



Distr.: General

E/ECA/GGIM-A/1/1

3 November 2014

Original: English

**UNITED NATIONS**  
**ECONOMIC AND SOCIAL COUNCIL**  
**ECONOMIC COMMISSION FOR AFRICA**

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United Nations Initiative on Global Geospatial  
Information Management in Africa (UN-GGIM: Africa)

First session

Tunis, Tunisia  
10-12 December 2014

## **Draft African Action Plan on Geospatial Information**

### **Executive summary**



## **I. Introduction**

1. Following extensive consultation with geospatial experts from Member States, the Economic and Social Council considered the Secretary General's report (E/2011/89) and adopted resolution 2011/24 to create the United Nations Committee of Experts on Global Geospatial Information Management. The United Nations Global Geospatial Information Management (UN-GGIM) initiative was established to create a formal geospatial information coordination mechanism involving Member States as the key stakeholders.
2. Such initiatives have recognized the significance of geospatial information in almost every area of government, commerce, academia and societal development. It is important to note that from the most local level, factors contribute to or have some effect on a broader scale to subnational events. This in turn influences national and subregional incidents, which continue to the regional level and ultimately contribute to global consequences, otherwise referred to as "the butterfly effect". Geospatial information is a means to track, monitor and analyse any occurrence that has a location or temporal element, and more importantly to look forward, creating models and analysis of potential consequences from policy and events.
3. To achieve optimum results from geospatial information requires content to be available in a format able to be consistently applied to datasets at the next level. Interoperable geospatial information relies upon common frameworks, standardization and compliance adopted at every tier. Such a task is beyond any single nation or even region, and it is for these reasons that UN-GGIM was established.
4. To date, regional entities contributing geospatial information to the global level have been initiated for all populated areas except Africa. The creation of UN-GGIM: Africa will build on the important efforts of CODIST-Geo, while simultaneously enriching the development and transparency of individual nations and Africa as a whole. These outcomes will ultimately benefit the African people through, among other things, better health care, infrastructure development and improved education.
5. Strategic guidance extended by the global initiative will be essential in implementing UN-GGIM: Africa, but the African entity will be able to mould policy suited to African issues and ensure that national bodies are capable of addressing their unique concerns.

## **II. Conclusions**

6. Geospatial information products, analysis and applications are essential to African development at all levels and as a contributor to issues from the global perspective. To achieve this requires a coordinated approach adopting common regional standards, in line with international policy. A sound methodology is required, which can be developed by referring to the experiences and efforts of organizations, such as UN-GGIM, and building on past efforts, such as CODIST-Geo.

7. The most critical point of this, or any effort, is setting realistic goals and achieving them in a timely manner in order to build confidence and gain respect. This will aid in attracting the funding required to drive the efforts, maintain support and gather momentum.

8. Although this is a daunting initiative, the effort is not commencing from a base of zero. A number of geospatial programmes from international through to local levels have or are being implemented. Those efforts can also serve as sources of guidance, thereby making the task much less onerous.

### **A. People and skills**

9. The number of individuals with relevant geospatial skills in Africa and the numbers required are unknown. These details must be determined for planning purposes and establishing strategies.

10. Some institutions within Africa offer high-level geospatial science training. However, more need to offer programmes with the highest standards to attract international students at all levels. In concert, geospatial research and development should be raised to international levels to gain such recognition.

11. Awareness training on what geospatial information is and how modern society utilizes it must be provided to all facets of society from primary school through to the general public and into the highest government offices.

### **B. Data**

12. Geospatial analysis requires sound data to be applied to the situation. As this data feeds upwards from one level to the next, several elements must be present:

(a) Useful – the data should be relevant and of a currency functional to the desired application;

(b) Standardized – interoperability of datasets is key to a successful geospatial programme;

(c) Discoverable – users must be able to locate the data to minimize duplication of efforts;

(d) Accessible – once a dataset is identified as potentially useful, it must be available to potential users.

## **1. Fundamental data themes and datasets**

13. To align with and contribute to international efforts, the UN-GGIM fundamental datasets should be adopted. These datasets have already taken into account the work of CODIST-Geo in this area.

14. Additional datasets may be added if proven intrinsic to the African situation. National mapping authorities can similarly expand the number and types of fundamental geospatial datasets based upon national interests, providing that the original list is maintained. Although entirely permissible, caution should be exercised with the addition of datasets, bearing in mind the extra burden that will ultimately be imposed upon individual national geospatial authorities.

15. The existence of freely available definitive datasets negates the need for projects to recollect, collate or create non-authoritative datasets. This saves funds in the tangible sense, but simultaneously yields a superior analysis and therefore facilitates better informed decision-making.

16. Second Administrative Level Boundaries (SALB) are identified by most studies as a fundamental dataset. As such, it would be logical for the African SALB initiative to be incorporated within UN-GGIM: Africa.

17. Similarly the gazetteer of the United Nations Group of Experts on Geographical Names can be used as a source for a single definitive dataset covering a theme universally acknowledged as vital.

## **2. Inventory**

18. Following the identification of the fundamental datasets, an African inventory should be conducted to ascertain what exists, its currency and the efforts required to align it to the adopted standards, as well as to appraise the data gaps.

## **3. Catalogue**

19. A functional African geospatial data catalogue requires an application permitting search, discovery and assessment of available datasets. Development and population of the catalogue can only commence once the fundamental datasets are identified, a detailed inventory compiled, required standards are confirmed and metadata fully populated.

## **C. Technology**

20. Although UN-GGIM: Africa has little influence on the direction or rate of advancement in the technology arena, it should monitor and evaluate such changes to ensure that opportunities are fully exploited. Therefore, the establishment of a working group to cover this area may be advisable.

## **D. Infrastructure**

21. Robust geodetic infrastructure is intrinsic to ensuring accurate and reliable geospatial data. The African Geodetic Reference Frame initiative, commenced by CODIST-Geo, serves as the foundation for this in Africa and therefore should be incorporated into UN-GGIM: Africa.

## **E. Standards**

22. The adoption of standards is paramount to ensuring compatibility and interoperability between all levels of geospatial information. To fully align with the global initiative and minimize effort, the direct application of internationally agreed standards and protocols to the regional and national levels is a logical path.

23. Standards for both metadata and a searchable data catalogue are required before the task of building appropriate functionality can begin.

## **F. Management and governance**

24. Policies related to geospatial information management and governance must be aligned with national efforts, while taking into account international perspectives. Those set by UN-GGIM, regional entities and national sources can be used as examples in this endeavour.

25. Legal issues may have severe ramifications on geospatial governance and as a consequence should be monitored closely.

26. The possibility of exploiting private-public partnerships, as well as utilizing sources such as foreign Governments, United Nations organizations and non-governmental organizations, should be vigorously investigated. Additionally, a fine line may need to be drawn between benefits and conflict of interests. Copyright and liability issues are of particular concern, requiring careful monitoring.

## **G. Funding, sustainability and awareness**

27. The issues of funding, sustainability and awareness are dependent on one another. Numerous geospatial initiatives have commenced within Africa over the years, with many of them failing to realize their full potential or be sustained. There are many reasons for this but ultimately it can be attributed to an inability to secure necessary funding or support, which in part is reliant upon making stakeholders aware of the potential benefits.

28. A paradigm for initial and sustainable funding is therefore key to implementing this initiative. If sufficient support is not secured, UN-GGIM: Africa is in danger of becoming another of those programmes that promises a lot but just fades away, injuring the significant role geospatial information could provide to the African development agenda. Critical for successful implementation is the setting and achievement of realistic goals, followed by honest reporting and clear explanations as to how they ultimately affect life in Africa. While it is easy to promote what geospatial information can do for Africa or an individual country, the management of expectations within allocated resources must be carefully balanced.

29. Funding is required not only for organizing substantive meetings, but also to work at the grass-roots level to ensure that infrastructure is maintained, education is enhanced and other areas developed.

30. As demonstrated, the presence and utilization of geospatial information at the community level has become extremely pervasive and is growing. It is the responsibility of the geospatial community, therefore, to raise and maintain awareness about where this data come from and why they must be constantly updated to be effective and efficient. The benefits arising from geospatial information must be communicated to feed into the sustainability and funding aspects of the initiative.

## **H. Initiatives**

31. A number of solid initiatives pertaining to geospatial information have been initiated in Africa. These need to be identified to ensure that UN-GGIM: Africa cooperates with them to become more effective in working towards common goals .

32. Several ongoing initiatives are beneficial to geospatial information utilization within Africa. Among them are UN-GGIM, the Second Administrative-level Boundaries project, the Regional Centre for Mapping of Resources for Development, the African Geodetic Reference Frame, the United Nations Group of Experts on Geographical Names, the Global Earth Observation System of Systems and the United Nations Programme on Space Applications, which is being implemented by the United Nations Office for Outer Space Affairs. Collaborating with those initiatives would greatly enhance the development of geospatial information on the continent.

33. Outdated or sidelined initiatives need to be examined to determine if they have any data, policies or aims that are worth revitalizing.

### **III. Recommendations**

34. The following are recommendations regarding the establishment of UN-GGIM: Africa:

(a) UN-GGIM: Africa should be established as the successor to CODIST-Geo with the aim of coordinating African geospatial development and contributing to the wider global initiative;

(b) Working groups should be set up within UN-GGIM: Africa with the mandate to concentrate on themes directly affecting geospatial development. Taking into account the experiences of other regional UN-GGIM entities, the number of working groups should be limited and their scope should be defined based on what is achievable within specified time frames and most beneficial to the initiative. In a constantly advancing arena, other areas should be kept abreast of and points noted for when they are activated;

(c) The scope and objectives of each working group should comply with the UN SMART mnemonic, or similar methodology, to ensure that expected outcomes are defined and attainable.

35. With regard to the last recommendation, carrying it out successfully will show that UN-GGIM: Africa is serious about becoming a functional and sustainable institution. Owing to the interlaced nature of the issues, a detailed analysis is required to determine the following: which topics are reliant upon input from other areas and therefore should be given precedence; which topics can operate simultaneously; and items not requiring immediate attention.

36. A number of these topics and their content have been examined by other UN-GGIM entities and national and international organizations. Full advantage should be taken from such work to the point in which simple adoption or modification can offer tangible results quickly.

37. Possible working group titles, topics and points are included in the annex. These are by no means exhaustive or definitive. Input is being sought from all members to ensure that pertinent points are included.



## **Annex**

### **Working group topics**

#### **I. Education and awareness**

##### **A. Education**

1. The following are suggested tasks for a working group on education:
  - Inventory of educational institutions offering geospatial science education, including:
    - Curricula
    - Facilities
    - Student numbers
  - Identify current numbers of geospatial specialists in Africa;
  - Identify future African requirements for professionals in fields related to geospatial information;
  - Develop means for monitoring standards and providing assistance, when necessary.

##### **B. Awareness**

2. The following are suggested tasks for a working group dedicated to building awareness:
  - Identify target audiences for awareness campaigns along with the appropriate language level and tone, as well as transmission channels;
  - Create an awareness campaign for geospatial and everyday users;
    - Newsletters
    - Conferences
    - Awards

#### **II. Data**

3. The following are suggested tasks and information for a working group on data:
  - Determine the fundamental data sets required, taking into account the African context
  - An inventory of spatial data should examine what exists and how it fits within the fundamental data sets or other categories
  - Consider all data sources, including non-governmental organizations, United Nations agencies, Governments and archives

- Some data will need to be modified to be usable, such as hardcopy maps, which need to be scanned and orthorectified; other data may not be in an Open Geospatial Consortium-compatible format. In such cases, cost estimates are needed
- All data must have metadata to be usable in the long term and searchable through a catalogue system. The establishment of metadata standards could be mandated to a data or policy working group

### **III. Technology**

4. Technology is a key driver of geospatial science. To develop and realize the potential of African geospatial information, there is strong need to remain highly cognizant of the latest advances in technology, including the implications and possible benefits for geospatial information management that may arise from them.

### **IV. Infrastructure**

5. The development of geodetic infrastructure is critical within the geospatial development context. While this is partly under the direction of the African Geodetic Reference Frame initiative, there is still need for national-level and below geodetic infrastructure.

### **V. Standards**

6. A working group on standards should consider the following:
- Integration with UN-GGIM and other regional entities
  - Compliance with ISO/OGC wherever possible
  - Compatibility with national standards when possible, or making recommendations to the national bodies to become compliant with UN-GGIM and ISO/OGC<sup>1</sup> standards
  - Prior to starting the initial efforts related to data collection (inventory, metadata and a centralized catalogue), these standards must be finalized

### **VI. Management and governance**

7. Policy is a large part of management and governance. When formulating policies on this topic, the African element must take into account the middle tier and the need to integrate policies on management and governance with national and global level policies.

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<sup>1</sup> ISO is the International Organization for Standardization. OGC is the Open Geospatial Consortium.

8. Other issues need to be considered, such as pricing policies, data exchange, public-private partnerships and ethics.

## **VII. Funding, awareness and sustainability**

9. A working group that deals with issues related to funding, awareness and sustainability should do the following:

- Examine means of achieving consistent funding from sources, and any ethics issue that may be associated with that source
- Examine means of administering collected funds, financial statements and auditors, and consider the possibility of setting up a trust fund administered by the Economic Commission for Africa

## **VIII. Initiatives**

10. A working group on initiatives should do the following:

- Identify geospatial initiatives that are currently in place in Africa and ascertain how GGIM: Africa can work in concert with their efforts, while allowing them to operate independently within their own mandate.
- Follow up on efforts that may be sitting on the shelf and awaiting revival, as they can be sources for data recovery, among other things.