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Enabling a legal and policy framework for geospatial information utilization in Africa

I. Introduction

1. Legal and policy frameworks play a critical role in geospatial information utilization. A comprehensive and transparent framework can enable the collection, use, storage and distribution of geospatial information in a country. On the other hand, a legal and policy framework that contributes to stifling the collection or use of geospatial information throughout a society or that is vague and incomplete, can have the opposite result. Over time, countries that operate with these restrictive legal and policy frameworks will be on the wrong side of the geospatial divide.

2. A legal and policy framework that enables the utilization of geospatial information has many elements, and each will have advantages and disadvantages. Countries will require a framework that is suited to their own unique legal systems, institutions, histories and cultural and societal norms. It is therefore important to understand the strengths and weaknesses of each element when developing such a framework, taking into consideration that the importance of each element will vary between countries.

3. Some aspects of a legal and policy framework will clearly apply to the utilization of geospatial information. These include laws that deal with a nation's spatial data infrastructure, such as the South African Spatial Data Infrastructure Act of 2003. There are other aspects of law that may be less obvious. For example, laws relating to intellectual property rights, data protection and privacy and national space programmes will have a significant impact on the collection and use of geospatial information. It is therefore necessary to consider a wide-range of laws and policies when creating a suitable framework.

4. In addition, it is important to recognize that a legal and policy framework that supports geospatial information utilization must extend beyond national or federal laws and policies. There are many international, regional and local laws and policies that must be considered in terms of how they will affect a country's utilization of geospatial information (e.g., international treaties and regional agreements and the data policies of cities). Similarly, data-sharing agreements or licence agreements can apply between two government agencies, between a government agency and a commercial enterprise or between two businesses. All such agreements must be considered, given that they will affect geospatial information utilization in a country.

5. When considering the development of a legal and policy framework for geospatial information utilization, another factor to recognize is that the geospatial ecosystem consists of more than just the government. Government agencies, industry, citizens, non-governmental organizations (NGOs) and universities all play crucial roles. Most are both data collectors and data users, often simultaneously. Accordingly, when considering a framework, a country must remember that a law or policy that restricts the ability of one part of this ecosystem to collect or use geospatial information will invariably have an impact on the other parts of the ecosystem.

II. Essential elements of a legal and policy framework

6. There are a number of elements that are essential when considering a legal and policy framework that enables a country to utilize geospatial information. These elements include laws, regulations, decrees, executive orders, policies, treaties, norms, best practices, contracts, licences and data-sharing agreements.¹ The extent and type of these elements will vary between countries, depending in large part on the type and extent of the country's legal system. Each element will have strengths and weaknesses, and, in general, each will play a key role in the overall framework.

A. Laws and regulations

7. There are many types of laws, decrees and executive orders, among others,² that can have an impact on the utilization of geospatial information in a country. Such laws can be used to tackle a wide range of issues and apply to a number of government agencies. Others can be tailored to a specific matter or office.

8. Regulations or rules³ are issued by government agencies, under the authority given to them by executive order or by legislation. Given that regulations have the force of law, they can also be an effective tool to promote geospatial information utilization. They can, however, take a long time to become effective. Most government agencies are reluctant to take on new responsibilities without extra funding. In addition, government agencies are often reluctant to be too forward leaning, especially with regard to innovative technologies, without clear guidance from leadership.

9. Once a law is passed or a regulation is published, it can be very difficult to modify or update. Given the rapid advancements in the technologies that collect and use geospatial information and the increasing number of applications that use this information, outdated laws and regulations could soon limit geospatial information utilization. For example, the potential for using drones to collect vast amounts of high-quality geospatial information in a timely and affordable manner is well understood. Governments, however, are struggling to adapt their current laws and regulations that will enable the use of this exciting new technology, while continuing to deal with legitimate concerns such as air safety and privacy.

¹ The terms used to define the elements of a legal and policy framework will vary among nations.

² For the purposes of the present paper, these will collectively be referred to as "laws".

³ For the purposes of this paper, regulations and rules will collectively be referred to as "regulations".

B. Agreements

10. Contracts and other forms of agreements between parties, most of which are legally enforceable, can be an element of a legal and policy framework that enables the utilization of geospatial information. These include contracts, licence agreements and data-sharing agreements. For example, a government agency may enter into a licence agreement to acquire the rights to satellite imagery from a commercial provider. Alternatively, one government agency may enter into a data-sharing agreement with another government agency as part of a spatial data infrastructure initiative. One of the benefits of agreements over laws and regulations is that they often take less time to negotiate and sign and are much easier to change or update in order to deal with changes in technologies or applications.⁴

11. Notwithstanding the benefits of such agreements, they do have several limitations. One limitation is that they are normally enforceable only between the organizations that enter into them. In addition, agreements will, in general, terminate after a specific period of time, after which they must be renegotiated. As a result, although they play an important role in a legal and policy framework, their role can be limited.

C. Policies, norms and best practices

12. There are other elements in a legal and policy framework that do not have the force of law. These can include policies, standards, norms and best practices. While these elements may not be enforceable under law, they do play an important role in the utilization of geospatial information in a country, and, in time, these informal elements can become law.

13. Standards are another example of a non-legally binding mechanism that can affect a legal and policy framework. For example, the Open Geospatial Consortium has published standards that facilitate the sharing of geospatial information between organizations. The adoption of informal policies by several key government agencies that promote the use of standards can result in broader adoption throughout a country. In addition, government agencies can include these standards in any procurements or contracts, further promoting adoption.

14. These informal elements of a legal and policy framework are much easier to develop and carry out than laws and regulations and can remain in force longer than an agreement. In addition, they are the easiest to modify to adapt to new technologies or issues. These advantages notwithstanding, they do not have the force of law. In general, they also cannot be enforced in a court. Furthermore, they usually apply only to a limited group, but peer pressure and the marketplace (e.g., including standards in contracts) can sometimes be used to increase their adoption.

III. Laws and policies at all levels affect legal and policy frameworks

15. There is a tendency to think only about national laws and policies when considering legal and policy frameworks. While national laws and policies do play a vital role, it is also important to consider how international, regional and

⁴ Treaties are another example of a type of agreement that can be legally enforceable, although negotiating treaties can often be lengthy.

subnational laws and policies affect the utilization of geospatial information in a country.

16. At the international level, there are several international treaties that have a direct impact on geospatial information utilization. For example, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, commonly known as the “Outer Space Treaty”, was signed by a number of African nations and includes provisions that directly affect satellite earth observation.

17. There are also less formal international obligations that should be considered, such as the Principles Relating to Remote Sensing of the Earth from Outer Space, adopted by the General Assembly in its resolution 41/65. Unlike a treaty, for example, it is not a binding instrument. Many countries have agreed to abide by less formal international obligations, which, as a result, carry a great deal of weight. It can be easier for countries in a region to tackle legal and policy issues, given the familiarity and similarities of their legal systems.

IV. Critical aspects of a legal and policy framework for geospatial information utilization

18. There are numerous legal and policy issues that can have an impact on the utilization of geospatial information in a country. Some are more general, such as funding, governance and accountability, while others relate more directly to the collection, use, storage and distribution of geospatial information. These issues include licensing and certification, standards, training and data-sharing between government agencies. While there are others that are equally important, because they do not relate directly to the availability and use of geospatial information they are overlooked. These include issues such as privacy, intellectual property rights and national security. When developing a legal and policy framework for geospatial information utilization, it is necessary to consider all these aspects.

A. Designation of lead organization

19. One of the obvious considerations is a law or policy that designates a lead organization to be primarily responsible for geospatial information utilization in a country, which has the authority to coordinate activities between the various stakeholders. In addition, it should be the focal point on budget and finance issues. Without a lead organization, it is difficult for a country to both initiate and follow through on geospatial information initiatives. The organization is usually a government agency, such as a land registry, a national mapping agency or in some cases, a military agency. The lead organization does not need to be a single government agency, but can consist of several government ones.

B. Financing

20. Financing is another critical issue that must be considered in a legal and policy framework. Appropriate financing must be in place for government agencies not only to collect geospatial information, but also for maintenance, storage and making it available to third parties. Costs to be considered include hardware, software, training and all the other aspects typically associated with operating a government programme.

21. Similarly, a legal and policy framework should allow for companies in the private sector to make sufficient profit to invest in the collection and use of geospatial information. Such a framework should include adequate protection for intellectual property. In addition, it should preclude government agencies from competing with industry.

C. Governance and data collection

22. Another matter that has a direct impact on geospatial information utilization and that is usually contained in a legal and policy framework is whether a specific government agency or private sector party (i.e., licensed or approved by a government agency) has exclusive authority to collect specific types of geospatial information. There are several reasons why the collection of geospatial information may be limited to entities that have been approved. For example, national mapping agencies or some military departments may wish to be responsible for collecting specific types of information for national security purposes. Alternatively, it may be important for licensed surveyors to collect detailed types of authoritative mapping data.

D. Data-sharing and licensing

23. The data-sharing and/or its licensing of geospatial information collected by government agencies is a critical issue that should be considered when dealing with a legal and policy framework for geospatial information management. One consideration is the sharing of geospatial information between government agencies. For example, in order for geospatial information to be fully utilized, government agencies must be willing to share information. Such sharing must be with other national government agencies, subnational government agencies and international organizations. Over time, as data-sharing becomes more accepted, it will be easier to develop legislation that mandates such sharing, which should include many of the details that are in memorandums of understanding or agreements, such as the type of geospatial information to be shared and under what conditions.

24. Geospatial information can be licensed under a number of open data licences.⁵ A licence is a complex legal document that needs to balance the needs of the user (the “licensee”) with the data provider (the “licensor”). If a licence is too restrictive (i.e., provides the licensor with too many protections), then the licensee may not be able to generate the value necessary from its use. On the other hand, a government agency may worry that, if the licence is too permissive (i.e., the licensor has limited protections), then it will be held liable for any damages that occur through the use of the geospatial information. In developing a legal and policy framework for geospatial information, it is important to consider both the risks and benefits, even if the data are open.

⁵ Examples of open licences used for geospatial information include Creative Commons licences (<https://creativecommons.org/licenses/>), a database contents licence (<http://opendatacommons.org/licenses/dbc/1.0/>), an open data factual information licence (www.opencontentlawyer.com/open-data/open-data-commons-factual-info-licence/), an open data use licence (India) (https://data.gov.in/sites/default/files/Government_Open_Data_Use_Licence_India.pdf), an open database licence (v1.0) (<http://opendatacommons.org/licenses/odbl/1-0/>), an Open Government licence (Canada) (<http://open.canada.ca/en/open-government-licence-canada>) and German Geolices (www.bmwi.de/Redaktion/DE/Artikel/Digitale-Welt/geolizenz.html). The following website claims to assist organizations in choosing an open licence: <https://choosealicense.com/appendix/>.

E. Intellectual property rights

25. Geospatial products and services are increasingly created by combining geospatial information from a variety of sources. In many cases, these data sets will be subject to diverse licensing terms. Accordingly, a legal and policy framework that clarifies the intellectual property rights with regard to geospatial information is likely to increase its utilization. For example, such a framework should help to clarify which, if any, geospatial products are protected by copyright. Such protection could be included in the Berne Convention for the Protection of Literary and Artistic Works, contained in a country's constitution or covered by decisions of applicable courts.

F. Privacy

26. As geospatial technology applications increase, so have the concerns of the general public with regard to location privacy. This is part of a larger global trend to protect personal information that can be used to identify an individual. Increasingly, government regulators are recognizing the power of geolocation information. Consequently, there are a number of initiatives to regulate its collection and use.⁶ While these initiatives do not include traditional geospatial information (e.g., satellite and aerial imaging and mapping technologies), and as capabilities to collect geospatial information becomes more possible with new technologies (e.g., drones and mobile devices), there is a greater likelihood that these initiatives will be caught up in this broader trend of protecting personal information. Even if traditional geospatial information is not regulated, there is a risk that broad data protection laws may limit the ability of the geospatial community to have access to and use of the vast amount of new geospatial-enabled information being collected.

27. According to an article published in 2018, “only 23 out of 55 nations in Africa have passed or drafted personal privacy laws and only 9 of them have data protection authorities”.⁷ A growing push for data protection is expected in Africa as laws are promulgated in other countries. For example, Kenya was expected to draft a data protection law in mid-2018.

G. Liability

28. As applications that utilize geospatial information grow, so will the legal disputes over the misuse and the quality of data. Consequently, it is important to clarify how a legal and policy framework will tackle issues associated with liability. For example, in some countries, government agencies are protected by sovereign immunity (i.e., they are immune from being sued for action that they take that relative to their governmental function). Such protections can be included in a country's constitution or in its laws.

H. National security

29. Government officials at all levels are concerned that the broad availability of specific types of geospatial information is a risk to national security. This is due

⁶ See, for example, the General Data Protection Regulation of the European Union and the California Consumer Privacy Act of 2018.

⁷ Abdi Latif Dahir, “Africa isn't ready to protect its citizens' personal data even as EU champions digital privacy”, Quartz Africa, 8 May 2018.

in part to the fact that, in many countries, geospatial technologies were initially developed by or for the defence and intelligence communities. As a result, these communities tend to be wary of new geospatial technologies or new applications that use geospatial information. While such apprehension is understandable, given the agencies' mandates, as described above, overly restrictive laws and policies that are intended to limit the collection and use of geospatial information for national security purposes will have much broader consequences. Accordingly, as with data protection and privacy laws, the geospatial community should actively participate in efforts to restrict the collection and use of specific types of information to make sure that any laws and policies are narrowly tailored.

V. Legal and policy frameworks affect entire the geospatial ecosystem

30. Recognizing that the geospatial community is an ecosystem is important when considering a legal and policy framework, given that a law or policy that affects one set of stakeholders in the ecosystem will often affect others. For example, if a nation's laws restrict the right to collect specific types of geospatial information from government agencies, then a country will likely be unable to take full advantage of all the other technologies that allow citizens to collect geospatial information.

31. Geospatial information and the products and services that utilize this information are often valuable to government agencies. For example, both citizens and industry can provide details on traffic and road conditions that can be valuable to transportation agencies. Such information will also be important for "smart city" initiatives. If industry is not permitted to collect or share geospatial information because of privacy concerns, then the geospatial information will not be available.

VI. Identifying and tackling gaps

32. In order to develop a legal and policy framework for geospatial information utilization, it is important to understand the current framework of a country. The first step that a government should take is to conduct a gap analysis, consisting of three parts. First is the current legal and policy framework regarding geospatial information and how it helps to bring about or hinder utilization. Second, the utilization of geospatial information at the national and subnational levels must be increased, including how it can be done. This stage includes identifying new measures that facilitate the collection and use of geospatial information and examining the aspects that hinder such collection and use. Lastly, considering how best to effectuate these changes could include the development of a law or to have something more informal (e.g., a policy) or more direct (e.g., an agreement).

33. It is useful to bring together representatives of stakeholders throughout the country's geospatial ecosystem in order to identify the gaps. This "geospatial council" should consist of both users and data providers from industry and governments, lawyers and representatives of the academic and research communities and NGOs. Their first task should be to create a broad range of questions that need to be asked to identify what gaps exist. The following list provides an example of the types of questions that should be considered:

(a) Is there a law or policy that identifies a lead organization for geospatial information management in the government?

(b) Has the country entered into any treaties or regional agreements that could affect the utilization of geospatial information?

(c) What rights do subnational governments have to regulate the collection, use, storage and distribution of geospatial information?

(d) Are there laws and regulations that specifically restrict or regulate the collection of geospatial information, including the relevant platforms and sensors?

(e) Are there laws, regulations, policies and other similar systems that specifically restrict or regulate the use, storage and distribution of geospatial information?

(f) What intellectual property protections do geospatial products receive?

(g) Is there a data protection law? If so, does it include geospatial information?

(h) Are there laws or policies that limit the collection or use of geospatial information for national security purposes?

(i) How is data shared between government organizations? Are there laws, regulations or policies that affect such sharing? Is there a standard data-sharing or license agreement used between government agencies or the private sectors (e.g., industry, the public, NGOs and universities)?

34. The next step is to identify the gaps between the current legal and policy framework and the desired framework. Again, this is best dealt with by a geospatial council that includes the entire geospatial ecosystem. These gaps should be considered in two ways: (a) ascertain what laws and policies are needed to enable the collection, use and sharing of geospatial information; and (b) identify what changes should be made to the current laws and policies that limit the collection, use and sharing of geospatial information.

35. The geospatial council should also determine how best to tackle the gaps. One way to approach this is to think of the elements of a legal and policy framework as tools in a toolbox. The council should consider which tool (e.g., law, regulation, policy, best practice and agreements) would work best to tackle the gaps. For example, does an informal policy work or is a law or regulation required? It is helpful to consider how other countries have approached these issues and then try to tailor that approach to the country's current legal and policy framework.

VII. Conclusion

36. A legal and policy framework for geospatial information utilization consists of a number of elements, each of which plays an important role in a broad range of issues that must be dealt with. In developing a framework, countries must consider international, regional, national and subnational laws and policies. They should also take into account how the framework will affect the entire geospatial ecosystem.

37. One of the challenges in developing a legal and regulatory framework for geospatial information utilization is that the technologies used to collect and process geospatial information and the applications that utilize geospatial information are undergoing tremendous changes. For example, cloud computing, drones and small satellites are having a radical impact on the geospatial community. In the future, the "Internet of things", machine learning and autonomous vehicles are all likely to have a significant impact on the collection, use, storage and distribution of geospatial information. It is important for a country to be prepared

for such technological advancements and to therefore “future-proof” the legal and policy framework so that it does not quickly become outdated.

38. It is critical to understand that legal and policy frameworks do not operate in a vacuum. Such frameworks must complement a country’s current legal and policy framework. Otherwise, it will not be sustainable.
