GIS support for Kampala City's Socio Economic Transformation

By Flavia Zabali Musisi
Established as a municipality in 1947 & became Uganda’s capital city at independence in 1962.

Profile of Kampala City:

City Population:

- Resident popn is est. at **1.5 million** while day population est. at **4 million**.
- The current urban population growth rate is **5.2%**.
- The city’s contribution to Uganda’s GDP is **60%**.

Area Size: **195 sq Kms**

Projected population by 2040 (source: KPDP).

10 Million
Sustainable Development Goals

Goal 11:
Make cities inclusive, safe, resilient and sustainable

11.1 Housing and Slums
11.2 Sustainable Transport
11.3 Participatory Planning
11.4 Cultural Heritage
11.5 Disaster Reduction
11.6 Air Quality and Waste Management
11.7 Public spaces
11.a Rural-urban and regional planning
11.b Mitigation of Climate Change, Resilience
11.c LDCs support – buildings
GIS in KCCA

**Before**
- Paper
- Analogue
- Static Data Collection
- No Imagery
- Desktop data management

**Now**
- Paperless
- Mobile
- Real Time data collection
- Use of current aerial imagery
- Centralized data management

**Future**
- Mobile GIS
- Participatory GIS
- Systems integrations with other agencies
- Constant image update with drones
- Digital Data collection integration within work operations
- Real time traffic monitoring
- Implementation of a Corporate GIS
- Monitoring real time weather data
- Flood modeling
- Pollution mapping
- Mapping Crime Hotspots
Data Collection with GIS

KCCA uses Survey 123 for Data Collection

Survey123 for ArcGIS is a simple and intuitive form-centric data gathering solution that makes creating, sharing, and analyzing surveys possible.

Data Collection form and Map showing Spatial Distribution of the collected data

Statistics of the collected data for performance tracking

Monitoring Individual performance of the Data Collectors

Accurate Data Collection is realized

We Replaced unreliable paper-based data collection with a trustworthy digital solution. We don’t regret.
Data Management with GIS

Any GIS system is only as good as the data that’s in it. KCCA uses ArcGIS for a complete set of tools to store, edit, and manage data in a way that fits with the existing processes.

**KCCA uses ArcGIS Enterprise to perform analysis**
ArcGIS Enterprise is a full-featured mapping and analytics platform that includes a powerful GIS server plus dedicated web-based GIS infrastructure to organize and share work. Deployed on the KCCA Servers

### Data Storage

**Geodatabases**
A geodatabase stores GIS data in a central location for easy access and management. We access this data in desktop, server and mobile environments. This data sits in the KCCA GIS SQL Servers

**KCCA Website**
Here Data is stored in the KCCA GIS Portal
[https://gis.kcca.go.ug/portal/home/](https://gis.kcca.go.ug/portal/home/)

**Cloud**
Here Data is stored in the Esri cloud with the KCCA ArcGIS Online account.
PLANNED AND GREEN ENVIRONMENT

KPDP 2012

DNP details guidelines on urban city management

- Support for implementation of the KPDP, through the DPP window on the GIS Portal
- Supports the Data need of the Detailed Neighbourhood planning teams
- Data need of the Building Plan Approval teams

General guiding plan on Urban City Management

Urban Design Layouts
Comprehensive Street Naming and Addressing

- Unique addresses with coordinates
- Named roads in the system and on ground
- Geo-coded signage
- Navigation application
Landscape and City Beautification
Kampala Urban Forestry Project

Precinct Map

53,268 trees in the City with over 300 species
Using Mobile Workforce To Monitor Fleet Management in Solid Waste Collection

Web Application and Mobile App to plan, monitor, and streamline field to office workflows using the ArcGIS platform

- Optimize daily field operations
- Know where your workers are and where they have been
- Efficiently plan, coordinate and assign work
- Complete work using ArcGIS apps and reports
GIS In Sanitation

An Inventory of Community Toilets 2016

Citywide Sanitation Database

Emptying in informal/formal settlements in Kampala

Emptying service in formal and informal settlements in Kampala
Current Transport Situation – Kampala City

• Kampala has about 2,110km of roads of which about 585 km are paved and the rest are unpaved.

• City Public Transport – Dominated by 14-seater Taxis, 2-wheelers (motorcycles), few buses and a peak hour passenger train service on one route

• Estimated modal split: Car (10%), PT (30%), Cycling & Walking (60%)

• 22 signalised junctions

• Est. 60% of vehicles in Uganda use Kampala roads even though the Kampala road network is only 0.083% of the estimated road length in Uganda

  ▪ Most roads outlived usefulness and need to be upgraded/reconstructed

Disaster Risk Reduction, Resilience and Crisis Management

- Disaster Risk Assessment and Action Planning
- Multi-Hazard Risk and Vulnerability Profile for the City – 2018 (Climate Change not well Captured)
- The Kampala Climate Change Action Plan (2016)
  - Guide mainstreaming of disaster and climate risk management in development and planning at local level

**KDMP 2016, KPDP, KCCAP, MHRVP**

- Integrated Resilience Strategy to Disaster Risk and Climate Change (6 Pillars)
Integrated Flood Management

- Open Cities projects in Gaba completed worked with Map Uganda and Humanitarian Open Street Maps funded by the World Bank
- Android apps OpenDataKit (ODK) and OpenMapKit (OMK) were used
- Nakamiro Open Cities project is yet to start.
  - Flood hazard maps as a tool for spatial planning and development control
  - Education and acceptance critical in ensuring success of drainage projects

Severe flash floods are a frequent occurrence in Kampala

The Lord Mayor of Kampala on the right looking on as Geoffrey (HOT) demonstrates mapping activity during the mapathon

Village pathway in Katoogo village

Some of the produced maps

Drain-Surveying Team during data collection in Ggaba parish
HEALTH, SOCIAL DEVELOPMENT AND INCLUSIVE GROWTH

Public Health Referral and City Ambulance System
Set up a call center under the smart City initiative for ambulance referral service and with ambulances at all the 5 urban Divisions.

Solid Waste Management

Web Application and Mobile App to plan, monitor, and streamline field to office workflows using the ArcGIS platform

Mobile Workforce

- Optimize daily field operations
- Know where your workers are and where they have been
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KCCA CALL CENTRE
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TOLL FREE
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KCCA - Kampala Capital City Authority
For a better City
The City Education Improvement

Kampala Education Master Plan

Strategic Areas of Focus

Schools Database

School Sanitation
Women, vulnerable groups and people with Special needs

- 1.3 Billion in grants disbursed by KCCA each Financial Year to about 250 Community Groups
- In 7 years 26,250 Community members have benefited from the program to date
- 75% of the beneficiaries of Community Driven Development Projects (19,687) are female
- Livelihood Projects set up mainly Art and Craft, tailoring, liquid soap making, catering and briquette
- 75% of the groups funded report an increase in household incomes between UGX 100,000 to 250,000

Database with the Gender groups

Community women displaying products (Uganda Women Entrepreneurship Program)
ECONOMIC GROWTH AND INSTITUTIONAL DEVELOPMENT
Kyanja Agricultural Resource Centre: Urban farming Model

- Pig Breeding Units
- Kuroiler Brooding Units
- Micro Gardening Units
- Green Houses
- Vermiculture
- Research & Development

- Over 10,000 visitors hosted on the farm annually
- 42 garden demonstration units

UPDF

Buganda Kingdom

Public
Urban Tourism

Visitors Guide to Kampala

Tourist Maps to Guide Visitors to Key Landmarks in the City

- Spatial database for tourists sites
- Spatial database for Historical buildings
Enhancing Mobilization of Local Revenue

Using Information and Communication Technology (ICT) as an enabler to the services that a city delivers in dimensions such as smart payments, smart planning, smart transportation, smart environment, smart education, smart communities and social services and smart governance.
THANK YOU FOR YOUR ATTENTION