Albanian Population and Housing Census 2020

Strategy and Planning Document

Prepared by INSTAT, National Statistical Institute of Albania
Mrs. Delina Ibrahimaj, Director General

In cooperation with international experts:
Werner Haug (coordination), Roberto Bianchini, Jean-Michel Durr, Guido Pierracini, Martin Teichgräber, Ian White

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Executive Summary

- INSTAT is planning to conduct the next Albanian Population and Housing Census in October 2020. The strategy presents the operational plan and the budget by year, group of activities and category of expenditures.

- The 2020 Census will be fully compliant with international recommendations and EU regulations. INSTAT will prepare a revised Census Law to be passed in 2018, harmonized with the new Law "On official statistics", EU regulations and the changed territorial and administrative structure of Albania.

- The Census 2020 will improve the coherence of the Albanian Statistical System, pave the way to create a resident population and building and dwelling register for statistical purposes and the use of administrative data for regular population and housing statistics after 2020.

- To prepare the 2020 Census and update the geospatial infrastructure, the Census geography will be revised, including the identification of the exact location of buildings and dwellings in all enumeration areas.

- The Census 2020 will invest in IT technology and conduct the mapping and the field enumeration with applications on tablets. The strategy analyses the feasibility of the CAPI census in Albania, and describes the benefits, risks and the necessary investments. All necessary steps and measures will be taken to ensure the confidentiality of the data during the enumeration process, during data processing and dissemination.

- Compared to the 2011 Census, the number of enumerators and controllers in the field will be reduced to 6'000 (from about 12'000), but the duration of the field work will be extended from four to six weeks. This will allow for a more selective recruitment process and reduces the hardware cost (tablets).

- INSTAT has defined a project organization for the Census, including INSTAT Regional Offices, the Municipal Offices and the Municipal Commissions. The role of INSTAT will be strengthened to make sure that the Census is conducted as an independent, professional operation.

- INSTAT will prepare a communication and publicity campaign and organize consultation workshops with stakeholders to discuss user needs regarding the questionnaires as well as the data dissemination strategy at the end of the data collection. Municipal data, supported by GIS tools, will be a priority during the dissemination of the results.

- The total cost of the 2020 Census is estimated at 16.2 million Euro. This represents 5.5 Euro per capita of the Albanian population which corresponds exactly to the European average for traditional censuses. Over 50% are staff costs, but many components of the budget are long term investments into a more sustainable statistical system of Albania.

1. Introduction

1.1 Purpose and elaboration of the document

In July 2017, INSTAT convened the first Donors Coordination Meeting for the 2020 Albanian Population and Housing Census. On the occasion of the second Donors Meeting on 6th October 2017, INSTAT submitted a first project outline for the 2020 Population and Housing Census, including a draft budget. It was suggested during the meeting that the most important project elements should be further elaborated and detailed. INSTAT, with support of the Swiss Development Cooperation and the Swiss Federal Statistical Office, convened a group of experts to outline a more detailed Census strategy and plan, which better reflects international standards and experiences. The experts and INSTAT staff met on March 12-16 and on April 12-13 2018 to jointly produce the present document.

The document outlines the key strategies and milestones and the legal, technological, operational and budgetary requirements for a Population and Housing Census to be conducted in October 2020. It should thus help the Albanian government and parliament, the international donor community and INSTAT to decide on their commitments to support and implement the Census 2020 during the coming four and a half years (mid-2018 to 2022).

1.2 Political, economic and social context and the demand for data

The last Population and Housing Census of Albania was successfully conducted in October 2011. Since then, the political, economic and social conditions in the country have evolved. In 2014, the European Council granted Albania candidate status and Albania continues to implement the obligations of the Stabilisation and Association Agreement.

In 2015, Albania conducted a Territorial and Administrative Reform, which reorganized the local governments and created 61 Municipalities out of the former 65 Municipalities and 308 Communes. At the same time, the new Municipalities received new competencies and functions, as well as instruments of citizen participation and oversight. In 2017, Albania published for the first time a General National Spatial Plan, and Municipalities developed Local General Plans. The strong focus on the local and regional level has dramatically increased the demand for reliable and up to date statistical information on the local and regional level in the areas of population, economy, housing and the environment.

The 2020 Population and Housing Census will play a crucial role in updating the urgently needed statistical information on the local and regional level and in understanding and presenting the changes which have taken place in Albania since 2001 and 2011. The Census will also contribute to the creation of a building and dwelling register and of population registers on the local and national level, which will be the source of annual Census statistics in the future.

The Census 2020 is considered a national priority project by the Albanian government. It is essential for evidence-based policy making and determining the socioeconomic goals and plans for sustainable development at national, regional and local levels, as well as for a sustainable and efficient statistical system, based on a combination of administrative and

survey data. The aim is that 2020 Population and Housing Census will be the last Census conducted in the traditional manner.

1.3 The Albanian statistical system and the role of INSTAT

Both Law 8669 of 26.10.2000 (as amended) on the General Census of Population and Housing and the Law No 17/2017 "On Official Statistics" identify INSTAT as the responsible authority to conduct the Census. Since the late 1990s, INSTAT has gained extensive experience in conducting Censuses (Economic Enterprise Census 2010, Agricultural Censuses 1998 and 2012, Population and Housing Census 2001 and 2011) and many sample surveys, based on United Nations, World Bank and Eurostat methodologies. INSTAT has also established a Business Register and is increasingly using administrative and register data for statistical purposes.

To strengthen the coordination role and independence of INSTAT in the Albanian administration and to bring the legal framework fully in line with EU standards and the European Statistics Code of Practice, a completely revised Law on Official Statistics was passed by the Albanian parliament in early 2018. The Population and Housing Census 2020 will be conducted with the new Law "On Official Statistics" in place. The necessary revisions of the Law on the Census of Population and Housing will be in line with the new legal context and the strengthened role of INSTAT.

1.4 The importance of donor support

However, the changed legal and political environment is not sufficient to achieve the expected progress in Albanian Official Statistics. The complexity of the issues at hand, the sheer size of the Population and Housing Census 2020 and the importance of sustainability, require timely investments in personnel, technology and infrastructure. INSTAT has limited qualified personnel and therefore continues to need technical assistance and supplementary human and financial resources. It is essential to guarantee that INSTAT can complete its mission and achieve a further development of the national statistical system of Albania.

The preparation and conduct of the Population and Housing Census 2020 requires respecting strict deadlines and thus the need for timely intervention of funding. This applies to the funding by the Albanian government as well as to donor contributions which need to reflect also the diversity of national administrative procedures. Based on the present strategy and planning document, INSTAT will intensify the discussion with donors and continue periodical meetings with the Donor Coordination Group to inform on the progress of the work-plan and ensure that funds will follow respective requirements and deadlines.

In addition to the commitment by the Albanian government, commitments to support certain areas and activities of the Census are currently acknowledged from other donnors.

2. Objectives of the 2020 Population and Housing Census

2.1 International requirements and recommendations

The 2020 Albanian Population and Housing Census will follow the "Recommendations for the 2020 Censuses of Population and Housing of the Conference of European Statisticians"[1] which were developed in close cooperation with Eurostat and in conjunction with the revision of the global "Principles and Recommendations for Population and Housing Censuses: the 2020 Round"[2].

The Albanian Census will deliver information on all core topics of the CES recommendations (Annex I of the recommendations): the usually resident population of Albania and their geographic, demographic, economic, educational characteristics, on migration, households and housing characteristics. The planned consultations and workshops of INSTAT with data users will indicate if non-core topics (such as disability, ethno-cultural characteristics or agriculture) should also be addressed in the Census or if they should be better covered by other surveys or data sources.

The European Union regulations build also on the CES recommendations. Framework regulation No 763/2008 on Population and Housing Censuses of the European Parliament and the Council requires that Member States follow a specific programme of statistical data and metadata to be transmitted to the Commission for a common census reference year. Three Commission implementing regulations of 2017 define in detail the variables, dis-aggregations, cross-tabulations, metadata, transmission modalities and quality reports which are to be followed. The year 2021 is defined by the Commission as the next joint reference year for the data to be transmitted to Eurostat[3].

The EU regulations are exclusively output oriented and do not prescribe a specific data collection methodology for Census statistics. Countries can submit Census data based on different data sources: conventional censuses, registers, sample surveys, rotating samples or different combinations.

The EU regulations are not mandatory for candidate countries to the EU. However, the Albanian Census 2020 will be *fully compliant with EU requirements* about topics, concepts, definitions and spatial breakdowns (including geographic grid data). This will be reflected in the Census Law and the Council of Ministers decisions (see below, chapter 3.4).

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[1] Conference of European Statisticians, Recommendations for the 2020 Censuses of Population and Housing, United Nations, New York and Geneva, 2015

[2] Principles and Recommendations for Population and Housing Censuses: the 2020 Round – Revision3, United Nations, New York 2015

[3] Commission Implementing Regulation (EU) 2017/543 of 22 March 2017 as regards the technical specifications of the topics of the population and housing censuses and of their breakdowns; Commission Regulation (EU) 2017/712 of 20 April 2017 establishing the reference year and the programme of the statistical data and metadata; Commission Implementing Regulation (EU) 2017/881 of 23 May 2017 as regards the modalities and structure of the quality reports and the technical format for data transmission.

2.2 Changes in census methodology

Since the 2000 round of international censuses, the methodology of census taking has changed dramatically in many European countries. Many countries moved away from the traditional information collection by enumerators in the whole country and use either completely register-based or combined data collection methods, including sample surveys, to reduce both cost and the burden on the public, while at the same time producing more regular and up-to-date statistical information. However, to achieve a change in methodology, certain conditions need to be fulfilled and implemented, with the agreement of census stakeholders and policy makers.[4]

Albania expressed in 2011 the intention to change census methodology for the next Census, but the necessary investments, particularly the build-up of reliable registers on buildings and dwellings as well as the resident population were not implemented. Today, the conditions for change are much more favorable than ten years ago. Albania has made important steps towards the digitalization of the administration, e-government and the electronic interaction with citizens. The citizens have unique ID numbers, which is used across the administration. A registration system for all businesses was developed for taxation and other administrative purposes. INSTAT is managing a business register for statistical purposes. GIS systems were implemented in different administrations and an Agency for the coordination of GIS installed (ASIG), where INSTAT is represented. Today, mobile communication systems cover the whole country and create the conditions for data collection via mobile computers etc.

The Census 2020 will still need to be conducted as an enumeration in the field, but it will build on the progress of e-government, it will include technological innovations and fill in the existing gaps on the road towards a register based Census. The preparations for 2020 will contribute to establish a statistical create a resident population and building and dwelling register and introduce the possibility to link Census information with information from administrative sources (for instance the Civil Status Registry) for statistical purposes. INSTAT intends to produce annual updates of important census information after 2020, based on a combination of different data sources, including the registers.

These efforts are in line with the Eurostat “Strategy for the post-2021 Census” and will also be supported by the project “Strong Local Statistics”, funded by the Swiss Development Cooperation and implemented by INSTAT and the Swiss Federal Statistical Office (FSO) in the years 2018-2022.

2.3 Lessons learned from the 2011 PHC

Important operational lessons can be learned from positive and negative experiences during the 2011 Population and Housing Census. Some main lessons include the following:

- The establishment of an INSTAT-owned Geographical Information System for all Municipalities, Communes and Enumeration Areas was a major success and

[4] Chapter I on Census methodology in the CES Recommendations (p. 4-31) discusses the different methodological approaches to censuses in Europe, including necessary conditions, advantages and disadvantages.

supported efficiently the preparation of the field work, the conduct of the enumeration and the dissemination of data. In preparation for 2020, additional investments will be done to update the GIS technology, the enumeration areas, the borders of spatial units, addresses and building/dwelling identifiers in cooperation with other administrations. This investment will serve not only the Census, but the updating of the sampling plan and the conduct of future surveys by INSTAT, and it will create conditions for the linkage of spatial data from different administrative data sources for statistical purposes.

- During the fieldwork, the level of drop-out of controllers and enumerators posed serious problems. For 2020 a better process for the recruitment, training and selection of field staff is necessary, including for reserve enumerators and controllers. Multimedia packages and computer-based training and instruction courses will be implemented and integrated with the data collection process on tablets.

- Data capture by Optical Character Reading (OCR) was time consuming, although more effective than manual data entry. In 2020 innovative data collection methods via Computer Assisted Personal Interviews (CAPI) will be developed and implemented to reduce time for data capture and improve data quality.

- The lack of sufficient comparable data from administrative data sources to check data quality slowed down data processing and editing. In 2020 a closer cooperation with the owners of administrative and register data is planned to improve the planning of the field-work and the checking of data quality.

- Planning and budgeting of the Census activities was not always carefully done and this had negative impacts on the calendar of activities. For 2020 it is foreseen to plan the work carefully ahead by defining processes, inputs and outputs and identify availability and needs for human and other resources. It will also be important to identify the operational risks and develop risk prevention and mitigation strategies and actions.

- During the 2011 Census, important investments were made in the visualization of data, including through grid data, the use of maps, atlases and other visualization tools. This will continue in 2020 with the use of new web-based and interactive tools. In addition, a much stronger focus will be laid on the dissemination of data for Municipalities and small areas, including Administrative Units below the Municipality level, and the implementation of a policy of access to microdata for research and planning purposes.

2.4 Strategic objectives of the 2020 PHC

Based on the above, INSTAT defines the following strategic objectives for the 2020 PHC:

- The 2020 Census will establish the basic statistical information on population, buildings and dwellings for the whole territory of Albania which is essential for institution building, sustainable development, democracy and good governance on the national, regional and local level.

- The spatial breakdowns of the 2020 Census will be made comparable to those of 2011 and 2001 and highlight the demographic, economic and social changes over two decades for the old and the new territorial and administrative units. The data will also serve international comparisons by following the requirements of the EU regulations and the dissemination of the data via the EU Census hub.

- The data will be made available in aggregate form and as microdata ranging from the smallest geographical areas below the Municipal level to the national level and via a km^2grid format to facilitate the implementation, monitoring and evaluation of development plans and programmes as well as for other policy purposes and scientific research. Greatest care will be exercised to protect confidentiality and to prevent inadvertent disclosure of Census information about identifiable individuals and other statistical units.

- INSTAT will use modern IT technology to prepare and conduct the Census in the field in a reliable, efficient and cost-effective way. Investments in IT hardware, software and capacity building will strive to strengthen the general IT environment of INSTAT and choose solutions which are sustainable and re-usable for other statistical surveys and activities.

- The 2020 Census will use available administrative data sources for the preparation of the Census as well as for quality checks. INSTAT will also work with other administrations during the Census to create conditions for establishing a building and dwelling register and a register of the resident population which can serve as sources for register based census statistics in the years after 2020. Based on the census, INSTAT will also develop a new master sampling frame to redesign and strengthen the sample surveys in Albania. This will improve the basic infrastructure of the whole statistical system.

- To involve the Albanian population, recruit and inform enumerators, controllers and supervisors and to prepare the municipalities and government administrations for the Census, INSTAT will initiate consultations and conduct a broad communication campaign about the participation of the citizens, the methodology, content, and expected data of the 2020 Census.

- In deciding on the Census topics, the relevant concepts and definitions and the statistical programmes and meta-data , INSTAT will follow the recommendations of the United Nations, the framework regulation of the European Parliament and the Council and the implementation regulations of the European Commission.

- It is currently planned to advance the Census date by one year to 1 October 2020, compared to the decennial rhythm followed for the two preceding Censuses (2001 and 2011). The reasons are operational. In summer of 2021, national elections will be held in Albania. The election campaign would overlap with the preparations for any Census in 2021 (including the start of the Census communication and publicity campaign). The field-work would take place at the beginning of a new government

cycle, starting in the early fall of 2021. INSTAT considers that this as a serious risk to the successful conduct of the Albanian Population and Housing Census.

3. Census Legislation

3.1 Amending the Census Law

For the Census 2020 to be carried out in line with the present strategy, the current Census Law (No. 8669, dated 20.10.2000 as amended) needs to be revised. The revision will achieve the following:

- Comply with terminology and definitions etc. of EU Census legislation;
- Align with the new Albanian Law No. 17/2017 "On Official Statistics";
- Adapt the articles on organisation (Commissions etc.) to the proposed structure of the 2020 Census after the Territorial and Administrative Reform and the strengthened operational and methodological role of INSTAT as outlined in the new Law on "Official Statistics";
- Support the register strategy of INSTAT and the future linkage of administrative data via unique addresses and/or IDs for statistical purposes;
  Ensure coherence between the articles of the law.

3.2 Council of Ministers decisions

Important decisions about the content and conduct of the Census (including the decision on the date of the Census, the period of data collection and the topic content of the questionnaires) are in the realm of the Council of Ministers, to be proposed by INSTAT and the Central Census Commission. It will therefore be necessary to consider not only the amendments to the Law but also the Council of Ministers decisions, once the amended Census Law is in force.

The first such Council of Ministers decision concerns the structure and functions of the Central Census Commission. The Central Census Commission will need to advise the government on other Council of Ministers decisions concerning - inter alia - the membership and competencies of the Census Committees in the Municipalities, the exact date and period of the enumeration, and the topics content of the census questionnaires.

3.3 Timeline of legislative work

With an estimated period of five to six months for all the consultations to be held and the revised Law to pass Parliament and be published, it is possible to conclude the process in 2018. It is the plan of INSTAT to submit a first draft of the revised Census Law for consultation with line Ministries in June 2018.

The process for approving and publishing the decisions of the Council of Ministers is shorter, but can still take up to three months. The decision on the Central Census Commission will be initiated immediately after the revised Law is passed, i.e. at the end of 2018 or early 2019. The Council of Ministers decision regarding the exact date, period of enumeration and the questionnaires can only be taken once the Pilot Census (planned for 1 October 2019) is evaluated. This decision as well as the decision on the Census Committees of the

Municipalities should be published in March 2020 at the latest, when the main Census operation starts.

3.4 Compliance with EU legislation

The Government of Albania has no statutory requirement to adopt EU regulations, but in presenting the draft proposals for changes to the national Census Law to Parliament, a table of concordance must be provided by INSTAT indicating the level of compliance with any relevant EU legislation.

To be fully compliant with the EU legislation (see chapter 2.1), Albania will make sure that the Census Law and the subsequent Council of Ministers decisions are in concordance with the definitions, topics, classifications, geographic breakdowns and statistical outputs required by the framework regulation of the European Parliament and the Council as well as by the European Commission implementation regulations. The required topics are shown in the table below.

Table 1: Topics on which data are required under EC implementation regulation No 2017/543

Topics referring to persons:

- Place of usual residence
- Location of place of work
- (Size of the) locality
- Sex
- Age
- Legal marital status
- Current activity status
- Occupation
- Industry
- Status in employment
- Educational attainment
- Country/place of birth
- Country of citizenship
- Ever resided abroad and year of arrival in the country
- Place of residence one year prior to the census
- Status with the household
- Status within the family (within the household)

Topics referring to family structure:

- Type of family nucleus
- Size of family nucleus

Topics referring to private households:

- Type of household
- Size of household
- Tenure status

Topics referring to housing units (dwellings):

- Type of dwelling
- Occupancy status
- Number of occupants
- Useful floor space and/or number of rooms

- Density standard
- Water supply system
- Toilet facilities
- Bathing facilities
- Type of heating
- Type of ownership

Topics referring to buildings in which the dwelling is situated:

- Type of building
- Period of construction

The EU framework regulation of 2008 says that censuses should be conducted at the beginning of a decade and includes the reference year for the 2011 EU census. The reference year for the following EU census is defined in EC implementation regulation 2017/712. Member States are requested to submit data sometime in the reference year 2021, but there is no common reference date. Article 3 says: "Each Member State shall determine a reference date falling in 2021 for the population and housing census data to be transmitted to the Commission (Eurostat). Member States shall inform the Commission (Eurostat) by 31 December 2019 of the reference date selected."

If Albania conducts a Census on 1 October 2020, its reference date will not be in 2021. However, Census data will be made available in 2021 and Albania will comply with the requirement of the framework regulation to conduct a Census at the beginning of the decade, in line with the UN/ECE Recommendations for the 2020 Census Round.

4. Communication and publicity campaign

4.1 Objectives

The success of the Census depends to a large degree from the positive commitment and the participation of the Albanian population. Therefore, it is essential to develop an effective communication and awareness campaign, supported by the government and implemented with modern media and public information tools. Articles 13 and 16 of the current Census Law mandate INSTAT to conduct such a campaign "before Census Day … and until the release of the final results".

The goal of the campaign is to promote the Population and Housing Census 2020, inform about the purpose and the results of the Census and help strengthening trust and confidence in the process itself and the responsible institutions.

The objectives of the campaign are to:

- Gain the public support of multiple stakeholders and influential political leaders on the national, regional and municipal level;
- Inform the population properly and precisely on what the Population and Housing Census 2020 is and why cooperation and participation are important;
- Inform and sensitize citizens about the process of electronic data collection, the role of enumerators and why it is easy and safe participate;
- Ensure citizens about privacy and confidentiality of the process as well as subsequent data protection;
- Eliminate misconceptions and counter false information by ensuring a competent and fair media coverage
- Foster public trust in INSTAT as a technically competent National Statistical Institute which is supported by the European Union and other international donors.
- Inform about the main results of the Census and return the collected information to the communities and stakeholders on the national, regional and local level.

4.2 Target groups

To make sure that the communication and awareness campaign reaches all citizens, stakeholders and intermediaries that may eventually play a role in the census operations, it will be designed to reach different target groups, particularly:

- Policy makers and opinion leaders;
- Ministries and Agencies on the national level;
- Rural and urban communities;
- Regional and municipal administrations;
- Key actors in the education sector;
- Civil society and NGO's, including women's associations, youth associations etc.;
- Potential candidates for the role of enumerator and controller;

- Media representatives.

To develop a partnership with the media will help having them on board for the Census operation, as well as to detect early issues that may hamper the participation of the population (for example confidentiality concerns).

4.3 Means of communication

The campaign shall outreach to the public and specific stakeholders, using a variety of media and communication channels and techniques. Indicatively, the following channels and supports will be used:

- Publicity through roundtables, print media, spots and radio and TV announcements, advertising inserts and pages, internet site installations etc.;
- Conferences, press releases, interviews, documentary advertisement, radio and TV broadcasts;
- Visual advertising: banners, posters, etc.;
- Direct advertising: letters, leaflets, meetings, seminars, telephone calls etc.;
- Dissemination of messages through social networks, etc.

A list of selected media and programs for spot broadcasts and insert publications will be developed in a publicity plan, based on the importance of the media (in terms of geographical cover, audience rating and programming quality) and the need to broadcast and distribute messages at different times and with different contents and target audiences.

4.4 Duration and modulation

The communication about the census will start during the preparation phase through identification of the key stakeholders, outreach to local government, parliament, civil society etc., and a more targeted campaign will be launched ahead of the actual enumeration. The big publicity campaign will last three months, and will gradually become stronger. Modest at the beginning, it will become increasingly more intense as the Census Day approaches and reach its climax during the month preceding the enumeration and during the enumeration period, until the end of the Post Enumeration Survey.

The communication plan will define the different aspects related to the implementation of the campaign and define a schedule of activities: modulation and duration of the campaign, schedule and frequency of radio and TV spot broadcasts and of the publication of the newspaper inserts, content of the messages, intervention of a specialized firm and of different actors etc.

4.5 External support

The services of a specialized communication firm, which will work together with INSTAT, will be contracted for the communication and publicity campaign.

In addition to the specialized firm, other actors will be called upon to play their role in the campaign, to maximize its impact on the population, such as ministries, agencies, civil society and municipal commissions. However, their interventions will comply with the terms defined in the general communication and publicity plan.

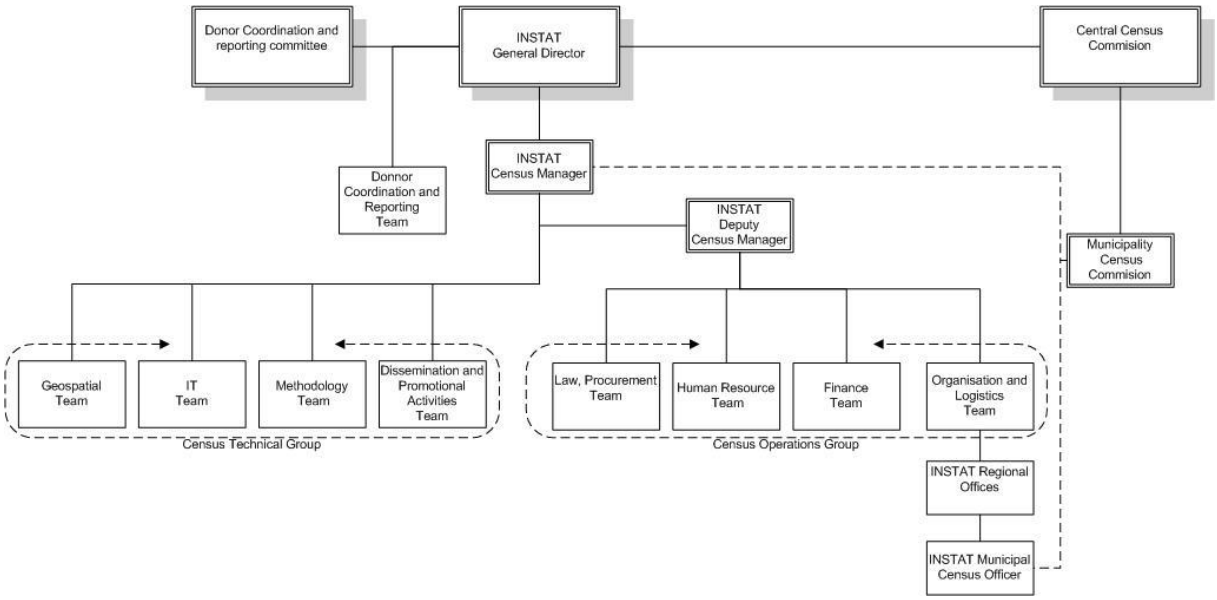
5. Census organisation and management

5.1 2020 Census organisation

Population and housing censuses are the largest statistical operations in any country. In a census, the preparatory phase includes the establishment of the organizational structure, cartographic activities, listing of buildings and dwellings and their clustering. After the enumeration, data processing takes place, followed by the dissemination of results and further analyses and reports, including an evaluation.

Based on the revised Census Law, the 2020 Census will be organized and carried out by the Albanian Statistical Institute (INSTAT), under the supervision of the Central Census Commission and with the support of Census Committees to be established in the Municipalities. Their roles and responsibilities will be defined by the Law and the Decisions of the Council of Ministers (see chapter 3). The figure below shows the planned Census organisation:

Figure 1: Organisation of the 2020 Census



5.2 INSTAT Census Unit

To ensure that INSTAT can successfully undertake the responsibility of implementing the 2020 Census and managing its budget, the Census will be organised as a project, planned in detail and implemented with efficiency. This requires a high level of technical and administrative expertise. The setting-up of a dedicated Census Unit in INSTAT is as important as the professional capabilities of the staff involved in its implementation.

The experience of the 2011 Census shows that the establishment within INSTAT of a professional unit for the 2020 Census is a necessary requirement. For this purpose, INSTAT

will recruit well qualified persons both at the central office and at the regional offices of INSTAT.

The following activities relating to census management will span throughout the tenure of census project:

- Define and implement the census organisational and management structure
- Organize and mobilize funds and resources
- Establish a management and reporting system for donor contributions
- Establish internal and external project reporting protocols
- Establish project monitoring, quality assurance and evaluation frameworks
- Conduct routine management reviews of all activities
- Build INSTAT institutional and staff capacities.

5.3 INSTAT Census organisation

The organisational structure of INSTAT for the Census will include:

a) The *General Director of INSTAT* has the overall responsibility for the 2020 Census, the coordination with external stakeholders and with the Parliament, the Council of Ministers, the Central Census Commission and the Donors.
b) The *Census Steering Committee* is the INSTAT body to guide the planning, management and implementation of the Census. It ensures the coordination and supervision of all entities involved in the implementation of the Census. The Census Steering Committee is chaired by the Director General of INSTAT and composed of the Census Manager, Deputy Census Manager, and the Directors of Technical Divisions involved in the census.
c) The *Census Manager* is the overall census project manager and the head of the Census Unit. He is responsible for the overall planning of the project, the choice of methodological options to be proposed to the Steering Committee, the follow-up of the implementation of the project timetable and of risk-management. He is directly managing the *Census Technical Group* (see below). He reports to the Director General of INSTAT and the Census Steering Committee on a regular basis. He will be supported by a small project management team under his direct supervision.
d) The *Deputy Census Manager* assists the Census Manager and exercises direct management of the *Census Operations Group* and the budgeting and control of resources (see below).
e) The *Census Technical Group* is composed of:
    - The *Geospatial Team*, in charge of the cartographic preparation for the census, including delineation of enumeration areas and their alignment with local administrative borders, identification of buildings and dwellings and preparation of the maps for the enumeration;
    - The *IT Team*, in charge of the census IT infrastructure and development of census IT applications (for data collection, supervision and monitoring, post enumeration survey, logistics, human resources, data processing and dissemination...).
    - The *Methodology Team*, in charge of the questionnaire content, data collection methodology and organisation, preparation of training and instruction manuals,

methodology of data processing (coding and editing), data quality evaluation, preparation of the tabulation plan and of thematic analysis.

- The *Dissemination and Promotional Activities Team*, in charge of the census communication campaign as well as the implementation of the dissemination programme.

f) The *Census Operations Group* is composed of:

- The *Law, Procurement Team*, in charge of the preparation of the Census Law, the procurement of the equipment and services needed for the census.
- The *Finance Team*, in charge of the preparation of the Census budget and its implementation.
- The *Human Resources Team*, in charge of the management of census human resources (recruitment, selection, contracts, payment procedures…).
- The *Organisation and Logistics Team*, in charge of the logistics of the census, and the census field organization, in relation with the regional offices of INSTAT and fieldwork follow up.

A Donors Coordination and Reporting Committee will be established to manage the relation with donors, informing them about the preparation and implementation of the census project, and review implementation reports. The secretariat of the Committee will be provided by a staff of INSTAT to prepare the reports responding to the requirements of each donor.

5.4 Project management and monitoring tools

The Census project will be developed following the project management method. An overall timetable will be developed with three levels of detail: phases, activities, tasks, responsible unit and KPI. The deliverables will be clearly identified. Important steps of the project will be identified as milestones.

The timetable and budget will be clearly documented and regularly reviewed and updated by the INSTAT Census Unit and the Steering Committee. The documentation of the project will be managed in a central repository, using a versioning system. Regular activity reports will be produced by the technical units and by the Census Manager for the Census Steering Committee, the Central Census Commission and the Donors Coordination and Reporting Committee.

6. Methodology of the 2020 Census

6.1 The methodological principles

The 'population census' is the operation that produces at regular intervals the official counting of the population in the territory of the country and in its smallest geographical sub-territories together with information on a selected number of demographic and social characteristics of the total population. In order to plan and implement economic and social development policies, administrative activities or scientific research, it is necessary to have reliable and detailed data on the size, distribution and composition of the population.

Whilst the Census is crucial for resource allocation and planning, because it is carried out only every ten years, other methods are required for planning in the intervening years. Population estimates are produced annually to allow for national and local planning and the work has started to create conditions for moving towards registered-based census increasing the use of administrative data.

The methodology of the census is based on the Recommendations for the 2020 Censuses of Population and Housing as approved by the Conference of European Statisticians[5], and in accordance with the EU regulation 2017/543 of 22 March 2017 laying down rules for the application of Regulation (EC) No 763/2008 of the European Parliament and of the Council on population and housing censuses regarding the technical specifications of the topics and of their breakdowns.

The 2020 Census will follow the principles as defined in the before mentioned international recommendations:

- Individual enumeration
- Simultaneity
- Universality
- Small area data.

For the Census of 2020, INSTAT will use the traditional door-to-door enumeration through interviews with questionnaires. However, interviewers will not use paper questionnaires (as in the 2001 and 2011 Censuses) but electronic questionnaires on tablets (see chapter 9 on the proposed IT environment and infrastructure).

6.1.1 The Preparation for the register-based census

The 2020 Census will provide the basic steps towards a building and dwelling register. Such a register will hopefully set as well the ground for a population and housing register in the future. The population and housing register, however, will be part of SALSTAT project to create the baseline elements using the operational infrastructure of the Census and the planned elements for the building and dwelling register. For that, the address system and

[5] Conference of European Statisticians, Recommendations for the 2020 Censuses of Population and Housing, United Nations, New York and Geneva, 2015, ECE/CES/41

the population register set up by the Civil Registry Office are essential references. The quality of their information will be assessed during the pilot activities of the Census.

Moreover, the census legislation will have to be adapted to allow the possible link with the existing registers for moving towards a population and household register. The possibility of further use and possible linkage of the collected Census data with administrative data for the build-up of such registers is a precondition for which many efforts have to be dedicated to ensure the success of the process.

While there are known the advantages of a census based register (reduced costs and less response burden) there are some conditions to be in place for establishing it and time might be needed to introduce the register approach on more steps. A tentative of utilizing the combined mode using for the field enumeration process the address list and the civil status registers will be tested during the Census 2020 implementation phase while the conditions to develop a register based population census requires an independent strategy to be developed.

The process of moving towards a register-based approach takes times and can be achieved in some steps. The first data items to be taken from registers can be addresses and basic demographic data items from civil registration information. As the share of administrative data increases step by step, including data from other registers: employment, education, etc., it is essential to have in place high quality population register and a system of common identification numbers before the attempt to link data from different administrative sources. The continuous updating of registers together with communication between the register systems must be effective.

The other condition to satisfy is that basic registers to be used for a population based census like population register and/or buildings and dwellings register might ensure full coverage and all the statistical units should be linked to one another by means of the identification systems. For example, there should be the capacity to link persons to household-dwelling units and to the dwellings and buildings in which they live, and for employed persons to be linked to their employers. Employers and buildings also need to be linked in order to determine workplace. Similarly, all units should be geographically located by using local area codes or map coordinates.

One major factor that facilitates the statistical use of administrative data records is the application of unified identification systems across different sources. The data linkage must occur at the individual level. Definitions of data items in the administrative sources should be the same as in census, or they should be transformable to meet the census definitions. It is also essential to harmonize the concepts and definitions between registers. To ensure this, quality assessments should be carried out periodically.

At the end, to ensure the whole process, the national legislation has to provide the foundation for the use of administrative data sources for statistical purposes. Such legislation should give powers to the NSI to access administrative data at the unit level with identification data and to link them for statistical purposes. Furthermore, the appropriate legislation should provide for sufficient levels of data protection. Then, it is also important that the general public appreciates and understands the benefits of using register sources

for statistical purposes and that there is broad public acceptance of the use of these administrative data for purposes of statistical production.

6.2 Modalities and type of enumeration

6.2.1 Usual residence

The population will be counted based on their *usual residence* either in an individual dwelling or in a collective living quarters. The 'usually resident population' is, by international definition, composed of those persons who have their place of usual residence in the country at the census reference time and have lived, or intend to live, there for a continuous period of at least 12 months. A 'continuous period of time' means that absences (from the country of usual residence) whose durations are shorter than 12 months do not affect the country of usual residence. The same criteria apply for any relevant territorial division (being the place of usual residence) within the country.

6.2.2 Population to enumerate

All person, with Albanian or foreign citizenship, and stateless persons, but excluding foreign diplomatic personnel accredited to Albania, who at the census moment are within the territory of the Republic of Albania, will be obliged to provide the information requested in the population and housing census questionnaires. This will, therefore, include usual residents and non-residents who are temporarily present in Albania at the census moment.

6.2.3 Reference date and duration of enumeration

The enumeration reference date, which is also the start-up date of the enumeration, will be 1 October 2020, at 0 hour. The data collection will last six (6) weeks. However, a period of two (2) additional weeks may be considered, in case of unexpected problems or difficulties to access the most remote areas.

6.2.4 Type of data collection

The main method used to collect the data will be the direct interview. Hence, the previously trained enumerators will interview, for each household, the adult members, or at least one adult member able to provide answers for all household members. For the collective households, they will count all the usual residents either directly or via the management of the institution.

6.2.5 Respondents

The appropriate interviewee is any person who is at least 15 years old and who resides in the household and can give correct answers to the questions asked by the enumerator. Responses will be sought as much as possible from the individuals present in the household at the time of the interview for themselves.

6.2.6 Modality of interview

The interview will be direct, meaning that the enumerator, using a tablet (hand held device) containing the questionnaire's application, will meet the interviewees face to face to ask them questions about each household member. The answers will be keyed in the tablet based on a pre-established order within the application.

6.2.7 Administration of questionnaires

The enumerator will use the stylus and/or the touch screen's keypad of the tablet to key in all the data in their respective domains. Lists of choices and menus will be installed to facilitate the enumerator's work. Tablet integrated control and quality parameters shall guarantee the consistency and reliability of the collected information. In addition, each counted dwelling and living quarters will be geocoded by the building (or the main building for living quarters) to collect their locations through the GPS devices of tablets. Geocoding will be supported by GIS support specialists deployed in each municipality during the enumeration. Once registered on the tablet, the data will be transferred as soon as possible directly to the central database for control and validation.

The use of the tablet presents the following advantages for the census operation:

(a) Validation checks embedded in the questionnaire;
(b) Automated routing leading to a more accurate and speedy progression through the questionnaire;
(c) Automated coding by provision of response options, such as drop-down menus;
(d) Customisation of questions, including possibility of administering the questionnaire in different languages;
(e) Reduced data entry errors;
(f) Time reduction due to the suppression of the data capture phase and reduction of the editing and imputation phase. Data can be disseminated and analysed faster.
(g) Cost reduction due to the elimination of the cost of printing, shipping and storing paper questionnaires and the suppression of the data capture phase. However, the increased equipment costs may balance the savings;
(h) Reduced number of unlinked forms;
(i) Improved field management and coverage control due to real time monitoring and control;
(j) Ease of handling;
(k) Positive perception of respondents who might show a more positive and cooperative attitude towards the census through use of up-to-date technology.

The controllers and enumerators will be trained to the handling of the tablets, the mastering of the CAPI application, and the use of the internal consistency checks incorporated in the application.

6.2.8 Population in institutions

A list of the institutions accommodating population will be drawn previously to the census enumeration with the support of the Municipal committees.

6.3 Content of questionnaires

The content of the Census questionnaire will be designed by considering national priorities, EU defined topics, comparability with previous and future register based Censuses, and ensuring operational efficiency at reasonable costs.

An important criterion to decide for the inclusion of a topic in the census will be its use a small geographical level. Topics only used at national or regional level may be preferably investigated in a sample survey.

However, the questionnaire will reflect topics that are considered relevant for national priorities like Sustainable Development Goals whenever they are not possible to be defined through other survey or administrative sources or when the indicators provided can be the baseline for further investigation in the future.

Statistical units and variables for which INSTAT plans to use register or administrative data for the update of Census statistics, should be defined in a way that is compatible with those other sources and allows for harmonisation between them.

A first draft of the topics and questions will be prepared by INSTAT in May 2018 to be discussed during five stakeholder consultations under the umbrella of the Statistical Council.

The questionnaire will cover four levels of statistical units: individual persons, households, dwellings and buildings and collect the information related to the following core topics:

- Location;
- Characteristics of the building and of the dwelling;
- Characteristics of the household;
- Former household members living abroad;
- General characteristics of the individual;
- Migration;
- Education;
- Economic activity.

The questionnaire will be available in Albanian and other minority languages as provided by the Constitution and major foreign languages in use in the country. Lighter versions of the questionnaire may be used for specific populations (collective households, homeless).

The questionnaire will be tested in the field before the pilot census, to evaluate the understanding of the questions by the population as well as the duration of the interview. The formulation and the list of questions will be reviewed after the tests.

6.4 Engendering the Census

It is important to make the census gender sensitive so that it can truly reflect men's and women's position in society. It is important to clarify that a census cannot be considered engendered just because it collects and publishes data on males and females. Provision of sex-disaggregated data is an important first step towards analysing gender issues but not necessarily sufficient for gender analysis.

To ensure a census free of gender bias, it is important for INSTAT and the Central Census Commission to demonstrate their commitment. In that regard, the following activities will be carried out before and during the Census 2020:

- Train the INSTAT census team and Census staff on gender issues in the Census;
- Include organisations dealing with gender issues in the census questionnaire consultations;
- Promote and foster the recruitment of women enumerators, controllers and supervisors in field work activities;
- Include in the communication campaign gender aspects of the census and target women's organizations.
- Reflect gender issues in the tabulation program, data analysis and dissemination.

6.5 Technical documents

A series of documents related to organization, questionnaires, field enumeration, logistics, data verification and validation, codification and imputation, tabulation, analysis and publication will be produced.

The documents will provide information on the different steps of the operation and give a comprehensive idea of the scope of the planned tasks and of the adopted strategies. Other documents will provide instructions for the enumerators, controllers and their supervisors to achieve a harmonised understanding and implementation of the Census operations.

Important technical documents to be prepared include:

- Manual of instructions for the Regional Offices
- Manual of instructions for the supervisors
- Manual of instructions for the Municipal Census Committees
- Manual of instructions for the IT support officers
- Manual of instructions for the GIS support officers
- Manuals of instructions for enumerators and controllers.

Manuals of instruction for the field staff will not be printed but installed on the tablets: firstly, as a standalone document in pdf format, and secondly in the contextual help of the applications. For example, the questionnaire application will include for each question screen an icon with a question mark to open a window with the corresponding instructions and information related to the question (see chapter 9).

6.6 Tests and Pilot Census

It is vital to execute different tests and field activities well before the actual Census enumeration takes place, for the operation to be successful. The following is planned:

6.6.1 Tests

Instruments and technical tools will be systematically tested in the field to have an initial indication of the administration of, and any difficulties in completing, the questionnaires, as well as the difficulties related to the interpretation of the instruction manuals and the CAPI procedures (see chapter 9).

The methodology consists in administering the questionnaire or a section of it to potential interviewees from different social strata. This will aim at:

- Evaluating the level of understanding of the questionnaire by both the interviewer and interviewee;
- Identifying any poorly worded questions and testing the applicability of the questionnaire;
- Identifying the problems that the enumerator may face in the field during the census;
- Measuring the effectiveness of the administration of the questionnaires and their completion in the field.

6.6.2 Pilot Census

The pilot census is a comprehensive test of all census procedures. Essential features of a pilot census are coverage of one or more sizeable administrative divisions and the execution of the preparatory, enumeration and processing stages of the census, by which it thus tests the adequacy of the entire census plan and of the census organization. To best serve this purpose, the conditions in the pilot census should be as close as possible to those that would be present during the actual enumeration as possible. For this reason, it is recommended a pilot to take place one year before the planned census to conform to the expected seasonal patterns of climate and conditions[6].

The main purpose of the Pilot Census is to test in real conditions the cartography, methodology, the organizational structure, the CAPI system, logistical planning and the interaction between all planned resources to be engaged in the actual Census itself. The direct objectives of the Pilot Census are to:

- control the effectiveness of the organizational structure;
- control the accuracy of planning and logistical support material;
- conduct a final test of the questionnaire on a large scale, especially test the clarity of questions and the way they are filled;
- certify the clarity and comprehensiveness of the field staff instructions;
- certify the handling of the CAPI data collection application, including the use of the help functions;
- verify the use of the enumerator, controller and supervisor applications;
- verify the effectiveness and efficiency of the data transmission procedures to the central database;
- verify the efficiency of the field staff selection and recruitment method;
- verify the efficiency of the field staff training;
- verify the interaction between all units and levels engaged in the census;
- verify the circulation of the information among all levels;
- in a later phase, verify and consolidate the data processing program using Pilot Census data.

The Pilot Census will thus be conducted in October 2019 on a sample of 100 enumeration areas, representing around 12,500 households and one collective institution. The process of enumeration will be completed within 3 weeks.

[6] Principles and Recommendations for Population and Housing Census, Revision 3, p.106, United Nations, New York, 2015

The areas will be selected to represent the diversity of socio-economic and geographical conditions of the population in the country, while ensuring a minimum of 5 enumeration areas in each selected municipality, to observe the management and supervision of the field operation in real situations.

The Pilot Census's evaluation instruments will be developed to include performance indicators related to planning, field operations management, and indicators related to the quality and efficiency of the questionnaires, the performance of the tablets as working tools, their endurance on the field, the transmission of data etc. The results of the Pilot Census will be carefully analysed by INSTAT to determine the potential modifications for the successful conduct of General Census.

6.7 Quality assurance

The product of any census of population and housing is statistical information, and confidence in the quality of that information is critical. The management of quality must therefore play a central role within any country's census. A quality management programme is an essential element in the overall census programme and should touch on all census phases and activities. A major goal is to systematically build in quality from the beginning through the sound application of knowledge and expertise by employees at many levels, and through defined quality assurance processes and reviews. It will also include reactive components to detect errors so that remedial actions can be taken during census operations. Without such a programme, the census data may contain errors, which might severely diminish the usefulness of the results. If data are of poor quality, then decisions based on these data can lead to costly mistakes. Eventually the credibility of the entire census may be called into question.

As recommended internationally[7], INSTAT will develop a quality assurance and improvement programme to measure quality at each stage of the census. The quality assurance and improvement system will be developed as part of the overall census programme, and integrated with other census plans, schedules and procedures. The system will be established at all phases of census operations, including planning, pre-enumeration, enumeration, data flow, coding, editing, tabulation, analysis and data dissemination.

Quality should be understood as a multi-dimensional concept, including the following dimensions:

(a) Relevance: understood as the degree to which statistics meet users' needs;
(b) Accuracy: The degree to which the data correctly estimate or describe the quantities or characteristics that the census was designed to measure.;
(c) Comparability: The degree to which statistics are comparable over space and time.;

[7] Conference of European Statisticians, Recommendations for the 2020 Censuses of Population and Housing, United Nations, New York and Geneva, 2015

(d) Coherence: the degree to which census information can be successfully brought together with statistical information from other data sources (including registers) within a broad conceptual framework and over time.

(e) Timeliness: the time elapsed between the reference date and the release of data;

(f) Accessibility: The availability of information and the suitability of the form in which the information is available.

The quality assurance plan will define quality assurance measures to ensure each of the quality dimensions. A draft plan is included in Annex 1.

6.7.1 Risk management

Good risk management practices reduce the probability or the negative consequences of undesirable events that can cause delays, increase costs or compromise the achievement of the objectives.

Risk management entails identifying potential risks, determining the probability of their occurrence and assessing the possible impacts on a project. Combining the probability of occurrence and the potential impacts allows risks to be classified according to their importance. A risk that has a low probability of occurrence and has limited impacts will be classified as minor, while a risk with a high probability of occurrence and high impacts will be considered major. One or more preventive or corrective actions must be determined for each risk identified.

A risk management plan will be developed for the Census project and will be reviewed and updated during each phase of policy implementation.

6.8 Post Enumeration Survey (PES)

6.8.1 Objectives

Collection of information related to housing and population is currently better controlled thanks to technological progress. However, quantitative and qualitative errors are still registered in population census operations. The most important quantitative errors are those linked to coverage. These are omission errors, where not all the population and housing units have been counted. Other errors could be linked to the enumeration due to eventual duplicates and double counting. These errors can arise due to problems at the level of the design of the operation, the implementation of the preparatory phases or the field work during the census enumeration. To evaluate the magnitude of these errors, a post enumeration survey will be conducted immediately after the enumeration.

The Post Enumeration Survey is an independent operation. Compared to the Census, the PES offers the possibility to calculate the level of reliability or the quality of the collected data, using a statistical model.

The results of the PES will make it possible to evaluate the coverage of the population in the Census at national level and possibly urban and rural level and of the quality of a few selected characteristics of the population. The specific objectives of the Post Enumeration Survey are:

- Quantitative evaluation of the census coverage;
- Evaluation of the quality of selected characteristics measured in the Census;
- Collection of information on sources of error during the Census;
- Serve as a basis to improve data quality in future enumerations;
- Serve as a basis to estimate correction factors, e.g. to improve demographic projections and inter-census population estimates.

6.8.2 Methodology of PES

The PES is a sample survey which will cover a limited but representative number of households located in randomly selected EAs on the national territory. The sample will be rigorously pre-stratified considering the different geographical and administrative areas of the country to provide significant results at national and possibly urban/rural level. The census geography will be used as sampling frame for the selection.

The enumeration techniques will follow those of the Census, to guarantee comparability of the data from the two operations. As in the Census, the population will be counted based on its usual residence.

The data collection method is the direct interview. Pre-trained interviewers will visit the resident households in their assigned area, to ask the planned questions to the respondents. The answers will be registered in the tablet on questionnaires developed to this end.

The PES shall start two weeks after the end of the general census enumeration and will last three weeks. An interviewer will cover all the households residing in his/her assigned EA.

6.8.3 Sampling plan

The PES of the 2011 Census included 105 enumeration areas selected randomly, stratified by their classification as urban or rural. The sample size allowed the production of estimates of the census coverage at national and urban/rural level.

To ensure full independence between the census and the PES, the sample will be drawn only after the end of the enumeration of the 2020 Census.

6.8.4 Field staff

To ensure proper selection, interviewers and supervisors of the PES will be selected among the field staff of the 2020 Census but will work in another area than the one they were assigned in the Census.

The supervision of the PES in the field will be done at two levels. The first level includes technicians and executives of INSTAT Offices.

The second level is the supervisor in the field. His/her main tasks are to:

- Coordinate the data collection activities in the selected EA;
- Control and supervise the work of the interviewers;
- Manage the material provided to his/her team on the field;
- Check the data collected and transmit them to the central database.

IT support specialists will assist interviewers and supervisors.

6.8.5 Use of the data

To estimate the coverage rate of the Census enumeration, household and dwelling data from the Census and the PES will be matched for the corresponding EAs and compared, using the Dual System Estimation model[8]. In a second stage, for the matched households, the responses to a selection of questions will be compared to estimate the accuracy of the responses (content errors).

The matching procedure will be carried out electronically, by comparing the records collected in the Census and by the PES. Unmatched cases will be resolved manually, using a visualisation application. The possibility to use probabilistic matching will be considered.

A report will be prepared by INSTAT to present the methodology used, the implementation, and the results in terms of accuracy indicators of the coverage and content of the 2020 Census.

[8] See for example: United Nations Statistical Division, Post Enumeration Surveys, Operational Guidelines, Technical Report, New York, 2010

7. Mapping and geospatial information

7.1 The cross-sectoral importance of geospatial data

As stated in the "Recommendations for the 2020 Censuses of Population and Housing of the Conference of European Statisticians"[9] and in the UN "Principles and Recommendations for Population and Housing Censuses: the 2020 Round"[10], geospatial technology is expected to play an increasingly crucial role in national census operations, from the preparatory activities to the dissemination of census results. Mapping has always been an integral part of census taking, to maximise the coverage, increase the quality of the data and improve the dissemination of census results. But nowadays, the available technology combined with emerging new census methods offers the opportunity to develop a more ambitious and sustainable census mapping strategy.

Geospatial information in the census operation is also instrumental for other statistical activities, such as the development of a new sample frame for household surveys, the setup of a national register of buildings and dwellings, the improvement of the coverage and quality of addresses in Local Administrative Units or the enrichment of the National Spatial Data Infrastructures (NSDIs) with new spatial datasets and standards. Census related operations increasingly support other geospatial national projects and help to produce small area data that can support policy actions of Local Governments.

The progress in the integration of geospatial and statistical data is also one of the main objectives of the recently established Global Geospatial Information Management (UN-GGIM), a worldwide initiative at government level. The 2020 Census Round and the 2030 Agenda for Sustainable Development are considered by UN-GGIM important drivers for the integration of geospatial and statistical information in support of evidence based decision-making across many sectors"[11].

7.2 A mapping strategy for the 2020 Census and beyond

INSTAT has developed in the past important internal capacities in digital mapping techniques and owns today a comprehensive geodatabase at building level for statistical use. For the 2020 Population and Housing Census, relevant additional steps are planned to further improve and enhance the available geospatial information for statistical use in Albania, taking also in consideration the recent important evolutions in the European and the Albanian national context. At European level, this refers for instance to the EU INSPIRE Directive[12], to the several initiatives taken by Eurostat in supporting the use of geodata and geocoding of statistics,[13] such as GISCO, GEOSTAT, DEGURBA, LUCAS, Regional and grid

[9] Conference of European Statisticians, Recommendations for the 2020 Censuses of Population and Housing, United Nations, New York and Geneva, 2015

[10] Principles and Recommendations for Population and Housing Censuses: the 2020 Round – Revision 3, United Nations, New York 2015

[11] Committee of Experts on Global Geospatial Information Management (2017), Integration of geospatial, statistical and other related information, E/C.20/2017/9/Add.1.

[12] https://inspire.ec.europa.eu/

[13] http://ec.europa.eu/eurostat/web/gisco/overview

statistics. At the Albanian level this refers to the 2015 Territorial and Administrative Reform of Local Government (TAR), the recent set-up of the Albanian State Authority for Geospatial Information (ASIG)[14], the efforts made by the government and international donors to develop in Albania an address system, and the work of the Territorial Planning Agency, in charge of the National Plan and the coordination of the General Local Plans.

Moreover, INSTAT decided that the Census 2020 will lay the ground for the development of a register of buildings and dwellings for statistical use, consistent as much as possible with other available national spatial datasets and other statistical registers, as internationally recommended and already experienced in other European countries. The main objective of the register of buildings and dwellings will be to put in place the basic conditions, together with the establishment of a population register, for the increased use of administrative data in the statistical production and future register-based Census statistics.

In consultation with other Albanian Ministries and Agencies, INSTAT has started to work to define a comprehensive strategy for mapping and geospatial information for the next Census, integrated with the plan of developing a statistical register of buildings and dwellings. This activity will produce a document on “Census Mapping Strategy and Register of Buildings and Dwellings”, addressing the objectives, phases of implementation, methodological approaches and use of technology, as well as the linkages and synergies with other geospatial-related activities in Albania.

In general terms, INSTAT plans to adopt for Census mapping activities an integrated electronic system approach composed of Geographic Information System tools (GIS), Global Navigation Satellite Systems (GNSS) and tablets for map updating activities, EA boundaries updating, numbering of buildings and dwellings, and listing of households. The system is also intended to be linked with the CAPI applications to be developed for the enumeration process, and to support the field management and monitoring activities. The system will in addition support the preparation and implementation of the Post Enumeration Survey (PES) and the dissemination of Census results, including the provision of geospatial data and tools for the use by Municipalities.

One of the main characteristics of the system will be the integration between geospatial and census data at point-based level, geocoded through unique identifiers, geographic coordinates, and potentially, through street addresses, postal codes, or cadastral data, when available. Such characteristics will allow the aggregation of census data in any spatial dimension, from small areas such as villages, quarters or communes to municipalities or regions, as well as by grids. Once disclosure control is ensured, geocoded census small area data can be used by local and regional administrations for planning and policy purposes.

In the paragraphs below, the planned census mapping activities are presented by main phases: activities for the pre-enumeration phase, for the enumeration phase, and for the post-enumeration phase. The planned implementation of the register of buildings and dwellings and synergies with the national address system are also addressed.

[14] As established by Law No. 72/2012, "On the Organization and Functioning of the National Infrastructure of Geospatial Information in the Republic of Albania".

7.3 Mapping activities in the pre-enumeration phase

7.3.1 Definition of the census geography

Census geography is the division of the whole territory for census purposes. Its objective is to define a hierarchy of administrative, geographical and statistical units for which census data is collected, and, for some of them, disseminated. The definition of the census geography is an important activity to be implemented well in advance during the pre-enumeration phase, to ensure that all the census units (buildings, dwellings, households, and individuals), are covered during the enumeration period. It supports the definition of operational zones (enumeration and control areas) for data collection, facilitates the organization and management of the census itself and, when organized in a GIS environment, provides an appropriate digital framework both for conducting and monitoring the field work and for data dissemination at local and small-area levels.

The current territorial division of Albania is governed by the 2014 Law "On administrative-territorial division of local government units in the republic of Albania"[15]. The legislation divides the country into two administrative levels: Regions (Qarks) and Municipalities. Today, there are 12 Regions and 61 new Municipalities, which are generally composed of the former Municipalities and Communes that are grouped to form the new Municipalities. The former Municipalities and Communes (in force during the 2001 and 2011 Censuses) continue to exist as "Administrative Units" of the new Municipalities. Official names of Regions, Municipalities, cities and villages are defined by the law. However, the new law does not clearly define and classify the territory into urban and rural areas.

The Census geography for the 2020 Census will be composed of the above mentioned territorial and administrative units, and by the operational areas designed in each municipality for the organisation of the enumeration: supervision areas managed by Municipal supervisors, controller areas, enumeration areas (EAs). As explained in the chapter on the Census field work, INSTAT plans to reduce the 11,775 EAs used in the 2011 Census to about 6,000 EAs, by extending the period of enumeration and by revising the demarcation of the EAs.

After a revision and update of the administrative boundaries with the new codes based on the 2014-2015 Territorial and Administrative Reform, the first activity of the Census mapping component will be to organise and implement the updating of maps at building level in all the territory of Albania. The 2011 Albanian Census recorded almost 1,000,000 buildings in the country, used both for residential (606,359) and non-residential purposes. The total number of dwellings was 1,021,330. Since then, an important number of changes are expected to have taken place in the country, less related to the construction of new buildings and more to modifications of existing buildings or to demolitions, due to the restrictive measures taken by the government in recent years in providing building permits and tolerating illegal constructions.

[15] Law No. 115/2014 "On the administrative-territorial division of Local Government Units in the Republic of Albania".

7.3.2 Preliminary results of map updating

From June to December 2017, INSTAT has already started to update census maps in 2,247 Enumeration Areas, about 20% of the total number of EAs of the 2011 Census. The update was conducted by contracted surveyors on paper maps. For each building the following information was collected on a paper form:

- Geographic identifiers (codes of municipality, EA, building);
- Building status (new building, building not existing anymore, building modified in shape or size, building under construction);
- Number of floors and presence of a basement;
- Number of entrances;
- Number and codes of units classified as dwellings, units used for business purposes, or for other purposes.

The spatial data on the paper maps were transferred to the INSTAT geodatabase by GIS operators, while the other data in the forms were entered in a separate database. At a later stage, the geospatial team will link them to the corresponding buildings in the GIS.

The 2017 map updating was an important activity to gather a set of fresh spatial data for evaluating and planning the workload expected for the overall updating of the maps. Some preliminary results of this first exercise show that out of 177,820 investigated buildings, 22.7 percent include now a different number of dwellings compared to 2011 (13.2% with more dwellings and 9.5% with less dwellings); 5.3 percent are newly constructed buildings, and 2.8 percent of buildings were demolished. These preliminary results confirm that changes in the physical structure of buildings are very common, while the number of new buildings in Albania is relatively low, certainly less important than in the decade between 2001 and 2011.

Although the 2017 map updating was mainly focused on urban areas, the preliminary analysis shows important and heterogeneous differences on the size of EAs during the six years considered. The differences in the size of EAs between dwellings and private households is mostly related to the high percentage (about 30 percent) of vacant dwellings registered in the 2011 Census. Therefore, taking into consideration the intended reduction in the 2020 Census of the number of enumerators (down from 11,775 to about 6,000), and the intention to better harmonise the size of EAs to include approximately 150 households, the revision of EA boundaries is a necessary and relevant, albeit time-consuming activity that needs to start in the very near future.

Immediately prior to the census enumeration, EA maps in some specific areas, particularly on the fringes of the urbanized territory, might again be updated to represent the real number and distribution of buildings as close as possible to Census Day.

Using electronic devices instead of digital paper map in the census 2020 will ensure that the process of data collection goes as planned and fulfill the responsibilities and the requirements for census activities. It will reduce time-consuming and costs in census stages such as data entry, editing, data collection; updating the geodata immediately from the fieldwork; monitoring and supporting the operations of enumerators in field work in geocoding of buildings and dwellings.

7.3.3 Computer-based updating of GIS layers

INSTAT plans to conduct the future map updating operations in the field with a computer application, loaded on tablets and synchronised with the geodatabase of INSTAT. Such an application is expected to include editing tools to reshape for instance boundaries of buildings, add new polygons representing new buildings, delete buildings not existing anymore, merge separate buildings, update building characteristics such as the number of floors, building entrances, numbers of housing units for residential or business purposes, building codes and addresses, boundaries of EAs, etc.

The computer application should be designed with a set of logical rules that improves the quality of the map updating operations. Surveyors should be allowed to select different GIS layers to edit (layer of buildings, layer of streets, layer of landmarks), and within each layer each spatial feature. The computer application for map updating is conceived to be used not only for the 2020 Census project, but also in future statistical activities of INSTAT, for instance to support the preparation of sample-based surveys, and for the update of the register of buildings and dwellings.

7.3.4 Preparing the ground for a building and dwelling register

In geocoding approaches, it is preferable to develop a point-based statistical system of geocoding statistical data, which is also more appropriate for a register-based Census. This means that the locations of buildings or dwellings are specified using unique identifiers and geographic coordinates, giving the exact location of each statistical unit. The adoption of unique identifiers at point level (e.g. building centroids and addresses) and map coordinates for buildings and addresses can also pave the way for a more flexible determination of small area spatial units for municipalities or at the level of villages for local development purposes. The point-based geocoding approach is also recommended for grid-based statistics.

As experienced in other countries, such a register should manage data on buildings and building units used for residential purposes, and optionally data on constructions used for other purposes. Its immediate benefit is in contributing to the modernization of the statistical system, improving quality and supporting statistical surveys. In its design, it will be also relevant to set up procedures and common identifiers for linkage with other registers already available in the country, or just planned. One of the main aspects that requires further investigation is the coding system for unique identifiers, and the definition of an official statistical dictionary for the local units, to achieve harmonisation and/or define keys of transition between different registers and sets of administrative and statistical data.

The Albanian address system is providing building units with an official address. In general terms, it is composed by the name of the owner of the building unit (to whom is associated a personal ID number - NID), a street name, building number, building entrance, city/village, postal code, municipality. Along streets, buildings are numbered with odd numbers in the left side and even numbers on the right side, starting from the beginning of the street closer to the center of the city.

Currently, the system of identification of building units used by the Albanian address system presents many differences when compared to the one used by INSTAT for statistical purposes. Even building numbers and floor numbers used in the two systems are assigned with a different methodology. INSTAT is discussing with the Ministry of Interior to develop

synergies between the two coding systems and is investigating the feasibility to include in the map updating activities for the Census, planned for 2019, the collection of data on addresses. A MoU will be signed between the two Institutions to define the details of the cooperation.

7.4 Mapping activities in the enumeration phase

During fieldwork operations, the census coverage rate can be increased not only through an accurate definition of the census geography and the exact delineation of administrative and EA units. It is also important to support the field orientation of enumerators. Indeed, each enumerator is generally provided with one or more EA maps, showing in detail all buildings where households may live, or where business units may be located. EA maps are a tool for the enumerators to ensure that during the enumeration all buildings, structurally permanent or not, built for residential and non-residential purposes, are investigated to identify and interview households, and/or locate and categorize business units, monitor the coverage of assigned areas by enumerators etc. The coding system reported on the EA maps should be consistent with the ID codes reported on the census forms. When direct linkages between census units and maps are established electronically in the field, census coverage increases (e.g. in CAPI techniques where GPS functions are enabled).

INSTAT plans to develop an electronic application for field management that will be able to handle staff and materials, and monitor in real time field operations through a tracking mechanism based on GPS functions in the tablets of enumerators. INSTAT will be able to access from a dashboard at the Offices the location of the field staff, monitor census coverage by EA and by building, and at the same time checking the progress on the ground. Field support for the geocoding of census data will be ensured by GIS support specialists. They are expected to participate in the training of the field staff, to support enumerators and controllers in the field to acquire GPS data, to support the orientation of enumerators and controllers in their assigned EAs and to monitor the correct acquisition of data on addresses.

7.5 Mapping activities in the post-enumeration phase

INSTAT plans to use GIS and GNSS tools also for the organisation and conducting of the PES after the completion of data collection operations. Geospatial technology will be used for the preparation of maps of the selected EAs and for the management of field operations. The integration of PES data in the geodatabase will support the comparison between the Census enumeration and PES results of the covered units in the sampled EAs.

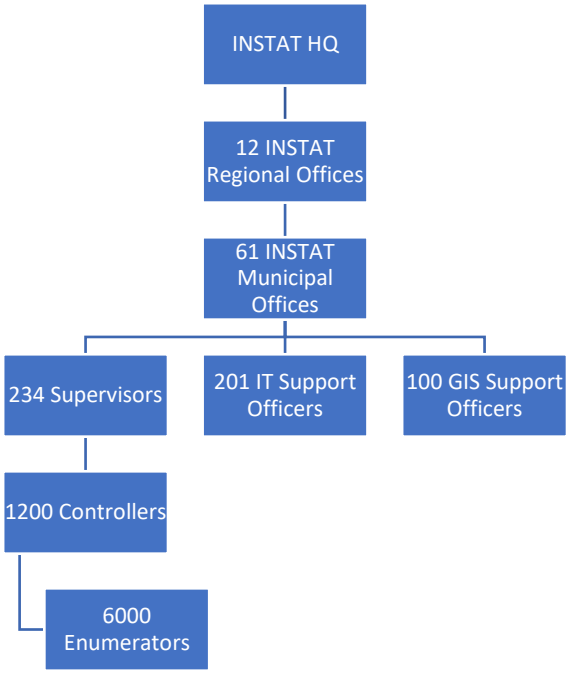
The dissemination of the census data (see chapter 10 on dissemination and analysis) includes the preparation of thematic maps and outputs of spatial-related analysis. If maps are prepared with GIS tools, they are an important way to disseminate Census results. They can be used to produce digital and hard-copy thematic maps, census atlases and for internet mapping applications (e.g. WebGis or Portals). They are also useful to perform geo-spatial analyses by combining variables to investigate relationships and to represent them where they occur.

8. Census enumeration

8.1 Organisation of the enumeration

The Census Unit (composed of the Census Technical Group and Census Operations Group) is the main entity in charge of the planning, organization and execution of the enumeration in the field. The structure includes the Regional Census Offices, and the Municipal Field Offices and their field staff (supervisors, controllers and enumerators).

Figure 2: Enumeration organisation of the 2020 Census



8.1.1 Regional Offices

The organizational structure includes one Census Regional Office in the INSTAT Regional Office.

The tasks of the Regional Offices are to:

- Participate in the training of the supervisors;
- Prepare and monitor the data collection operations in the region;
- Control the work of the Municipal Field Offices;
- Establish, within the Prefecture, the needed contact with the authorities, the media and the public at large, to facilitate the census activities;
- Actively participate in the promotion of the Census and the awareness campaign in the Prefecture;
- Make sure that all the tablets, and the equipment and material, used or unused, are transmitted to the INSTAT Headquarters at the end of the data collection operation.

8.1.2 Categories of field staff

Under the leadership of the INSTAT Regional Office, the field data collection operation will be executed in each Municipality by a Municipal Office Team including the following agents:

- A Head of the Municipal Office in charge of the management of the team, chosen among the supervisors. In large municipalities (such as Tiranë, Durrës, Elbasan and Shkodër), more than one municipal office can be established.
- Supervisors in charge of the training of the enumerators and controllers, and of the administrative and technical management of the enumeration in the assigned area in the municipality. Depending on the size of the Municipality, there will be one or more Supervisors.
- Information Technology Support Officers (ITSO) in charge of the proper functioning of the tablets in the field. They will take care of the maintenance of the computer devices used in the field and in the Census Offices (Central, Regional, Municipal) and shall guarantee the permanent availability of the computer networks to facilitate data transfer.
- GIS Support Officers (GSO) in charge supporting enumerators and controllers in the field to deal with cartographic issues, for example to acquire GPS data to geocode census data;
- Controllers in charge of the quality control of the work done by the enumerators. These controllers will act as links between the enumerators and the supervisor.
- Enumerators in charge of the enumeration in the assigned enumeration areas, conducting the interviews with the households and/or institutions and registering the collected information on the tablets, as per the instruction manuals.

Table 2: Number of field staff during the collection phase

Type of field staff	**Number of field staff**
Supervisors	234
IT Support Officers	201
GIS Support Officers	100
Controllers	1200
Enumerators	6000

8.1.3 Municipal Committees

The Municipal Committees are important structures, as they will support INSTAT in the implementation of the census operation on the Municipal level. Their main tasks are to motivate the population and ensure the smooth running of the operations in their respective territory. Their members are mainly political, administrative, civil and religious authorities, including groups and NGOs dealing with gender issues.

Key functions of the Municipal Committees include:

a) Support of INSTAT in the organisation and management of the preparatory work of the Census in the enumeration areas within the territory of Municipalities;
b) Mobilise stakeholders and dignitaries in the Municipalities to support the Census and assist INSTAT in the Communication and Publicity campaign on the local level;
c) Provide the premises necessary to facilitate the training of field staff within the Municipality

8.1.4 Communication in the field

Contact and communication constitute key aspects of the census operation, as they make it possible to rapidly share information, allowing the INSTAT Census Unit to better plan the execution of activities, be informed promptly of problems that may rise in different places on the territory and bring the needed solutions as soon as possible.

The sharing of information or the transmission of orders, will take place in a cascade process in such a way that the Census Manager will be in direct contact with the heads of the Regional Offices which, in turn, will transmit instructions to the Municipal Offices and supervisors from where they will go to the controllers and enumerators.

8.1.5 Numbers and distribution of enumeration staff

The data collection of the Census 2011 was conducted during 3 weeks, extended to 4 weeks in some places, by 11,906 enumerators, 2,330 controllers, and 128 supervisors. For the Census 2020, it is planned to extend the data collection period to six weeks to halve the number of enumeration staff. Not only will this reduce the number and cost of the tablets, but it will also allow for a more selective recruitment (see chapter 11 on the recruitment process). The following table 3 presents the planned numbers and distribution of field staff by Municipality.

8.2 Training

8.2.1 Training strategy

The goal of the training is to reach a common understanding among the staff of the content, phases and organisation of the census project and to introduce and master the technical instructions at the different intervention levels to ensure quality and homogeneity of the enumeration. The training will be largely organised as training of trainers at different levels.

The first training level is addressed at INSTAT permanent staff regarding the different components and the management of the census operation, the communication campaign, the questionnaires and CAPI enumeration tools, the data processing and editing, the publication and dissemination tools, the management software, quality assurance etc. The trainings will be provided through seminars and workshops by the Census Unit executives and national and international consultants.

The training of the field staff will essentially focus on the administration of the questionnaires, the household interviews, the mastering of the tablets and the transmission and reporting processes. The trainings will use the instruction manuals as a basis, for the staff to fully understand the enumeration methods and the technical tools they will be using.

The training of field staff will be organised in a cascade: INSTAT HQ staff will train the Regional Office staff, who then will train the Municipal Office staff and supervisors, who will then train enumerators and controllers.

However, the cascade scheme carries the risk to “loose messages” throughout the process. Therefore, a participative training programme will be prepared and the acquisition of knowledge about the essential objectives and instructions will be systematically controlled.

Table 3: Number of enumeration staff by Municipalities

Municipality	Municipal super-visors	Controllers	Enume-rators	Municipality	Municipal super-visor	Controllers	Enume-rators
Berat	5	26	129	Dropull	1	2	8
Ura Vajgurore	3	12	58	Korçë	6	33	163
Kuçovë	3	13	67	Pogradec	5	26	132
Skrapar	2	5	27	Maliq	4	18	89
Poliçan	2	5	23	Pustec	1	1	7
Dibër	5	26	132	Kolonjë	2	5	24
Bulqizë	3	13	67	Devoll	3	11	57
Mat	3	12	59	Kukës	4	21	103
Klos	2	7	36	Tropojë	2	9	44
Durrës	12	75	375	Has	2	7	36
Shijak	3	12	60	Lezhë	5	28	141
Krujë	5	26	128	Mirditë	2	9	47
Elbasan	10	61	304	Kurbin	4	20	99
Cërrik	3	12	59	Shkodër	9	58	291
Belsh	2	8	42	Vau I Dejës	3	13	65
Peqin	3	11	56	Malësi E Madhe	3	13	66
Gramsh	2	10	52	Pukë	2	5	24
Librazhd	3	14	68	Fushë Arrës	1	3	16
Prrenjas	3	11	53	Tiranë	35	239	1194
Fier	8	52	259	Kamëz	7	45	223
Lushnje	6	36	179	Vorë	3	11	55
Patos	2	10	49	Kavajë	3	17	86
Roskovec	2	9	47	Rrogozhinë	2	9	47
Divjakë	3	15	73	Vlorë	7	45	225
Mallakastër	3	12	58	Himarë	1	3	17
Gjirokastër	3	12	61	Sarandë	2	10	50
Libohovë	1	2	8	Konispol	2	4	18
Përmet	2	5	23	Delvinë	1	3	17
Këlcyrë	1	3	13	Finiq	1	3	16
Tepelenë	2	4	19	Selenicë	2	7	35
Memaliaj	2	5	23	**Total**	**234**	**1200**	**6000**

The number of trainees per session will be 15 on average with a maximum of 20 participants to ensure active participation. In addition, INSTAT census staff will participate as much as possible in these training sessions to ensure proper training results. The training of the IT Support Officers will be carried out by the staff of the IT Directorate of INSTAT. The duration of the trainings will be around 5 days for each field staff.

At the end of the training, a test will be organised using an IT application on the tablets. The best trainees will be selected either as controllers or enumerators, the others will be kept in a pool of reserve controllers or enumerators.

8.2.2 Training venues

Training sites will be identified by the Regional Offices for the training of the supervisors. In each Municipality, the Municipal Office, with the support of the Municipal Census Committee, should identify in advance the potential venues for the training. Selected buildings may be public or private schools, or other public buildings that meet the security standards and are big enough to receive the trainees. Attention will be paid to the availability of projection equipment and good electrical power connections.

8.2.3 Curriculum and tools for training

Independently from the staff category, the trainings will cover:

- The 2020 Census, its definition and importance, the organizational structure, the mapping process, the enumeration tools and instruments (maps, questionnaires, forms, tablets, manuals), supervision techniques, confidentiality principles, etc.;
- Communication with authorities, respondents and supervisors;
- Responsibilities of the Census staff, based on elements such as reliability, leadership, sense of decision making, respect of confidentiality etc.;
- Material management (transportation, transmission of data, recovery, repair etc.);
- Administrative and financial procedures, reporting, control and supervision etc.
- Staff management (deployment in the field, communication, reporting, supervision etc.);

In preparation for the training sessions, an online training will be offered to present the main features of the 2020 Census (objectives of the census, concepts, main steps…) which every staff will be requested to follow. The online training will also include test questions.

The training sessions will include both theory and practice. A dynamic and participatory method, supported by audio-visual tools, will be applied. In addition, time will be planned for debates and discussions. This should create, from the beginning, a team spirit among the participants. Practical exercises using the tablet will be included in real interview situations to make sure that the manipulation of the tablet is well mastered.

The trainers will use a Trainer's Manual and the different instruction manuals prepared for each category of staff. The Trainer's Manual will present the content of each training session, including timing, objectives, materials used and how the knowledge acquisition will be controlled. To provide a uniform training to all, irrespective of the training venue, pre-registered CDs and DVDs, as well as other equipment or devices, will be provided to the different trainers to fulfil their task.

8.3 Census field work

8.3.1 Tasks of enumerators

The enumeration is expected to take place for 6 weeks. The main tasks of the enumerators are the following:

- Identify, with the help of the controller, the exact boundaries of the assigned enumeration area (EA);
- Identify, from the map on the tablet, all buildings inside the assigned EA;
- Enumerate all resident persons in the dwellings or institutions of the assigned EA;

- Interview the members of the households or collective households in institutions based on the instructions;
- Fill in the questionnaires on the tablet following the instructions;
- Check the questionnaires after each interview;
- Regularly notify the controller of completed questionnaires;
- Make sure that the data collected are transmitted (this should be done automatically by the application);
- Prepare a report at the end of the enumeration by answering a questionnaire on the tablet;
- Maintain and secure the equipment and material made available and return it at the end of the field work.

8.3.2 Control and supervision

The control of the enumeration process and of its compliance with the instructions is essential to ensure coverage and data quality during the Census. The control and supervision of the fieldwork takes place at four levels.

The first level is entrusted to the controller. Each municipality will be divided into enumeration areas and control areas. The control areas are placed under the responsibility of a controller and regroup four to five enumeration areas, based on their proximity and the size of their population. Controllers will use an application on their tablet to check the data collected by the enumerators under their responsibility. This application will include specific checks and warnings, based on indicators related to the data collected (such as size of the households, sex and age structure, as well as other critical variables). The application will also draw a sample of households to be revisited by the controller, to verify that the enumerator effectively interviewed this household.

The second level of supervision is under the responsibility of the supervisor, in charge of the following tasks:

- Coordinate the data collection activities in the Municipality or part of the Municipality;
- Control and supervise the work of the controllers and enumerators;
- Make sure that the census fully covers the whole area under his/her responsibility.

The supervisors, through a sample, will control the quality of the questionnaires transmitted by the controllers, to make sure that these questionnaires meet the quality standards.

The third level of supervision is ensured by the Regional Office, which will execute the following tasks:

- Organize and monitor the data collection operations in the Region;
- Control the work of the Municipal Offices and supervisors in the Region;
- Make sure that the whole Region is fully covered by the census.

The fourth level of supervision includes the technicians and executives of the Census Unit which will be exclusively assigned to the supervision of the field work and will present regular progress reports for information and decision making.

A web application will be available to access the data of the respective areas of supervisors, and the technicians of the Central Census Unit will be able to control the data transmitted from the field as soon as they are entered in the central database. Specific indicators will be developed to assess the quality of the data, with the possibility for the Census Unit to query directly the database for further investigations.

8.3.4 Monitoring of progress

A specific web application will be developed to ensure the monitoring of the enumeration progress in the field. This application, linked to the central database, will allow to access the number of questionnaires completed by areas. This application will be accessible to the Municipal and Regional Offices for their respective areas of responsibility, and of course to the INSTAT headquarters.

Standard dashboards will present the progress of the enumeration and compare with the expected numbers of buildings and dwellings identified during the mapping phase to follow the completion rate. This will allow close monitoring of the progress of the enumeration as well as comparisons across the territory.

8.3.5 Validation of the collected data

The validation of the collected data will be done at the different levels of the field structure. At the first level, controllers verify their enumerators' questionnaires, applying the instructions of enumerator and controller manuals and using the controller application on their tablet. They guarantee the quality of the work done by each of their enumerators. Once they consider the data to be correct, they validate the corresponding questionnaires through the application and flag as "validated" those records in the central database. This validation can be cancelled by the supervisor or the HQ team in case they find anomalies during their control process.

9. Information technology and data processing

9.1 Background

Rapid advances in information and communication technologies are transforming the way data, and particularly census data, are collected in the field. Recent advances, particularly in handheld computing devices and mobile connectivity, have resulted in innovative approaches for collecting data in a faster way and with higher quality, offering a large potential for integrating these new methods to strengthen INSTAT statistical data collection programs. Handheld devices, such as tablets, smartphones and laptops, have demonstrated high potential to improve data quality and reduce data collection time. They are rapidly becoming the standard in field-based data collection.

The transition from traditional Pen And Paper Interview (PAPI) to Computer Assisted Personal Interview (CAPI) involves the use of electronic questionnaires administered via handheld devices through face-to-face interviews. This approach is motivated by the advantages achievable in terms of efficiency, effectiveness and data quality. Compared to the traditional process involving a centralized data capture phase, the use of handheld electronic devices offers immediate digitization of the data at the point of collection. This allows for faster and automated data processing.

However, the introduction of CAPI has an impact on the entire census process, and its implementation will create various challenges in census operations. The benefits associated with the successful introduction of CAPI-based data collection in the census cannot be realized without a strong commitment of INSTAT to move tactically and strategically towards new technological systems. The decision to use CAPI instead of PAPI is important and should be made in the initial census planning stages with a clear understanding of the technology and assessment of the operating environment in terms of institutional capacity, infrastructure and terrain.

9.2 Feasibility of CAPI-based data collection

The success of any electronic data collection depends on sound strategic, operational and managerial planning as well as a well-designed institutional environment. To ensure the success of the 2020 Census, it is critical to identify all requirements for introducing electronic data collection technology, and to develop plans for doing so early in the census life cycle. The planning should take into consideration several critical factors.

9.2.1 Infrastructure considerations: mobile network coverage and Wi-Fi use

Infrastructure issues such as the availability of electricity and internet access in Albania can affect the success of electronic data collection. Mapping areas that lack such connectivity is important for planning.

The following map (https://opensignal.com/) shows the coverage of the 2G/3G and 4G mobile network for the whole territory of Albania. The points in green show a strong signal while moving towards red, the data signal becomes weaker.

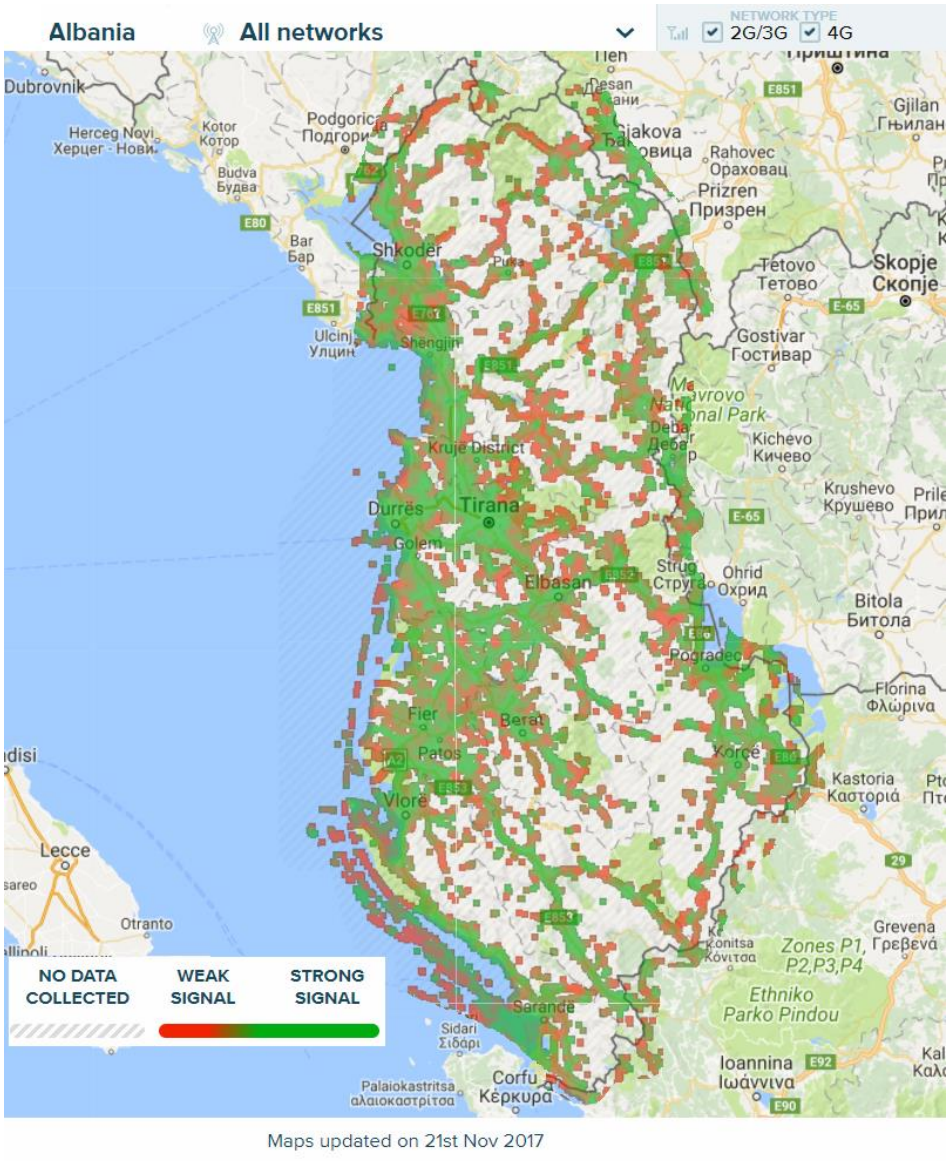


Figure 3: Signal strength of the mobile network in Albania

Most of the country is well covered with a satisfactory signal. Moreover, a detailed analysis of the areas not covered by the mobile network shows that these are mainly mountain areas with no or a very limited number of inhabitants. The coverage of the 4G mobile network in Albania is much more limited and basically restricted to the main cities (Tirana, Skoder, Shengin, Kruje, Dures, Elbasan, Fier, Berat, Vlore, Sarande).

The Speedtest Global Index (http://www.speedtest.net/global-index) compares internet speed data from around the world monthly. Data for the index come from the hundreds of millions of tests taken by real people every month. The overall speed in a country is defined as the average mobile data connection a user experiences, based on both the speed and availability of a country's 2G/3G and 4G networks.

Considering all the countries examined by the Speedtest Global Index in January 2018, the overall average mobile broadband speed is 22.2 Mbps in download and 9.0 Mbps in upload. Albania is ranked 39th of 123 countries, just after Italy and before the US, UK, Japan and Germany. The Albanian overall mobile speed is estimated at 28.5 Mbps in download and 10.6 Mbps in upload.

Similarly, the Speedtest Global Index of January 2018 shows an overall average of fixed broadband speed of 42.7 Mbps in download and 20.39 Mbps in upload. Albania is ranked 93rd of 130 countries, with an overall speed of 13.9 Mbps in download and 5.3 Mbps in upload, which is lower than the average speed available for mobile broadband.

On June 30 2017, 1,932,024 internet users were counted in Albania out of an estimated population of 2,911,428 persons (https://www.internetworldstats.com/stats4.htm). This indicates an internet penetration rate of 66.4%, compared with an average rate of 80.2% for the whole of Europe.

The OpenSignal latest report on the global state of mobile networks (https://opensignal.com/reports/2017/02/global-state-of-the-mobile-network) found that Wi-Fi use in Albania was decreasing during the last years. The following map shows that Albania is one of the countries in the region with the lowest rate (38.6%) of internet time spent on Wi-Fi.

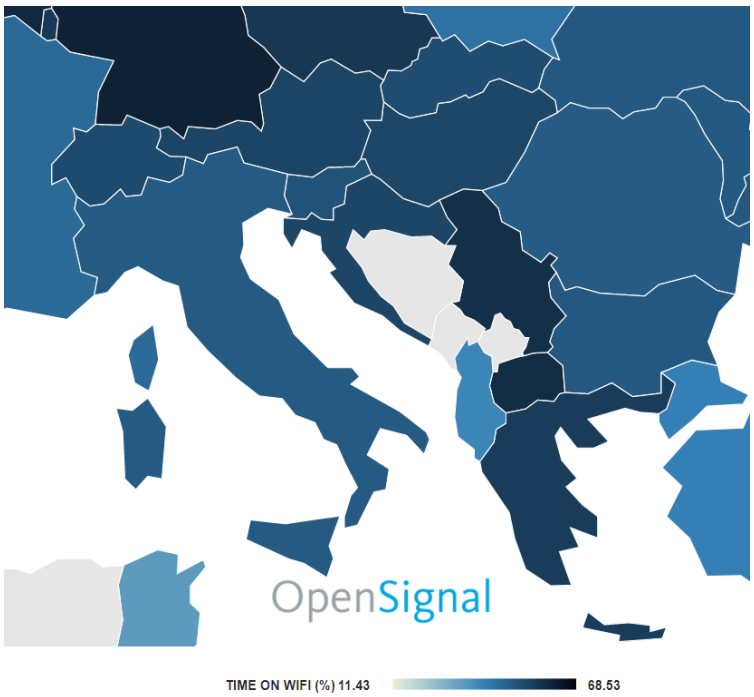


Figure 4: Internet time spent on Wi-Fi in Albania and neighboring countries

The analysis of mobile and fixed broadband in Albania underlines the feasibility of adopting an electronic data collection for the Census. It also highlights the advantages of relaying on the mobile (2G/3G, 4G) broadband rather than Wi-Fi as a standard mean to transmit the data. Nevertheless, contingency plans should be developed for charging and backing up the devices when and where electricity and/or internet is not available. Finally, the Albanian internet penetration rate, together with the increasing number of time spent on mobile broadband, seems to be enough to ensure the recruitment of field staff that are confident with the operating principles of handheld devices.

9.2.2 Budgetary considerations

The adoption of any innovative technology presents challenges and should be considered only after costs and benefits have been evaluated. The following table compares the estimated expenses of conducting the 2020 Census with PAPI (using scanning technologies), based on the cost of the Census 2011, and with CAPI.

The table below shows only the elements of the budget that are affected by the adoption of a PAPI or a CAPI data collection method. It is assumed that the overall cost of the required manpower in the field (salaries of enumerators, controllers etc.) is the same in both cases, because the reduction by half of the number of enumerators in the CAPI census is compensated by the doubling in size of the EAs to be covered and the duration of fieldwork. But the reduction of the number of enumerators has a huge impact on the cost of the hardware, because only 6000 tablets for enumerators need to be procured.

The table below highlights in red the items where costs increase passing from PAPI to CAPI, while the items where costs decrease are marked in blue.

Table 4: Estimated cost of IT, training needs, material and equipment in a PAPI and a CAPI census

Items		Method of Data	
		PI with Scan	CAPI
	Fixed costs:		
1	Hardware	751'942	2'358'150
2	Software	421'792	514'482
3	Other electronic equipment	60'155	87'000
4	Maintenance Fees	16'241	48'903
	Variable costs:		
5	Technical assistance, trainings and study visits	2'564'883	3'077'860
6	Printing paper questionnaire and field materials (PAPI only)	587'667	-
7	Material's transportation and Archiving	731'239	64'600
8	Data transfer fees (CAPI only)		218'000
9	Scanning and verifcation (PAPI only)	883'340	-
	Total cost	**6'017'259**	**6'368'995**

As can be noted, the overall costs are of a similar size in the two modes of data collection. The CAPI costs are slightly higher, which is essentially due to the increase in hardware costs, passing from 751,942 to 2,358,150 euros. This includes investments for around 8,500 tablets (including 12% reserve), 300 laptops, 1 dedicated server and 1 backup server. These investments are clearly more sustainable than the costs for paper, transportation, archiving and scanning in the PAPI census, which cannot be recovered.

Item 5 (Technical assistance, training and study visits) increases by about 20% because the highly technical nature of digital data collection and the necessary development of applications. Indeed, careful consideration needs to be given to the technical skills and

the type of expertise needed to build the capacities of INSTAT staff. Technical assistance is crucial in providing know-how for developing and testing the applications, setting up the data transfer system and testing the handheld devices.

On the other hand, using an electronic questionnaire almost eliminates the costs for printing the paper questionnaires (item 6), the transportation and archiving of materials (item 7), and for scanning and verification (item 9). Item 8 (Data transfer fees) it is necessary only in CAPI and includes the cost of SIM cards, using the mobile network from tablets, and the dedicated internet connection at headquarters with a 1Gbit/sec bandwidth.

9.2.3 Benefits and risks of CAPI versus PAPI

CAPI changes the nature of data collection and leads to investments that are more sustainable than a PAPI mode. The expected benefits (in blue) compared to the risks (in red) of adopting a CAPI data collection mode are particularly relevant for the efficiency of data processing, as is shown in the table below (PAPI based on the experience of the 2011 Census). The CAPI mode creates on the other hand new risks which need to be mitigated (in red).

Table 5: Benefits and risks: PAPI with Scan and CAPI

Items	**PAPI with Scan (2011)**	**CAPI**
Instantaneous cross-validation with other records	Low	High
Automatic sequencing of question skips patterns	Low	High
Built-in consistency checks	-	High
Built-in instructional and help materials	Low	High
Rapid transmission of data to central servers	-	High
Rapid production of performance metrics of field operations; and cumulative report of enumerated units	Low	High
Ability to undertake quality assurance of geographic boundaries	Low	High
Switching between questionnaires in different languages	Low	High
Incompatibility between hardware and/or software	Possible	Possible
Solution failure (lack of connectivity, hardware failure, battery, GPS black spots, software bugs, device theft)	Applies to a certain extent	Applies to a certain extent
Lack of skills or knowledge by system users, particularly temporary census staff	Low	Higher
Hacking, online attack or others IC security issues	Lower	Higher

The risks listed at the end of the table could be mitigated in several ways. Concerning the incompatibility between hardware and/or software, the risk can be mitigated

through an accurate preparation of the technical specifications and through the tests to be performed with the devices.

The risk of solution failure should be mitigated adopting alternative ways to transmit data (Wi-Fi), with power banks, replacement of stolen or broken devices, etc.
The lack of skills or knowledge by system users should be mitigated by developing a user-friendly application with built-in help, trainings and through the IT field support staff.

The risk of hacking, online attack and other security issues should be mitigated by ensuring that the collected data are encrypted, and that each user has its own account in the central database, which is made possible through credentials known only by the application and not by the user. For the entire operation, dedicated servers will be used to enhance security.

Other important benefits of CAPI (in blue) are to be considered as shown in the following Table 5b:

Table 6: Additional benefits of CAPI versus PAPI

Items	**PAPI with Scan (2011)**	**CAPI**
Data receiving and storage space	Large space required for storage of questionnaires with long storage duration	Efficient – minimal space required
Access for transportation to deliver the forms or devices	Proved to be difficult in 2011	Devices can be easily distributed and collected
Physical security for storage	Not easy to manage, especially after data capture	Devices can be made traceable
Estimated time for data collection retrieval	1 month	Return of raw data to HQ is 1 week
Estimated time for first tabulations after data collection and scanning	7 months	2 month
Quality of the collected data (ceteris paribus)	Satisfactory	Good
Labour force requirements	Important phases of manual labour: packing, loading and unloading materials	More time spent on technical work

This short cost-benefit analysis shows that although the budget with CAPI is a bit higher than with PAPI, this mode has many benefits deriving from technology and the related investments.

9.2.4 Institutional readiness

Institutional readiness refers to the capability of INSTAT to adopt electronic data collection and to apply it strategically. It should be kept in mind that the necessary investments required for the adoption of electronic data collection differ depending on INSTAT's existing capacity, including the experience in using these technologies in other statistical areas.

During the last years INSTAT started to introduce electronic data collection with CAPI in several surveys. Right now, several surveys are conducted using electronic data collection: Labour Force Survey, Demographic and Health Survey, Migration and Return Survey, Information and Communication Technology Survey, and two surveys conducted by INSTAT for the Bank of Albania (Enterprise Confidence Survey, Consumer Confidence Survey). The LFS is conducted regularly using Windows laptops, the other surveys use also Windows laptops while the surveys for the Bank of Albania were implemented with Android tablets. In both cases the CAPI development was made by INSTAT, with technical assistance provided by different donors.

Right now, basic knowledge about developing and testing CAPI applications exists within INSTAT, but it is not enough to develop and run a full in-house solution for the 2020 Census. Moreover, the IT department of INSTAT is under dimensioned and understaffed. Temporary IT staff should be hired, and technical assistance provided for developing and testing the census CAPI platform and transmitting know-how to the INSTAT IT staff. These are the reasons why workshops trainings and study visits are planned in the project.

9.2.5 Census timetable

The census timetable needs to fit the needs of implementing data collection with handheld devices. With CAPI data collection, previously separate processes may be integrated, or may need to be carried out earlier in the census life cycle. For example, data collection, capture, and editing can be done simultaneously when adopting a CAPI solution. However, generally, more time is needed to develop and test the application, prepare the coding and validation rules, set up the data transfer and processing systems, procure, program and test the handheld devices. Much testing must be built into the project schedule, and adequate time allocated to make any necessary improvements prior to implementation.

At the time this report is produced (April 2017), the timetable, even if tight.

9.3 ICT infrastructure for CAPI

9.3.1 Data synchronization and server infrastructure

A mobile data collection allows the transmission of data from remote geographical locations to central data storage repositories through wireless or mobile networks. Transferring data between devices in the field and to central servers, or in a cloud service, is referred to as synchronization.

For synchronization over the internet, a central server is required. Depending on the capabilities of the CAPI application, three types of servers could be used:

- **Cloud-based service**: Cloud-based services could be employed. This would require setting up an account with the cloud service.
- **Web server**: to use internet synchronization, a server running a web application software is required. The server can be set up on a system on-site at the head office, that is connected to the Internet, or it may be set up on a hosted website or virtual server in the cloud.
- **FTP server**: Some CAPI applications can synchronize with an FTP server (file transfer protocol) for data transfer. This option requires an account configured on an FTP server.

The choice of synchronization should consider the cloud-based service as the first option, to obviate the need to configure a server for synchronization at INSTAT. In this regard, preliminary talks were made with the National Agency for Protection of Personal Data (NAPPD) and with the National Agency for Information Society (AKSHI).
NAPPD was asked if they would preclude the use of a cloud system for collecting census data. The representative of the Agency expressed the opinion that if the cloud servers are in the territory of Albania/EU and the access to the data is controlled and secured, there is no objection to the use of cloud services, by a public or a private provider.

AKSHI was asked if they could provide the cloud services needed for the Census, with an estimated space of 1Tb and a dedicated internet connection, having a bandwidth of 1Gbit/sec. The Agency answered that such an arrangement may be possible and would require an official request.

Regardless of the need for INSTAT to setup a cloud-based service, there is the need to setup a dedicated Census server, mirrored with a backup server, for census data editing, coding and tabulation. These servers could also be used for synchronization, in case a cloud-based service could not be set up. It would be efficient for INSTAT, to choose a dedicated Census server that can be easily integrated with the new INSTAT IT infrastructure. Indeed, INSTAT is right now in the process of procuring three new servers and one backup server to modernize the actual IT infrastructure. The technical specifications of the Census dedicated server and of the backup server are included in Annex 2.

9.3.2 Data transfer during CAPI field work

Data transfer should be provided as synchronization from the enumerator's tablet directly to the INSTAT headquarters and should performs two tasks. Firstly, it should automatically push any completed case to the central database. Secondly, it should update the CAPI applications in the field by downloading the latest versions from the server. In this way, modifications of the application by the head office can easily be distributed to enumerators in the field.

The CAPI applications should synchronize data files at questionnaire level, keeping track of which cases have been added or updated and transferring only cases that are new or have been modified since the last synchronization. This significantly reduces the amount of data transferred and therefore reduces bandwidth and the cost of data transfer via the mobile network.

Once enumerators have used synchronization to upload data to the server, a management tool associated with the CAPI application can be used to download and review the cases from the supervisor's device. At the same time, all the data on the server can be downloaded into a single data file that can be used by the Census Unit at the INSTAT headquarter to monitor the field coverage and the quality of the data.

Data collected in the field on a mobile device need to be uploaded using networking components. Different mobile devices have different networking components and it is important to plan and get devices that have the required components. The choice of networking components can have a real impact on the price paid for the devices. At least the following components should be present:

- **Wi-Fi**: This is the most basic networking component. Different standards exist, and thus different Wi-Fi types and components, but for CAPI work it does not make a difference which Wi-Fi network is supported. Almost all handheld devices have Wi-Fi capability. Since Wi-Fi will only work near a Wi-Fi network, it will not allow the uploading and synchronization of data from the field.
- **2G/3G, 4G mobile**: These are not usually present in low-end devices. This component comes at a cost when included in mobile devices and when used for cellular data transfer. Usually a data plan is needed to use a cellular network. When cellular networks are available, data uploading can be executed as soon as an interview is completed.
- **Bluetooth**: not always present in low-end devices but is usually included in the mid-range and up. Bluetooth allows the connection of one device to another similar device or a central server for the transfer of files and data. Bluetooth transfer requires proximity between the devices to transfer data.

The technical specifications of the tablets to be used during the enumeration are also included in Annex 2.

9.4 Data security

Confidentiality is the protection of information from disclosure by unauthorized parties. Census data are confidential and INSTAT has by law the obligation to protect such information.

Data security is a prime issue for any form of data collection and the daily backup of the data should be done securely. After completing each interview, the data should be saved and secured until transmission to the central database server. Data collection via handheld devices requires investments in data security and staff training to prevent unauthorized access and the loss of sensitive personal data. Security concerns include failures in hardware and software, human error and accidents. Data transfer protocols from the field should be designed with specific security features, including encryption.

A very key component of protecting confidential information should be encryption. Encryption ensures that only the authorized people can decrypt the information. Encryption is widespread in today's environment and can be found in almost every

major protocol in use. A very prominent example is SSL/TLS, a security protocol for communication over the internet that has been used in conjunction with large numbers of internet protocols to ensure security.
Moreover, confidentiality should be also enhanced by enforcing user's permissions to access census data in the central IT system.

9.5 Development of the data collection application

9.5.1 Standardized software solutions

In most of their IT related activities, INSTAT staff rely on off-the-shelf solutions. They use off-the-shelf packages for data analysis (SPSS, SAS), standard packages for data editing (CONCORD/SCIA) and online data dissemination (PX-WEB). It is reasonable, therefore, to utilize similar approaches for CAPI systems. The advantages of off-the-shelf systems are their wide familiarity and acceptance by many users. Many such systems are free and have been developed and supported by large international institutions, like the US Census Bureau (CSPro) and the World Bank (SurveySolution).

Moreover, since INSTAT adopted CSPro in the last years as the main system for developing CAPI applications, it is reasonable to use CSPro also for the CAPI data collection of the Census. With the CSPro solution, INSTAT is investing not only in a software solution, but also in increasing the capacity of its own personnel that will be using a standardized tool. These acquired skills and knowledge will be applicable in for surveys long after the 2020 Census.

Converting a paper questionnaire into an electronic format involves more than simply replicating it on the screen of a handheld device. The kind of device used fundamentally affects the way in which enumerators interact with the questionnaire. The wording and structure of some questions may need to be changed to make it easier for the enumerators to work quickly and accurately on the device. Furthermore, added features like data validation, edits, and preloaded modalities can be included in an electronic questionnaire. The specifications for these features must be written when developing the questionnaire, to program them into the software application. Below are a minimum set of specific features that the CAPI application of the 2020 Census should support.

9.5.2 Filtering questions and skip patterns

Electronic questionnaires can facilitate filtering questions and skip patterns by automatically displaying only the relevant questions and skipping those that are irrelevant or not applicable to specific respondents. The automatic skips both improve accuracy of the response and reduce enumerator burden by eliminating the need for complex instructions.

One disadvantage of having hidden skip patterns programmed into the questionnaire is that if the enumerator makes a mistake on a filter question, then a set of questions will be skipped erroneously. Since the set of questions will not appear on screen, the enumerator may not easily detect the mistake. One way to mitigate this problem is to consider using consistency checks and/or re-asking the filtering question before a long skip.

9.5.3 Data validation

Given the pressure to release data soon after collection, edit checks should be added to the application before the enumeration begins, rather than programming those separately in the post-enumeration stage. One advantage of using an electronic questionnaire is that it can validate the data as the enumerator enters the responses on the handheld device. To do so, data validation rules should be written by subject matter specialists in the questionnaire development stage so that they can be programmed into the application. Checks that should be included in the validation rules are: a) range checks; b) inconsistency checks; c) completeness checks.

Once the errors are identified, there are two ways to manage them: hard and soft edits. With hard edits, the enumerator is not able to continue the interview until the error has been rectified. With soft edits, the enumerator is notified of the possible error and should attempt to correct it but can also continue without doing so.

Error messages should inform the enumerators about which questions have errors, what the errors are, and how to correct them. They should be short but instructive. The questionnaire application should allow enumerators to go back to the problematic questions easily for correcting the errors. As with the data validation rules, subject matter specialists are best suited to write such error messages because of their in-depth understanding of the questionnaire content.

9.5.4 Preloading the questionnaire with administrative data and geocodes

One advantage of using an electronic questionnaire is that some administrative data and geocodes can be used to prefill the census forms. This can save interview time and improve accuracy. However, there should be a facility for the enumerator to edit any such prefilled items so that if there is an error or there has been a change to the prefilled data, the correct information can be recorded in the field. Enumerators should be able to take and record GPS measurements, which can not only be used to validate the geocodes but can assist field monitoring and management.

9.5.5 Multiple language capabilities

As with a paper questionnaire, an electronic questionnaire can be prepared in multiple languages but at a much lower cost. An option to select the language should be programmed at the beginning of the questionnaire. The questionnaire should, however, be tested in all languages before implementing it in the field, ensuring that back-translations of the different language versions have been carried out to achieve consistency across all versions.

9.5.6 On-screen help

Electronic questionnaires should include an on-screen help available to the enumerator from the screen of his/her mobile device. The on-screen help eliminates the need of the enumerator to carry around a separate manual and makes it easier to access definitions or other items needing clarification during the interview. Unlike a paper manual, the on-screen help in an electronic questionnaire can be linked to each question or a term needing definition or clarification. Subject matter specialists should prepare the text for the on-screen help items and work closely with the programmers to implement them.

9.6 Management and monitoring systems

The availability of an efficient management and monitoring system is a key factor for successful field enumeration using an electronic data collection methodology such as CAPI. The information required for management and monitoring can be more easily collected and transmitted by management modules on handheld electronic devices. Performance indicators for the evaluation of the field enumeration can be generated from the data transmitted from the field in real time.

During the data collection phase, it is essential for enumerators and supervisors to be able to see the enumeration status of each housing unit in real time, to ensure as complete an enumeration as possible. In addition, supervisors should be able to control the quality of the work of enumerators and require them to revisit households for making any necessary corrections. Management and monitoring systems provide tools for the field staff for the management of all activities during the enumeration phase. These systems attempt to fulfil the following modules.

9.6.1 Municipality supervisor module

Municipality supervisors are basically responsible for high level of field staff supervision and for monitoring administrative and operational activities to ensure that they are implemented as scheduled. They also have a responsibility for monitoring operational and IT-related performance during the field enumeration. The system developed for municipality supervisors should allow them to perform the following duties:

- Monitor daily progress of the enumeration based on operational performance indicators and reports generated by the system;
- Monitor the changes in the number of the enumerators, controllers and electronic devices to ensure that there are no problems affecting the performance;
- Monitor the work of the field staff at EA level, using other modules developed for the enumerators and their immediate supervisors.

9.6.2 Controller module

This allows the controllers to review the data collected by their enumerators and to communicate any remarks and instructions to them. Controllers basically monitor the daily progress in each EA and evaluate the status of the enumeration of each housing unit. The system should allow supervisors to perform the following duties:

- Assign the EAs to the enumerators and ensure complete coverage with no overlapping or omission;
- Monitor the daily progress of the enumeration in terms of the number of housing units visited and each enumerator`s assignments and their status;
- Follow up non-response and refusals;
- Display the entered data at aggregate and individual levels for checking purposes;
- Control data transmission to headquarters.

9.6.3 Enumerator module

This module allows enumerators to provide daily information on the status of the enumeration at the building/dwelling and household level, showing which units are, and which are not yet covered. The status of each housing unit should be recorded after each completed interview or visit and should indicate one of the following outcomes:

- Completed,
- Refused,
- No contact,
- Interview rescheduled (including information on reason and appointment time/date),
- Vacant dwelling,
- Addresses/buildings not used for residential purposes
- Other explanation

Such a system can also be used for providing information on residential addresses/buildings not included on the EA map or address list and for communicating with supervisors and IT support teams.

9.7 Testing the data collection system

Adequate preparation and sufficient time must be allocated to designing and testing the electronic questionnaire and to the overall testing and debugging of the software, particularly for questionnaires in multiple languages. It is crucial to ensure that the question flow and skip patterns function correctly before using them in the field.

Prior to the deployment of the technologies in the field, several pilot exercises using the selected or developed devices and systems should be conducted to test their reliability in the different circumstances present in the field.

It is critical to have contingency plans for when electricity and/or internet access are not available. Plans should be developed for charging and backing up the devices as well as for transmitting collected data. Where the handheld devices are unable are not working or are lost or broken, there should be a provision of a back-up device.

It is important to allocate time and resources to test the data transfer and storage system. Planning for the data transfer system should include a thorough testing of the system during the preparations and the pilot test. The data transfer system should be ready and thoroughly tested before the training of field staff begins.

Time should be allocated for training the IT support staff (about 200 persons) in how to configure the mobile devices.

9.8 IT support to enumerators and supervisors during field work

Considering the complex structure of the field enumeration and the involvement of many field staff, the success of the data collection operation will largely depend on the effective use of CAPI. Therefore, potential IT-related risks should be identified early in the planning to recruit sufficient numbers of technical staff (right now estimated at 200 people) and train them appropriately for working in the field. The main tasks of the IT support will be to:

- Maintain the handheld devices;
- Configuring the device as required;
- Take a back-up copy of the collected data;
- Act as the first line of support in the field to resolve technical problems;
- Fix faults related to the handheld devices and their operating system;
- Fix faults and operational difficulties related to data transmission.

A more specialized support should be provided by expert staff at headquarters with the aim to resolve serious IT problems that cannot be solved by the IT Support Team. It is important therefore that the HQ team can handle field enumerator devices using remote access software.

9.9 Data editing and processing

When data is collected, there should be a system in place to code and edit the responses. Centralized post-coding will be necessary for the open-ended question, such as questions on education, occupation and industry and, eventually, for other open-end questions. With CAPI collection, the interviewer records the response on the handheld device and the coding should be performed at census headquarters during the data processing. Indeed, post-coding with a small number of well trained staff will produce more consistent results, even if it will require more time.

The use of a properly designed CAPI system should minimize the needs for data editing. Indeed, in 2010 Caeyers et al.[16] produced a study which compares the data obtained from CAPI and PAPI surveys in a systematic way. The authors conducted a randomized experiment among 1840 households, with three groups. The first group comprised households where a PAPI interview was administered, the second group included households were a CAPI interview with only automated routing was administered, while the third group consisted of households where a CAPI interview with both routing and built-in consistency checks was administered.

Their results show that 94% of the errors in PAPI were due to routing errors, avoided in the second group through the automated routing system of the CAPI software. They

[16] 2010; Bet Caeyers, Neil Chalmers, Joachim De Weerdt; A Comparison of CAPI and PAPI Through a Randomized Field Experiment

also find that the use of consistency checks further reduced the number of inconsistencies: the share of questionnaires with more than one missing or impossible value was 2% for CAPI questionnaires with consistency checks, 40% for CAPI questionnaires without consistency checks, and 83% for PAPI questionnaires!

Despite the quality improvements that a well-developed CAPI application will produce, the need for a minimum of data editing will remain. The primary objective of the editing strategy is to produce a complete and consistent database. The following three key principles should be adopted:

- Impute all missing data to provide a complete and consistent database;
- Minimize the number of changes to the data;
- Ensure that all the changes made to the observed data do not affect their quality.

A good editing and imputation procedure is automatic, objective and replicable, makes an efficient use of the matching fields, and ensures that imputed records are internally consistent. INSTAT intends to adopt for this purposes CONCORD/SCIA, the same software used to edit the 2011 Census data.

The implementation of the editing strategy should have an audit trail for documentation and evaluation purposes. This should be done comparing the raw data with the set of edited data, after applying the editing procedure. Indicators at aggregate level, which consider the changes produced in terms of numbers and/or magnitude, and indicators at variable level, that evaluate the differences produced in the distributions of each variable, should be considered in this process.

10. Dissemination and analysis of Census results

The publication and dissemination of the Census data in different formats and for different stakeholders and users is the apex of each Census operation and needs proper preparation and budgetary allocation. New technologies offer enormous possibilities to give access to Census statistics for a wide range of users, visualize the results and offer users the possibility to create their own tables, graphs and maps in an interactive mode. The Census 2020 will follow the international standards of data dissemination, use modern tools for data presentation and partner with national and international institutions and experts for thematic data analysis.

10.1 Statistical disclosure control

After data processing and editing, a clean data base with the Census files will be available. In addition, the database will be disclosure controlled before the tabulation of the data starts.

All statistical information from the Census will be published or otherwise presented in a form that precludes the direct or indirect identification of individual persons or households. INSTAT will define and apply a statistical disclosure control policy for the statistical data, including for small area data and the use of microdata by external users.

10.2 Standard tabulation plans and metadata

11.2.1 Standard programme of cross tabulations for 2020

INSTAT will define a standard programme for the cross tabulations of the 2020 Census topics, including metadata. The standard tabulations will cover *all Territorial and Administrative Units* of Albania (Country, Regions, Quarks, Municipalities, Administrative Units of Municipalities (old Municipalities/Communes before 2015) and other spatial units which might be requested by users.

10.2.2 Standard programme of historical cross tabulations and indicators of change

INSTAT will harmonise - as far as possible - the information of the 2020 Census with the data of the 2011 and 2001 Censuses for all actual and former Administrative and Territorial Units and define a standard programme of *historical cross tabulations and indicators of change* for the main Census topics.

10.2.3 EU requested cross tabulations of breakdowns

INSTAT will in addition produce the cross tabulations of breakdowns (hypercubes), including the metadata, which are requested in 2021 by Community Regulation (EU) 2017/12 for the purposes of *comparison with EEA and accession countries*.

10.3 Ad hoc requests and access to microdata

Not all user needs and requests can be satisfied with standard tabulation programmes and interactive applications. Also, not all users have the same level of technical sophistication

and ease in manipulating and interpreting data sets, or their requests can pose challenges for disclosure control.

To respond to special requests and needs two modalities will be offered:

- Special tables will be produced by the INSTAT methodology team to respond to ad hoc requests;
- Microdata sets will be made available for public use and for specific research projects under the contractual arrangements prescribed by the INSTAT microdata policy.

10.4 Thematic analysis and reports

For the thematic presentation and analysis of Census data (e.g. on population dynamics, migration, commuting), the analysis of specific population groups (e.g. women and men, minorities, children, youth, elderly), the comparison of spatial units (e.g. urban and rural areas, the 61 Municipalities and there administrative units), the calculation of indicators (e.g. indicators relevant for the Sustainable Development Goals) or the observation of historical trends and international comparisons, a thematic analysis programme will be developed together with users and external stakeholders. Where relevant, complementary data sources (sample survey data or administrative data) can be included to explore specific topics and their statistical representation from different angles.

The thematic analysis programme of the 2011 Census produced nine in depth thematic publications, many of them supported by donors: Population and population dynamics; Population projections 2011-2031; Migration in Albania; Housing and Living Conditions in Albania; Population ageing in Albania; Economic characteristics of the Albanian population; Commuting from home to work; A new urban-rural classification of the Albanian population; Communes and Municipalities Typology.

For the 2020 Census thematic analysis programme, INSTAT intends to focus on a sequence of short (4-6 page), descriptive publications with 2-3 maps and graphs on different key topics of the Census. They can be produced more rapidly and published as a well-designed newsletter or leaflet in printed format, on the web and via the social media. The substantive in-depth publications in printed format will be limited to 5-6 main topics for which the 2020 Census results will remain the essential reference for several years.

These topics include:

- Analysis of population dynamics and migratory trends (internal and international);
- New population projections based on the age and sex structure determined by the Census;
- Analysis of the housing situation of the Albanian population;
- Comparative analysis of the demographic, economic and social situation in the Municipalities and their Administrative Units;
- Identification and analysis of vulnerable social groups, combined with the monitoring of Sustainable Development Goals.

Workshops and seminars with national and international stakeholders, donor groups and interested users will be conducted to discuss potential topics for thematic analysis as well as important findings.

10.5 Dissemination media

The results of the Census (including the historical data from earlier Censuses) will be disseminated on the INSTAT website and in printed formats, including formats which are easy to read and can be made available via social media. INSTAT will also explore to offer an interactive application where users can create their own tables, graphs and maps for the different administrative and territorial units of Albania.

There will be a strong focus on a GIS-based Census data dissemination. This is of crucial importance not only for understanding demographic and socio-economic characteristics in Municipalities and small areas, but also for applications that are strategic for public sectors such as disaster management, social services delivery, transportation and in general for the Local Government Units.

The planned Census geographic outputs include:

- Thematic maps for data dissemination in Census analysis reports and on the web;
- Census data presented by square kilometer grid;
- Story maps;
- An interactive web-based Census atlas providing small-area data;
- Access to spatial data (e.g. shapefiles, data on buildings, data on localities/communities), based on a revised dissemination policy of INSTAT.

INSTAT will organise sensitisation, information and training workshops for different user groups and particularly the staff and stakeholders in Municipalities and regions.

10.6 Timetable of dissemination

The following timetable is envisaged for the main dissemination activities of 2020 Census:

- 31 December 2020: Launch of preliminary Census results
- 31 June 2021: Launch of final Census results
- 1 October 2021: All Census results are published and made accessible
- 31 December 2021: Census data and metadata are sent to Eurostat
- 1 June 2021-31 December 2022: Thematic newsletters and reports about Census results, GIS based data dissemination
- 31 December 2022: Microdata available for external users.

11. Logistics, procurement and recruitment

The Census is a huge operation which involves procurement, recruitment of staff and poses many logistical challenges. INSTAT will carefully plan the procurement and recruitment processes and where necessary will put special procedures in place, e.g. for the recruitment of enumeration staff.

11.1 Office space

The premises of INSTAT which were used as office space for the 2011 Census will again be available to house the staff of the 2020 Census. The Regional Offices will be housed in the INSTAT Regional Office premises. The Municipal Offices will be housed in suitable public buildings (city halls, public schools, and others) identified by the INSTAT Census Unit and Regional Offices. Requests to make buildings available for the Census will be made to the competent authorities by INSTAT.

11.2 Material and equipment

11.2.1 Procurement

INSTAT will procure material, supplies and equipment (computers, servers, tablets, batteries furniture, generators, etc.) following national procurement rules and donor requirements. INSTAT will store and distribute the material to the units involved in the Census.

The call for bids for the tablets, the selection and contracting, will be done as soon as possible, to leave enough time to develop and install the applications for the mapping, the tests, the pilot census, and to be distributed within the established timeframe in the different areas of the country.

11.2.2 Management of material and equipment

The INSTAT Logistics Unit will be the main manager of the material and of all the equipment procured for the Census. However, after having received the material and equipment needed to execute their tasks, the Municipal supervisors, assisted by the IT support officers, will themselves manage the material and equipment provided to them, in compliance with the conditions defined by the Logistics Unit for the storage, distribution, verification, reception, etc.

11.2.3 Management of the data collection devices

The Logistics Unit will receive the equipped tablets and control them (condition of the tablets and accessories, received quantity, etc.) and, together with the IT unit, will prepare the batches to be sent to the different regional and municipal offices. The dispatching will be based on a plan with a clear distribution schedule, the transportation means, the itinerary to follow, the safety conditions (protection against rain, dust, theft, etc.), the reception modalities, as well as the registration, verification and storage conditions.

11.2.4 Maintenance and repair of computer equipment.

It is essential that the computer equipment is properly cared for, kept in a secure space, and maintained in good working conditions. If needed, it should be repaired or exchanged. Contingencies in the event of problems with the computer equipment must be planned for. To this end, a list of previously identified replacement parts will be developed and the material procured. Until they are ordered for replacement in the field, the parts will be entrusted to the head of the Logistics Unit. Procedures to replace ill-functioning or defective material or equipment will be defined. For the decentralized units, timely missions will be conducted to verify the material and ensure the proper functioning of the equipment.

11.2.5 Vehicle maintenance and repair

INSTAT will rent a certain number of vehicles for the Census. All vehicles serving the project will be the object of periodic maintenance. To guarantee the continuity of the field work, at least two vehicles shall be kept in good working condition as backup at the INSTAT headquarters to replace any other vehicle that becomes defective or needs repair.

11.3 Recruitment of staff

11.3.1 Categories of Census staff

Two categories of staff will constitute the 2020 Census's personnel: office staff and field staff. They will again be subdivided into two types:

- INSTAT's *permanent staff*, meaning the civil servants who will be assigned full time to the Census. These civil servants will constitute the main technical core and management unit;
- The *contract personnel*, who will be recruited, during a limited time, for the census operation. This group include office staff (international and national consultants, processing and analysis staff, support staff, etc.) and field staff such as enumerators, controllers, IT support officers and supervisors.

11.3.2 Recruitment Committee

To learn from the experiences of the 2011 Census and improve the quality of the Census staff, a Central Recruitment Committee will be created at INSTAT. It will include the Director General of INSTAT, the Census Manager and Deputy Census Manager, and staff of the Census Technical and Operations Groups.

The Central Recruitment Committee will decide first on the office staff to be recruited for the management of the Census Unit, the Census Technical Group and the Census Operations Group, second on the heads of Census Regional Offices and Municipal Offices.

The staff in charge of the enumeration in the field will also be recruited centrally, but the assignment to the precise enumeration areas and control zones will be decided by the Municipal supervisors.

11.3.3 Recruitment of enumeration staff

INSTAT intends to recruit the 6,000 enumerators and 1,200 controllers from the areas in which they will work, for several reasons: (i) their knowledge of the area, (ii) their familiarity with the population, and (iii) to reduce transportation and accommodation cost.

Criteria for recruitment are:

- Minimum age 18 years,
- Preferably university degree or currently studying at university,
- Ability to use electronic devices,
- Preferably experience in data collection,
- Management skills and experience (for controllers)

INSTAT is conscious that these criteria may be too restrictive in some places, particularly regarding the level of education, which might be lowered to completed secondary education.

Recruitment notices will be published in the media and candidates will be asked to register and fill in a recruitment form on the INSTAT web site. If the form is duly filled in, candidates can add their documents (school degrees, work certificate, Fiscal ID and National ID Card copies, recommendation letters, etc.).

Based on the submissions and the selection criteria, a list of candidates will be prepared for each assignment zone and validated by the Central Recruitment Committee. The candidates will be informed about their selection and invited to the training sessions. If they pass the training sessions successfully, they will be contracted for the enumeration phase or put on the reserve list.

11.3.4 Legal framework governing the personnel

The law on the general status of civil servants governs the status of permanent staff, and the labour code the status of contract staff. Internal regulations of the Census will complement the above regulations, and essentially cover disciplinary matters having to do with the control of the movement of staff during the Census.

As for the field staff, given the relatively short duration of their intervention and the specificity of their tasks, their work contracts will include specific clauses describing their obligations, the rules of conduct, and their responsibilities towards the supervisor as well as the sanctions they may incur should they not meet their obligations, do not follow their instructions or do not take care of their equipment.

11.3.5 Staff remuneration

The scope of the Census adds to the workload of the technical and administrative staff of INSTAT, and entails the mastering of the special procedures and mechanisms developed for the Census. Consequently, a salary scale will be established, and fees will be budgeted for the staff assigned to the Census, to guarantee their motivation and commitment (both permanent and contract staff) during the full course of the operation.

Both contract and permanent office staff will be paid at the end of each month, upon transmission of the activity reports to the financial accounting unit, following the regular procedures (payment notice, delivery of the checks, signature of the payroll sheet, etc.).
For the field staff, which will need to be permanently present in their assignment area, a special payment procedure will be established.

The project may explore alternative methods of payment to make use of technological advances in banking and mobile payments since the last census. A final decision will be based on cost, security, verification procedures, and ease of transfer of funds.

11.3.6 Staff identification

The nature of the census operation (interacting with authorities and other stakeholders, mapping areas, entering buildings, dwellings, interviewing household members, entering and transmitting data etc.) requires that all Census staff can be clearly identified. Hence, identification badges with the 2020 Census logo, duly laminated, sealed and signed by the responsible managers, will be delivered to all staff involved in the Census activities. In addition, a T-shirt as well as a cap with the logos of INSTAT and the 2020 Census will be provided to the field agents, to give them visibility and better locate them in the field.

The identification cards of enumerators and controllers will be prepared at the very moment of their contractual engagement. The names and the photograph of their electronic registration file will be used to print the identification cards. They will then be sent to the Regional Census Offices to be laminated, controlled and distributed following the final selection of the field agents.

12. Budget and timeline of activities

Based on the objectives of the 2020 Census, the areas of work and the timelines mentioned in the preceding chapters, a detailed list of activities for the Census 2020 was established with a provisional timetable by months and years, starting from April 2018 and ending in December 2022.

The activities were costed by category of expenditures with estimates for the number of units and unit costs per year. The list of activities, the detailed timetable and the budget estimates are included in the Excel file referred to in Annex 3.

The tables below give an overview of the budget by group of activities, main categories of expenditure by year in absolute numbers (Euro) and in percent.

Table 7: Budget of 2020 Census by group of activities and year, in Euro

Activities	***TOTAL (Euro)***	***2018***	***2019***	***2020***	***2021***	***2022***
Census management and organisation	489,200	10,000	146,200	232,000	101,000	0
Census communication	634,600	50,000	200,600	357,000	27,000	0
Census methodology, questionnaires and quality assurance	398,680	89,500	180,930	80,750	47,500	0
Mapping and Geospatial Information	1,889,160	528,700	628,980	265,900	310,480	155,100
Census field work and enumeration	8,293,338	0	30,000	8,229,938	33,400	0
Tabulation, analysis and dissemination of Census results	563,000	0	32,000	22,000	182,000	327,000
Information technology and data processing	3,597,500	20,000	268,060	3,174,440	135,000	0
Contingency	317,310	0	0	317,310	0	0
Total (with contingency)	16,182,787	698,200	1,486,770	12,679,337	836,380	482,100

The total budget for the 2020 Census is estimated at 16.2 million Euro. This represents approximatively 5.6 Euro per capita of the Albanian population and is very close to the median cost of 5.8 USD which was estimated for traditional Population and Housing Censuses in the whole European region during the 2010 Census Round[17].

Table 7 also shows that although the biggest expenditure will be in 2020, important investments need to be done already in 2018 and in 2019, particularly for mapping, census methodology and IT.

[17] United Nations Economic Commission for Europe, Measuring population and housing, Practices of UNECE countries in the 2010 round of censuses, Tables 7.1. and 7.2, p. 64 and 65, United Nations, New York and Geneva 2014. In the proximity of Albania, the following per capita expenditures in USD were reported for the 2010 Round: Albania 6.1, Bosnia-Herzegovina 7.6, Croatia 4.8, Greece 8.5, Hungary 7.6, Italy 13.9, Montenegro 5.6, Serbia 4.7.

Table 8 makes clear that over 50% of the budget will be allocated to the Census field work in 2020. This percentage is also corroborated by the international comparisons for traditional Censuses. Approximately 23% will go for activities related to IT and data processing, an area which is of growing importance in a CAPI Census, 12% will go for mapping and other geospatial activities, which are of special relevance for the Albanian context and will also support the creation of a statistical building and dwelling register.

Table 8: Budget of 2020 Census by group of activities and year, in percent

Activities	***TOTAL (Euro)***	***2018***	***2019***	***2020***	***2021***	***2022***
Census management and organization	3%	0%	1%	1%	1%	0%
Census communication	4%	0%	1%	2%	0%	0%
Census methodology, questionnaires and quality assurance	2%	1%	1%	0%	0%	0%
Mapping and Geospatial Information	12%	3%	4%	2%	2%	1%
Census field work and enumeration	51%	0%	0%	51%	0%	0%
Tabulation, analysis and dissemination of Census results	3%	0%	0%	0%	1%	2%
Information technology and data processing	22%	0%	2%	20%	1%	0%
Contingency	2%	0%	0%	2%	0%	0%
Total (with contingency)	100%	4%	9%	78%	5%	3%

Table 9: Budget of 2020 Census by category of expenditure and year, in Euro and in percent

Categories of expenditure	***TOTAL (Euro)***	***2018***	***2019***	***2020***	***2021***	***2022***
Permanent and temporary staff costs	1,004,300	800	156,800	635,700	179,400	31,600
Field staff costs	7,486,418	1,500	535,430	6,949,488	0	0
External expertise	1,475,000	210,000	270,000	411,000	346,000	238,000
IT Equipment (HW/SW/Services)	3,567,960	368,900	181,540	2,830,640	114,880	72,000
Other costs	2,331,800	117,000	343,000	1,535,200	196,100	140,500
Total (with contingency)	15,865,478	698,200	1,486,770	12,362,028	836,380	482,100
Contingency	317,310	0	0	317,310	0	0
Total (with contingency)	16,182,787	698,200	1,486,770	12,679,337	836,380	482,100

* Materials, transportation, communication, dissemination etc.

Categories of expenditure	*TOTAL (Euro)*	*2018*	*2019*	*2020*	*2021*	*2022*
Permanent and temporary staff costs	6%	0%	11%	5%	21%	7%
Field staff costs	46%	0%	36%	55%	0%	0%
External expertise	9%	30%	18%	3%	41%	49%
IT Equipment (HW/SW/Services)	22%	53%	12%	22%	14%	15%
Other costs	14%	17%	23%	12%	23%	29%
Contingecy	2%	0%	0%	3%	0%	0%
Total (with contingency)	100%	100%	100%	100%	100%	100%
Total (with contingency)	16,182,787	698,200	1,486,770	12,679,337	836,380	482,100

* Materials, transportation, communication, dissemination etc.

Table 9 above presents the breakdown of the budget by categories of expenditure. Over 50% of expenditures will go for staff costs, particularly field staff. The second biggest category of expenditures relates to IT hardware, software and services with 22.6 percent.

To manage the budget, the related procurements and activities, it will be very important for INSTAT to recruit additional staff at headquarters reflecting the priorities and the timetable of the Census strategy and plan. It appears particularly urgent to strengthen the management of the Census project and the IT department, which is affected by a high number of vacancies.

13. Sustainability of the 2020 Census

It is a major objective of the methodology and conduct of the Census 2020 to achieve sustainable investments in different areas and with complementary approaches.

13.1 IT infrastructure and capacities

At the end of the 2020 Census, much of the procured equipment, applications and know-how will be reused and/or adapted to future activities.

A considerable number of the tablets (approximately 4,000) can be reused for the Agriculture Census 2022 and for INSTAT sample surveys. The remaining 3,500 tablets could be donated to Municipalities, the Albanian Public Education system or other institutions (depending also on donor priorities).

The Census dedicated server, together with the backup server, will be integrated with the network infrastructure of INSTAT, contributing also to the build-up and management of the building and dwelling register, the INSTAT GIS and the Agricultural Census of 2022.

The general architecture of the CAPI application will be adapted to support other regular or ad-hoc surveys of INSTAT, resulting in a long-term investment and supporting the strategic commitment to use state of the art IT technology for data collection tasks.

Similarly, the computer application for map updating will be conceived to be used not only for the 2020 Census, but also in future statistical activities of INSTAT, for instance to support sample-based surveys in the field, and for the update of the register of buildings and dwellings.

Through the development of the CAPI and mapping applications and the related databases, INSTAT staff will be better trained and equipped to use efficiently the new IT technology and support also others users across the Albania.

13.2 Mapping and geospatial data

The investments in Census geography will bring major improvements to the Albanian national context and allow to catch up with recent European evolutions in geospatial data. The updating of the EAs and the determination of the exact location of all buildings and dwellings, using unique identifiers at point level and geographic coordinates, is the appropriate approach to harmonise with other spatial data sources, link with register data (e.g. the Civil Status Registry) and thus create conditions for future, register based census statistics on population and housing. This investment will serve the statistical system more generally by creating flexibility in collecting and publishing data for different spatial breakdowns (all Territorial and Administrative units, small area and grid data) and improving the sampling frame for surveys.

Moreover, the mapping and the subsequent enumeration of buildings and dwellings will lay the ground for a register of buildings and dwellings for statistical use, consistent as much as possible with other available national spatial datasets and statistical registers, as already experienced in other European countries.

13.3 Coherence of the statistical system

By planning and conducting the 2020 Census not as a standalone statistical activity, but in considering the synergies and the harmonisation with other data sources, such as sample surveys, registers and other administrative data sources, INSTAT strengthens the coherence and efficiency of the Albanian statistical system and its capacity to produce regular data not only for the national and regional but also for the local level. By investing in registers for regular statistics on population and housing, INSTAT implements changes in the data collection methodology which are in line with national needs and opportunities, as well as with the EUROSTAT strategy for post-2021 Censuses.

Annexes

Annex 1: Table of quality assurance dimensions for the 2020 Census
Annex 2: Technical specifications of ICT hardware for the 2020 Census

Annex 1: Table of quality assurance dimensions for the 2020 Census

Table A1: Quality assurance dimensions of the 2020 Census

Dimension	Description	Quality assurance measures
I. Relevance	The degree to which data serve to address the purposes for which they are produced and sought by data users.	▪ Conduct of the Census by INSTAT as the delegated authority by law ▪ Compliance with the information requirements of the Census Law ▪ Series of consultations with data users in Albania on census questionnaire contents ▪ Series of consultations with census experts on census questionnaire design, including for CAPI ▪ Compliance with international recommendations with regard to Census core and non-core topics ▪ Series of consultations with users on the analysis and dissemination program
II. Accuracy	The degree to which the data correctly estimate or describe the quantities or characteristics that the census was designed to measure.	▪ A series of consultations with Census experts on Census questionnaire design to assure correct conceptualization of the data to be collected ▪ Development of a plan to correctly map all statistical units and identify their spatial location ▪ Development and use of a comprehensive enumerator manual as to improve understanding of information to be collected and to adequately respond to data-collection challenges ▪ Development and use of detailed and advanced training materials for enumerator-, controller- and supervisor trainings as to improve understanding of information to be collected and to adequately respond to data-collection challenges ▪ Thorough testing of questionnaires, forms, and procedures in a field test and pilot Census ▪ Controls, validation and editing functions embedded in the tablet application. ▪ Observation and checking by Census field staff ▪ Provision of field support by INSTAT staff and technical assistance experts ▪ Conduct of a post-enumeration survey to check coverage and some statistical distributions ▪ Development and application of editing and imputation rules in the Census database to identify and solve inconsistencies and out-of-range values ▪ Evaluation program to document the changes carried out during editing and imputation procedures in terms of their number and/or magnitude
III. Comparability	The degree to which statistics are comparable over space and time.	▪ Compliance with EU and UN recommendations on definitions, classifications and procedures applied in the Census ▪ Compliance with international recommendations on the inclusion of 'core topics' in the questionnaire ▪ Maintaining overall comparability with the 2011 Census ▪ Creating and maintaining comparability with available register data

		and administrative data sources ▪ Maintaining comparability in the conceptualization of specific statistics with targeted surveys, register data and the 2022 Agricultural Census ▪ Compliance with international regulations on comparability of Census results between countries
IV. Coherence	The degree to which census information can be successfully brought together with statistical information from other data sources (including registers) within a broad conceptual framework and over time.	▪ Application of coherent definitions and classifications and use of internationally recommended methodologies ▪ Capacity to link and update Census based data with register based information and with sample survey data ▪ Inclusion of questions in the 2020 PHC for planning and implementing the 2022 Agricultural Census ▪ Capacity of the Census for providing up to date sampling frames for household surveys ▪ Use of Census mapping procedures for the build-up of a statistical building and dwelling register
V. Timeliness	The delay between the period to which information pertains and the date on which the information becomes available.	▪ Data upload on the fly during CAPI enumeration ▪ Training of a pool of reserve field staff to avoid delays in enumeration due to drop-out ▪ Testing the Census procedures with all interconnected components in a comprehensive pilot operation ▪ Detailed logistic planning for procurement of equipment and field staff recruitment and training ▪ Development of an effective and efficient CAPI application, including editing and validation elements ▪ Implementation of effective and safe synchronization mechanisms from the field to the central data base ▪ Timely definition of Census database and statistical programmes
VI. Accessibility	The availability of information and the suitability of the form in which the information is available.	▪ Implementing a communication strategy to inform stakeholders and the public about the procedures of the Census and the Census results ▪ Meetings with donors and users to review and finalize the Census dissemination and thematic analysis program ▪ Implementing dedicated websites providing timeless dissemination of Census data and interactive applications ,including for mobile users ▪ Availability of GIS grid data and microdata for specialized users