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**Items for discussion and decision: programme review:
developing a statistical-spatial framework in national
statistical systems**

Report of the Australian Bureau of Statistics on developing a statistical-geospatial framework

Note by the Secretary-General

Following discussions within the Statistical Commission, the Economic and Social Council, in its resolution 2011/24, recognized the need to promote international cooperation in the field of geospatial information and established the United Nations Committee of Experts on Global Geospatial Information Management. This intergovernmental Committee is tasked with making joint decisions and setting directions on the production and use of geospatial information within national and global policy frameworks, working with Governments to improve policy, institutional and legal frameworks, address global issues and contribute collective knowledge as a community with shared interests and concerns and developing effective strategies to build geospatial capacity in developing countries.

At its second session, in August 2012, the Committee of Experts considered an inventory of issues relevant to many national geospatial information authorities and international organizations engaged in geospatial information management. There were nine thematic issues identified by the Committee. One of the key issues identified was the need to link geospatial information to statistics, in particular through geocoding.

As an initial step in establishing mechanisms to support the linking of geospatial information to statistics, it was suggested that a Statistical Commission programme review would be helpful to support the development of a statistical-geospatial framework in national statistical systems.

* E/CN.3/2013/1.



The Secretary-General has the honour to transmit the report of the Australian Bureau of Statistics on developing a statistical-geospatial framework, which contains a programme review of national geospatial activities focusing on linking socioeconomic information to a location. In its report, the Bureau of Statistics presents a review and analysis of users' needs and challenges based on a global consultation process, explores areas where the value and usability of official statistics can be enhanced through the application of a location context and seeks to raise awareness of current national geospatial activities and how national statistics offices can play a role in linking socioeconomic and spatial information. It makes specific recommendations on how to achieve the linking of socioeconomic information to a location at national and international levels. The Statistical Commission may wish to express its views on the substance of the report and make recommendations for future work in this area.

Report of the Australian Bureau of Statistics on developing a statistical-geospatial framework

I. Introduction: the need for linking socioeconomic information to a location

1. There is an increasing interest in many communities in the benefits that arise through adding a location to socioeconomic information. In simple terms, this means that linking people, business and the economy to a particular place can result in a fuller understanding of social and economic issues than is possible through a socioeconomic information lens on its own. From a technical perspective, this means adding a physical location to socioeconomic information through geocoding — the process of finding associated geographic coordinates (often expressed as latitude and longitude) from other geographic data, such as street addresses. With geographic coordinates, the features can be mapped and location-enabled, and then used for location-based modelling and analysis processes, or “location analytics”. Adding location information increases the value of statistics for our societies.

2. Demand for location-enabled socioeconomic data is driven by a diverse range of user needs. These needs can be broadly summarized as a desire to better understand issues at local levels with the improved evidence that occurs from using location as a link for integrating information from multiple sources.

3. Geospatial and statistical communities are major contributors of information used as evidence to inform decision-making processes across sectors, both public and private. However, with the increasing complexity of today’s issues, the need to understand the interrelationships among economic, social and environmental issues is becoming critical. In today’s global community, there is a clear recognition of the need to link socioeconomic and spatial information (which includes much environmental information) to improve the relevance of the evidence, on the basis of which decisions will be made. Understanding the impact of the environment on socioeconomic activities, and vice versa, is just one of the key issues currently being addressed locally, nationally and globally.

4. The benefits of linking socioeconomic and spatial information are increasingly acknowledged. This is reflected in the growing demand for statistical organizations to provide information for smaller and smaller geographic areas, right down to the geocode. In addition, the geospatial community is starting to recognize the significance of social and economic information as an important value-added element to their traditional focus on the natural and man-made environments. Location provides a common factor or point of reference supporting the linking of diverse information.

5. The need to link statistics to a location is clear, but the challenge being faced is how best to achieve this integration in an effective and consistent way. This challenge was recognized by the Secretary-General in his report to the Statistical Commission in 2012 on global geospatial information management, in which he noted that the work on global geospatial information management over the past two to three years had confirmed that one of the key challenges was a better integration of geospatial and statistical information as a basis for sound and evidence-based decision-making (E/CN.3/2012/31, para. 14).

6. The utility of information increases with the addition of a location element. It also becomes easier to integrate it with other information that has a link to the location, and the integrated information often has more value than the individual sets of information, enabling a greater understanding of the issue or concern and providing more evidence on which to base decisions.

7. Many communities, covering a wide range of interests, are now appreciating the value of linking their information to a location and are establishing such a link to improve their understanding of relevant issues. Location is becoming a significant factor in the process of bringing together information to make more informed decisions.

8. In response to the challenge of linking spatial and socioeconomic information, the Australian Bureau of Statistics has undertaken the present programme review. The review aims to identify the current geospatial capabilities and activities of national statistics offices and how those organizations are approaching the demand for location-based statistics; the roles national statistics offices have in the activities of the geospatial communities of their countries; and which activities can be undertaken internationally and which at the national level to achieve the required linking of statistical information to location.

9. The present document is structured as follows. Section II gives an overview of current geospatial activities in statistical organizations, including national drivers for linking socioeconomic information to location and trends in this respect. Organizational capabilities and three broad types of institutional arrangements are discussed, as are the national benefits of linking socioeconomic information to location. Finally, there is a brief summary of common issues and themes.

10. Section III presents major international agendas that provide further drivers for bringing socioeconomic and spatial information together. Section IV examines various approaches to linking socioeconomic information to a location, discusses the development of a common global approach and how to bring this approach to the attention of both the producers of location-enabled statistics and the user community, and proposes a mechanism to establish a global approach to developing a common and agreed methodology for linking socioeconomic information to location.

II. The current situation

A. Global consultation

11. A global consultation process yielded 52 responses (see annex) and established a baseline with respect to existing activities of national statistics offices for linking socioeconomic information to location. It is hoped that this will serve as a useful reference for the analysis of progress towards the goal of integration in the future. The replies also provided information on the various institutional arrangements for collaboration between national statistical and geospatial activities, as well as on what was driving the interest in linking socioeconomic information to a location and what approaches national statistics offices are already using to establish this link.

12. The global consultation took the form of a questionnaire that aimed to identify a range of national statistical and spatial activities, capabilities and institutional

arrangements. Specific details of the questionnaire will be provided in a background document. Some of the key findings from the questionnaire are summarized in the present section.

B. National trends and drivers

13. A large number of common influences drive the growing interest in geographically enabling statistical information. The Czech Republic, for example, is seeking to use linked statistical-geospatial information to support, among other things, emergency management activities, while many European countries are developing capabilities to support European Union obligations arising from the INSPIRE (Infrastructure for Spatial Information in the European Community)¹ initiative. Many countries, including Finland and Croatia, see new and emerging areas of need for spatial information coming from health, social welfare and urban planning activities. Providing a greater geographic context for population census information was also an important driver reflected in the responses from Ecuador, Egypt, Hungary and Madagascar among others. Some countries, such as Mexico, indicated that they were responding to legislation that was aimed at establishing national spatial capabilities. Furthermore, a number of countries outside the European Union, such as Switzerland, were responding to the INSPIRE requirements.

14. The global consultation indicated a growth in the demand for location-enabled socioeconomic information, and much of this growth is coming from sectors that have not traditionally been significant users of spatial information. Considerable growth in demand is coming from activities in which people are the Government's focus, such as health, education and social welfare programmes. Many countries have already seen the significant value of linking information about people to a location and how this improves support to decision processes. In many countries, there is also a general growth in demand from the more traditional users of spatial information, such as urban planning, emergency management, national security and land administration programmes.

15. Other countries, such as Mozambique, were in the process of moving from paper-based to electronic spatial and statistical capabilities and saw the opportunity in this transition for establishing links between statistics and location.

C. Spatial capabilities

16. There is significant diversity in the capability of national statistics offices to link socioeconomic information to location. There is also a wide range of levels of engagement between national statistics offices and the geospatial communities in each country.

17. The demand for socioeconomic information linked to location is growing quickly in most countries. While much of this growth is to support Government information needs, there is also increasing interest from the research sector, the general public, industry and social and economic communities. The levels of growth

¹ INSPIRE aims to create a common spatial capability across Europe, and the fundamental data themes include population data.

and the types of demand are generally dependent on the level of spatial capability within each country. Those countries with significant spatial capabilities show growth in non-traditional areas, while countries with basic or developing spatial capabilities are supporting more traditional uses of spatial information. The types of applications for location-based statistics also reflect this trend.

18. Many countries have developed or are working on developing ways to provide statistical information for smaller geographic regions. There appears to be a high level of common interest and understanding of the need for geographically referenced statistics. Many countries indicated that they were applying some form of location attribute to their statistical data. Furthermore, most countries that were applying a location to their statistics were also using formal administrative boundaries as the geographic areas for which they released aggregated statistical information.

D. Institutional arrangements

19. The global consultation provides an excellent baseline description of activities and relationships that exist between the statistical and geospatial communities. Each type of arrangement has its pros and cons, and the key to moving forward to meet the statistical-geospatial integration challenge is to determine how best to leverage and build on existing institutional arrangements. It must also be acknowledged that while institutional arrangements are the responsibility of each country, the present review has looked at institutional arrangements in the context of possible models and good practices.

20. While it is not easy to categorize institutional arrangements, given the diversity that exists, there do appear to be three broad types of arrangements that cover the interaction of the statistical and geospatial communities in most countries. These arrangements can best be summarized as follows:

(a) **Fully integrated.** Geospatial and statistical activities are undertaken by a single organization. This arrangement obviously provides for a close link between statistical and geospatial activities, and, in many cases, countries with such arrangements are well advanced in meeting the integration challenge (e.g., Brazil and Mexico). Countries with these arrangements are well aware of the increasing demand for statistical information describing small areas. These countries have sophisticated mapping and related spatial capabilities and the expertise to effectively align statistical information with relevant geographical areas;

(b) **Separate but closely linked.** Most countries operate with separate but closely linked institutional arrangements. National statistics offices have a range of internal geospatial capabilities and a good level of collaboration with their national geospatial community (e.g., Colombia, Netherlands, New Zealand and Singapore). Close collaboration is also occurring in many of the European countries as a result of the need to comply with the European Union INSPIRE directive. National statistics offices in the European Union provide support for the INSPIRE programme. In many countries, the level of national geospatial capability and collaboration with the geospatial community relates to the specific capabilities of the national statistics office. The maturity of these capabilities varies widely, from national statistics offices just starting to establish spatial systems to those with many years' experience. A common theme in this broad category is that the national

statistics offices understand the value of linking statistics to a location and are working in this direction and together with their spatial agencies to meet the growing demand for such products;

(c) **Separate.** This is where there is a clear separation between the statistical and spatial activities within a country. In these countries, there are separate organizations to meet national statistics and geospatial requirements and there is minimal or no interaction or collaboration between the organizations. The ability to effectively link socioeconomic information to location in a consistent and common way is very limited, although most national statistics offices within this category do understand the need and benefits of such a linkage.

E. Benefits

21. Member States recognize the benefits of linking socioeconomic information to a location. For example, Mongolia indicated that such a link would improve the usefulness of statistics, enable statistics to be more widely used and result in better decisions because of the “where” element being available for decision makers. Other benefits, such as those identified by Egypt, included the ability of Governments to provide more focused (localized) responses when resolving important issues and problems, and those identified by Mozambique, which suggested that “mapping” statistical information resulted in the identification of patterns that were not easily visible through other forms of presentation. Portugal suggested that the geographic dimension enriched statistical data to generate better information that was essential to support Government decisions.

22. There was a considerable level of consistency in the understanding of the benefits of linking socioeconomic information to a location. The field of small area statistics is acknowledged as an area of rapid growth.

F. Common themes and issues

23. The global consultation process has identified a number of recurring themes and issues. Two key issues were identified: statistical geographies and standards. Transformation was a third recurring theme. These are discussed in detail below.

1. Statistical geographies

24. Many national statistics offices have, are developing or plan to develop capabilities to link socioeconomic information to geographic areas. National statistics offices are using existing administrative boundaries and often the hierarchy of those boundaries as their geographic framework (for example: suburban, local government, state/jurisdictional and national boundaries).

25. However, in many cases such boundaries are not permanent and, when changed, result in complications for the national statistics offices, especially for time series. Also, in many cases where administrative boundaries are used, the population numbers within each administrative area are highly variable, since the boundaries have been established for purposes other than for socioeconomic analysis.

26. Geographic boundaries designed around a consistent number of people within each set of boundaries enable a robust base for socioeconomic analysis. Australia, New Zealand and Poland apply a set of hierarchical geographic boundaries, the coverage (area) of which is determined predominantly by consistent population numbers. This provides a mechanism to enable comparisons between geographic areas.

27. In recognition of the variation in population numbers in administratively defined geographic areas, and as a consequence of the inability to easily compare these areas, some countries, such as the Netherlands, are also using regular grids to provide some level of geographic consistency. However, this approach still does not effectively provide comparable population numbers within each grid cell to support socioeconomic analysis.

2. Standards

28. Globally, there is a need for appropriate standards to underpin and support the linking of socioeconomic information to location. This requirement is an important part of the development of location-enabled statistical information. The development of standards would make statistical information more useable and more relevant to a wider range of stakeholders. Bangladesh described the need for such standards to improve the ability to integrate statistical and geospatial information, while New Zealand recommended the establishment of a geospatial statistical integration framework by the Statistics Division. Other countries, including Belarus, Israel, Lithuania, Malaysia, Namibia and Serbia, agreed that standards were an important element in addressing the challenge of linking statistics to a location.

3. Infrastructure transformation

29. Many national statistics offices are already transforming, or are planning to transform, their statistical infrastructure. Countries such as Indonesia and Malaysia are rapidly building statistical infrastructure and capability, while many countries, including Australia and New Zealand, are undertaking significant transformation programmes. These activities provide an opportunity to link socioeconomic information to a location. For example, in Mongolia a business register has been created to underpin the economic statistical system. The addition of a location identifier to this business register also builds geospatial capability enabling better understanding and analysis of business geography. The development of an enterprise data warehouse also provides a key opportunity to incorporate location identifiers into business systems and applications.

III. The future information agenda

A. International drivers

30. There are a number of significant international agendas that are important drivers for the establishment of the link between location and statistics. Some of these international agendas will require access to a very broad range of information in order to foster the development of a realistic understanding of all the dimensions of the issues being faced. The ability to use location as a mechanism for linking much of this often disparate information concerning society, the economy and the

environment provides a significant enabling benefit. Two of the significant international agendas that will benefit from linking socioeconomic information to a location are described briefly below.

B. Post-2015 development agenda

31. As the timeframe for the Millennium Development Goals draws to a close in 2015, the international community is directing its attention towards formulating a new set of goals. The Secretary-General has established the High-Level Panel on the Post-2015 Development Agenda, comprising members of civil society, the private sector and Government leaders, to advise him on the post-2015 development agenda. The United Nations system Task Team on the Post-2015 Development Agenda was established to coordinate preparations for the development agenda beyond 2015 and to support the work of the High-Level Panel. The United Nations Development Group has been requested to organize country and global thematic consultations on the post-2015 agenda as input to expert and intergovernmental processes such as the High-Level Panel. Much of this work has commenced only recently and is still in its formative stages.

32. The ability to effectively link socioeconomic information with a location in a consistent manner will provide a powerful input into the discussions that will take place to inform the post-2015 development agenda.

C. Sustainable development

33. Twenty years after the 1992 United Nations Conference on Environment and Development, countries again gathered in Rio de Janeiro, Brazil, in 2012, to discuss progress towards and commitment to a plan of action for developing and measuring progress in sustainable development. The United Nations Conference on Sustainable Development identified a number of sustainable development themes or priorities, including poverty reduction; food security, nutrition and sustainable agriculture; water and sanitation; energy; sustainable tourism; sustainable transport; sustainable cities and human settlements; health and population; promoting full and productive employment, decent work for all and social protections; oceans; small island developing States; disaster risk reduction; forests and biodiversity; desertification, land degradation and drought; chemicals and waste; sustainable consumption and production; mining; education; gender equality and women's empowerment; and sustainable development goals.

34. Governance processes to take the outcomes of the United Nations Conference on Sustainable Development forward are still being established. However, there is emerging a strong intention that the sustainable development and post-2015 development agendas should converge.

35. Many of the sustainable development themes and priorities cover activities and interests for which a wide range of statistics are already collected. Linking these statistics to a location in a consistent and common manner will further empower what already exists. This will provide a more comprehensive method of comparison and assist in monitoring the effectiveness of mitigation solutions.

IV. Future directions

A. How to link geospatial and statistical information

36. There is overwhelming agreement within the global statistical community that the demand for linking socioeconomic information to a location is growing. Considerable effort is already being made by many national statistics offices to support this demand, and the demand for appropriate standards to support the link is high. Just as our existing statistical systems are underpinned by standards such as the Central Product Classification and the United Nations International Standard Industrial Classification of All Economic Activities, new standards are needed to provide coherence and consistency to spatially enabled statistics. Standards will help increase the usefulness and relevance of statistical information to today's society and societal issues.

37. Providing a location context to information is relevant to all statistical areas, including population, social, economic and environmental areas. Location is a commonly used context for population and social statistics, where comparisons such as urban versus rural, or jurisdictional-level reporting is commonplace. In our statistical systems, macro-micro relationships are a common phenomenon and increasingly, business demography (e.g. business entries, exits and survival rates) and business geography (e.g. business location and business growth areas) are needed. Mapping is becoming commonplace.

38. There is a demand for linking social, population, economic and business statistics to a location and there is a considerable wealth of experience in a number of national statistics offices in this respect. How can this knowledge and experience be leveraged globally? How best to establish a common approach to meet the information challenge?

39. Two main areas of activity are identified in the present review. The first relates to increasing the collaboration between geospatial and statistical communities nationally and internationally. The second proposes a common and consistent way to leverage a geocoded location attribute linked to socioeconomic statistical information.

B. Collaboration

40. To effectively meet the challenge of linking socioeconomic information to location, there needs to be increased collaboration between the statistical and geospatial communities. Both communities are beginning to seek ways to develop this link. Each has its own views on how this can be best achieved and each brings different and relevant expertise to the table. It is important that a collaborative effort be made to avoid having two or more approaches applied.

41. There are a number of activities that can be undertaken to increase collaboration. These include:

(a) **Outreach.** While there are a number of forums discussing geospatial and statistical activities at the international level, there is presently no focused discussion taking place on the specific issue of linking socioeconomic information to a location. Attendance at such forums is also very within-community. For

instance, less than 10 of the delegates at the recent session of the United Nations Committee of Experts on Global Geospatial Information Management came from the statistical community. Convening an international conference that brings together members of the geospatial and statistical communities, that focuses on linking socioeconomic information to a location, would help to establish an effective outreach programme. It would also help identify and address common issues achieving this linkage. Similar events could be held at the national level to promote common understandings between the geospatial and statistical communities within a country. National statistics offices, ideally in collaboration with their national spatial organization, would be well placed to provide this leadership;

(b) **Best practice.** The development and wide distribution of best practice principles is another mechanism for developing a consistent approach to integrating socioeconomic and spatial information. Some countries are well advanced in establishing this linkage and would be able to contribute to the development of best practice principles. The establishment of a section on the website of the Statistical Commission to provide access to best practice principles would help promote best practice;

(c) **Partnerships.** The establishment of formal linkages between geospatial and statistical communities and with relevant organizations seeking similar outcomes would also build collaboration. Such organizations could include the United Nations Committee of Experts on Global Geospatial Information Management and similar standards-based groups. The global analytics community has similar interests and objectives and could be a powerful ally in meeting the challenge of linking socioeconomic information to a location. Furthermore, international developments associated with the modernization of statistics, such as the High-Level Group for the Modernization of Statistical Production and Services,² could consider the nexus between statistics and spatial information as part of the scope of their work. The United Nations Committee of Experts on Environmental-Economic Accounting is another body that could be involved, as there is a strong spatial dimension to environmental economic accounting.

Recommendations

42. Based on the considerations discussed in the paragraphs above, it is recommended that:

(a) An international conference be convened to identify and address common issues relating to linking socioeconomic information to a location, including developing best practice principles;

(b) Linkages between relevant statistical and geospatial organizations be formalized, building on the efforts of the United Nations Committee of Experts on Global Geospatial Information Management activities, and working with other relevant international entities, including the United Nations Committee of Experts on Environmental-Economic Accounting and the High-Level Group for the Modernization of Statistical Products and Services.

² The High-Level Group for the Modernization of Statistical Production and Services was set up by the Bureau of the Conference of European Statisticians in 2010 to oversee and coordinate international work relating to the development of enterprise architectures within statistical organizations.

C. A common linking approach

43. There are obvious benefits to establishing mechanisms to link socioeconomic information to a location, but if each organization or Member State does this in a different way, the full potential of these benefits will not be realized. For example, many countries are linking socioeconomic data to existing administrative boundaries. While there are good reasons for doing this, it limits the ability to undertake effective and consistent socioeconomic analysis within a country and between countries, since these administrative boundaries have very different population numbers even within one country. One country's urban area may be another country's rural area.

44. Ideally, an agreed approach is needed to provide a level of consistency in carrying out this linking activity. With a consistent and common approach, the ability to make realistic comparisons of social and economic activities within a country and between countries becomes possible. This will significantly increase the benefits arising from adding location information to statistics. Furthermore, a consistent approach will simplify the development of computerized tools and applications to support the linking of socioeconomic information to a location. Shared development of such tools can occur, perhaps under the umbrella of mechanisms such as the aforementioned High-Level Group for the Modernization of Statistical Production and Services. Without a consistent approach to linking, the development of common applications would not be practical.

45. An internationally consistent methodology or framework would also provide the economic incentive for commercial developers of relevant software applications to establish tools to meet the need to both create and consume statistics linked with location. Business intelligence and analytics applications, as well as geospatial applications, could add a joint statistics and spatial functionality to their existing suite of tools and applications. If a common approach was supported by such software vendors, their use of a standard within their tools would also help promote the use of the standard and enable the benefits to be more widely applied.

46. There is a range of options for developing a consistent approach to linking socioeconomic information to location. A number of countries, such as Australia, New Zealand and Portugal, have developed approaches, and these should be more closely examined to determine a best practice methodology. For example, the Australian Bureau of Statistics has developed the Statistical Spatial Framework to provide a consistent and common approach to linking socioeconomic information to location via authoritative geocoding methods using a consistent national address database that is based on a standards-compliant framework. The Australian National Address Management Framework is a coordinated national approach to address management. It is a consistent, standards-based framework, which guides the process for verifying addresses and provides a standard for the exchange of address data. The Statistical Spatial Framework builds on the National Address Management Framework and other standards and best practice approaches. Its concepts could help guide other nations and provide the framework to meet the needs of the international community.

47. The Statistical Spatial Framework contains a number of elements that jointly help establish a consistent and structured approach to geographically locating socioeconomic information. These elements include:

- (a) An agreed and common approach to geocoding address information;
- (b) The addition of a geocoded reference (ideally latitude and longitude) in each data record in the data management system;
- (c) The use of a common set of hierarchical geographic boundaries that are based on population numbers, so that each geographic area within each level of the hierarchy contains similar population numbers;
- (d) A common approach to metadata, supporting the statistical metadata needs and providing sufficient spatial metadata details to meet discovery and access needs based on geographic needs;
- (e) A set of standards, guidelines, best practice and, possibly, legislation to support key issues such as privacy and confidentiality of the spatially enabled socioeconomic information.

48. The Australian Statistical Spatial Framework concept is quite simple, with the most complex element being the establishment of the hierarchy of geographic boundaries to provide a level of consistency of population numbers within each area across each level of the hierarchy.

Recommendation

49. Based on the considerations discussed in the paragraphs above, it is recommended that the approach used in Australia through the Statistical Spatial Framework be examined as a possible methodology to guide a common global approach to linking socioeconomic information to a location.

D. Establishing a statistical-geospatial framework

1. International activities

50. In order to provide an effective coordination mechanism to establish an effective mechanism to meet the linking challenge, it is proposed that an expert group be established. The expert group should comprise representatives from the statistical and geospatial communities to help further the ideas and concepts arising from this programme review. The expert group would be best placed to report to the Statistical Commission, while building and maintaining links to the United Nations Committee of Experts on Global Geospatial Information Management.

51. Activities of the expert group could include:

- (a) Development of a global statistical-geospatial framework based on a hierarchy of population-centric geographic boundaries;
- (b) Examination of the Statistical Spatial Framework concept developed by the Australian Bureau of Statistics and proposed by New Zealand, and determination of how this could be internationalized;
- (c) Development of approaches to increase spatial skills and capabilities within national statistics offices;
- (d) Development of communication mechanisms to increase the visibility of spatial activities beyond the Geographic Information System units that exist in some

national statistics offices, and development of essential communication channels to help keep the statistical and geospatial communities aware of developments;

(e) Identification of existing capability development programmes that could be leveraged to include spatial components, including the ability to promote and standardize geocoding processes, methodologies and frameworks;

(f) Development of data management practices enhancing the interface of location-based datasets from multiple sources;

(g) Development of location analytics;

(h) Promotion and sharing of best practices.

52. The expert group would need the appropriate expertise to help develop and refine best practice approaches and provide a mechanism for structuring the statistical-geospatial framework in a manner applicable to all Member States.

Recommendation

53. Based on the considerations in the paragraphs above, it is recommended that a group of experts be established to further the development of a common approach to linking socioeconomic information to a location.

2. Country-level activities

54. A number of countries have developed, or are planning to develop, national statistical plans. The development of these plans provides an opportunity to consider the statistical-spatial linkages, particularly with regard to a country's own development priorities. Furthermore, many countries are developing new information and communications technology capabilities, and it is during this development process that it is easiest to add a spatial attribute capability, including the ability to geocode addresses to facilitate the spatial enablement of statistics. Countries moving from paper-based to electronic systems and those rebuilding their information and communications technology capabilities have an opportunity to include the spatial component. In relation to this the following activities are suggested:

(a) At the national level: leverage existing Government priorities for economic growth, societal well-being, human development and environmental sustainability and work with Governments on transformation and economic development plan activities, linking to governmental priorities where a location attribute will empower statistics, resulting in better decisions for society;

(b) National statistics offices:

(i) Add geospatial capabilities to new information management infrastructure development, including data warehouses, collection tools and dissemination capabilities, and ideally implement the capability to provide latitude and longitude with each unit level record;

(ii) Look at developing statistically focused spatial training activities.

Recommendations

55. Based on the considerations in the paragraphs above, it is recommended that:

(a) In developing national statistics plans, countries be encouraged to consider the possibilities for linking statistical and spatial information, consistent with their development priorities;

(b) As national statistics offices undertake information management infrastructure transformation activities, consideration be given to adding geospatial capability, including the geocoding of addresses.

V. Points for discussion

56. **The Commission may wish to express its views on:**

(a) **The benefits of the statistical community linking its information to a location, as outlined in sections I and II above;**

(b) **Recommendations and actions on increasing collaboration between the spatial and statistical communities, as proposed in section IV.B above;**

(c) **Recommendations and actions on developing a statistical spatial framework as an international standard for the integration of statistical and spatial information, as proposed in section IV.D, and on the establishment of an expert group.**

Annex

Countries that responded to the global consultation questionnaire

Austria
Australia
Azerbaijan
Bangladesh
Barbados
Belarus
Botswana
Cape Verde
Chile
Colombia
Croatia
Cuba
Cyprus
Czech Republic
Dominican Republic
Ecuador
Egypt
Estonia
Finland
France
Germany
Ghana
Hungary
Israel
Iran (Islamic Republic of)
Italy
Japan
Jordan
Lithuania
Madagascar

Malaysia
Mexico
Mongolia
Mozambique
Namibia
Netherlands
New Zealand
Poland
Portugal
Republic of Moldova
Romania
Serbia
Seychelles
Singapore
Slovakia
Slovenia
Swaziland
Sweden
Switzerland
Ukraine
United Arab Emirates
United States of America
State of Palestine
