Sustainable urban development in Africa: Challenges and solution-oriented research approaches

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Presentation outline

• Urbanization trends in Africa
• Characteristics of urban growth
• Challenges and opportunities of urbanization
• Some examples socio-ecological systems
• Goals of sustainable urbanization
• Need for capacity building
• Policy guidelines for application of sustainability science
Urban growth rate in Africa

• Africa least urbanized – but annual growth rate is fastest compared to other regions

• Urban population doubled from 205 mi in 1990 to 400 mi in 2010

• Urban population projected to triple to 1.23 mi by 2015

• Proportion urban projected to reach 50% by 2030 and 60% by 2050
Population density
Inhabitants per square kilometre, 2010

- 1 to 5
- 6 to 25
- 26 to 50
- 51 to 100
- 101 to 250
- 251 to 500
- 501 to 1,000
- More than 1,000

Large urban agglomerations
Million inhabitants, 2010

- 11
- 5
- 2
- 1

Notes
1. Only agglomerations bigger than 1 million inhabitants are shown.
2. Data projections based on 2009 estimates

Urbanization Trends in Kenya (1948-2055)
Characteristics of urban growth

• Rapid and massive coastal urbanization in some regions e.g. west africa
• Emergence of urban regions and domestic and cross-border development corridors

• Implications:
  • Rapid geographic concentration of poverty in urban areas
  • Latitudinal and longitudinal mobility
  • Climate change and its effects/impacts
Characteristics of urban growth cont’d

• Urban primacy – traffic congestion, air pollution, land supply shortages, escalating real estate prices etc

• Natural growth and in-situ urbanization major contributors to urban demographic expansion

• Intermediate cities (<500,000) absorbing the lion’s share of total urban demographic growth
Characteristics of urban growth cont’d

• Strong links between poverty, inequality and slums
  • Lack of access to affordable adequate land and housing for predominantly poor urban populations
  • Severe inequality in domestic wealth sharing
  • Unequal access to basic infrastructure

• Presence of urban development corridors
  • The Kampala-Entebbe corridor
  • The greater Nairobi metropolitan area
Challenges & opportunities

- Planning failures
- Food and nutrition security
- Urban mobility/traffic congestion
- Poverty
- Water and sanitation
- Environmental degradation
- Weak rural-urban linkages – policy, economic
- Poor governance
- Large inequalities- economic & social
- Climate change
Challenges & opportunities

• Economic – business opportunities (SMEs, technological, etc), infrastructural development

• Social – urban mobility, innovation and creativity,

• Environmental – solid waste management, improved water and sanitation, enterprise development,

• Training, research and innovation possibilities – fieldwork, internship, joint research, link research to policy
60% of Nairobi population lives on the same surface as the golf courses, 5% (Tibaijuka 2009)
Section of Kibera informal settlement, Nairobi
Encroachment of railway reserve, Kibera, Nairobi
Challenges of high rate of urbanisation

- Provision of services
- Informal settlements
- Environmental pollution
- Ecosystem degradation
- Urban poverty & food insecurity
Urban poverty
Urban food (in)security
Water demand and supply for Nairobi

Water demand

Water supply and demand in Nairobi

Sources of water

Water deficit

Daily demand

Daily supply

The major sources of water for Nairobi

- Dry season flows: reduced
- Wet season surface runoff: increased
- Sediment load: High
- Chemical and biological pollutants:
  - Heavy metal pollutants ($\text{Pb}$)
  - High microbial pathogen counts in raw water esp. near town centres
- high water treatment costs
Increasing reliance on groundwater (8 African cities studied (UNEP/UN-HABITAT 2011)

- 4,800 active boreholes (2010) - for domestic, industrial, livestock & irrigation
- Several “groundater hotspots“ identified – Westlands, Kikuyu triangle, Karen, Ongata Rongai and Thika
- Groundwater abstraction increasing leading to lowering of water levels in some hotspots e.g. Karen area. Water table in some places falling at 0.1 – 0.9 m/yr
Most boreholes shallow – prone to pollution > waterborne diseases

“honey sucker” discharging raw sewage into the environment

Abattoir discharging untreated wastewater into the river
Goals of sustainable urbanization (environmental sustainability)

- Reduce GHG emissions and take CC mitigation and adaptation actions
- Minimize urban sprawl – develop more compact towns and cities served by public transport
- Non-renewable resources are sensibly used and conserved
- Renewable resources are not depleted
Goals of sustainable urbanization (environmental sustainability)

- Reduce energy and waste produced per unit output
- Recycle waste produced/dispose in environmentally sound way
- Reduce ecological footprint of towns and cities

(NB: these have national, regional and even international dimensions)
Goals of sustainable urbanization (economic sustainability)

- Focus on local economic development
  - develop basic conditions for efficient operation of economic enterprises (large/small, formal/informal
  - Reliable infrastructure and services – water supply, waste management, transport etc
  - Develop/support financial institutions and markets capable of mobilizing investment and credit
  - A healthy educated workforce with appropriate skills
Goals of sustainable urbanization (economic sustainability)

- Focus on local economic development
  - A legal system that ensures competition, accountability and property rights
  - Appropriate legal framework – which defines locally appropriate standards for workplace, treatment and handling wastes and emissions
Goals of sustainable urbanization (social sustainability)

- Focus on local economic development – giving support to:
  - The urban informal sector
  - Equal access to, and fair and equitable provision of services
  - Gender and disability
  - Prevention, reduction and elimination of violence and crime
Through........

- Appropriate SuS policy on:
  - Mainstreaming SuS in curricula at all levels
  - Encouraging and supporting transdisciplinary research
  - Providing needed resources to SuS education and research
  - Urban and regional planning schools should review their curriculum - make it more responsive to the complex issues
  - Embracing more participatory urban & regional planning
Through........

➢ Retooling teaching methodologies – e.g. the ESDA-SUD

➢ Reducing the gap between theory and practice

➢ Promotion of action research involving many perspectives, stakeholders and muti-levels
Sustainability science can help avoid a situation like this......