



# Data Integration – Definition of priority user needs for combinations of data

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UN-GGIM: Europe, Work Group B, First delivery

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## Executive Summary

This report of the UN-GGIM: Europe Work Group B on “Data Integration” is the deliverable for Task 1 “Definition of the priority user needs for combinations of data”. According to the work plan, Task 1 has two sub-tasks; Sub-task 1.a is to define what combinations of data provide the greatest value to users, with a particular focus on the UN Sustainable Development Goals, Digital Agenda for Europe and Europe 2020 targets, taking into account national and regional priorities, and Sub-task 1.b is to define which kind of geospatial data, especially core data, and which kind of statistical and other thematic data should be given priority.

The user needs presented here have been derived from use cases provided from countries in the work group as well as from the European Commission and various European projects. The use cases can be found in more detail on the UN-GGIM: Europe website<sup>1</sup>.

In order to focus on the UN Sustainable Development Goals (SDG) the following selection of user needs has been made for this report. The selection highlights the geospatial and statistical communities’ perspective in order to achieve or monitor goals:

- To end poverty and fight inequalities, highlighting the need to take action against inequality on a local and national level (Poland) or of great importance of the urban and rural dimension (Turkey).
- To ensure healthy lives, knowledge, and the inclusion of women and children, highlighting the need to ensure access to Emergency Hospitals (Europe) or for the accessibility to Schools (Portugal).
- To grow a strong, inclusive, and transformative economy, demonstrating the benefits of good evaluation of location for Wind Power (Germany), the catchment areas of European airports (Europe), the territorial coverage of broadband internet (Portugal) or the accessibility to central urban locations (Germany). Further needs for economic prosperity are highlighted by showing the benefits of the establishment of a spatial management (Poland) and the access of a green infrastructure (Sweden).
- To protect our ecosystems for all societies and our children, demonstrating the need to support preventive measures in a crisis situation caused by the climate (Denmark) or for the adaptation to the climate change in general (Europe). Further needs are highlighted by showing the benefits of data combinations about land that is valuable for biodiversity (Sweden) or for a diagnosis of the sensitivity to the degradation and desertification (Spain).

By showing a number of use cases that can be seen as best practices responding to user needs on local, national and European level, this report aims to increase the awareness of geospatial and statistical information as a strategic asset in policy-making and data-driven decisions. The opposite of data-driven could be thought to be ‘data-blind’. However, in a society with limited resources that is not a realistic alternative.

Early in the process of creating new policies there is almost always a fact finding phase. The statistical and geospatial community can provide professional support in this phase to make policies evidence-based. It is essential to embed consideration of the ‘Where’ in the policy making. When policies are transformed into action it also helps to use spatial statistics, as well as geospatial information in

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<sup>1</sup> <http://un-ggim-europe.org/content/wg-b-data-integration>

itself, to ensure that the money lands on the targets. With result-based performance, it is essential that outputs and outcomes are measured. Data-driven decisions are helped by putting many sources of information together with the geospatial dimension. This allows patterns to be seen that can be acted on. By keeping statistical data and geospatial data apart a number of possibilities that comes from this combination may be missed.

To avoid the duplication of work within the public sector there is a need, for all European countries, to work on data sharing and cooperation in the spirit of the Infrastructure for Spatial Information in the European Community (INSPIRE<sup>2</sup>). This European perspective – reflecting a global one – should lead to a European Spatial Data Strategy based on National Spatial Data Strategies. These national strategies together with institutional arrangements are needed as strategic drivers of this development. National Spatial Data Strategies help all the stakeholders to develop a European strategy and to take active steps towards sustainable solutions for society and create value for all kinds of users.

One of the main aims for the work within UN-GGIM is to promote geospatial information supporting Sustainable Development and the post-2015 development agenda. Geospatial information is a key factor for improved decision making and policy formulation, and will support governments, international organisations and researchers to analyse, monitor and report on UN Sustainable Development Goals.

There is an increasing awareness that traditional surveys and censuses with fixed output areas don't meet the user demands on territorial flexibility. To fulfil these growing demands it's necessary to have a new territorial dimension in the statistical production, supported by a point-based framework. By combining administrative and/or census data with address coordinates for example it is possible to get information on a wide set of functional areas (urban/rural, coastline etc.) including small areas like grids. However, a point-based framework is not yet in place in many European countries.

The most important recommendation, on how to enable more timely, accurate and cost efficient spatial statistics, is for all countries in Europe to create a spatial reference framework for statistics. Its centrepiece will be geocoded administrative address, building and dwelling registers. These registers should form the reference framework for geocoding all future censuses, starting from the 2021 round, as well as linking administrative data sources to geographical locations. An important aspect of the spatial reference system is that it needs to be equipped with unique identifiers that are stable over time and can be used as unique keys to reference all relevant information to them. Access to the data forming this spatial reference system must also be easy. Understanding the origin, production process and other aspects of the quality of geospatial data, is essential for the statistical production process. Corresponding documentation standards are not completely part of INSPIRE and should be developed, potentially by UN-GGIM.

A relatively new type of geospatial data are Big Data. Research into the potential of this as a source for spatial statistics has only started and needs to be developed. The first projects have been launched using traffic control data and mobile phone positions with the goal to create detailed time aware snapshots of the movement of people.

In a nutshell, UN-GGIM: Europe Work Group B proposes the following recommendations for the combination of geospatial data with statistical data to be supported and tackled by UN-GGIM: Europe.

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<sup>2</sup> Infrastructure for Spatial Information in the European Community (INSPIRE), <http://inspire.ec.europa.eu/>

UN-GGIM: Europe, reaffirming the purposes and principles of the Charter of the United Nations and recognizing the importance of international cooperation,

- 1 *Encourages* Member States in Europe to support the development of a European Spatial Data Strategy based on comprehensive **National Spatial Data Strategies**. Member States are invited to decide on institutional arrangements, including legal arrangements, needed to enable and increase the cooperation between NMCAs and NSIs as well as commercial, scientific and public domains. The data sharing principles of Service-Oriented Architectures (like INSPIRE) should be extended to all European countries. The essence of the National Spatial Data Strategy will be the obligation to directly or indirectly geocode all administrative data records at the unit record level and to use available geospatial information instead of creating own datasets.
- 2 *Invites* Member States to initiate a process to increase the number of **national, authoritative geospatial datasets** (addresses and others) meeting stakeholders (like statistics) requirements within Member States. This should be incorporated into a geospatial infrastructure maintenance process including its data, services, architectures and business models. The content (data and services) should be accessible to all stakeholders (authorities). The report of the Eurostat task force, on the integration of statistical and geospatial information, states which data that are needed from the NSIs and should be used when deciding which data to give priority.
- 3 *Supports* Member States to consider requirements from National Statistical Institutes (NSIs) to provide geospatial information covering all the **dimensions, including time** (timeliness and periodicity), which is very important to follow trends and changes in the environment.
- 4 *Encourages* Members States to promote the use of **geospatial workflows and technology**, as a key to advance on the integration of geospatial and thematic (e.g. statistical) information namely supporting initiatives like GEOSTAT 2<sup>3</sup> that aims to create a model for a point based **spatial reference framework (e.g. for statistical production)**.
- 5 *Encourages* Member States to promote the use of geospatial workflows and technology, in particular for the **census 2021**.

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<sup>3</sup> <http://www.efgs.info/geostat/2>

## Introduction

It is easy to understand that geospatial information is a strategic asset for a country. The largest users probably are defence and security, construction, transportation, forestry and mining. What might not be recognized enough is the subject for this report, namely the use of geospatial information in combination with statistics to create a solid basis for evidence based policy making and political decisions on all levels in society. The UN Sustainable Development Goals, the Commission and Europe 2020 Priorities, the UN GGIM and Eurostat initiatives are drivers that hopefully will change this.

The regional committee UN-GGIM: Europe focuses on two issues: increasing data interoperability and harmonization, by proposing core geospatial data, and enabling the integration of geospatial data with other information/data (statistical, environmental, etc.) in order to foster further usage. Issues related to the integration of geospatial data, including cadastral parcels, with other information are tackled by the UN-GGIM: Europe Work Group B on “Data Integration”.

This Work Group B report is the deliverable for task 1 “Definition of the priority user needs for combinations of data”. The objective for this report is to provide priority user needs relevant for policy makers and politicians and show how evidence based decision making can benefit from geospatial information in combination with other information on different levels. The report is on a strategic, non-technical level reflecting the UN and the European goals (e.g. UN Sustainable Development Goals and European Union Top 10 political priorities and challenges). It consists of a number of use cases showing the benefits and needs for policy makers and politicians.

Use cases with none or just a weak connection to policy making or political decisions are left out of this report. That implies that user groups like private companies, organizations and the citizens in Europe are not directly in focus – but they will also benefit if the recommendations of this report are taken on board by the UN-GGIM: Europe. Use cases that purely focus on data production issues have also been left out. Due to the fact that only National Mapping and Cadastral Agencies or National Statistical Institutes were represented in Work Group B, this deliverable focuses on data combinations of geospatial with statistical data only.

The chapter “Priority User Needs – the geospatial and statistical communities’ perspective” includes examples of user needs on European, national and local level. The user needs are presented with the focus on how they connect to the UN Sustainable Development Goals, with quotes taken from the Synthesis Report of the UN Secretary-General on the Post-2015 Agenda “The road to dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet”.

Connections to various European initiatives aiming for sustainable development such as Europe 2020, the Territorial Agenda and national agendas are also explained. The chapter “How to better meet user needs in Europe” comprises proposals on which kind of geospatial data in combination with statistical data should be given priority and on the improvement of the interaction between National Statistical Institutes (NSIs) and National Mapping and Cadastral Agencies (NMCAs).

In Annex I: A Sustainable Europe – policy making and monitoring the UN sustainable development goals are briefly explained together with various European initiatives where combinations of geospatial and statistical data are essential.

## Background, acknowledgements and disclaimers

The United Nations initiative on Global Geospatial Information Management (UN-GGIM) aims at playing a leading role in setting the agenda for the development of global geospatial information and to promote its use to address key global challenges. It provides a forum to liaise and coordinate among Member States, and between Member States and international organizations.

The regional committee UN-GGIM: Europe was established on 1 October 2014. Its work plan mainly focuses on two issues: increasing data interoperability and harmonization by proposing core geospatial data and enabling the integration of geospatial data with other information/data (statistical, environmental, etc.) in order to foster further usage. Two work groups, one focusing on core data (Work Group A) and the other on integration of geospatial data, including cadastral parcels, with other information (Work Group B) tackle these issues.

Germany chairs Work Group B “Data Integration”. It is common understanding that Work Group B envisages a global vision with the focus on Europe for all tasks / deliverables. Strategic and political papers for “evidence based decision making” are needed rather than technical ones.

Following its work plan, Work Group B will supply three deliverables for three main tasks 1-3:

1. Definition of the priority user needs for combinations of data
2. Recommendation for methods implementing the prioritised combinations of data
3. Recommendation about how to manage side-effects induced by data combinations

WG B decided to distribute the work to three subgroups B.1, B.2 and B.3, one for each task.

Subgroup B.1 started its activity in December 2014 and concludes its activity by submitting this report to the UN-GGIM: Europe Executive Committee. The subgroups B.2 and B.3 will deliver reports by mid-2016.

According to the work plan, task 1 comprises the definition of what combinations of data provide the greatest value to users, with a particular focus on the UN Sustainable Development Goals, Digital Agenda for Europe and Europe 2020 targets, taking into account national and regional priorities (sub-task 1.a). Furthermore, it consists of the definition of which kind of geospatial data, especially core data, and which kind of statistical and other thematic data should be given priority (sub-task 1.b).

Subgroup B.1 conducted telephone conferences on 27 January 2015, 18 February 2015 and 17 April 2015 focused on the elaboration of a draft outline of this report. Updates concerned the alignment of the needs to the ‘UN Sustainable Development Goals’, the ‘Europe 2020’ strategy and European challenges. The joint meeting of the Geographical information system of the Commission (GISCO) Working Party and of UN-GGIM: Europe, on 2-3 March 2015 at Eurostat premises in Luxembourg, was used to present a draft report for task B.1 to a wider audience. Afterwards the report has been developed to take into account the feedback received at that Session and subsequent meetings and submissions. Amongst others a Work Group B Meeting on 7-8 May 2015 particularly addressed the elaboration of the report.

Since its constitution, 15 countries comprising 20 organizations are committed to Work Group B. These organizations are either mapping or statistical ones. There is no representation from other

thematic domains yet. Unfortunately, there are weak responses or commitments and contributions from the Baltic, Balkan and Eastern European countries.

Work Group B has taken into account the global recommendations from UN-GGIM such as of the UN Expert Group on the Integration of Statistical and Geospatial Information as well as of other relevant UN and global initiatives. Work Group B considered the requirements of NSIs for the integration of statistical and geospatial information, which were investigated and identified by a Task Force<sup>4</sup> led by Eurostat from November 2013 to December 2014.

Work Group A on “Core Data” aims at identifying essential data for sustainable development i.e. the core data needed by UN, European and national activities related to sustainable development, in order to get political and financial support to fulfil this need. The specific issue of the core data addressing the requirements of national statistics institutes (NSIs) has still to be investigated by Work Group A, in cooperation with Work Group B (sub-task 1.b). Thus, this issue could not be addressed by Work Group B in this report.

Generally, the purpose to share the work between as many participants as possible is important in order to ensure both that individual contributions accommodate participant's availability, and that the collective work, benefitting from as many contributors as possible, will be able to deliver relevant outcome and findings.

A full list of those who have contributed can be found at the end of this report. We are grateful to every person and organization for giving their time; either to provide written contributions or to attend the meetings and telephone conferences for allowing us to include their contributions in this report.

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The UN-GGIM: Europe Executive Committee approved this report in July 2015 and uploaded it to the UN-GGIM website<sup>5</sup>.

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<sup>4</sup> [Mandate and scope of the Task Force.](#)

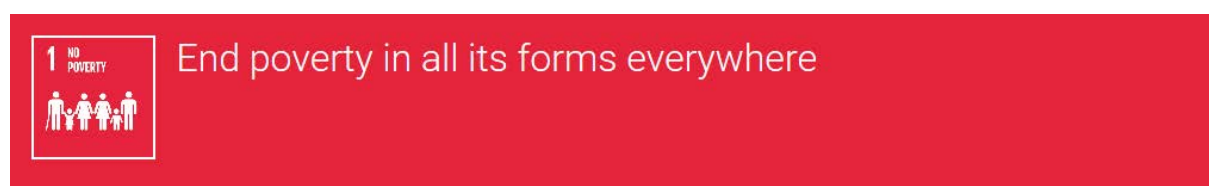
<sup>5</sup> <http://un-ggim-europe.org/content/wg-b-data-integration>



## Priority User Needs – the geospatial and statistical communities’ perspective

The main task for the work group B has been to identify priority user needs for policy relevant information, where a combination of geospatial and statistical information are crucial for more informed decisions. The user needs presented here have been derived from use cases provided from countries in the working group as well as from the European Commission and various European projects. The use cases can be found in more detail on the UN-GGIM: Europe website<sup>6</sup>.

The user needs are presented in connection with a selection of the SDG’s. This does not mean that the SDG’s that have been left out cannot benefit from statistical or geospatial data. The selection for this report has been made in order to focus on goals with a strong geospatial connection where adding statistical information makes it possible to achieve or monitor the goals. Use cases help to illustrate the identified user needs.



*“Eradicating poverty by 2030 is the overarching objective of the sustainable development agenda. Income inequality specifically is one of the most visible aspects of a broader and more complex issue, one that entails inequality of opportunity. This is a universal challenge that the whole world must address.”*

When the “Outlook on the Global Agenda 2015” lists the top ten trends of the world the most important trend is deepening income inequality, which is a global phenomenon but also exhibits local dispersion. For each region in the world the report states the most efficient ways to deal with the problem of income equality. For Europe tax policy, improved education and redistribution are promoted as most efficient. In a similar direction, two of the five headline targets of the Europe 2020 strategy call for reducing poverty and social exclusion. To be able to measure redistribution of wealth, the census results presented on maps are a powerful tool. In that way it is possible to detect regional patterns and make policy interventions.

### Solid facts to take action against inequality on a local and national level in Poland

The censuses that are conducted every 10 years in all European countries provides detailed information that shows the spatial distribution of income, economic and social conditions. In Poland the census in 2011 was conducted in a totally different way compared to previous censuses, making use of digital maps and GPS technology in order to receive results with coordinates on address level. By doing so they didn’t just save a lot of money, but also got flexible census information that can be used to create a wide range of statistics on all kinds of areas.

When statistics are put on maps, showing the socio economic spatial pattern of a country or district, it is possible to take action on where money should be spent to support areas that are lagging behind.

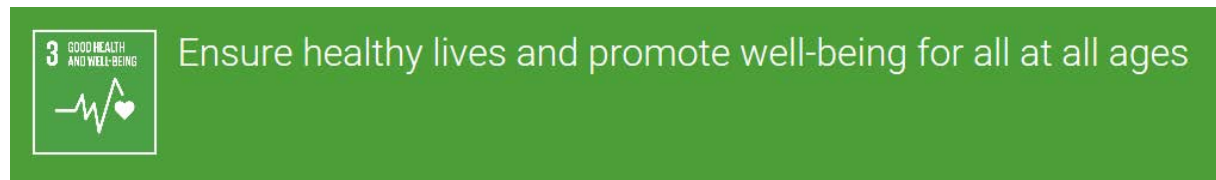
### Why the urban and rural dimension is of great importance in Turkey

Statistical figures related to urban-rural classification guides the decisions related to planning of all types of public service allocations such as agricultural incentives, housing, employment, etc. Without

<sup>6</sup> <http://un-ggim-europe.org/content/wg-b-data-integration>

the urban-rural differentiation it is not possible to fully understand the dynamics of the labour market, education, living conditions, welfare and tourism in Turkey.

When there is a change of administrative division in a country and the urban-rural classification rely on that division it could have unwanted effects: what was considered rural before the change can all of a sudden become urban and the effects might be that some areas no longer get the special political and territorial attention they deserve. By using kilometre grids as a fundament for the urban-rural classification, instead of administrative boundaries, this can be avoided. Such functional areas are more true to reality and can be updated in a more sustainable way.

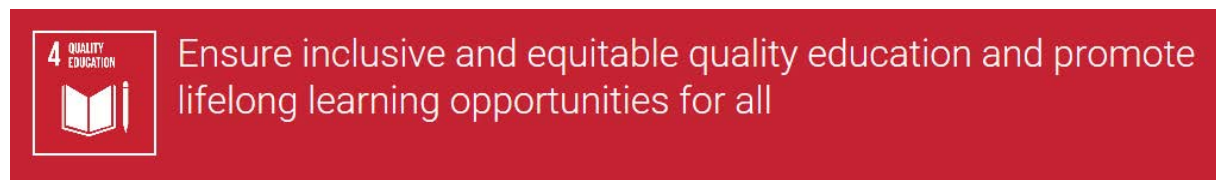


*“The SDG agenda must address universal health-care coverage, access and affordability.”*

#### Ensure access to Emergency Hospitals in Europe

The population in Europe all have the same need to be able to access health care services. Accessibility is important from many perspectives as part of the Territorial Agenda for Europe and needs to be taken into account to achieve cohesion policy.

A project was carried out with members from Norway, Bulgaria, Czech Republic, Estonia and Finland with the aim to measure access to emergency hospitals in each country. By using data sources like grid statistics in combination with road network and geocoded health care services the possibility to monitor access to health care is improved and also the possibility to take this factor in to account on the political level.



*“Today, more than ever, the realities of 1.8 billion youth and adolescents represent a dynamic, informed, and globally connected engine for change. Integrating their needs, rights to choice and their voices in the new agenda, will be a key factor for success.”*

#### Accessibility to Schools in Portugal

The number of children that needs school services varies over time depending on if the area is expanding with new dwellings being built, or declining due to migration or change of demographic conditions. It may be very costly to keep schools that no longer have enough pupils, and, on the other hand, it is important to consider the impact of closing a school in areas with low accessibility to near-by schools. At the same time, when new school facilities are built, it is important that they get a good location in relation to the area it should serve.

In Portugal a study was carried out using census data linked to buildings in combination with road network and school locations. The result showed the time distance to the closest pre-primary school on foot, both for census districts and for grids. This way it was possible to derive new statistical information relevant for decisions on school locations.



Ensure access to affordable, reliable, sustainable and modern energy for all

*“Economic growth should lead to shared prosperity. As such, the strength of an economy must be measured by the degree to which it meets the needs of people, and on how sustainably and equitably it does so. We need inclusive growth, built on decent jobs, livelihoods and rising real incomes for all and measured in ways that go beyond GDP and account for human well-being, sustainability and equity.”*

#### Where establishing new Wind Power could still be worthwhile in Germany

In order to move away from a dependency on coal, oil, gas and nuclear power towards renewable energy studies have been carried out to identify where new wind turbines still are a reasonable option. Increasing the share of renewable energy is recognized as one of the Europe 2020 headline targets: 20% greenhouse gas emission reduction, 20% renewable energy sources, and 20% improvement in energy efficiency. The new European Commission has reaffirmed this goal and linked it to the establishment of a European wide, connected Energy market.

By combining the information from two maps, one that shows where the wind blows strongly enough to ensure that wind power plants will be worthwhile and one that shows where wind power capacity has already been installed, it became visible where there are still unused wind power capacities. A statistically computed performance of a sample wind wheel was used and any possible new wind wheel sites have to be measured against this sample wind wheel.



Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

*“Innovation and investments in sustainable and resilient infrastructure, settlement, industrialization, small and medium enterprises, energy and technology can both generate employment, and remedy negative environmental trends.”*

Global targets for this goal include: to develop quality, reliable, sustainable and resilient infrastructure, including regional and trans border infrastructure, to support economic development and human wellbeing, with a focus on affordable and equitable access for all and to significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020.

#### Catchment areas of European airports to ensure proper return on investment

EU funding is aimed at improving territorial cohesion and helping less developed regions to increase their potential for economic growth. Regional airports are considered an effective way of improving the accessibility of regions both for the residential population and for tourists making their service areas more attractive for investments. Large amounts of EU funds have therefore been spent on expanding EU regional airport infrastructure. At the same time scarce public funds should be spent wisely and the return on investment must be measured using objective criteria. One criterion is the area of influence of the airports, i.e. their capacity to attract visitors and customers (the catchment area) which depends on the population nearby and the surface transport possibilities. The definition of catchment areas using a standardised method helps airport managers, local, national and

European authorities to assess the impact and of planned investments and avoid investing into oversized or redundant infrastructure.

The European Court of Auditors and Eurostat conducted an analysis of selected regional airports using the latest Eurostat data available on current road connections, traffic speed data, population and potential tourist numbers. The study analysed the overlaps of catchment areas, applying a uniform criterion of 120 minutes' driving distance. This was also done for all neighbouring airports to understand if catchment areas overlapped. It could be shown that for many airports significant overlaps of the catchment areas existed meaning that at least 75% of the population in a certain catchment area could also reach at least one other airport within two hours' drive.

#### Potential territorial coverage of broadband internet access at regional level in Portugal

Broadband internet access is an important dimension to take into consideration regarding competitiveness and innovation. The possibility of having regional data on this subject is a significant input for the assessment of regional competitiveness, which constitutes a relevant indicator for monitoring regional development.

Therefore, a broadband internet access indicator was created based on spatial data information on points of distribution of the network. Based on the theoretical curves that relate the speed according to the distance for copper cables and resorting to GIS techniques it was possible to calculate areas of influence within a 2 500 m range. The combination of applied buffer zones with the Administrative Map of Portugal and by using Geospatial Analysis techniques, made it possible to obtain the broadband internet access areas of influence at a regional and local level. This analysis allowed mapping the broadband coverage level of the territory.

#### Accessibility to Central Places in Germany

Germany's urban settlement system is basically characterized by its central places. These locations are designated as such and allocated by the respective state planning authorities in order to ensure nationwide provision of public and private facilities and services to the population, as well as the supply of workspaces within a reasonable distance. In this vein, central locations are relevant to underpin statements and conclusions about the regional supply structure, above all with respect to the social infrastructure facilities.

A period of 30 minutes is considered as a reasonable travel time to reach the nearest intermediate centre. This target value is reached or even exceeded throughout Germany: Nearly 90% of the population reach the next medium-sized centre already within 15 minutes by car, less than 1% of the citizens need more than the required 30 minutes car travel time.

This urban settlement system supports the social and economic development and the human well-being, with a focus on affordable and equitable access for all, and promotes an inclusive and sustainable industrialization.



Make cities and human settlements inclusive, safe, resilient and sustainable

*“People want decent jobs, social protection, robust agricultural systems and rural prosperity, sustainable cities, inclusive and sustainable industrialization, resilient infrastructure and sustainable energy for all. These transformations will also help tackle climate change.”*

Global targets for this goal include: to provide access to safe, affordable, accessible and sustainable transport systems for all, to enhance inclusive and sustainable urbanization, to significantly reduce the number of people affected by disasters and to provide universal access to safe, inclusive and accessible, green and public spaces.

There are also a number of global indicators proposed to measure Goal 11 that will rely on a combination of geospatial and statistical information.

#### The state of spatial management in Poland

Legal and organisational problems of spatial planning and monitoring of local planning have been identified in Poland, as well as lack of spatial order and mismanagement of resources. As a result there are problems with unrestrained suburbanisation manifested by chaotic changes in the management of rural areas. Effects of this can be seen not only in the physical space, but also in the social sphere.

In order to improve the land management the National Statistical Institute can provide new statistics by using GIS tools. It is possible to show the current problems in land management and support better informed decisions. This might lead to a more sustainable urbanisation process.

#### Access to green infrastructure in Sweden

Increased public access to green space in urban areas is stated among the national, environmental objectives in Sweden and policies for densification of cities versus preservation of green areas are currently under debate in many Swedish municipalities. Greenery is a key element of a sustainable urban environment. Green areas are important from an ecological as well as cultural and public health perspective. As urbanization puts demands for a more dense urban fabric, data on green spaces and peoples access to it becomes increasingly important. In addition, the inversion of green space mapping shows urban soil sealing. Information on the imperviousness of the urban environment is increasingly important from a climate change adaption perspective.

Statistics Sweden releases statistics on urban green space every fifth year. In 2005, the statistics for the first time was based on interpretation of satellite imagery combined with register data on population and real estates. During 2013, Statistics Sweden carried out a development project together with a remote sensing consultant aiming to improve the methods for urban green space statistics. The procedure encompasses methods for sub-pixel classification and post-processing of land cover data to categorize the green areas by ownership and vegetation qualities. The latest update<sup>7</sup> was published in May 2015.

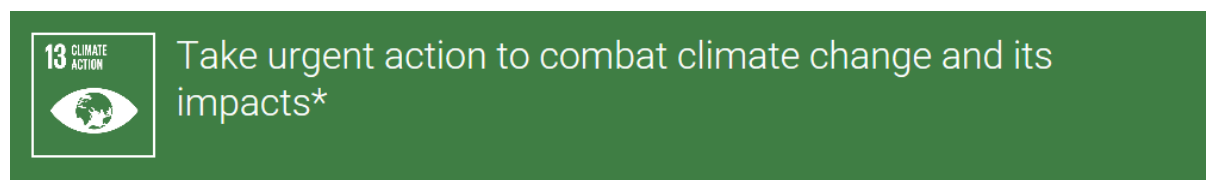
#### Access to public transport in urban areas in Europe

Access to public transport has been proposed as one indicator to measure progress of SDG 11. Within Europe there have been multiple attempts to collect data on the supply and access to public transport in cities. So far none of these attempts have produced comparable results because they were (1) not based on comparable geographies, (2) did not take into account the spatial distribution of the population and (3) did not take account of the frequency of public transport. As a result, the number of vehicles, trips or length of the routes could not be interpreted in a meaningful way.

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<sup>7</sup> [http://www.scb.se/en/\\_/Finding-statistics/Statistics-by-subject-area/Environment/Land-use/Green-areas-within-and-in-the-vicinity-of-urban-settlements/Aktuell-Pong/12905/Behallare-for-Press/390926/](http://www.scb.se/en/_/Finding-statistics/Statistics-by-subject-area/Environment/Land-use/Green-areas-within-and-in-the-vicinity-of-urban-settlements/Aktuell-Pong/12905/Behallare-for-Press/390926/)

A new methodology<sup>8</sup> helps to solve these obstacles using a new EU-OECD<sup>9</sup> city definition, high-resolution data on population distribution inside the cities and ‘big data’ on public transport stops and trips. Because of these three new ingredients, it produces comparable indicators of the access to and supply of public transport in cities. These indicators allow for the first time a comparison of the offer of public transport that is easily accessible to the urban population, and to calculate aggregated indicators on speed and frequency of the transport offer. This allows cities to benchmark themselves against other cities of a similar size. This is particularly relevant given that Cohesion Policy allocated 6 billion Euros in the period 2007-2013 to clean urban transport; an amount which is expected to increase significantly in the period 2014-2020.



*“As underscored by the Intergovernmental Panel on Climate Change (IPCC), climate change exacerbates threats. It makes delivering on the sustainable development agenda more difficult because of reversing positive trends, new uncertainties, or mounting costs of resilience. This enterprise can therefore not be business as usual.”*

Global targets for this goal include: to strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries, to integrate climate change measures into national policies, strategies and planning and to improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

#### Preventive measures in a crisis situation caused by the climate in Denmark

Flooding in densely populated areas in Denmark might cause a lot of damage and even loss of lives if the authorities don't prepare and make use of all relevant, available data sources. In order to plan the right emergency response a number of data sources and weather forecasts have been prepared by the Danish Meteorological Institute (DMI) and the Danish Coastal Authority (DCA).

Using the Elevation Model has proven to be very accurate as it gives the necessary level of detail, in the case of flooding the exact area of the quay edge that was needed to take the right action. Based on the Elevation Model a Rubber Boot Index has been created. This index provides an excellent illustration of where in a flooded area it is possible to wade through in rubber boots, where you can go through in a vehicle, and where you need to sail.

Denmark's Elevation Model and flooding calculations can be downloaded as free data from the Danish Geodata Agency's website, and flooding calculations are accessible at [Klimatilpasning.dk](http://Klimatilpasning.dk). The emergency authorities are urged to make use of the data and to prepare their own geodata for when there is an emergency situation.

#### Adaptation to climate change in Europe

Impacts of climate change will vary across Europe and take different expressions in different regions. The pattern of impact of climate change on Europe's regions should be seen as evidence basis for adaptation needs: the higher the potential negative impacts, the more important are actions of

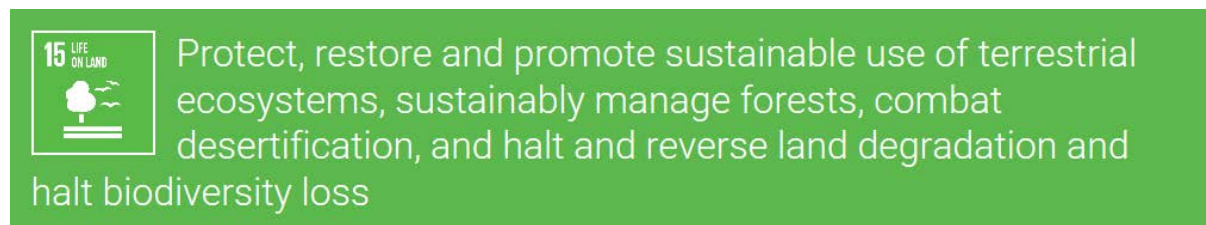
\* Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change

<sup>8</sup> [http://ec.europa.eu/regional\\_policy/sources/docgener/work/2015\\_01\\_publ\\_transp.pdf](http://ec.europa.eu/regional_policy/sources/docgener/work/2015_01_publ_transp.pdf)

<sup>9</sup> The Organisation for Economic Co-operation and Development (OECD), <http://www.oecd.org/>

adaptation in order to avoid negative consequences on the economy, population, physical assets, cultural heritage and the environment.

The ESPON Climate Project shows that projected impacts of climate change will most strongly affect southern European regions. Similarly, some coastal regions in north-western Europe may experience high negative impacts as well. The potential impacts were calculated as a combination of regional exposure to climate change and most recent data on the dimensions of physical, economic, social, environmental and cultural sensitivity to climate change.



*“To respect our planetary boundaries we need to equitably address climate change, halt biodiversity loss, and address desertification and unsustainable land use.”*

Global targets for Goal 15 include: to promote the implementation of sustainable management of all types of forests and halt deforestation, to combat desertification, to take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity, protect and prevent the extinction of threatened species and to integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts. There are also a number of global indicators proposed to measure Goal 15 that will rely on a combination of geospatial and statistical information.

#### [Land accounts for Biodiversity in Sweden](#)

The 7<sup>th</sup> Environmental Action program covering the period until 2020 has the ambition to protect, conserve and enhance the European Union’s natural capital and to minimise or even halt the loss of biodiversity. The value of biodiversity shall be integrated in development plans, economic decisions and national accounts based on the concept of natural capital and ecosystem services. The Swedish environmental quality objectives also aim for this target: by latest 2018 the importance of biodiversity and ecosystem services shall be publicly known in Sweden and be integrated in economic decisions, political discussions and other decisions in society.

Statistics Sweden has in cooperation with the Swedish University of Agricultural Sciences (SLU) conducted a project to develop a new statistical module within the environmental accounts in Sweden. The purpose was to combine data about land that is valuable for biodiversity in line with EU Art and habitat directive, article 17 with data related to the economy. The project covered the habitats western taiga, grasslands, wetlands and key biotopes (forestry). To get information eight registers and databases have been used and interlinked in a geospatial analysis.

By developing methods to link the economic actors in mandate of the land that is important for biodiversity it will be possible to take actions and better plan for how to preserve valuable ecosystems.

#### [Sensitivity to desertification in Andalusia 1956-2100](#)

The diagnosis of sensitivity to the degradation and desertification (evaluation and multitemporal monitoring of desertification in Andalusia through a Geographic Information System within the DESERTNET II project) has been performed according to the methodology MEDALUS (Kosmas et al. ,

1999) that allows to identify the vulnerable or sensitive areas to desertification through the application of biophysical and socio-economic indicators.

The DESERTNET II project focuses on themes related to the study, monitoring and sustainable management of drought areas of the Mediterranean basin in particular in relation to the impact of agricultural policies and pastoral activities.

The study is based on the implementation of four quality indexes of factors straight related to the desertification: soil, climate, vegetation and management of the territory. An analysis is made of the main parameters or indicators that mark its sensibility to the degradation.



## How to better meet user needs in Europe

### The role of data integration in the policy life cycle

The list of examples given above could be extended, and many interesting and relevant use cases can be found in more detail on the UN-GGIM: Europe website<sup>10</sup>. In general terms the use cases can be grouped into those that focus on the analysis of a situation, those that help to design a policy to improve the situation, and those that contributed to implement the policy and monitor the outcome.

The cross-cutting element through all the examples was to demonstrate how a more spatial and temporal resolution helps to detect patterns that otherwise would be invisible. These patterns are a precondition that other main users need to understand to better understand the real causes behind phenomena that impact our lives in all its aspects: economy, society and environment. Only with a complete description we will get to a full understanding of the situation which should be the basis for future actions of decision makers. Only by combining the 'Where', 'When' and 'What' at the right level of detail we will get to the 'Why', which in turn can be used to decide on the 'How' to improve the overall condition of our planet and humanity.

### Sustainable policies, actions and outcomes



Figure: Connecting policy with action and outcome, examples given in the Priority User Needs chapter

It is easy to understand that geospatial information is a strategic asset for a country; the largest users of geospatial information are usually, defence and security, construction, transportation, forestry and mining. What might not be recognized enough is that the use of geospatial information can be combined with statistics to create a solid basis for evidence-based policy making and political decisions at all levels in society. The Sustainable Development Goals and the UN-GGIM Committee of Experts are drivers that hopefully will change this.

<sup>10</sup> <http://un-ggim-europe.org/content/wg-b-data-integration>

The aim of this report is to increase the awareness of geospatial and statistical information as a strategic asset in policy making and data driven decisions, this is achieved by showing best practice through case studies looking at user needs at local, national and European level. The opposite of data-driven could be thought to be 'data-blind'. However, in a society with limited resources that is not a realistic alternative.

During the creation of a new policy there is almost always a fact finding phase, the statistical and geospatial community can provide professional support at this time to make policies evidence based – it is essential to embed consideration of the 'Where' in the policy making.

When policies are transformed into action it is an advantage to use spatial statistics as well as geospatial information to make sure that the policy is reaching its target audience. Data driven decisions are enhanced by combining different sources of information with the geospatial dimension, this helps to see patterns that you can act on.

By keeping statistical data and geospatial data apart you miss out on a number of possibilities that comes from combinations.

### Monitoring the Sustainable Development Goals

One of the main aims for the work within UN-GGIM is to promote geospatial information supporting sustainable development and the post-2015 development agenda. Geospatial information is a key factor for improved decision making and policy formulation and will support governments, international organisations and researchers to analyse, monitor and report on UN Sustainable Development Goals. Every object on the earth's surface has a specific location – a geographical location – whether static or dynamic it can there for be identified by using geospatial information. Consequently, almost everything that happens occurs somewhere, and knowing 'where' something happens is critically important to our lives – hence, most SDG's have a geospatial component.

As an example climate change (SDG 13) has made early warning, forecasting and risk assessments essential management tools for countries to ensure sustainable development, economic growth and appropriate resource management. The availability of geospatial information in areas of meteorology, topography, coastal marine, socio-economic information of the local population and disaster emergency facilities can assist in modelling, forecasting and production of evacuation routes, flood inundation scenarios, flood hazard and risk maps. Geospatial information becomes the vital integrator of the many disparate datasets and allows the risk or impact from natural hazards to be understood, and thus supports policy makers, disaster managers, and planners in national, provincial and local government agencies to reduce community vulnerability to the hazards.

### A European Spatial Data Strategy building on National Spatial Data Strategies

National Statistical Institutes play an important role in a democratic society to provide facts produced in an impartial way by professionals, relying on the European Code of Practice and the UN Fundamental Principles of Official Statistics. Geospatial data is used to a greater or lesser extent throughout the statistical production process. Depending on national conditions the NSIs can either access and use existing geospatial data, or have to create geospatial data needed for the statistical workflows - sometimes duplicating what already exists.

National Mapping and Cadastral Agencies (NMCA) play a likewise important role in society as providers of geospatial information to a number of various users and by setting up the Spatial Data Infrastructure, SDI, in a country. Many countries have also developed National Spatial Data

Strategies, based on the current situation of the national SDI and setting up goals for the years to come.

Instead of duplication of work within the public sector there is a need for all countries in Europe to work on data sharing and cooperation in the spirit of INSPIRE. This European perspective – reflecting a global one – should lead to a European Spatial Data Strategy. However, with a stepwise approach the first step could be to make sure that National Spatial Data Strategies are in place in all Member States and that they reflect these collaborative efforts. National Spatial Data Strategies together with institutional arrangements are needed as strategic drivers and helps all the stakeholders to take active steps towards sustainable solutions for society and create value for all kinds of users.

There is an increasing awareness that traditional surveys and censuses with fixed output areas do not meet the user demands on territorial flexibility. There needs to be a new territorial dimension in the statistical production supported by a spatial reference framework. This should be embedded into a general transformation process in the public sector and within local, national and regional statistical systems whereby information should increasingly come from administrative data sources; this reduces the costs and burden on respondents. By using administrative data and/or census data in combination with address coordinates, for example, you can get information on functional areas (urban/rural, coastline etc.) including small areas like grids. By adding various geospatial data it's also possible to analyze and describe the land use, soil sealing, urban sprawl and other phenomena of great importance for sustainable development.

Furthermore, UN GGIM: Europe will also discuss, in line with the G8 Charter on Open Data, comprehensive open data master plans. However this is not part of this report, but these issues will be reflected and recommendations be given by Work Group B (Task 3: "Recommendation about how to manage side-effects induced by data combinations") with a focus on the topic "Open Data and its side effects".

### Priority data for a spatial reference framework for statistics

The spatial reference framework should be based on a single official administrative reference dataset per country with clear ownership, defined scales and attributes taking into account statistical requirements. Both administrative data sources and survey information, including microdata, should be geocoded to the same reference framework. In general terms all Member States should make the use of this spatial reference system mandatory for all public stakeholders at all level of government and administration, for all public data and all administrative tasks.

For statistics the actual extent of spatial objects is often not relevant and a point representation of buildings, addresses, public service locations etc. is in most cases sufficient. Hence a point-based spatial reference framework based on address, building and dwelling registers is the most important element in a spatial reference framework for statistics. These registers should form the reference framework for geocoding all future censuses, starting from the 2021 round, as well as linking administrative data sources to geographical locations. A point-based framework is not yet in place in many European countries. Eurostat is currently funding the GEOSTAT2 project<sup>11</sup>; one of its main objectives is to come up with a suggestion for such a framework that can be implemented on national level.

As a second priority, the address file should be integrated with other detailed topographic and thematic geospatial information. For accessibility studies for example a routing network based on

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<sup>11</sup> <http://www.efgs.info/geostat/2>

transport networks needs to be created, and address locations need to connect to this routing network to calculate journey times from one point to another. Also address points and cadastral parcels should be spatially integrated and connected via stable identifiers.

Transport networks for transport statistics and spatial analysis and detailed and harmonised land use and land cover map for Europe to measure biodiversity and ecosystem services feature high on the list.

Geocoded registers of public services and infrastructures providing services to all citizens, and subpopulations, either on a daily basis or in specific situations of life need to be established and provided to NSIs. Examples include registers of health services, education services, emergency services and public transport services. In some countries, those public services and infrastructures, are already integrated in the NSI's Business Registers but are not yet geocoded. Services such as electricity grids, telecommunication networks that might be private but cover essential needs should also be provided as part of this framework.

An important aspect of the spatial reference system is the need to be equipped with unique identifiers that are stable over time and can be used as unique keys to reference all relevant information to them. A concept for time series of this reference system needs to be developed, this includes aspects like referencing versions of data in a unique manner.

An emerging aspect of geospatial data is the concept of Big Data, (this can relate to large quantities of information than is captured and then analysed and used for other purposes – for example the positions of mobile phones). Research into the potential of Big Data, as a source for spatial statistics, has only started and needs to be developed further. Projects have been launched using traffic control data and mobile phone positions with the goal to create detailed time aware snapshots of the movement of people.

Access to the data forming this spatial reference system must be easy, the implementation of INSPIRE should improve the situation in this regard. NSIs should avoid having to create essential data sources which already exist, but to which they have limited access, either due to access or quality problems. Another recommended best practice is national, central data pools.

Understanding the origin, production process and other aspects of the quality of geospatial data is essential for the statistical production process. Corresponding documentation standards are not part of INSPIRE and could be developed through the UN-GGIM standards work.

More detailed information on what the statistical institutes need in order to provide spatial data can be found in a recent report from a Eurostat Taskforce<sup>12</sup>.

### Improved workflows with geospatial technology

Statistical domains like national accounts, business and population statistics have agreed frameworks, guidelines and standards in place, while spatial statistics (that rely on geospatial information at some stage in the production process) are currently in a developing phase. There are various ongoing initiatives, both at global<sup>13</sup> and European<sup>14</sup> level, which will help to enable the production of spatial statistics.

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<sup>12</sup> "Report from the task force on the integration of statistical and geospatial information"

<sup>13</sup> [http://ggim.un.org/UN\\_GGIM\\_Expert%20Group.html](http://ggim.un.org/UN_GGIM_Expert%20Group.html)

<sup>14</sup> <http://ec.europa.eu/eurostat/web/gisco>

The Census 2021 will be a big undertaking for the NSIs as geospatial workflows and technology can increase the usefulness of the results and make them point-based rather than census-area based. Transforming the census data collection methods also saves money and allows for more timely dissemination of the results. A number of NSI's are already using GIS technology on different phases of their statistical production process e.g. sampling and data collection with smart devices for enumerators doing field work, but the technique should be more widely spread. Using geospatial data from the NMCA and share GIS knowledge are crucial.

Collecting census microdata linked to an exact location instead of linked to an enumeration area makes it possible to create statistics with a high degree of flexibility, of course without giving away personal information in the statistical results. There is a need for a high level of spatial detail in the data; otherwise it is impossible to provide relevant information answering the needs from SDGs and other high level goals and policies.

NSIs in many countries use administrative registers that are georeferenced on address, building or real estate level. There needs to be legal arrangements in place to allow the NSIs to use administrative sources from tax authorities and others for statistical purposes. This also goes for the use of big data such as telecommunication data. This is also an example of collect once – use many times. When the NSI has developed a system of statistical registers based on administrative sources to cover population, enterprises and real estate / dwellings, the traditional censuses can be replaced, not only by a register based census every ten years, but also of yearly updated statistics on flexible output areas.

To provide climate related information and indicators the NSIs also need to process data from satellite images – often in combination with census or register data. There are ongoing initiatives to promote the use of Copernicus images and information derived by the public administration. In Portugal framework legislation was produced to support the activities and the implementation phase by the institutions involved.

## Recommendations

Work Group B has discussed the success factors for a better integration of statistical and geospatial information.

Although the situation of data integration varies greatly between countries, and although statistics is only one element in an information infrastructure for sustainable development, Work Group B agrees on the following recommendations as absolutely essential to achieve the integration of geospatial and thematic information:

UN-GGIM: Europe, reaffirming the purposes and principles of the Charter of the United Nations and recognizing the importance of international cooperation,

- 1 *Encourages* Member States in Europe to support the development of a European Spatial Data Strategy building on comprehensive **National Spatial Data Strategies**. Member States are invited to decide on institutional arrangements, including legal arrangements, needed to enable and increase the cooperation between NMCA's and NSIs as well as commercial, scientific and public domains. The data sharing principles of Service-Oriented Architectures (like INSPIRE) should be extended to all European countries. The essence of the National Spatial Data Strategy will be the obligation to directly or indirectly geocode all administrative data records at the unit record level and to use available geospatial information instead of creating own datasets.

- 2 *Invites* Member States to initiate a process to increase the number of **national, authoritative geospatial datasets** (addresses and others) meeting stakeholders (like statistics) requirements within Member States. This should be incorporated into a geospatial infrastructure maintenance process including its data, services, architectures and business models. The content (data and services) should be accessible to all stakeholders (authorities). The report of the Eurostat task force, on the integration of statistical and geospatial information, states which data that are needed from the NSIs and should be used when deciding which data to give priority.
- 3 *Supports* Member States to consider requirements from National Statistical Institutes (NSIs) to provide geospatial information covering all the **dimensions, including time** (timeliness and periodicity), which is very important to follow trends and changes in the environment.
- 4 *Encourages* Members States to promote the use of **geospatial workflows and technology**, as a key to advance on the integration of geospatial and thematic (e.g. statistical) information namely supporting initiatives like GEOSTAT 2<sup>15</sup> that aims to create a model for a point based **spatial reference framework (e.g. for statistical production)**.
- 5 *Encourages* Member States to promote the use of geospatial workflows and technology, in particular for the **census 2021**.

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<sup>15</sup> <http://www.efgs.info/geostat/2>

## Annex I: A Sustainable Europe – policy making and monitoring

### The UN Sustainable Development Goals

The Millennium Development Goals (MDGs) were adopted by UN Member States in 2000, they committed world leaders to the pursuit of concrete, measurable improvements on global poverty, hunger, health, education and other key social issues by 2015. Eight goals were set, and progress towards them has been measured by 21 targets and 60 official indicators.

As the deadline for the MDGs were approaching, the United Nations launched an ambitious program to develop a set of Sustainable Development Goals (SDGs). The SDGs recognise that the MDGs were mainly of relevance to developing countries, and as a result call for action all over the world.

Europe faces a number of challenges that must be tackled on European, national and local level in order to create a sustainable Europe in line with the new UN Sustainable Development Goals (SDG's). This report focus on how increased use of geospatial information in combination with statistics can help to achieve and monitor the goals.

The SDGs have been prepared by an Open Working Group and they stress the importance of improving “the availability of and access to data and statistics disaggregated by income, gender, age, race, ethnicity, migratory status, disability, **geographic location** and other characteristics relevant in national contexts to support the support the monitoring of the implementation of the SDGs. There is a need to take urgent steps to improve the **quality, coverage and availability of disaggregated data** to ensure that no one is left behind<sup>16</sup>.”

The new SDGs include **17 goals** which will need action on European, national and sub-national level. This report focuses on a number of goals where the working group has identified that they will benefit from the use of geospatial information in combination with statistics to be achieved. The goals also need to be measured. From the list of indicators the goals 11 and 15 stand out where a large number of indicators rely on a combination of statistics and geospatial information.

The goals are:

- Goal 1 – End poverty in all its forms everywhere
- Goal 2 – End hunger, achieve food security and improved nutrition and promote sustainable agriculture
- Goal 3 – Ensure healthy lives and promote well-being for all at all ages
- Goal 4 – Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
- Goal 5 – Achieve gender equality and empower all women and girls
- Goal 6 – Ensure availability and sustainable management of water and sanitation for all
- Goal 7 – Ensure access to affordable, reliable, sustainable and modern energy for all
- Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- Goal 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
- Goal 10 – Reduce inequality within and among countries

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<sup>16</sup>

[https://sustainabledevelopment.un.org/content/documents/4518SDGs\\_FINAL\\_Proposal%20of%20OWG\\_19%20July%20at%201320hrsver3.pdf](https://sustainabledevelopment.un.org/content/documents/4518SDGs_FINAL_Proposal%20of%20OWG_19%20July%20at%201320hrsver3.pdf)

- Goal 11 – Make cities and human settlements inclusive, safe, resilient and sustainable
- Goal 12 – Ensure sustainable consumption and production patterns
- Goal 13 – Take urgent action to combat climate change and its impacts
- Goal 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development
- Goal 15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- Goal 16 – Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- Goal 17 – Strengthen the means of implementation and revitalize the global partnership for sustainable development

## European policy frameworks

In parallel to the global development agenda of the UN, as set out in the Millennium Development Goals and now in the SDGs, the European Union has been putting forward a number of policy frameworks for sustainable development in all its facets.

While the targets of these agendas largely overlap with the objectives of the SDGs their priorities might be different, notably their clear focus on creating jobs and economic growth. In addition topics like climate change, energy policy, environmental protection and social disparities feature high on the agenda. Besides the formulation of goals the quantitative targets, geographical perspective, time horizon and monitoring framework differs from the SDGs. These policy frameworks form the basis for many EU-wide policies that, in most cases, have a strong impact on national, regional and local policies; due to the importance of the EU for Europe, they are also highly relevant for most of the other non-EU European countries.

Although the report mainly focus on user needs as derived from the SDGs many of the policy actions leading to their achievement will nevertheless be formulated under EU programs. It is therefore essential to understand that these complementary frameworks exist and how they impact on EU policies.

Not all elements of these EU policy frameworks will require detailed geospatial-statistical information to be implemented but depending on how the priorities develop over time, a greater demand for more geographical detail within the monitoring framework can be expected<sup>17</sup>. In addition these frameworks are likely to evolve resulting in increased information needs.

## Europe 2020 and the Territorial Agenda

The Europe 2020<sup>18</sup> strategy is about delivering growth that is: **smart**, through more effective investments in education, research and innovation; **sustainable**, thanks to a decisive move towards a low-carbon economy; and **inclusive**, with a strong emphasis on job creation and poverty reduction. The strategy is focused on five ambitious goals in the areas of employment, innovation, education, poverty reduction and climate/energy. Building on the subsidiarity principle each Member State has adopted its own national targets in each of these areas.

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<sup>17</sup> <http://ec.europa.eu/eurostat/web/ess/about-us/ess-vision-2020>

<sup>18</sup> [http://ec.europa.eu/europe2020/index\\_en.htm](http://ec.europa.eu/europe2020/index_en.htm)



An important mechanism to achieve the Europe 2020 goals will be the Regional and Cohesion Policy of the EU<sup>19</sup>. Its main objective is to diminish the gap between regions with regard to the Europe 2020 targets.

About one third of the EU budget (c.350bn€ until 2020) has been set aside for corresponding measures. Through partnership agreements the EU member states outline their strategy for closing development gaps and as a result receive money from three funds<sup>20</sup> to invest in various projects. The focus is on creating growth, jobs and promoting territorial cohesion in living conditions. Hence a great deal of the projects aim at improving accessibility, enhancing services of general economic interest, territorial capacities, endowments/assets, upgrading city networks and the better integration of functional regions. The planning and monitoring of many of these projects will require a vast amount of statistical and geospatial information at regional level<sup>21</sup>.

### A New Start: The 2015 Work Programme of the European Commission

At the beginning of its term the Juncker Commission has adopted a work program<sup>22</sup> that will have a strong influence on many policy areas until 2020 and beyond with a strong focus on jobs and growth. It presents a limited number of new proposals including a 315bn€ investment plan.

The headline plans for 2015 include topics that are also relevant under the Europe 2020 strategy, and where the combination of statistical and geospatial information has to play a vital role in the planning, execution and monitoring of the actions, including:

- Delivering on our Investment Plan for Europe
- An Ambitious Digital Single Market Package improving broadband connectivity
- Building a European Energy Union including upgrading the connectivity of national energy markets
- A European Agenda on Migration including actions to halt illegal immigration

### 7th Environmental Action Programme of the EU (EAP)

Over the past decades the European Union has put in place a broad range of environmental legislation. As a result, air, water and soil pollution has significantly been reduced. Today, EU citizens enjoy some of the best water quality in the world and over 18% of EU's territory has been designated as protected areas for nature. **The 7th Environment Action Programme (EAP)**<sup>23</sup> will be guiding European environment policy until 2020.

In order to give more long-term direction it sets out a vision beyond that, of where it wants the Union to be by 2050: "In 2050, we live well, within the planet's ecological limits. Our prosperity and healthy environment stem from an innovative, circular economy where nothing is wasted and where natural resources are managed sustainably, and biodiversity is protected, valued and restored in ways that enhance our society's resilience. Our low-carbon growth has long been decoupled from resource use, setting the pace for a safe and sustainable global society." The linkage to many of the

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<sup>19</sup> [http://ec.europa.eu/regional\\_policy/en/policy/what/investment-policy/](http://ec.europa.eu/regional_policy/en/policy/what/investment-policy/)

<sup>20</sup> The European Regional Development Fund, the European Social Fund and the Cohesion Fund.

<sup>21</sup> European Commission (2014) *Investment for jobs and growth: promoting development and good governance in EU regions and cities*. Sixth report on economic, social and territorial cohesion, European Commission, Directorate-General for Regional and Urban Policy.

<sup>22</sup> [http://ec.europa.eu/priorities/index\\_en.htm](http://ec.europa.eu/priorities/index_en.htm)

<sup>23</sup> <http://ec.europa.eu/environment/newprg/index.htm>

SDG's is evident and in fact the implementation of the EAP can be considered as the European contribution to the achievement of many of the SDGs.

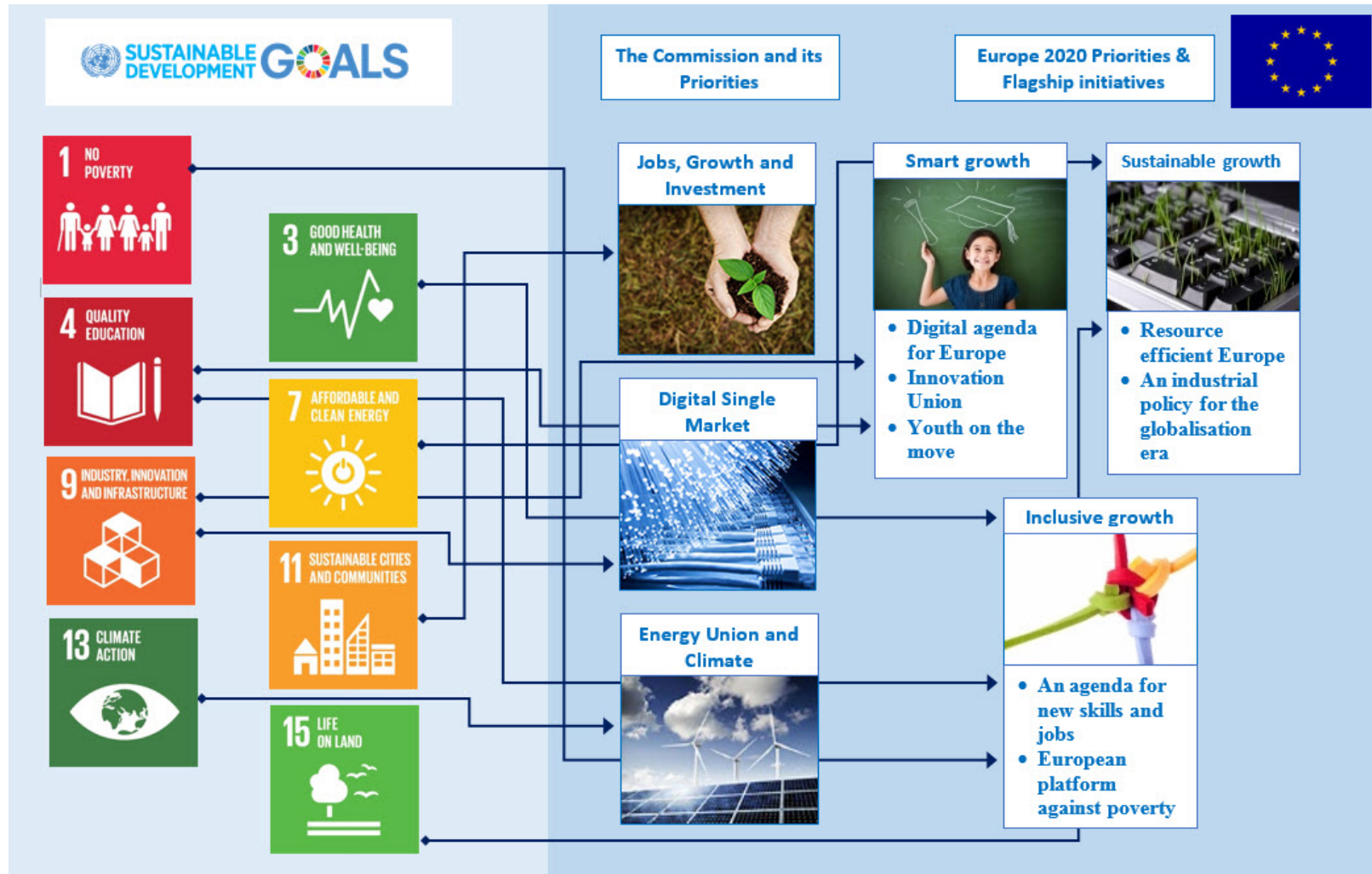
The EAP identifies five in parts cross-cutting goals:

- to protect, conserve and enhance the Union's **natural capital**
- to turn the Union into a **resource-efficient**, green, and competitive low-carbon **economy**
- to **safeguard** the Union's citizens from **environment-related pressures** and risks to health and wellbeing
- to **make** the Union's **cities more sustainable**
- to help the Union **address international environmental** and **climate challenges more effectively**.

The design and monitoring of these measures will require vast amounts of qualified information. A sound knowledge base is actually mentioned as one of the enablers. The integration of statistical and geospatial information will be play a crucial role and in fact the achievement of most of the goals cannot be planned and monitored without integrated, qualified geospatial and statistical information. As an example, the need to develop an accounting framework for our ecosystems requires geospatial delineations of ecosystems and their spatial characteristics, to be integrated with data on their services, stocks and flows provided from these ecosystems, and their degradation.

### Links between UN SDG's and EU initiatives

The following two schemas show the linkages between the UN Sustainable Development Goals (SDG's) referred to in this document and the initiatives, targets and strategies by the European Commission. Both schemas try to visualize the complexity, relations and overlapping of these different topics.





## Annex II: Use cases

More than 40 use cases that were provided during the work on the report can be found in more detail on the UN-GGIM: Europe website<sup>24</sup>. The use cases selected and highlighted in the report are listed below for each of the contributors.

National Survey & Cadastre Denmark:

- Preventive measures in a crisis situation caused by the climate in Denmark

German Federal Agency for Cartography and Geodesy (BKG), the Germany's National Meteorological Service (DWD) and the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR):

- Where establishing new Wind Power could still be worthwhile in Germany
- Accessibility to Central Places in Germany

GEOSTAT I project, coordinated by Statistics Norway

- Ensure access to Emergency Hospitals

Statistics Poland:

- Solid facts to take action against inequality on a local and national level in Poland
- The state of spatial management in Poland

Statistics Portugal:

- Accessibility to Schools in Portugal
- Potential territorial coverage of broadband internet access at regional level in Portugal

Spanish Directorate General for Cadastre:

- Sensitivity to desertification in Andalusia 1956-2100

Statistics Sweden:

- Access to green infrastructure in Sweden
- Land accounts for Biodiversity in Sweden

Statistics Turkey:

- Why the urban and rural dimension is of great importance in Turkey

European Commission:

- Catchment areas of European airports to ensure proper return on investment
- Access to public transport in urban areas in Europe

ESPO:

- Adaptation to climate change in Europe

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<sup>24</sup> <http://un-ggim-europe.org/content/wg-b-data-integration>

## Annex III: List of contributors

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- Joint UN-GGIM: Europe - and WORKING PARTY MEETING – Geographical Information Systems for Statistics on 2-3 March 2015, in Luxembourg
- Workshop on UN Global Geospatial Information Management: Europe on the occasion of the joint INSPIRE conference and Geospatial World Forum on 28 May 2015 in Lisbon, Portugal