

## TERMS OF REFERENCES

Job title:	<b>National consultant to advise NBS on GIS technology applied for the statistical purpose and population census</b>
Potential Applicants:	Expert in GIS
Application Deadline:	20 November 2012
Expected Duration of Assignment:	December 2012 – February 2013, estimated volume of work – up to 40 working days (8-hours full day)
Reference to Project:	UN Joint Project on Strengthening the National Statistical System, Participating agencies -- UNDP, UN Women
Project Activity:	Activity 2. Preparation of the Population and Housing Census
Contract type:	Individual Contract
Beneficiary:	Government of the Republic of Moldova, local public authorities, civil society, general public

### BACKGROUND

The needs for better interpretation and presentation of statistics, together with improved and more available tools for mapping of statistics and its analysis from geographical perspective, have put Geographical Information Systems (GIS)<sup>1</sup> on the agenda of the most national statistical offices. The widespread use of such tools has contributed to increased demand for regional and geo-referenced statistics. To meet this demand, producers of statistics also have to increase their knowledge and experience in this field.

A national statistical office is the main institution for production and dissemination of official statistics to be used for analyses and research. The use of geo-informational system in the framework of Population and Housing Census is a modern method recommended by UNSTAT and which, in fact, has been already implemented by a series of countries for the census.

The international bodies specialized on GIS and census-mapping<sup>2</sup> emphasized the need for countries to approach the use of census geography programmes as a continuous process rather than merely a sequence of mapping and dissemination operations. Therefore, the use and application of contemporary geospatial technologies and geographical databases are beneficial at all the stages of the population and housing census process. Geospatial technology can make contributions before, during and after the census enumeration.

Moreover, Censuses usually play an important role in geo-referencing of statistics, providing a basis for thematic mapping and geographical analyses in general.

In 2014, the Republic of Moldova is to undertake the next round of the Population Census that will, this time, also include the housing component. In this respect, the Law<sup>3</sup> on conducting the Population and Housing Census (PHC) in (April) 2014 has been approved, aiming, among other scopes, to harmonise the national legislation with the international one in order to ensure the international comparability of the Census results. According to the Law the National Bureau of Statistics (NBS) is the main body of public administration responsible for methodological support, organisation and conducting of the Census, processing of collected data, aggregation and dissemination of results. While other specialised public institutions should provide the necessary support to NBS and grant free access to sources of administrative data and information.

Joint UN Project on Strengthening the National Statistical System of RM (Statistics Project) is currently implemented by the UNDP, UN Women, UNICEF, UNFPA and ILO, in partnership with the National Bureau of Statistics (NBS) and aims at improving data production, dissemination and use of statistical information with particular attention to national needs and overall conformity of official statistics with international standards. One of the Statistics Project's intended results is the *improved capacity* of the National Bureau of Statistics and other line ministries, involved in production of information (through administrative reporting system, surveys and censuses) *to produce*, in a timely manner, *data* of appropriate quality being multi-dimensionally disaggregated. The second expected result would be the *improved use* of available disaggregated

<sup>1</sup> Geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present all types of geographical data.

<sup>2</sup> The *Handbook on Geospatial Infrastructure in Support of Census Activities, 2009* reflects the recommendations of the expert group meetings and regional workshops on GIS and census-mapping.

<sup>3</sup> Law no.90 as of 26.04.2012 on the Population and Housing Census in RM in 2014, <http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=343677>

*statistics* by different categories of data users, in particular for evidence-based monitoring of policies, development strategies, programmes, necessary to analyze and monitor such phenomena as poverty, social exclusion, gender equality, etc.

## Context

Given the fact that a Census represents a complex exercise of recording the targeted statistical population and its characteristics, the quality of its results depends on the successfulness of each stage being passed which are interlinked and should follow a certain succession. In particular, the preparation activities play a key role as it regards the effectiveness of the data collection and data processing processes. Therefore, the level of naming and numbering of streets, buildings, houses and apartments in the country is impacting the establishment of the schematic plans of localities and their boundaries, while the lack of cartographic materials disables the drafting of plans to conduct the census.

These represent the background materials on the basis of which the census units are delimited. The schematic plans of towns and maps of raions are used to mark the boundaries of the census sections and sectors, lists of buildings with corresponding addresses are developed to be visited by the census staff.

Basic statistical units for the Population Census 2004 and the General Agriculture Census 2010 were established based on a series of administrative sources, such as: Households Registers and Farmers Registers (printed) held by the local public administration, orthophotograph<sup>4</sup> and digitized maps provided by the cadastral authorities.

In Moldova, until recently data collection was based on censuses or surveys with samples drawn from registers, and with the exception of land use statistics, there has been no need for using geographical methodology in data collection. Even if large parts of statistical data are geo-referenced (i.e. to development regions, raions, municipalities), there has been little tradition for analyses of regional and geographical patterns in NBS. Most of researches and analysis are undertaken with time series where data without geographical dimensions are used.

Even if the potential for statistical thematic mapping is still underdeveloped in NBS, attempts to use maps for presentation and dissemination of statistics have been made over the last years, including:

- Thematic maps on demographic situation of the RM in 2008<sup>5</sup> (printed);
- Publication "Women and Men in RM. Analysis from territorial perspective", including territorial representation of socio-demographic gender indicators on 11 maps (printed and electronic version);
- Visualization of data on demographic events, households' provision, population number and density, participation of population in economic activities in territorial perspective through animated maps<sup>6</sup> (online application);
- Other - recently NBS has obtained 2 licenses for ArcView application, which is going to be used for the dissemination activity related to the results of the General Agriculture Census 2010.

Moreover, at present, the NBS is not equipped with a Geographic Information System which would allow the use of geo-referenced statistical information for the current statistics purpose (addresses plan for sectoring in the framework of Population Censuses, sample basis for household surveys, etc.), as well as for dissemination of territorial statistics in an attractive and user-friendly format/manner.

Hence, GIS technology has not been used in statistical analyses to any significant extent in NBS. However, several new GIS activities are planned, and the use of presentation tools for statistical thematic mapping gains increased interest in NBS.

Agency for Land Relations and Cadastre and the State Enterprise "Cadastru" are offering graphic information to visualize the place of the assets on the map and their boundaries, accompanied by textual information from the Register of Assets regarding their value. Moreover, according to the mentioned Law on PHC 2014, the territorial cadastral offices of State Enterprise "Cadastru" will have to ensure the distribution by Census sectors of each locality according to NBS's methodological principles.

Due to such availability of administrative information, cooperation of NBS with cadastral and other competent institutions of public and local administration is considered important and crucial when establishing the census units by NBS and conducting the Census in the field.

---

<sup>4</sup> An orthophoto, orthophotograph or orthoimage is an aerial photograph geometrically corrected ("orthorectified") such that the scale is uniform. Unlike an uncorrected aerial photograph, an orthophotograph can be used to measure true distances, because it is an accurate representation of the Earth's surface, having been adjusted for topographic relief, lens distortion, and camera tilt.

Orthophotographs are commonly used in the creation of a Geographic Information System (GIS). Software can display the orthophoto and allow an operator to digitize or place linework, text annotations or geographic symbols (such as hospitals, schools, and fire stations). Some software can process the orthophoto and produce the linework automatically. Source: <http://en.wikipedia.org>

<sup>5</sup> Set of maps regarding the demographic situation in the Republic of Moldova in 2008, [http://www.statistica.md/public/files/Demographic\\_Situation\\_2008.pdf](http://www.statistica.md/public/files/Demographic_Situation_2008.pdf)

<sup>6</sup> Animated maps of NBS, developed in collaboration with Data Visualisation Center of the Office for National Statistics of UK and Northern Ireland, <http://www.statistica.md/pageview.php?!=ro&id=3807&idc=390>

Within the described context, the *Project on Strengthening the National Statistical System* gathers the efforts of several specialised UN agencies in the process of strengthening the statistical capacities of Moldova and brings additional technical assistance offered to NBS regarding the preparation of the future Population and Housing Census in 2014.

## SCOPE OF WORK AND EXPECTED OUTPUTS

The scope of work of the national consultant is **to elaborate the concept on creation and use of GIS in NBS's activities, in particular for the purpose of Population and Housing Census 2014.**

### Specific objective

The specific objective of the assignment is to provide national stakeholders with the concept that will consist of, but not be limited to, the situational analysis of the field of Geographical Information System at the national level, including the best practices, relevant experiences available within other national institutions (Agency for Land Relations and Cadastre and its subordinated specialized entities, Institute of Geography, etc.).

Another specific component of the concept will be represented by the strategy on creation/development and use of GIS, including the descriptions of main stages to be passed, activities to be carried out, estimation of needed efforts/resources (personnel, financial costs, etc.).

The participation and involvement of the relevant specialists from NBS will be ensured. Activities envisaged under the present task will contribute to the achievement of mid-term priorities of NBS and will be carried out in accordance with the Law of RM on Official Statistics, Law on Population and Housing Census 2014, Strategic Development Plan 2012-2014 of NBS and other legislation.

National stakeholders to benefit of the results of the given assignment include: NBS, National Commission for Population and Housing Census that is to coordinate and monitor the whole exercise, the State Chancellery, central and local public administration bodies in compliance with their competencies and functions.

The GIS consultant will work in close collaboration with specialists of the National Bureau of Statistics and the Project staff.

### Main Tasks and Responsibilities

Under the overall supervision of the UNDP and the NBS focal point, in partnership with the Project's counterparts, the consultant is expected to perform the following activities:

1. **Desk review** — The consultant will have to review the available technical guides on the contemporary methods, tools and best practices that would enable NBS statisticians to better articulate their needs and deal with census-mapping operations more efficiently:
  - Get acquainted with the results of previous activities undertaken so far by the NBS and involved stakeholders in the area of concern for the present assignment;
  - Analyze international and European standards and best practices on the use of GIS for statistical purpose, in particular for census activities;
  - Review and evaluate the resources and materials available at the moment related to GIS at the national level (in Cadaster, and other similar organisations) which could be relevant for statistical/Census purpose;
  - Consultations with the staff of NBS will be undertaken to determine more details on the actual use of geographic materials for statistical works and activities, needs for new improvements/updates;
  - Propose own approach for the expected activities and detailed work plan that encompasses the above-mentioned objectives and discuss them with Project stakeholders;
2. **Undertake an analysis on GIS resources available in/for the country's context**
  - A envisaged revision of available resources will consist of, but not be limited to, the situational analysis of the field of Geographical Information System at the national level, including the examples of country best practices, relevant experiences available within other national institutions (Agency for Land Relations and Cadastre and its subordinated specialized entities, Institute of Geography, etc.). in the application of GIS, GPS and digital mapping;
  - On the basis of this, the NBS will need to evaluate how available mapping options fit into the context of its own census programme and national statistics planning;
  - Such issues as existing geographic resources in the country, technology resources and staff, available funds and the time frame allocated to complete the geographic tasks for the census will determine the best mix of technology and approaches for the NBS case;
  - The envisaged analysis of GIS resources will serve as a basis for formulation of GIS concept and strategic note for NBS (see next activity);
3. **Formulate a concept and strategic note** on creation and use of GIS in NBS's activities, in particular for the purpose of Population and Housing Census 2014
  - A *GIS concept for NBS* will be formulated on creation, development and use of GIS within the statistical processes and activities, in particular censuses. The concept will be designed to envisage an optimal implementation scenario using the GIS resources available in the country.

The report will describe the role of geospatial technology in each step of the census process, will show how these/GIS technologies would improve efficiency in the preparatory, enumeration, processing and dissemination phases of the census, potential costs and benefits of investment in geospatial technology by NBS. The concept will address managerial, organizational and institutional issues that the NBS management should consider when implementing/applying the geospatial infrastructure within the organization to permit the full use of it;

- This concept will also include a *strategic note*, or roadmap, containing the recommendations and follow-up activities on further implementation of GIS technologies in statistical processes by NBS, including: descriptions of main stages to be passed by NBS, activities to be carried out, estimation of needed efforts and relevant resources (personnel, financial costs, etc.) to ensure the successful implementation of GIS;
- In addition, *suggestions* for GIS map sets utilization for *sampling activities* will be made and *recommendations* to overcome the existing/eventual *gaps* in the appropriate legislation or policy-making framework will be provided;
- The structure of the report will be in advance agreed with the NBS and the Project.

#### 4. Other activities

- Present the results of the assignment, in particular, the GIS concept, to the NBS's staff;
  - Support the organisation and facilitation of round-table (or practical workshop) with the participation of NBS specialists and other national partners aimed to present the developed GIS concept, results achieved and outputs delivered, to gather participants' feedback, as well as to advocate for the subsequent follow-up of the produced outputs by the concerned institution/s.
- Develop an activity report on consultancy undertaken, including stages passed, resources used, results obtained versus expected, impact of obtained results, risks overcome, problems faced, lessons learned, conclusions and next stage recommendations.

The contracted consultant will ensure a high level of analytical support, efficient communication and cooperation with the National Bureau of Statistics, the Project and national relevant institutions and is expected to perform a team-work together with the specialists of named institutions for the successful fulfilment of the formulated tasks.

#### DELIVERABLES

Performing the mentioned above activities, the contracted team of consultants will be responsible for delivering of the following outputs, comprising the main milestones:

Deliverable	Tentative timeframe
1. Own <b>approach</b> for the expected activities and detailed <b>work plan</b>	In 1 week from contract date
2. Paper with <b>situational analysis on GIS resources</b> available in/for the country's context	In 4 weeks from contract date
3. <b>Concept and strategic note</b> on creation and use of GIS in NBS's activities, in particular for the purpose of Population and Housing Census 2014	In 8 weeks from contract date
4. <b>Handouts</b> for public presentation of outputs to NBS and other national stakeholders a	In 10 weeks from contract date
5. <b>Activity report</b> on undertaken assignment (including stages passed, inventory of resources used, results obtained versus expected, impact of obtained results, risks overcome and problems faced, lessons learned, recommendations etc.) plus documentation related to the conducted work	In 1 week from the date of preceding deliverable

All the deliverables should be agreed with NBS and the Project Team and be provided in Romanian, the last deliverable – also in English.

The success of given activity can be ensured only by team work of all partners involved via active participation at all the stages of the assignment and the contracted consultant should play the role of guarantor of these joint effort.

#### Estimated Duration of the Contract

The activities under the present assignment are expected to commence at the **end of November 2012** and be fully completed by **end of February 2013**. The volume of consultancy has been estimated at up to **40 working days overall per whole assignment** (full days of 8 hours) (*could be changed if correspondingly justified*) during which all the activities and outputs/results envisaged under the present assignment are expected to be performed.

*Note: The mentioned number of working days has been estimated as being sufficient/ feasible for the envisaged volume of work to be completed successfully and is proposed as a guideline for the duration of assignment, and it can not be used as criteria for completion of work/assignment. The provision of envisaged deliverables approved by the Project partners and concerned national stakeholders would be the only criteria for the Contractors work being considered completed and eligible for payment/s.*

#### Expected Outcomes of the work

The GIS Concept and Strategic Note to be produced by the consultant are expected to:

- emphasize the need to extend the scope of census cartography to the national spatial framework of the country;
- provide constructive options for the reorganization of census-mapping and analytical tasks around digital geographically referenced databases;

- highlight the need to develop realistic plans in order to harness the power of GIS and other geospatial technologies for modernizing census operations and obtaining better results and analysis.

In the long run, such work will contribute to the:

- increased availability of data in a variety of useful formats;
- implementation of new technology to make data collection, analysis and storage easier than before;
- development of capacity to analyze census data and deliver products to the public in a timely way.

## QUALIFICATIONS AND SKILLS REQUIRED

The consultants are expected to comply with the following qualification criteria:

### *Education:*

- Higher or more advanced **education** in the fields of geography, computer science, or geo/information technology and/or other science related to areas of assignment;
- Other relevant formal education (preferably certified), in particular on office IT technologies and GIS related software (ArcGIS, MapInfo, etc.);

### *Experience:*

- At least 5 years of proved previous working **experience** with the GIS technology applied in development and/or implementation of similar Information Systems
- Experience of collaboration with **Government** in IT topics concerning the Public Service (incl. e-governance);
- Experience in working with **development partners** (in particular UN/UNDP) and nongovernment organizations, in particular in area/s relevant for the present assignment;

### *Competencies and Skills:*

- Excellent **analytical**, writing and communication **skills**;
- Good **knowledge** of the geography and GIS **concepts**;
- Familiarity with the **national context** related to the areas of concern and international practice;
- Romanian **language** proficiency; Good knowledge of English;
- Ability to analyse, plan, communicate effectively orally and in writing, draft reports, solve problems, organize and meet expected results, adapt to different environments (cultural, economic, political and social);

### *Personal Qualities and other requirements:*

- Good interpersonal skills, solid judgment/decision making, initiative and creativity;
- Ability to be independent, impartial and credible in a challenging environment;
- Availability to work with UN and Project's national stakeholders during the indicated/approved period;
- Adherence to UN's values and ethical standards;
- Cultural and gender sensitivity.

## Performance evaluation

Contractor's performance will be evaluated against such criteria as: timeliness, responsibility, initiative, communication, accuracy, and quality of the products delivered.

## Reporting requirements

When the need is confirmed and at the request of Project Manager, the Consultant will report (informally) on ad-hoc basis on the progress achieved, difficulties encountered in the process of work and the supported needed from the Project or counterparts, results accomplished as well as eventual changes in the activity plan/schedule, etc.

## Financial arrangements

Payments will be disbursed in installments upon confirmation of Joint UN Project on Strengthening the National Statistical System on delivering of the contract obligations, services and products in a satisfactory manner.

## Travel Requirements

During the contract period no travel is required.

## SUBMISSION OF PROPOSAL

The submission package will consist of:

1. Technical Proposal:
  - explaining how applicant responds to qualification requirements and why he/she is the most suitable for the work;
  - describing a short vision on achievement of tasks;

Applicant will provide reference list of previous similar works/projects with contact details and permission for reference check indicating the e-mail addresses or fax numbers for contact persons.
2. Personal information (as a detailed CV or as a Personal History Form /P11) including records on past experience in similar projects/assignments and concrete outputs obtained;
3. Financial proposal (in USD, specifying a total lump sum amount (including all related costs e.g. fees, phone calls etc.) and the number of anticipated working days.