

Transitions Towards Developing Sustainable Urban Environmental Infrastructures in East Africa

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Why do we need modernised mixtures in sanitation?

■ centralised systems

- capital intensive: large investments and high running costs
- do not fit very heterogeneous conditions
- not accessible for the poor
- vulnerable for breakdowns in unstable circumstances
- high dependence on central governmental authorities for service provision
- not environmentally sustainable

■ de-centralised systems

- no solution at the larger scale of big cities
- often considered low quality (esp. users' comfort)
- a 'second best' solution in view of many authorities
- sustainability in heavily populated areas questionable

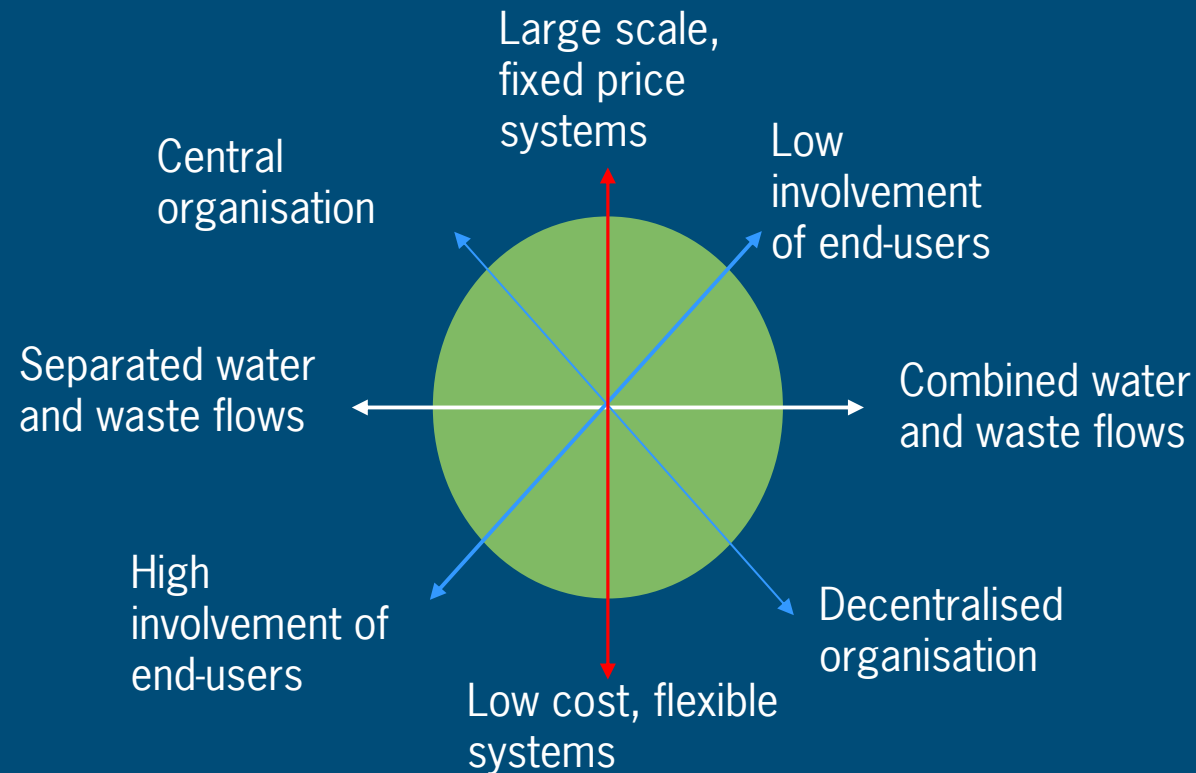


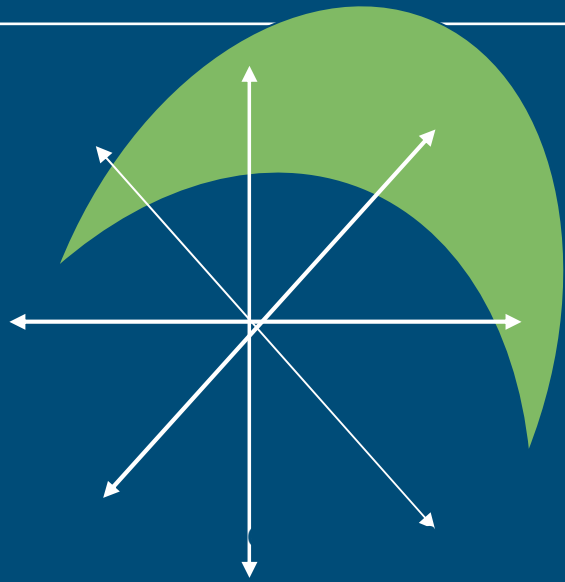
What are Modernized Mixtures in sanitation?

- medium- and large-scale
- combine technologies and experiences from centralised and de-centralised systems
- variations in different dimensions
 - scale
 - involvement of end-users
 - combination of flows
 - organisation
- create a better “fit” between options for infrastructures and specific socio-economic, technological, political and ecological conditions

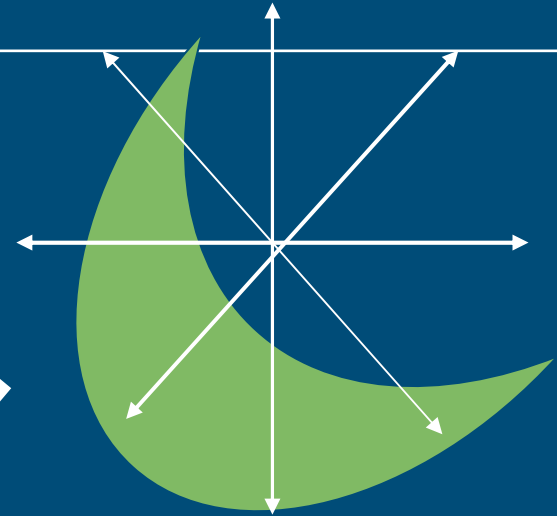


4 Dimensions of development: towards modernised mixed infrastructures

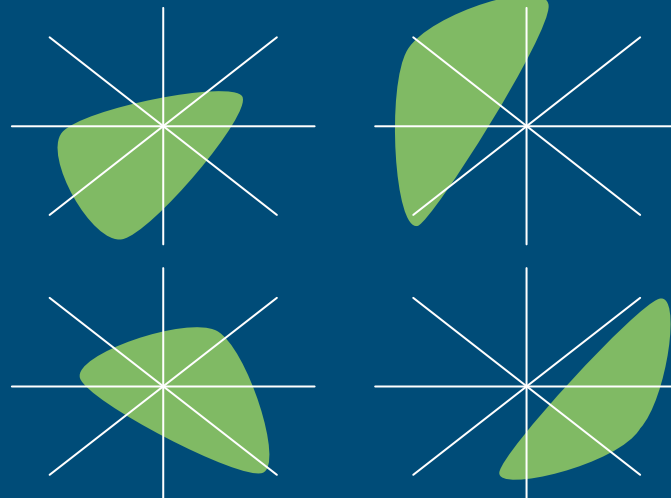




centralised systems



de-centralised systems



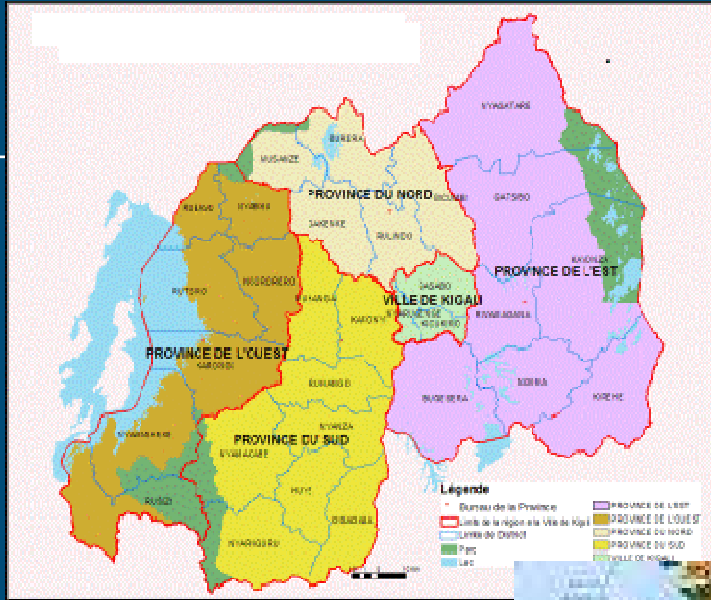
modernized mixtures



Background on Kigali

- capital city of Rwanda
- surface: 730 sq. km of very hilly terrain
- dramatic recent past (genocide and return of former refugees)
- population: 1 million (2007) up from 140,000 (1991)
- no centralised sewerage system
- decentralised on-site sanitary systems unsustainable





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Perspectives for MM in Kigali

■ opportunities

- decentralisation policy allows better involvement of local stakeholders
- no lock-in effects from existing systems
- acceptance from local population of communal wastewater treatment systems

■ challenges

- limited interest from responsible authorities
- limitedly available human resources for developing alternative socio-technical systems that may fill the gap
- absence of readily available technological solutions
- high dependence on international donors



Conclusions

- sanitation problem in Kigali requires innovative solutions
- some conditions are fulfilled but others not:
 - political commitment
 - financial resources
 - applied technological research
 - participation from private sector
- MM may show multiple pathways towards improved sanitation
- niches may serve as first steps in transition



Thank you

Questions? Comments?



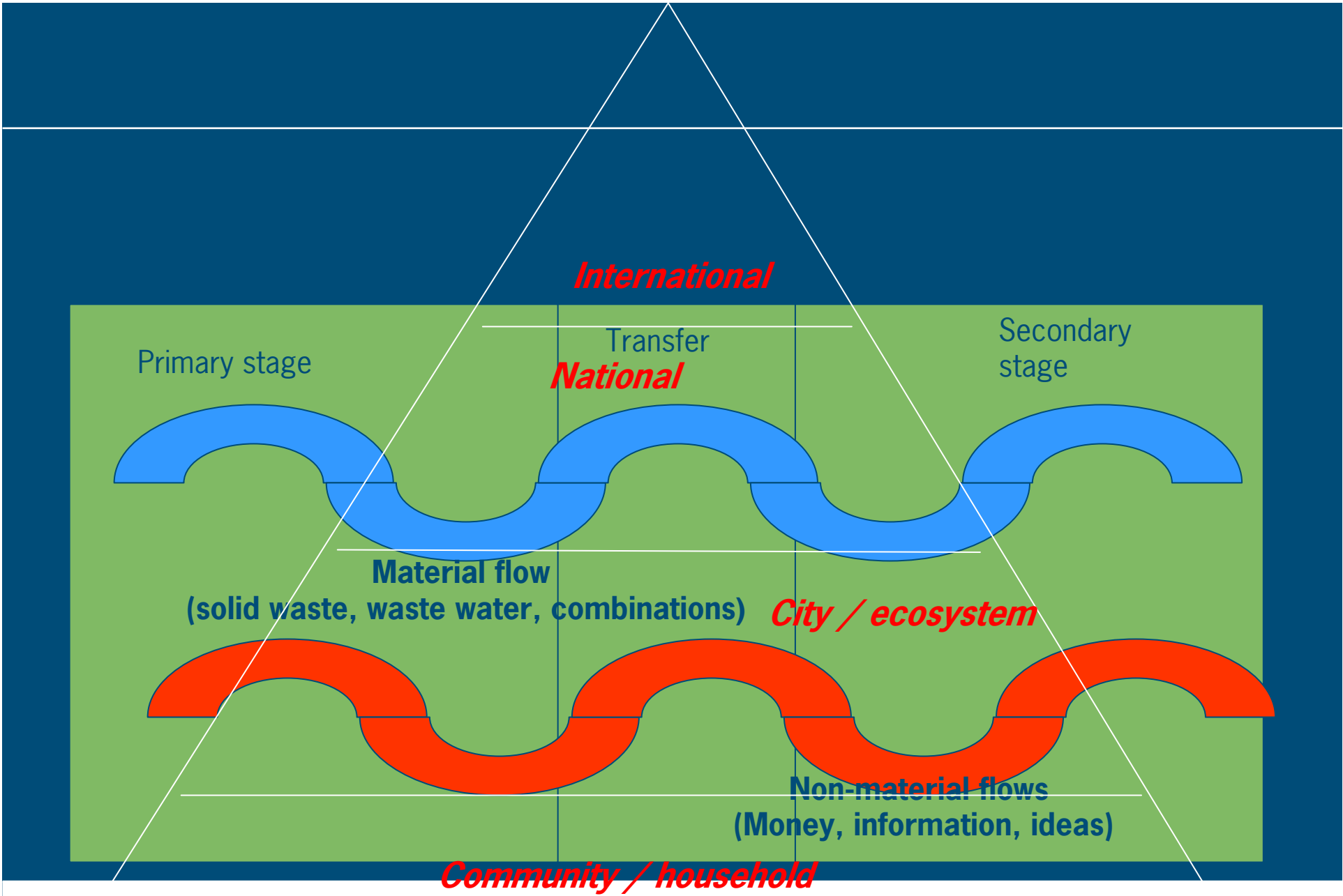
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Flows approach

- material flows: chains of waste (water) and their interaction with the socio-cultural, institutional and ecological environment
 - generation =>
 - collection =>
 - treatment =>
 - reuse =>
 - disposal
- social flows: networked with material flows, mutually influencing
 - money
 - information
 - people







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