# Chapter VI. Geographic features

## Introduction

409. The establishment of a detailed classification of geographical characteristics is one of the distinctive features of population and housing censuses. Once the base population has been determined, its geographic distribution can be examined. This question is the subject of this chapter.

## Location of place of residence (essential characteristic)

410. The location of the place of residence is the precise location of the “habitual place of residence”, as defined in Chapter V (paras. 392 and 393). If a country is unable to use the “usual resident population” as the basis for enumeration, it should use an estimate as close as possible to that population. The location should be coded to the smallest administrative division and georeferenced using geographic coordinates.

411. The place of usual residence must be georeferenced using a pair of precise geographic coordinates19 of the point in question or, in the absence of such coordinates, in relation to a precise and complete postal address for coding purposes geographical. The objective is to enable the development of tables and spatial aggregates for small geographical or administrative subdivisions and, if possible, population grids, which is necessary to meet the needs of users in terms of information and data. spatial analyses. The link between census data and the location of the place of usual residence must be a permanent and integrated component of the information collected at the individual level.

## *Locality (derived essential characteristic)*

412. In censuses, “locality” means an agglomeration of population or a distinct human settlement, that is to say an area defined by a population group whose place of residence is located in neighboring buildings. from others or contiguous.

413. These constructions:

a) Or they form a compact built-up area, with clearly identifiable roads;

b) Or, although not belonging to a built-up area of this type, constitute a group of constructions designated exclusively by a locally approved place name;

[19] In the European Union and on the European continent, geographical coordinates must refer to the European Terrestrial Reference System (ETRS) 1989 (ETRS89, EPSG 4258). In regions outside the European continent, they can also refer to the global coordinate reference system WGS-84 (EPSG, code 4326).

c) Or, although not meeting either of the two aforementioned conditions, constitute a group of constructions, none of which is more than 200 meters from the nearest construction.

414. Within the meaning of this definition, certain land uses should not be considered as breaking the continuity of a built-up area (and, therefore, should not be taken into consideration when applying the aforementioned 200 meter criterion).
These include industrial and commercial buildings and installations, public parks, playgrounds and gardens, football fields and other sports fields, waterways crossed by bridges, railway lines, canals , parking lots and other transport infrastructure, cemeteries, etc.

415. This definition aims to give countries general guidelines for identifying localities and determining their boundaries; it may be necessary to adapt it to national conditions and habits. The population living outside the agglomerations defined above can be described as “living in dispersed constructions”. Whatever definition of a locality is adopted for the census, it must be detailed in census reports and metadata.

416. The locality, as defined above, should not be confused with the smallest administrative division in the country. They may coincide in some cases but even the smallest administrative division can include two or more localities. Some large cities, on the other hand, may include two or more administrative divisions, which must be considered as subdivisions of the same locality and not as distinct localities.

417. A large locality in a country (a large city or town) is often part of an urban agglomeration, composed of the city or town itself and its suburbs or the densely populated territory located outside its limits but in the adjacent area. The urban agglomeration is therefore not identical to the locality; it is an additional geographical unit which can include several localities. In certain cases, it happens that a large urban area includes several cities or towns and their suburbs. The elements that make up these large urban areas must be specified in the census results.

418. Countries are recommended to compile their census statistics for localities according to their national possibilities and needs. To do this, they must comply as far as possible with the notion of “population agglomeration” defined above. Countries which compile tables only for administrative divisions should, at a minimum, endeavor to collect data on the total population of each part of an administrative division which contains a population agglomeration, or part of agglomeration, with at least 2,000 inhabitants, in order to have the necessary data to establish a clearer distinction between urban areas and populations, on the one hand, and rural areas and populations, on the other hand (see para. 422 at 427 below).

419. It is recommended to classify the population according to the size of the locality, in accordance with the following categories:

(1.0) 1 million inhabitants or more;

(2.0) 500,000 to 999,999 inhabitants;

(3.0) 200,000 to 499,999 inhabitants;

(4.0) 100,000 to 199,999 inhabitants;

(5.0) 50,000 to 99,999 inhabitants;

(6.0) 20,000 to 49,999 inhabitants;

(7.0) 10,000 to 19,999 inhabitants;

(8.0) 5,000 to 9,999 inhabitants;

(9.0) 2,000 to 4,999 inhabitants;

(10.0) 1,000 to 1,999 inhabitants;

(11.0) 500 to 999 inhabitants;

(12.0) 200 to 499 inhabitants;

(13.0) Population living in localities with less than 200 inhabitants or in scattered or isolated buildings:

(13.1) Population living in localities of 50 to 199 inhabitants;

(13.2) Population living in localities with less than 50 inhabitants or in scattered or isolated buildings.

420. This classification could also be applied to other relevant base populations, such as labor force, households, families and dwellings (possibly using other ranges).

## Location of place of residence (essential characteristic)

421. As indicated in paragraph 872 of the chapter devoted to dwellings, place of residence covers the types of dwellings which constitute the usual residence of one or more people (whether or not present at the time of the census). Therefore, it is possible to classify them with the same geographic precision as “location of place of residence” (para. 411 above). In addition, the definitions and classifications set out in paragraphs 412 to 420 and 422 to 438 above also apply, but to an extent that varies depending on the statistical needs of each country for information relating to localities and smallest administrative division.

## *Urban and rural areas (derived essential characteristic)*

422. To enable international comparison of data, it is suggested that countries define urban areas as localities with 2,000 or more inhabitants, and rural areas as localities with less than 2,000 or regions with less than 2,000 inhabitants. low population density. Some countries may also consider defining urban areas using other criteria, for example:

a) Administrative division;

b) Built-up areas;

c) Areas served by businesses, school infrastructure, leisure facilities, jobs, etc.

The solution chosen will be clearly indicated in the report on the census and metadata.

423. For national uses and for international comparability, the most useful classification unit for distinguishing between urban and rural areas is locality, as defined in paragraphs 412 to 418 above. However, it is left to the countries to choose the locality or the smallest administrative division as the classification unit.

424. Countries using the smallest administrative division as a unit should strive to obtain results as close as possible to those obtained by countries opting for locality. The choice of method to follow for this purpose depends mainly on the nature of the smaller administrative divisions of the countries concerned. In some countries, the smallest administrative divisions (and the average number of inhabitants) are relatively small and there is generally no more than one population agglomeration (or part of a larger agglomeration). If some of these countries cannot use locality as a unit, they are encouraged to apply the concept of multi-municipal agglomeration (that is to say to consider as distinct units the groups of two or more contiguous administrative divisions forming part of the same population agglomeration). It is also suggested that small administrative divisions which lie on the periphery of this agglomeration be included in the agglomeration, if the majority of the population residing there lives in areas belonging to the contiguous built-up area of the agglomeration, and that small administrative divisions containing one or more isolated localities be classified according to the number of inhabitants of the largest population agglomeration within the unit.

425. The situation differs, however, in the case of countries where the smallest administrative divisions (and average number of inhabitants) are relatively large, and often contain two or more population agglomerations of varying sizes. If some of these countries cannot use locality as a unit, they should endeavor to use smaller units for this purpose than small administrative divisions, for example parishes, census districts, parcels resulting from a grid, etc. They should endeavor to use these smaller units as basic elements, and to group them to make them correspond as closely as possible to locality boundaries in the manner indicated above in the case of multi-municipal agglomerations. If some countries cannot adopt this method, they should seek to develop others for the classification of entire small administrative divisions, so as to obtain results which are as comparable as possible with those obtained by taking the locality as the unit.

426. It is recommended to group localities or similar units into seven categories, namely:

(1.0) 1 million inhabitants or more;

(2.0) 250,000 to 999,999 inhabitants;

(3.0) 100,000 to 249,999 inhabitants;

(4.0) 50,000 to 99,999 inhabitants;

(5.0) 10,000 to 49,999 inhabitants;

(6.0) 2,000 to 9,999 inhabitants;

(7.0) Less than 2,000 inhabitants.

427. Countries are also encouraged to provide locality or similar area types based on additional criteria, which can be used to distinguish different area types within the categories of the suggested classification. For example, some countries may want to subdivide category (1.0) (and, in some cases, category (2.0) as well) to distinguish between agricultural localities and other types of small localities. Other countries may wish to subdivide one or more of the intermediate categories to distinguish between trade centers, industrial centers, service centers, etc. Still others may wish to subdivide large urban areas into categories (4.0) through (7.0) to distinguish between various types of central and suburban areas. By enlarging the classification in this way or in another way, it will be made a more useful instrument for analysis.

## Characteristics of a mesh

### *Population grid (derived subsidiary characteristic)*

428. In censuses, the term “population mesh” means a geocoding framework for the population in the form of a network and made up of meshes of the same size located at fixed and clearly defined locations.

429. Each grid cell contains the total number of people whose residence location geocoding, as described in paragraphs 410 and 411 above, corresponds to a point within that grid cell. In countries where it is not possible to obtain this total, the population grid can be broken down from the smallest administrative division using auxiliary data such as land use maps, detection of built-up areas or cadastral information.

430. In addition to assigning usual residents, a mesh network can also be used to assign people to their place of work or the location of their school, college or university. This same network can also be used for households, families and homes. For cross-border interoperability purposes, the grid cells must all be 1 square kilometer. Depending on national requirements, countries may wish to create additional meshes of another size.

431. Although this characteristic is considered subsidiary for the purposes of these recommendations, countries are urged to consider the adoption of data collected at the grid cell scale. For countries on the European continent embarking on this path, the mesh system must comply with the legal framework for Geographic Information Infrastructure in the European Community (INSPIRE)20.
In regions outside the European continent, countries can define the meshes

[20] Commission Regulation (EU) No 1253/2013 of 21 October 2013 amending Regulation (EU) No 1089/2010 laying down detailed rules for the application of Directive 2007/2/EC as regards interoperability of series and services geographic data.

as they wish from a geodetic coordinate system conforming to the International Terrestrial Reference System (ITRS) and an equivalent azimuthal Lambert projection, following the same principles as those set for the INSPIRE mesh.
In this case, they will need to create an identifier for the coordinate system and include it in the population grid metadata.

432. Census statistics have always focused on administrative areas or particular segments of the census. Population grids are very useful complementary systems for producing results, which offer several advantages.
They are all the same size and therefore perfect for comparisons of regions or distances (accessibility of services, for example). They are stable over time and therefore immutable in the face of changes in administrative divisions. In addition, they are easily integrated with other scientific data (climate data, for example).
Adaptable, they can be assembled to form areas to serve a specific purpose and area of study. In a system, the size of the meshes can be progressive, in order to correspond to areas of study ranging from local to global level.

433. In terms of census, it is important to note that grid cells are very useful for spatial analysis in an international and cross-border context because they remain insensitive to changes in the size of municipalities depending on the country. However, statistics produced from these grids for sparsely populated regions may pose confidentiality problems or when the data are drawn from a sample source. It is therefore necessary to carefully choose the characteristics for which they will be produced and therefore make a compromise between responding to a demand for detailed and adaptable statistics and data protection.

## *Degree of urbanization (derived subsidiary characteristic)*

434. The degree of urbanization21 classifies the areas in which people's usual place of residence is located into areas with low population density, areas with intermediate density and areas with high population density. This classification is based on a combination of criteria of geographic proximity and minimum population threshold, which are applied to population grids of 1 square kilometer (see para. 428 above). These meshes all have the same shape and size in order to avoid distortions due to variations in unit size.

435. The degree of urbanization classifies local administrative units/municipalities as follows:

a) Highly populated areas where more than 50% of the population lives in densely populated towns22 (urban centers);

21 The degree of urbanization (DEGURBA) is a classification developed by the Organization for Economic Cooperation and Development (OECD) and the European Commission; see Directorate-General for Regional and Urban Policy, Directorate-General for Agriculture and Rural Development, Eurostat and the Joint Research Centre.

22 In each of these densely populated agglomerations, at least 75% of the population must live in densely populated local administrative units/municipalities. Thus, all these agglomerations belong to at least one densely populated local administrative unit/municipality.

b) Intermediate density areas where more than 50% of the population lives in urban centers, but which are not densely populated;

c) Areas with low population density where more than 50% of the population lives in rural areas.

436. The degree of urbanization can also be used to create another classification of areas, into “urban” and “rural” areas. Intermediate density and high population density areas then fall into the category of “urban areas” while areas with low population density fall into the category of “rural areas”.

437. In the classification of local administrative units/municipalities above, the definitions and thresholds for population and density23 used are as follows:

a) High-density agglomerations (urban centers) are defined as contiguous grid cells of 1 km2 , having a density of at least 1,500 inhabitants per square kilometer and a minimum population of 50,000 inhabitants. In the case of high-density urban areas, the contiguous meshes do not include the diagonal meshes (i.e. those whose corners only touch) and the gaps in the meshes are filled (in this case, the meshes surrounded by meshes high density);

b) Urban agglomerations are defined as contiguous grid cells of 1 km2 , having a density of at least 300 inhabitants per square kilometer and a minimum population of 5,000 inhabitants. The same rule of “contiguous meshes”, described in point a), also applies in the case of high-density urban agglomerations, but the gaps in the meshes are not filled (in this case, the meshes surrounded by meshes urban);

c) Rural areas are areas located outside urban areas.

438. Since the area of local administrative units/municipalities varies greatly, this method will better match high-density settlements with densely populated local administrative units/ municipalities in countries with small local administrative units/municipalities than in those where the latter are large. To take this difference into account, the classification can be

adapted as follows:

a) A densely populated local administrative unit/municipality may be classified as having 75% of its densely populated arms remaining in densely populated areas of the local administrative units/municipalities;

b) A local administrative unit/municipality with a low or intermediate population density may be considered densely populated if it belongs to a group of local administrative units/municipalities with a political vocation and the majority of the population of this group lives in a high density urban area.

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populated, even when the population of the agglomeration accounts for less than 50% of the population of the unit/municipality.

[23] In Europe, we use the same threshold in all countries. In other regions of the world, however, both density thresholds may need to be adjusted up or down.

## Characteristics of pendulum migrations

439. The following features relate to issues associated with commuting between home and work, school, college or university. Calculating commuter flows accurately is important for a variety of reasons, including transportation planning, real estate development, and economic development.

## Workplace location (essential characteristic)

440. The location of the workplace is the precise place where a person employed during a short reference period carries out their professional activity.
Where possible, the location should be coded based on the precise address and/or geographic coordinates24 or, failing that, the smallest administrative division25.

441. The collection of information on the place of work makes it possible above all to link it to the place of usual residence in order to better understand commuting flows, and this information is added to that gathered according to the mode of transport to the place of work, the distance traveled and the duration of the journey. The precise address of the workplace must be collected and the data coded according to the smallest possible division in order to accurately calculate commuting flows between the place of residence and the place of work.
Information relating to people who do not have a fixed place of work but who present themselves at a fixed address at the start of their work period (bus drivers, airline cabin crew, street stall sellers public and in markets which do not dismantle their stall at the end of the working day, for example) must indicate this address. People who regularly travel to a neighboring country to work can also be classified in this category. However, it may not be possible to assign a place of work to some people (such as seafarers, fishermen and offshore workers), who are then coded as having no fixed place of work (see classification in paragraph 443 below).

442. In order to track commuting flows, it is recommended to create a classification that compares the location of the workplace with that of the place of residence. This involves measuring commuting between the place of departure and the place of destination of the daily journey. It should nevertheless be noted that, for certain people in employment, the place of departure is not necessarily their usual place of residence if they live, during the week, at an address different from that from which they generally leave for work.

443. The recommended classification is as follows:

(1.0) Same small administrative division as the place of residence;

(2.0) Other small administrative division located in the same large division administrative as the place of residence;

[24] In the European Union and on the European continent, geographic coordinates must refer to the European Terrestrial Reference System (ETRS) 1989 (ETRS89, EPSG 4258). In regions outside the European continent, they can also refer to the global coordinate reference system WGS-84 (EPSG, code 4326).

[25] It is recognized that if the location of the workplace is abroad, it is in principle not necessary to code it other than according to the country concerned.

(3.0) Other major administrative division;

(4.0) Foreigner;

(5.0) Other workplace:

(5.1) Offshore installation;

(5.2) Without a fixed place of work.

444. “Small administrative division” means the smallest geographic unit for which to measure commuting flows. Depending on the national situation and user needs, these may be small areas (such as districts or municipalities) or larger areas (such as municipalities or districts). “Large administrative division” means a higher geographic unit such as municipalities (when the small division corresponds to small areas) or counties/departments (when the small division corresponds to municipalities or districts).

445. Another more detailed two-digit classification may be considered by some countries which wish, for example, to separately identify people working from home or making long commutes:

(1.0) Same small administrative division as the place of residence:

(1.1) Working from home;

(1.2) Work elsewhere than at home but in the same small administrative division;

(2.0) Small neighboring administrative division;

(3.0) Other small administrative division:

(3.1) Same large administrative division;

(3.2) Other major administrative division;

(4.0) Foreigner;

(5.0) Other workplace:

(5.1) Offshore installation;

(5.2) Without a fixed place of work.

## Location of school, college or university (subsidiary characteristic)

446. By incorporating this feature into their census, countries can broaden the scope of their data on commuting flows and take into account pupils and students in addition to people in employment by place of work. In order for data to be comparable with workplace data, the location of the school, college or university must be coded with the same level of geographic precision.

## Mode of transport to the place of work (or study) (subsidiary characteristic)

447. The mode of transport to the workplace is linked to the daily journey. For people who make several journeys or who use several modes of transport, the mode of transport used for the majority of the daily journey must be indicated. People who do not travel to work are classified as having no journey to travel.

448. The following classification is suggested:

- (1.0) Railways:
  - (1.1) National/international rail network;
  - (1.2) Metro;
  - (1.3) Tram/light rail;
- (2.0) Bus, minibus or coach;
- (3.0) Car or van:
  - (3.1) Driver;
  - (3.2) Passenger;
- (4.0) Others:
  - (4.1) Motorcycle;
  - (4.2) Bicycle;
  - (4.3) Walking;
  - (4.4) Boat or ferry;
  - (4.5) Others;
- (5.0) No movement:
  - (5.1) Working from home;
  - (5.2) Another reason.

449. Other countries may wish to subdivide a category (3.1) to distinguish people alone in their car from those traveling with passengers, although this would involve collecting other information during the census.

450. In order to provide more comprehensive information on commuting, some countries may wish to extend the question of mode of transport to the daily journeys made by children and students to their respective educational establishments. As with the mode of transport to the place of work, the mode of transport used for the majority of the daily journey must be indicated. The classification indicated in paragraph 448 should be adopted.

## Distance traveled to place of work (or study) and travel time (subsidiary characteristic)

451. Countries may wish to collect information on the distance traveled daily to the place of work (or study) and the duration of the journey to determine the extent to which people are living further from their place of work (or study) and what is the impact of traffic jams on journey time. To do this, they should take into consideration the departure address.