Friend or Foe? Open Data Initiatives and National Spatial Data Infrastructure (NSDI)

Kaspar Kundert
kasparjkundert@gmail.com

AfricaGIS, 18-22 November 2019, Kigali
Abstract

While some still claim Africa is the continent of no data, others talk about a data revolution and hail data as the new oil. Not a year passes without new buzzwords being hyped, only to leave us wondering why – despite all the Data Cubes, Big Data, Open Data, and National Spatial Data Infrastructures – we still have difficulties accessing data we need for our daily work.

This paper compares data initiatives on the African Continent and particularly in Rwanda during the last decade, highlighting their origins, custodians, differences and complementarities, and their common challenge: Sustained funding.

Sub-Saharan African countries often receive funding for the development of data portals. Elaborating on the fundamental economies of data, the author will explain, why data needs operational expenditures by the African Governments and why generous investments into software developments, platforms and other kinds of capital expenditures by themselves will never be enough to ensure permanent access to all the data we need to develop our countries in a sustainable and ecological way.

While the paper will focus on spatial data and the examples given will be map-centric, the points made are applicable to most other types of data too.
Content

+ Introduction
+ Looking back
+ Friend or Foe? Open Data Initiatives (ODI) and National Spatial Data Infrastructures (NSDI)
+ Is Spatial Data available and accessible in Sub-Saharan Africa?
+ The Economies of Investments into IT-Systems and Data
+ Conclusion: Be Smart – Focus on Data
Open Data compliant?

+ PDF containing tables of data is shared on a Government Internet Portal **No:** A PDF is not (easily) modifiable
+ Data only to be published on Internet Portals built using Open Source Software / Products
+ Downloadable Excel files restricted «for educational use only» **No:** Favoring or discrimination of a particular use is not allowed
+ The Military does not disclose the locations of their barracks **Yes:** Open Data stops where National Security…..
+ The Land Office makes parcel boundaries and identifiers downloadable, but not the owners of the parcels … or Privacy starts
Introduction II: Spatial Data Infrastructure

+ A (national) spatial data infrastructure (SDI) is a data infrastructure implementing a framework of geographic data, meta data, users and tools connected in order to use spatial data in an efficient and flexible way*
+ Another definition is the technology, policies, standards, and related activities necessary to acquire, process, distribute, use, maintain, and preserve spatial data*
→ An SDI is about organizing Information to make it useful for gaining Knowledge**
→ Data is Infrastructure (the descriptive part of Infrastructure)

** while a GIS turns data into information (establishing context, spatial relationships)
Looking back (I)

+ October 2006: CGIS-NUR/NISR/President’s Office: Towards a Spatial Data Infrastructure in Rwanda, Workshop
+ April 2008: RITA: National GIS Portal, Workshop
+ Fall 2009: Presentations and Meeting at President’s Office re NSDI
+ December 2009: Launch of Metadata Portal by CGIS-NUR
+ August 21-23, 2013: 1st National Geo-Information Committee Workshop
+ December 2013: Concept Paper / Roadmap defining 28 steps for the Establishment of NSDI in Rwanda is circulated and commented by Stakeholders
+ February 2014: One Week Metadata Training in Musanze (by RCMRD)
+ June 2014: Revised and corrected Concept Paper circulated by RNRA
Looking back (II)

+ Nov. 26, 2014: RNRA (today RLMUA) launches National Land Use Planning Portal
+ July 26/27, 2015: RNRA (today RLMUA) launches the first Rwanda Geoportal
+ June 2016: Open Data Policy Consultative Workshop
+ April 2017: Rwanda adopts the National Data Revolution policy
  > Big Data and Open Data
  > States that data is open by default
  > To be implemented by the National Institute of Statistics
+ Nov. 2016: Smart Rwanda Masterplan
+ May 2017: Transform Africa Summit: Smart Cities Fast Forward
+ Summer 2017: Sweden and since 2019 South Korea offer support to implementing an NSDI
The ODI / NSDI / Smart Initiatives Hype Curve

* Own diagram according to the logic of the Gartner Hype Cycles for emerging technologies based on Rwandan Events
Friend or Foe (I): Some Differences

+ Open Data: Not limited to Geographical (spatial) Data
+ Open Data: Focus on Availability, (free) Access, Reuse, Distribution and Universal Participation.
+ NSDI: Limited to (preoccupied with) Geographical (spatial) Data, free access not implied
+ NSDI: Decentralized, standards-based approach, data at custodians, discovery services
+ NSDI: Focuses (additionally) on organizing and curating data turning it into information and making it useful for gaining knowledge
Friend or Foe (II): NDSI started in the early 2000s...

+ The Rwanda Concept Paper follows best practices for a NSDI as outlined in the SDI Cookbook published 2004 by GSDI (Global Spatial Data Infrastructure, www.gsdi.org)
+ NSDI-Initiatives in Europe (Inspire) and the US have taken some 10 to 15 years to deliver data – i.e. tangible results
+ In Rwanda we have done 2 and some of 28 steps, when will we have an NSDI?

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Outcome</th>
<th>Indicator</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Metadata training and education support on-line training module to support producers of spatial data in their creation of discovery metadata</td>
<td>On-line training module in place</td>
<td>NSDI Management Unit</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Study / Report on required core datasets for Rwanda</td>
<td>Definitive list ….datasets should be produced ….</td>
<td>List of required core reference datasets</td>
<td>NSDI Mgmt Unit with external TA support</td>
</tr>
<tr>
<td>18</td>
<td>Set up Pilot Examples</td>
<td>Pilot example cases to demonstrates feasibility for specific applications</td>
<td>Pilot examples publicized as part of NSDI Communications Plan</td>
<td>NSDI Committee acting on recommendations from the TWG.....</td>
</tr>
</tbody>
</table>

April 2017: The Cabinet approves the Data Revolution Policy to be implemented by NISR

?DISRUPTION?
**Friends or Foes (III): An Open Data Policy is a blessing for the NSDI !**

<table>
<thead>
<tr>
<th>No</th>
<th>Activity</th>
<th>Outcome</th>
<th>Indicator</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Data Policy agreed by government</td>
<td>Having a well communicated data policy creates clarity for all stakeholders</td>
<td>Published data policy (including metadata)</td>
<td>Government</td>
</tr>
<tr>
<td>8</td>
<td>Specification of the NSDI Management Unit</td>
<td>Agreed legal status, role, funding, staffing, funding, activities, etc</td>
<td>Final specification for the NSDI Management Unit</td>
<td>NSDI Implementation Team</td>
</tr>
<tr>
<td>14</td>
<td>Adopt and use the draft Data sharing agreement</td>
<td>Data sharing between public sector bodies</td>
<td>Signed copies of the finalized Data Sharing Agreement</td>
<td>All public sector stakeholders in the NSDI Council</td>
</tr>
<tr>
<td>17</td>
<td>Public sector bodies to explore possibilities ...to exploit location-related information available on the shared technical infrastructure</td>
<td>More “joined-up” data sharing will eventually promote the delivery of increased and better public services</td>
<td>Example cases of joint data sharing and service delivery</td>
<td>Working Group on governance &amp; administration. Results should ….</td>
</tr>
<tr>
<td>18</td>
<td>Set up Pilot Examples</td>
<td>Pilot example cases to demonstrates feasibility for specific applications</td>
<td>Pilot examples publicized as part of NSDI Communications Plan</td>
<td>NSDI Committee acting on recommendations from the TWG. ….</td>
</tr>
<tr>
<td>20</td>
<td>A set of data sharing licenses, suitable for use by public sector data providers will be produced and used</td>
<td>A simple and usable licensing system for public sector data</td>
<td>A set of data sharing licenses like Creative commons, suitable for use by public sector data providers</td>
<td>NSDI Mgmt Unit working on recommendations from the Legal Working Group</td>
</tr>
<tr>
<td>21</td>
<td>Study / Report on required core datasets for Rwanda</td>
<td>Definitive list ....datasets should be produced ....</td>
<td>List of required core reference datasets</td>
<td>NSDI Mgmt Unit with external TA support</td>
</tr>
<tr>
<td>26</td>
<td>Metadata training and education support</td>
<td>On-line training module to support producers of spatial data in their creation of discovery metadata</td>
<td>On-line training module in place</td>
<td>NSDI Management Unit</td>
</tr>
</tbody>
</table>
...and still we hear: "There is no Data in Africa"

AFRICA is the continent of missing data. Fewer than half of births are recorded; some countries have not taken a census in several decades. On maps only big cities and main streets are identified; the rest looks as empty as the Sahara. Lack of data afflicts other developing regions, too. The self-built slums that ring many Latin American cities are poorly mapped, and even estimates of their population are vague. Afghanistan is still using census figures from 1979—and that count was cut short after census-takers were killed by mujahideen.

As rich countries collect and analyse data from as many objects and activities as possible—including thermostats, fitness trackers and location-based services such as Foursquare—a data divide has opened up. The lack of reliable data in poor countries thwarts both development...
Is there really NO DATA in Africa ???

+ It can’t be stressed enough, how much money, effort and time has been invested by Governments, International Organizations, the Academia, Donors, NGOs and the private Sector for Decades

+ Investments are made in Projects creating data as a collateral (e.g. surveyed terrains when a road is planned and constructed) or in Projects with data collection as their main purpose (e.g. parcel data in a Land Tenure project).

+ There is data in Africa, but the end of many projects is often the end of the created data too,

+ In many cases Data is still difficult to access.

+ Data may not come in the form needed requiring creativity and work to make applicable
Where is Africa today on the Road to Open Data/NSDI?

Many – except maybe one – countries have done a few of the 28 steps recommended, how long will it take for the remaining 20+ steps?

SAEO: NSIF Meta-Data Catalogue: http://www.sasdi.net/
NB: New Website to be launched on the 11th of August 2015

* As reported by RCMRD (www.rcmrd.org) and their member countries during the Regional Forum on National Spatial Data Infrastructures (NSDI) 27-28 July 2015 in Kigali, Rwanda.

Carville coined as a campaign strategist of Bill Clinton’s successful 1992 presidential campaign against president George H. W. Bush.
The Economies of Data and IT Projects (in general)

Typical Life Cycle Costs of an IT Project

- Hardware, Hosting, Network: 5%
- Software: 10%
- Professional Services: 10%
- Data*: 15%
- People: 60%

* Data costs proportionately reducing with increasing open data initiatives

GSDI 2013

by Andrew Coote
The Economies of Data and IT Projects (RW GIS Portals)

Operationalization

Software and Developments

Data Validation and Uploading

Discovery, Identification, Harmonization and Cleaning of Data, incl. Training of Staff

Data and People are the Key to successful IT

Typical Life Cycle Costs of an IT Project

- Hardware, Hosting, Network: 60%
- Software: 15%
- Professional Services: 15%
- Data*: 10%

* Data costs proportionately reducing with increasing open data initiatives.
The Economies of Data and People

Projects, Hardware, Software and Professional Services (incl. initial Trainings) are tendered, procured and implemented.

Data requires ongoing efforts (in staff and/or external services) not to lose, maintain and update it.

There is Data in Africa, but too often Data does not remain accessible beyond the end of the initial project creating it and is not accessible to a wider audience than the few engaged in capturing it.

Resources are wasted and the same data needs to be captured again.

There are Open Data Portals with various degrees of relevance/topicality, while the NSDIs have not yet evolved much beyond being a beautiful concept.

→ There is (big) data in Africa like everywhere in the World, but not enough curated, easily accessible, «Open» data. And why is this often the case?
Conclusion: Be Smart
– Focus on Data and People
+
We are too often fixated crusading for Open Source or any brand of proprietary software – why for only 15-25% of the value of a project?
+
Tenders only call for the development of a Portal, a Platform or a NSDI but do not provide for populating the developed portal with relevant content → Portals are built, get less and less relevant, become obsolete and disappear
+
Smart Cities, Agriculture, Transportation, … need a solid plan to collect, maintain and use Data.
+
Create a business model/funding mechanism for Data – A Data (and IT) Maintenance fund

It does not matter how we call it – we just need to do it… together