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**Geographical Data as National Asset: Benefits of National Situs Addressing  
System for Africa**

**An extended summary**

## **Introduction**

In the context of the globalizing economy and rapid geoinformation development, African countries need to keep pace with developments in other technology areas. In this context, there is an urgent need to bridge the technological divide between Africa and the rest of the World, through standardization of practices and the appropriate use of information technologies to instill social and economic developments. One of these developments is a boom in location-based services (Global Positioning Systems, mobile telecommunication, ambulance response, cable television, etc.). These services require that the general public, including people from out of town, be able to easily navigate, locate places and access of interest.

Situs addresses provide a means for this type of navigation, without relying on memory or extensive local knowledge. However, many African cities and towns do not have intuitive situs addresses. Unlike planned urban areas in developed countries, streets and properties in most African cities are poorly named and numbered. Thus, streets and parcels (in both rural and urban areas) are often characterized by a lack of physical address, a poor sign and name-posting, absence or very poor numbering systems, a duality of 'official' and 'popular' naming practice. Even in planned areas with proper layouts, there may still not be functional street naming and numbering system; sometimes streets may be planned, well-laid out, named and sign-posted, but still lack a functional numbering system for place finding. As a result, locating, accessing to and navigating through urban areas remain a major challenge for residents and visitors of African cities. Such a situation has far reaching negative implications on economic development, poverty reduction, city governance, tourism, social security, safety and emergency services.

This addressing project fits within the general mandate of the Committee on Development Information (CODI) to raise awareness on emerging issues in information technologies. The proposal presents the economic benefits of implementing addressing project in Africa and highlights the need for urgent action from African governments. CODI will serve as an ideal forum and platform to endorse the project. Countries will then take advantage of the proposed addressing framework to improve their governance, economic performance, services and security delivery and data reliability.

This document aims at presenting a synopsis of the situs addressing project for African countries. In doing so, it first discusses the rationale for, and the benefits of an addressing system in the African context, especially in relation to its overall economic development. Second, the benefits and needs of a functional addressing system are discussed. Third, major challenges for the design and the implementation of addressing systems in African realities are presented with the view to guide the implementation of a framework suitable for the region. Finally, the challenges identified are then used to make appropriate recommendations on how to implement an addressing system in the African context.

## **I. Justification**

Street and property in most Africa countries are mainly characterized by the lack, incomplete and inaccurate street identification and names, sign-posted and properties numbering. In terms of address and communications, P.O. Box and landmark identification are widely used with obvious shortcomings: for instance, they are not related to precise and accurate physical addresses. The lack, incomplete and inaccurate of street names, sign-posted and property numbering cause location problems and difficulty to navigate and easily identify addresses. When official street names exist, they sometimes contradict how the local residents relate to them.

With globalization, products and services from 'local' activities and industries are being integrated into national and global economies. Economists and entrepreneurs from the consuming national and oversea locations become interested in the source of the goods and services as investment options. This creates opportunities for foreign direct investment, which has been credited with improving economic development and reducing poverty. One of the factors considered by non-local investors is the logistics, which include ability to move goods and services from, to and within areas of interest. It is therefore becoming necessary to develop a standard addressing system which could serve multiple purposes such as assisting and guiding investors, visitors and residents, improve private and public services performance and delivery, ameliorate census enumeration, electoral roll, improve mailing system and increase emergency responses from fire, ambulance and police. Similarly, there is an urgent need to move from fuzzy directions, large sign posting showing direction, lengthy description of the location in media, reliability on local knowledge and landmarks, and personalized directions to a systematic and comprehensive addressing method. Such move would have significant benefits for government, local council, public and private companies, emergency services, utilities companies, mailing system, foreign investors, tourists, visitors, etc.

Development of such functional addressing system for Africa is becoming more attractive and feasible, thanks to the recent development in the area of geoinformation technologies and the global market. In that respect, this project shows how countries can use geospatial technology to develop a standard that will not only take advantage of best practices in urban and rural addressing system, but more importantly will incorporate local knowledge and practices for a functional naming and numbering of properties and buildings. An example of this project is advocating is the participation of residents (bottom-up approach) in the development of street name gazetteer.

## **II. Benefits of a standard addressing system in Africa**

Developing an addressing system for African countries would bear several advantages at various levels, which include:

1. Stimulate **socio economic development, new activities** and save money. Governments will be one of the prime beneficiaries of a standard addressing system, especially in relation to various tax collections (e.g., personal, properties and businesses) mechanisms and cost-effective census enumeration. At the individual level, general public would save lasting effort to locate exact

addresses, which often causes unnecessary and additional cost for fuel, time, energy, advertising in the media, etc. A functional addressing system will have far reaching positive impacts, not only in (revitalizing) economic activities, but more importantly, will generate downstream socio-economic activities and job creation such as maintaining up to date street maps and various guides, 3G mobile communication, tourism, e-mapping (e.g., map quest on the internet), street directory sales (hardcopy and online), and the use of local material and personnel, thus contributing to poverty reduction.

2. Achieve efficiency in **e-governance**: In Africa, various government agencies (and utilities) use different ways (no system at all) to locate or provide services. For instance, postal services, telecommunication, police, health, emergency services and electoral divisions vary across the country. Such variation makes difficult data sharing and efficiency in data management. Developing a uniform addressing system support by geoinformation technologies will improve the management of services that rely on spatial data, and thus serves in making informed decision. Similarly, a functional addressing system will contribute to the ability of the state or municipality to collect, store and efficiently use reliable and accurate data on citizens. Land tenure in Africa is critical not only for economic development, but also for effective governance. An addressing system will highly serve such purpose in the sense that government will then be able to track land ownership and reduce (or diffuse) land disputes. In particular, an addressing system will contribute to the development of a stable, standard and reliable public property record-keeping system (titles, deed, securities, and transactions that reveals the evolution of the economic value of the property, etc.), which can be monitored through time. Such information contained in the property documentation is vital for a range of businesses such as real estate, mortgage brokers and insurance companies. Such exact location will contribute to improve the reliability and sharing of government records such as census, population and properties.
3. Achieve **effectiveness and efficiency in service delivery** in both private and public sectors. For example, businesses will locate customers much easily, which will ultimately improve utilities billing system, accelerate goods delivery, reduce the cost of transactions, easy update of company records, extend taxi operations, expand personal mail and courier delivery, etc. In respect to mailing system for example, there are unnecessary delays as a result of having to go to the P.O. Box to collect a letter instead of home delivery. In the competitive globalized economy, courier companies need in situ addresses to deliver packages promptly
4. Improve the **production and maintenance of record keeping** of deeds (e.g., maintain accurate legal documents such as individual identification cards, electoral records, property records, vehicle registration, driver licenses, etc.). This record keeping is very important to speed e-government and cross-reference with utilities companies and other governmental agencies, which could, therefore, access and use common address database. Such data sharing mechanism will, for instance, eliminate redundancies and duplicities in data collection by various bodies. A functional addressing system, conceived with the large number of stakeholders interested in spatial database in mind, will go a long way to facilitate and harmonize access to critical data necessary for informed decision-making

process. In so doing, the addressing system could not only improve the reliability of data on population and properties, but more importantly, would significantly enhance urban and regional planning and governance in Africa.

5. Improve **safety and security**: for instance, a functional addressing system will assist speedy emergency responses (for fire, police and ambulance); crime prevention; accessibility to functional street network associated with easily and quickly location (street, property or landmark-considered here as an alias address-); increase law enforcement capacity; etc.
6. Provide a consistent and systematic addressing system, which is **free from duplicity, redundancy, overlapping and inconsistency** in street identification and property numbering in African countries. This will resolve the problem of the duality and erroneous street addressing with numbers and/or names, or streets that are known by two different names: 'official' and 'popular'.
7. Improve **public relations**, especially the sense of belonging. This is particularly important when the local population is associated in street addressing system projects.

Although not exhaustive, the above examples make clear immediate and long-term benefits of an urban and rural addressing system at various levels. The project therefore makes a strong case for African governments to immediately consider the adoption and implementation of functional addressing system. Notwithstanding, there are several foreseeable challenges that might jeopardize a rapid and smooth development and the implementation of addressing system in Africa. The purpose of the proposed addressing standard is to account for these issues and make clear recommendations on how to handle them in African context.

### III. Core addressing issues in Africa

This section points out some of the key challenges that African countries may face in their quest to develop and implement a sustainable national addressing system. The project seeks to account for these difficulties and proposes ways to address them. In particular the addressing project makes clear recommendations on some key factors, which include (but are not limited to):

1. Issue of **data** in Africa context: type, format, collection/production (standard, core datasets, metadata), requirements, availability, accessibility, awareness, relevance, sharing, integration, use (copyright, privacy), custody, accuracy, updating and upgrading, dissemination (clearinghouse, geoinformation networks, web-mapping facilities), integration of addressing system within the National Spatial Data Infrastructure and e-strategies as part of the core dataset, decision-making impacts and cooperation benefits, etc.
2. How to account for **land issue** in Africa? These issues include cadastral, tenure, land record and property right.
3. How to incorporate well-known **landmarks** as a core component of addressing system?

4. How to conceive an addressing system that takes into account **plots, buildings and parcels that do not have direct access to a thoroughfare** (e.g., in slums, villages and other unplanned areas) and multiple dwellings/households in one 'compound'?
5. **Financial issues** (e.g., cost, affordability and cost recovery; services with fees or without, etc.). What are the financial institutions likely to support such project?
6. What **reference system** (coordinates or identifiers --i.e. addressing system-- to use?)
7. What **address hierarchical model** (e.g. names, alias, definition, reference).
8. **Legal and institutional implications** (e.g., pass legislation? If so, what are the risks of law enforcement mechanisms? Legal responsibility)
9. What recommendations to make on **practical issues** such as street and property naming and numbering formats, sign-posting, material to use, thoroughfare classification, etc.?
10. **Technology** (e.g., software hardware): access, availability, skills, e-government, etc. How to ensure that a comprehensive framework (database management system) is put in place for recording and updating address database, while controlling error propagation within a shared and multi-users database? What are the components of a comprehensive addressing system for African countries?
11. **Literacy, citizen engagement and awareness campaign:** For example, how to design and implement a national addressing system for the majority of the residents (that is that will be used by the majority of the citizen, including those with low literacy)? How to account for cultural sensitive dimension of the addressing system? How to design and implement a bottom-up addressing system whereby local residents are fully involved in the process? How to eliminate the dualities and overlapping in addressing systems (e.g., 'official' vs 'popular' names; street as number and/or name)?
12. **Skill training and staffing** (capacity building): What are the needs for capacity building? What are the needs for long-term education and training of personnel for operating and re-engineering the addressing system (in the public and private sectors and professional organizations)?
13. How to foster **political will (and commitment) and democratic process** for street addressing? How to ensure that the project is not used for political self-interest and that the outcome could cut across political programs/agendas? (This would avoid renaming street after, for instance, a 'regime change').
14. **Project implementation:** How long would it take to implement all the stages of the project? How to ensure that an urban and rural addressing workbook, for example, will be applicable across various countries. What are the criteria for the selection of pilot cities or countries? If addressing 'best practices' are identified, how to capitalize on these experiences for the benefits of other countries?

#### IV. Example of functional addressing recommendations

<b>Issue</b>	<b>Recommended</b>	<b>Optional</b>	<b>Comments</b>
<b>Street Naming</b>	Unique name across jurisdictions	Variant suffixes (St, Rd, Ave, Pth, Trl)	Use same name and different suffixes when Off major Road for example
<b>Street as number system</b>	Replace by a name	Unless chronological/numeric sequence (1, 2, 3, etc.) and easy to remember	Associate with local numbering system (e.g. Arabic): consistent
<b>Street name posting</b>	Each intersection Legible Accessible	Reflective at night With municipality and/or landmark	Uniform (color, size labels), clear, visible, frequent and systematic
<b>Street naming format</b>	Name + Suffixes	Associate Prefixes+ name + suffixes	e.g., Menelik Ave
<b>Material to use</b>	Local material Durable	Economically beneficial	Boost local economy
<b>Numbering</b>	Consistent Chronological Odd/even	Roman letter an numbering system (e.g. 1,2,3)	Should allow update without altering the chronological numbering system
<b>Choice of name</b>	Resident choice	Propose names and for local to select	Easy to write, short (<15 characters)
<b>Thoroughfare classification</b>	By size (Hwy, Ave, Rd, St, trail, path, etc.)	Associate length and width/size	Add pathway to the classification to accommodate building without direct known road frontage
<b>Property identifier</b>	Unique across the nation	Regional/local municipality code	Easy for national property and building database management
<b>Landmarks</b>	Use street name	Associate with sign and name posting As prefixes or mixture or below the main name	e.g. Airport Transit St North Bole Ave
<b>Building with No direct access to known Street</b>	Use suffix for the building at the front	Associate with landmark Use proxy or path naming	e.g. 4A Palm St
<b>Several households in the same compound/estate</b>	Use suffix for the building at the front	Associate with landmark	e.g. 56A Gata Rd
<b>Parcel address</b>	One address for one parcel record	Multiple addresses for compound (or complex) with various households	Parcel Unique Identifier

## **Epilogue**

There are overwhelming evidences to support the immediate development and implementation of a functional addressing system for African countries. This project recognizes that although countries could be at different stages of implementing situs addressing, it is of paramount importance to conceive and standardize situs addresses, which priorities end-users and African realities. The analysis of African context has led to specific suggestions as to how to go about implementing the project. Some of the key African addressing standard recommendations include consistency, broad-based user, flexibility and local population participation. Adopting the proposed framework will, therefore, constitute an important step towards economic development and social integration in Africa.