

TERMS OF REFERENCES

National Consultant to perform additional calculation of demographic indicators in regional aspect

Contract type:	Individual Contract modality
Duty station:	Home based
Estimated Duration:	July–September 2013, up to 20 working days
Contracting Authority:	United Nations Development Programme (UNDP)
Main stakeholder:	National Bureau of Statistics
Main beneficiary:	Ministry of Regional Development and Constructions, Ministry of Labour, Social Protection and Family, State Chancellery, other CPAs and LPAs
Reference to Project:	UN Joint Project on Strengthening the National Statistical System, donor Government of Romania
Activity 7:	"Improvement of availability and reliability of regional statistics for decision-makers of the Republic of Moldova", component 1 – Support the evidence-based monitoring of regional development policy.

BACKGROUND

The population of the Republic of Moldova, just like in the EU countries, faces a progressive ageing process. This change is a result of a significant and constant increase in life expectancy at birth, combined with decreased fertility rate. A method to illustrate this structural change in population would be the demographic dependency ratio, which analyses the relation between the number of elderly people and active-age population. The analysis of the demographic situation shows that there are significant differences among the main demographic indicators in territorial profile. Having determined values for every administrative territory, it is possible to carry out the dynamics analysis of the used indicators and to classify the efforts' results and applied resources.

Based on the Government Decision No. 768 as of 12 October 2011, the National Strategic Program in the area of demographic security in the Republic of Moldova (2011-2025) was approved. The respective program provides for transparent monitoring and objective fulfillment of the established tasks and the way of work at the national, municipal, and district levels. Quantitative and qualitative statistical indicators corresponding to the concerned objectives, tools and specific procedures shall be used within the monitoring system, according to the provisions of the Program and the recommendations of the scientific project "Modeling the demographic security level for the Republic of Moldova"¹.

The statistical reports and information, prepared at different stages, regarding the carrying out of the Program shall be provided to the Government, the National Commission for Population and Development, to local public administration authorities, general public, including through available web pages and information newsletters.

When monitoring the results, a set of indicators shall be used to measure the progress level in carrying out the main tasks related to ensuring the gradual establishment of demographic development conditions. For this purpose, it was envisaged to calculate the benchmark limit-values of the demographic security indicators by certain stages, which would characterize the demographic security/insecurity level in all the administrative-territorial units.

The statistical indicators regarding the general characteristic of the demographic situation at the national level, based on the list set in the above Program, will be submitted annually to the Ministry of Labor, Social Protection and Family (MLSPF) by the National Bureau of Statistics (NBS) within the deadlines set in the Annual Program of Statistical Activities, approved by the Government.

The evaluation of the impact induces by the actions undertaken at the territorial level, following the strategic objectives of the Program, will be carried out by applying the toolkit, which would determine the value **of the territorial integral demographic security indicator for every district and municipality** (hereinafter referred as the TIDSI). By calculating and analyzing the TIDSI and its evolution, it would be possible to assess the social-demographic situation, measuring the aggregated impact of the social, economic, and demographic policies within the scope of the administrative-territorial unit.

The territorial integral demographic security indicator represents the sum of the aggregated indicators from the areas with the highest weight of influence on demographic security, calculated on the basis of the sets of selected indicators. The block of demographic indicators, besides the general indicators regarding the population evolution, provides for calculating the sets of additional indicators at the territorial level, namely:

- Coefficient of population aging

¹ According to Joint Order of the Ministry of Labour, Social Protection and Family, NBS and Institute of Economics, Finance and Statistics no. 112/70/180 as of 16.08.2012, on approval of the regulation on determination of the statistical data, calculation and presentation of the territorial integral demographic security indicator, Published in Monitorul Oficial no.216-220, Chisinau, as of 19.10.2012, p. 80-86

- Average age of the population
- Total age dependency ratio
- Young age dependency ratio
- Old age dependency ratio
- Age-specific fertility rate
- Total fertility rate
- Mean age of women at childbirth in a given year
- Life expectancy.

Context

The complexity of the process for establishing the data on population is related to the fact that the processing of the huge volume of primary data is not limited only to their generalization, but also to calculating a number of demographic values for absolute and relative data, which should be taken into account when setting the database on current statistics about population. On the other hand, so as to meet the different needs of the data users, the database should also include information about the population for a rather long period of time.

A concrete output of the Joint UN Project on strengthening the national statistical system is the demographic database which includes a set of the most important demographic indicators. Among other objectives, this project aimed at improvement of production, quality and use of demographic statistics in the country, as well as on enhancing the statistical potential of the National Bureau of Statistics and other data producers. This database is envisaged to serve as an information and inquiry platform for carrying out statistical analyses, providing forecasts, debating policies and taking decisions on demographic issues, including the monitoring of the National Strategy in the area of demographic security, also it serves as a tool for statistical information dissemination.

The National Bureau of Statistics is providing demographic calculations at the national level since long ago. The databank includes information about the population ageing coefficient for 1980-2012, the average age of the population for 1992-2012, reproductive indicators for 1980-2012 (total fertility rate since 1978), life expectancy at birth for 1958-2012, and demographic burden indexes for 2000-2012.

The regional profile of the databank is rather weak being limited to: population number and the main statistical indicators for natural movement of population. Because of the insufficient technical and human resources, the demographic calculations, including the statistical tables on births and deaths by territorial profiles, are not actually undertaken by the NBS.

Besides that, NBS has all the necessary information for producing the above-mentioned indicators by districts and, respectively, by development regions. The time frame would also represent a significant limitation. Because of the frequent administrative-territorial reforms in the country, the dynamics of the population number of the districts by sex and age is available only since 2007. Nevertheless, this information is enough to monitor the indicators necessary for calculation of the territorial integral demographic security indicator for every district and/or municipality. These data are also relevant for carrying out different studies in demography area for further development of the regional social-economic policies.

Aiming to present the above-mentioned indicators in a complete and timely manner, it is necessary to carry out additional calculations of the demographic indicators in the regional aspect. This workload is huge and complicated (NBS does not have no staff for carrying out such works). Hence, it is necessary to have the assistance of a national consultant to perform.

SCOPE OF WORK AND EXPECTED OUTPUTS

To address the afore mentioned issue and to ensure the effective completion of the data collection effort undertaken at the regional level, the Joint UN Project on Strengthening the National Statistical System of the Republic of Moldova is seeking to hire **a national consultant to undertake calculations of demographic statistical indicators in regional profile.**

Main scope of this assignment is to ensure the completeness and quality of statistical data on demographic phenomena in regional perspective.

The expected results will help to establish the necessary prerequisites for NBS to develop output tables with new statistical indicators in territorial profile (by regions, districts) in the area of demographic statistics and dissemination of obtained indicators via the NBS official web page (chapter „statistics by areas”), databank of the NBS, regional statistics publications, etc. to provide the central and local public administration authorities, as well as other users, with demographic statistical information.

Main Tasks and Responsibilities

The contracted consultant, under the overall supervision of the Project and in cooperation with NBS, is expected to:

1. Calculate the following statistical indicators according to generally accepted definitions and formulas:

1.1. Coefficient of population aging (*number of persons aged 60 years and over per 100 inhabitants*)

$$Af(t) = \frac{P_{60+}}{P} \times 100, \text{ where:}$$

$Af(t)$ – the ageing factor of population the beginning of year t ; P_{60+} – the population aged 60 and older at the beginning of year t ; P – the population at the beginning of year t

1.2. Average age of the population is the mean age of the population at the beginning of a respective year:

$$\bar{A} = \frac{\sum (x + 0.5) \cdot P_x}{\sum P_x}, \text{ where:}$$

\bar{A} – mean age of the population; x = age; P_x = the population aged x at the beginning of year.

1.3. Total age dependency ratio is the number of children aged under 15 and elderly persons (aged 60 and older) per 100 persons aged 15–59 at the beginning of a respective year:

$$DR(t) = \frac{{}_{14}P_0(t) + P_{60+}(t)}{{}_{59}P_{15}(t)} \cdot 100, \text{ where:}$$

$DR(t)$ – the total age dependency ratio at the beginning of year t ; ${}_{14}P_0(t)$ – the population aged 0–14 at the beginning of year t ; ${}_{59}P_{15}(t)$ – the population aged 15–59 at the beginning of year t ; $P_{60+}(t)$ – the population aged 60 and older at the beginning of year t ;

1.4. Young age dependency ratio is the number of children aged under 15 per 100 persons aged 15–59 at the beginning of a respective year:

$$DR_{0-14}(t) = \frac{{}_{14}P_0(t)}{{}_{59}P_{15}(t)} \cdot 100, \text{ where:}$$

t – year; $DR_{0-14}(t)$ – the young age dependency ratio at the beginning of year t ; ${}_{14}P_0(t)$ – the population aged 0–14 at the beginning of year t ; ${}_{59}P_{15}(t)$ – the population aged 15–59 at the beginning of year t ;

1.5. Old age dependency ratio is the number of elderly persons aged 60 and older per 100 persons aged 15–59 at the beginning of a respective year:

$$DR_{60+}(t) = \frac{P_{60+}(t)}{{}_{59}P_{15}(t)} \cdot 100, \text{ where:}$$

$DR_{60+}(t)$ – the old age dependency ratio at the beginning of year t ; t – year; ${}_{59}P_{15}(t)$ – the population aged 15–59 at the beginning of year t ; $P_{60+}(t)$ – the population aged 60 and older at the beginning of year t ;

2. Generate tables with the results of fertility indicators' calculations

2.1. Age-specific fertility rate defines the annual fertility rate at each age group of women. To compute the rate for the group at the age of 15–49, all births are taken into account in the numerator, including births to women at the age under 15 and 50 and older.

$${}_N F_x = \frac{{}_N B_x}{{}_N P_x}, \text{ where:}$$

x – woman's age at birth; n – the length of the age interval; ${}_n B_x$ – the number of live births in the age interval of $[x, x + n)$; ${}_n P_x$ – the average annual number of women in the age interval of $[x, x + n)$; ${}_N F_x$ – the age-specific fertility rate in the age interval of $(x, x + n)$.

2.2. Total fertility rate is the average number of children who would be born alive to a woman during the reproductive period of her life (aged 15–49) if she lived to be 50 years old and at each age experienced the given year's age-specific fertility rates

$$TFR = n \sum_x {}_N F_x, \text{ where:}$$

TFR – the total fertility rate; x – woman's age at birth; n – the length of the age interval; ${}_N F_x$ – the age-specific fertility rate in the age interval of $(x, x + n)$.

2.3. Mean age of women at childbirth in a given year:

$$x_t = \frac{\sum_x (x + 0.5) \cdot {}_Nf_x}{\sum_x {}_Nf_x}, \text{ where:}$$

x_t – the mean age of women at childbirth; x – woman's age at birth; n – the length of the age interval;
 ${}_Nf_x$ – the age-specific fertility rate in the age interval of $([x, x + n)$.

3. Generate complete life table

Complete life tables represent a modern tool for the analysis of the status and trends in the population death rates, these consisting of a system of interlinked indicators, such as:

I_x – population number in age intervals;
 D_x – population number dying in age intervals
 m_x – показатель смертности в возрастных группах
 q_x – probability that a person who reaches a certain age dies within a year
 P_x – probability that a person who reaches a certain age lives another year
 L_x – average number alive in the age interval
 T_x – total number of person-years lived in each age interval
 e_x – expected number of years of life remaining at any given age.

Each of these indicators can be used to calculate the other indicators from the above list. The final and core indicator of complete life tables is life expectancy at birth which is a probability index indicating the average length of life of every person, or a person having attained a certain age, provided the mortality rate of every age group of the population of the target generation remains unchanged.

DATA SOURCES to be used for accomplishment of above tasks:

1. *Structure of population in RM districts by sex and age at the beginning of 2007-2013 years*, (calculations performed by the Demographic Statistics Division of the NBS).

2. *Data regarding the natural movement of the population* during 2006-2012 – annual reports developed by NBS based on the statistical bulletins about birth and death, received from the SE "CRSE „Registru" of the Ministry of Information Technology and Communications"

- Table NV-4 „Live births by newborn's rank and mother's age";
- Table DEC-2 „Distribution of deaths by sex and age";

DISAGGREGATION LEVELS to be ensured:

Coefficient of population aging – by regions, districts, sex, and areas
 Average age of the population – by regions, districts, sex, and areas
 Total age dependency ratio – by regions and districts
 Young age dependency ratio – by regions and districts
 Old age dependency ratio – by regions and districts
 Age-specific fertility rate – by regions and districts
 Total fertility rate – by regions and districts
 Mean age of women at childbirth in a given year – by regions and districts
 Life expectancy – by regions, districts, and sex.

The data will be grouped according to the Classifier of the administrative-territorial units of the Republic of Moldova (CUATM), approved via the Decision of the Moldova-Standard Department No. 1398-ST dated 03.09.2003, entered into force starting in 03.09.2003.

The contracted consultant will have the possibility to cooperate and be advised by the NBS and Project staff.

DELIVERABLES

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

#	Deliverable	Tentative timeframe and time sequence
1	Calculations of indicators disaggregated by territorial unit: <ul style="list-style-type: none"> - Coefficient of population aging - Average age of the population - Total age dependency ratio - Young age dependency ratio - Old age dependency ratio 	1 months from contract date
2	Fertility tables in territorial perspective including calculation of indicators: age-specific fertility rate, total fertility rate, mean age of women at childbirth in a given year	1.5 months from contract date
3	Complete life tables in territorial perspective	2 months from

		contract date
4	Final report 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 for improvement of national legislation in the field etc.) plus documentation related to the developed outputs	In 1 week after provision of deliverable 3

Estimated Duration of the Contract

The activities under the present assignment are expected to commence by the beginning of **July 2013** and be fully completed by **end of September 2013**. The consultancy presumes up to **20 working (full) days**. The consultant/s will be assisted by the staff of NBS and the UN Project for conceptual and technical aspects of the assignment.

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 and its 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

- Increased availability of the demographic indicators in territorial profile;
- extension of the NBS databank with demographical statistics indicators in regional profile;
- contribute to the improvement of demographic processes monitoring in the country;
- determination of the value of the territorial integrated demographic security indicator for every district;
- provide evidence for evaluation of the implementation of the National Strategic Program in the area of demographic security of the RM (2011-2025);
- improve the use of regional statistics in strategic planning at the national and regional levels for the development of policy documents' studies and relevant analyses for regional development.

QUALIFICATIONS AND SKILLS REQUIRED

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

Education:

- Higher **education** in the area of social (in particular demography, etc.), economic and/or other science related to areas of assignment;

Experience:

- At least 6 years of proved previous working experience of work related to **data collection and/or production**, but also **use of population & demography statistical data**;
- Experience of collaboration with **Government** in area/s relevant for the present assignment;
- Experience in working with **development partners** (in particular UN/UNDP);

Competencies and Skills:

- Ability to work with **large datasets**, on-line web-based applications;
- Familiarity with the **national context** (legal and policy framework) related to the areas of assignment concern and international practice;
- Good knowledge of the **terminology, definitions and procedures** used on international level (European/international standards) as it regards population and demography statistics areas
- Romanian and English **languages** proficiency;
- Ability to analyze, 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);
- Good interpersonal skills, solid judgment/decision making, initiative and creativity;
- Ability to be independent, impartial and credible in a challenging environment;
- Adherence to UN's values and ethical standards;
- Cultural and gender sensitivity.

Organizational settings

The consultant is expected to work in a close cooperation with the national counterparts and the UNDP staff, and under the supervision of the Joint UN Project, and to keep them updated on the progress at appropriate intervals during the assignment. The reporting should summarize in progress, timesheets, difficulties encountered, results accomplished as well as recommendations, any requests and plans for project activities for the forthcoming reporting period.

All reports shall in be submitted to the Project Manager who is responsible for approving the reports and deliverables (with prior coordination with the Project coordination team created under the present assignment). The Portfolio Manager will supervise the progress and quality of each stage and the overall process.

Performance evaluation

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

FINANCIAL ARRANGEMENTS

Payments will be disbursed in instalments upon submission and approval of high-quality deliverables and certification by National Coordinator & Project Manager, that the services have been satisfactorily performed.