessment and technical specification document discuss in detail methodological, logistical, capacity, equipment and infrastructural problems and short comings as well as recommendations on how to address them successfully.

#### **9.2.1 Training and capacity building**

Appropriate and proper training of the GIS Unit staff is important to the success of this project. The GDDS missions can play their part in this need, but specialized GIS and database training would be needed at some point. The technical specification includes the envisaged training that will be needed in this regard.

#### **9.2.2 Implementation of the GIS**

The whole census mapping process will be driven by an operational and sustainable GIS. The timely procurement of the necessary hardware and software, coupled with the training highlighted above will be paramount to the success of the census mapping effort. It is therefore essential that the GIS infrastructure and database be implemented before by May 2008.

#### **10. Assessment of the way forward**

The general Situational Analysis, Infrastructure Assessment and technical specification document details specific processes that must be achieved in the short and long term in order for the GIS UNIT to fulfill its role successfully within the Bureau of Statistics.

The Bureau of Statistics has until the end of 2012 to conclude its census mapping activities, the SEA maps must be printed and completed by then.

The details of the way forward after the GIS/Cartography unit has been established must be finalized during the follow-up consultation and after the census mapping methodology has been decided upon.

#### **11. BUREAU OF STATISTICS Counterpart actions**

The consultant's counterpart at the GBOS is Mr. Abdoulie Gaye, the following actions are to be concluded before the commencement of the second mission. The tentative timeline for the second mission was set at the end of May 2008.

#### **The following actions can be specified for the mission counterpart at the BUREAU OF STATISTICS:**

- Complete Country report on consultant
- Complete Donor Work Plan and Financial document and submit it to the relevant donor organizations for review.
- Obtain necessary funds for the procurement of necessary infrastructure.
- Finalize the procurement for the additional hardware, software and infrastructure as specified in the GIS Situational Analysis, Infrastructure Assessment and Technical requirement document.
- Finalize the GIS Unit staff organizational requirements.
- Set up GIS Office and infrastructure with appropriate implementation partner
- Acquire the hardcopy 1: 50 000 toposheets from the Lands and Surveys Department
- Commence with the scanning of the 1:50000 toposheets
- Obtain the entire digital vector line mapping dataset from the Lands and Surveys Department.

#### **12. Deliverables**

The following table depicts the expected deliverables, if they were achieved or not and accompanying reasons.

<b>DELIVERABLE</b>	<b>COMPLETED</b>
Training of GBOS staff. Training Manuals	Yes, the consultant provided the necessary training material in softcopy format. A hardcopy of each topic was printed and handed over to the trainees.
Assess current situation regarding hardware and Software	Yes. The consultant drew up an Analysis and Infrastructure Assessment report. It was reviewed by us and we are satisfied with the content.
Create and Draw up functional and Technical specification document for hardware and software.	Yes. The draft document has been drawn up and provided to us for review. The final draft has also been emailed to us and we are satisfied with its contents.

### **12.1 Additional Deliverables**

The consultant was requested to provide additional support regarding the situational analysis of the GIS/Cartography unit. The Gambia Bureau of Statistics is currently busy drawing up a Statistical Strategy Document aimed at the next five years; the GIS/Cartography Unit is an important part of the Strategy. The consultant was therefore asked to add to his current scope of the TOR and include the necessary assessment and recommendations necessary for the GBOS Statistical Strategy with specific reference to the GIS/Cartography Unit.

The consultant was also requested to set-up two newly acquired HP black and white plotters and to convert various different data sets received from the Surveys Department to be used as back drop information for digitizing of the Enumeration Data in Arcview 3.3.

### **13. Annexes**

## 13.1 Annexure 1: Original Terms of Reference for Mission 1

### **General Data Dissemination System, (GDDS phase 2) Socio-Demographic Statistics Project for Anglophone Africa: Provision of technical assistance as a lead expert for the topic (module) Geographic Information Systems to The Gambia Bureau of Statistics, Banjul.**

#### **Background**

With financial support from the Department for International Development (DFID) of the United Kingdom, the World Bank is implementing a project to assist 21 Anglophone Africa countries to participate in the General Data Dissemination System (GDDS). Participating countries are being assisted to participate in the GDDS through two separate, but linked projects both financed by DFID. The IMF is providing project management and technical support in the area of economic and financial statistics. The World Bank is providing technical support in the area of socio-demographic statistics. Both projects run concurrently until February 2010.

#### **Technical Assistance**

Technical assistance is being provided through the World Bank to help countries implement plans for improvement in population, health, agriculture, labor market, justice and security, management of statistical systems, GIS and small area statistics. The GDDS framework developed by the IMF provides the framework for the detailed elaboration of long-term statistical development strategies. Participating countries have already expressed their requests for technical assistance and both the IMF and the World Bank have developed their assistance strategies. The Gambia was one of the countries which asked for technical assistance in the field of GIS and small area statistics.

#### **Terms of Reference**

##### **Background**

The Gambia attended the GDDS 2 GIS Module launch workshop in Accra, Ghana during the end of May, 2007 where they, in conjunction with the lead consultant, drew up their Country Work Plan regarding the deliverance of three technical assistance missions covering three country identified priorities. The purpose of the work plan is to act as a living document for the duration of the technical assistance and to serve as an information base from which the ToR for every mission can be drawn up. To this end, this ToR for the first mission to The Gambia has been drawn up from the work plan, based on the expressed objectives of the chosen priorities.

It has been agreed that there are two types of reports. First there is the report of the consultant about the mission, secondly, the report of the staff of the Bureau of Statistics. The consultant will assist the staff of the Bureau of Statistics to draft their report as part of the living document.

Separately, the consultant has agreed to draft his own mission report. This report will use the format that will be provided in detail by the World Bank before the mission. It will comprise of: a) introduction, b) background, c) detailed agenda of all working days (in annex), d) description of the type of discussions, e) overview of all technical advises given, f) overview of problems and shortcomings encountered, g) overview of the own assessment of these issues, h) assessment of the way forward, i) list of recommendations of work to be done by the counterpart for the next period till the next visit, j) list of deliverables achieved/not achieved (and why), k) List of persons worked with for each of the days.

The reason the Bureau of Statistics of The Gambia has chosen this particular module is due to the fact that there is currently no GIS unit within Bureau of Statistics and the Bureau is committed to the establishment of the GIS as part of the preparations for the 2013 Population and Housing Census. GDDS can provide technical assistance in the establishment

of the GIS, training and methodology development for the 2013 census pre-enumeration mapping.

The specific country objective would be:

To develop a GIS strategy and implementation plan that covers:

- a. GIS unit with the required hardware and software
- b. Training
- c. Methodology development (including data requirements) for the 2013 population and Housing Census

#### **Purpose of the assignment**

The purpose of the assignment would be to complete the first technical assistance mission at the Bureau of Statistics successfully.

The mission will cover two pre-set priorities to varying degrees. These are:

- o Priority 1: Training
- o Priority 2: GIS Infrastructure

Priority 1 will comprise 40% of the mission time and priority 2 will comprise 60% of the mission time. The total consultant time for the mission is 12 days divided as follow:

- o 10 days actual mission time, can also be used in part for report writing
- o 2 days consultant preparation and additional report writing time

#### **Following are the objectives and planned activities by priority for the mission:**

##### **Priority 1**

- Objectives
  - To train staff in basic GIS concepts and definitions
- Activities
  - Prepare training programme
  - Logistics (venue, etc.)
  - Invitations to stakeholders
  - Conduct training

##### **Priority 2**

- Objectives
  - To prepare a specification for hardware and software
  - To identify and approach potential donors for funding
- Activities
  - Assess current status with regards to hardware and software
  - User needs assessment
  - Prepare functional specification
  - Prepare budget
  - Prepare technical specification document (required for funding)

#### **Skill requirements**

The consultant would need relevant census mapping and GIS experience and skills within the African context and need to read and write English fluently. GIS experience needs to be hands-on and practical instead of purely theoretical.

#### **Deliverables**

The deliverables is listed by priority:

##### **Deliverables for Priority 1:**

- Training manuals
- Trained staff

**Deliverables for Priority 2:**

- Technical specification
- GIS Infrastructure assessment and infrastructure document
- GIS Infrastructure and assessment budget and implementation plan

A concluding Mission Report will form part of the final deliverable as well as a report by the Gambia Bureau of Statistics staff on the mission success and value.

**Duration**

As noted, the total consultant time for the mission is 12 days with 10 days mission time and 2 days preparation time.

**Timing**

To be completed from 29 October to 9 November, 2007

## 13.2 Annexure 2: List of Abbreviations and Acronyms

GBOS	Gambia Bureau of Statistics
SEA	Standard Enumeration Area
GIS	Geographic Information System
IT	Information Technology
GDSS	Global Data Dissemination System
IMF	International Monetary Fund
DFID	Department for International Development
UNFPA	United Nations Population Fund
GPS	Global Positioning System

**13.3 Annexure 4: GIS Situational Analysis, Infrastructure Assessment and Technical Specification document**

**To be provided as an accompanying, separate document**

## 13.4 Annexure 5: The Gambia Country Report

### Introduction

The consultant, Mr. Etienne de Fortier arrived in Banjul on the 28<sup>th</sup> of October and departed again on the 7<sup>th</sup> of November. The main objectives for The Gambia Bureau of Statistics regarding this mission was to receive the necessary training regarding GIS concepts and definitions as well as new Census Mapping Methodology using GIS technology, determine the exact type and cost of hardware and software needed for the GIS office and to receive a technical specification document that can be used for funding of the above mentioned hardware and software.

All of these objectives were successfully reached during the mission.

The mission Terms of Reference detailed the specific activities and deliverables for this mission. The following tables are a breakdown of the mission activities and deliverables with an indication of successful completion or not.

### Specific Activities according to the ToR

ACTIVITY	SUCCESSFULLY COMPLETED
Training of GBOS staff	Yes, the consultant provided the necessary training on the following Topics: Introduction to GIS, Concepts and Definitions; Organizational Assessment; GIS Implementation, GIS in Statistical Agencies; Census Mapping and Survey Methodologies; GIS Analysis; GPS and Remote Sensing
Assess current situation regarding hardware and Software	Yes. The consultant assessed the current situation regarding the hardware and software in the GIS/Cartography Unit of GBOS. Different assessment meetings were held where the consultant had the opportunity to speak to the relevant role players and assess the current situation.
Create Specification for Hardware and software	Yes. A Hardware and Software Specification was created by the consultant.
Get quotations for the necessary hardware and software	Yes. The consultant visited three of the bigger companies in The Gambia to obtain the necessary quotations. The consultant could only obtain some of the software quotations in South Africa
Create and Draw up functional and Technical specification for hardware and software.	Yes. The draft document has been drawn up and provided to us for review. The final draft has also been emailed to us and we are satisfied with its contents.

### Specific deliverables according to the ToR

DELIVERABLE	SUCCESSFULLY COMPLETED
Training of GBOS staff. Training Manuals	Yes, the consultant provided the necessary training material in softcopy format. A hardcopy of each topic was printed and handed over to the trainees.
Assess current situation regarding hardware and Software	Yes. The consultant drew up an Analysis and Infrastructure Assessment report. It was reviewed by us and we are satisfied with the content.

Create and Draw up functional and Technical specification document for hardware and software.	Yes. The draft document has been drawn up and provided to us for review. The final draft has also been emailed to us and we are satisfied with its contents.
---	--

**Additional Support**

The consultant was requested to provide additional support regarding the situational analysis of the GIS/Cartography unit. The Gambia Bureau of Statistics is currently busy drawing up a Statistical Strategy Document aimed at the next five years; the GIS/Cartography Unit is an important part of the Strategy. The consultant was therefore asked to add to his current scope of the TOR and include the necessary assessment and recommendations necessary for the GBOS Statistical Strategy with specific reference to the GIS/Cartography Unit. The consultant was also requested to set-up two newly acquired HP black and white plotters and to convert various different data sets received from the Surveys Department to be used as back drop information for digitizing of the Enumeration Data in Arcview 3.3.

The consultant performed all the above mentioned tasks satisfactorily and we received the necessary information and assistance required.

**Timing**

The time allocated to this mission was sufficient and allowed us to cover all the activities successfully, especially when one takes into account the additional tasks that were not planned for.

**General remarks**

The mission was certainly successful in that the consultant was able to provide us with the training that we needed, the training on the Introduction to GIS and new Census Methodologies were particularly helpful in understating the need and potential of a GIS in an Statistical Agency. We were able to sit with the consultant and plan our specific needs for the future. The consultant himself was excellent and is very knowledgeable about GIS as well as the needs regarding the Hardware and Software requirements of the Office. The additional assistance regarding the GIS Institutional Arrangements needed for our Statistical Strategy was of particular importance as well as the creating of the backdrop data for EA digitising. We are looking forward to the next mission; hopefully by the end of May 2008 when we will need specific practical hands on training using the proposed, newly acquired, hardware and software.