A ‘CUT’ perspective on new technologies for improved municipal asset management in urban Ethiopia

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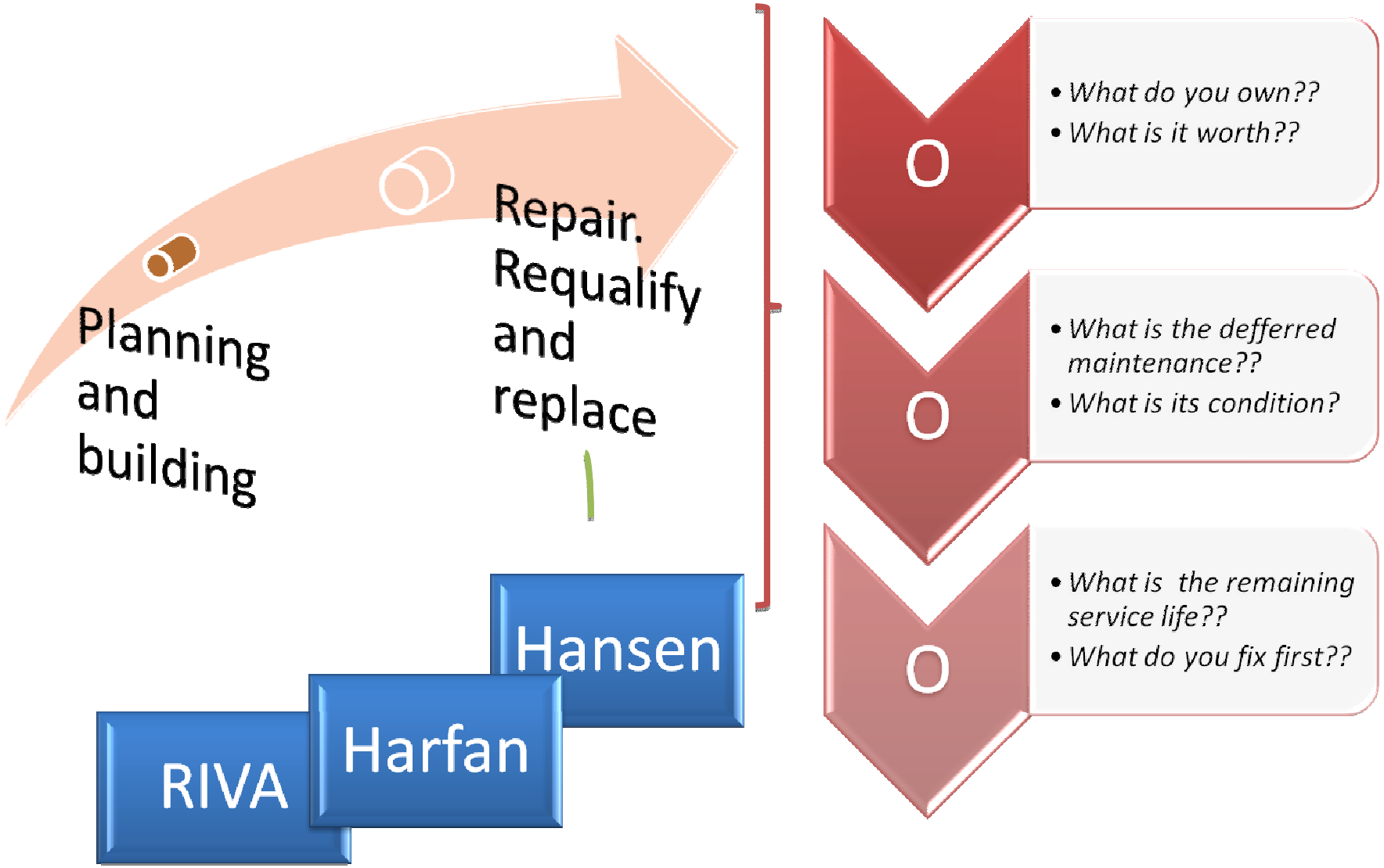
Introduction

- In the recent past, there has been a growing realization that effective systems of asset management can strengthen the performance of a local economy and community significantly.
- Such a governance perspective has been complemented by the development of new and interactive technologies for recording and communicating assets and asset management.
- Until recently, measuring the uptake of such technologies and subsequently the associated transformation in asset management practice has been difficult.
- This analysis attempts to appraise the extent to which such new technologies have made and can potentially make a difference in the management of water infrastructure assets of urban Ethiopia.

New technologies for managing water utility assets

- Since the 90's, new technologies and methods have been developed to improve the water asset management process.
- Such progresses have been characterized by a multiplicity of important functions such as the feedback data management, the planning maintenance management, the works management, the probabilistic models of degradation, the lifecycle cost analysis, and the performance levels of supplied services (Michele and Daniela, 2011).
- New requirements for improved water infrastructure management have seen major developments in the state of art technologies in the infrastructure asset management sector.
- Traditionally, system software for asset management has dealt largely with methodologies for monitoring, repairing or replacing ageing infrastructure.
- Such methods have since expanded scope to include methods for deteriorating infrastructure conditions, assessing historical incident data and inherent risk failure, devising replace or repair strategies, enumerating lifecycle costs and the ultimate representation of modelled conditions via geospatial data bases and geographical information systems (Christodoulou et al, 2009).

A new water asset management paradigm



Water Infrastructure issues in Ethiopia

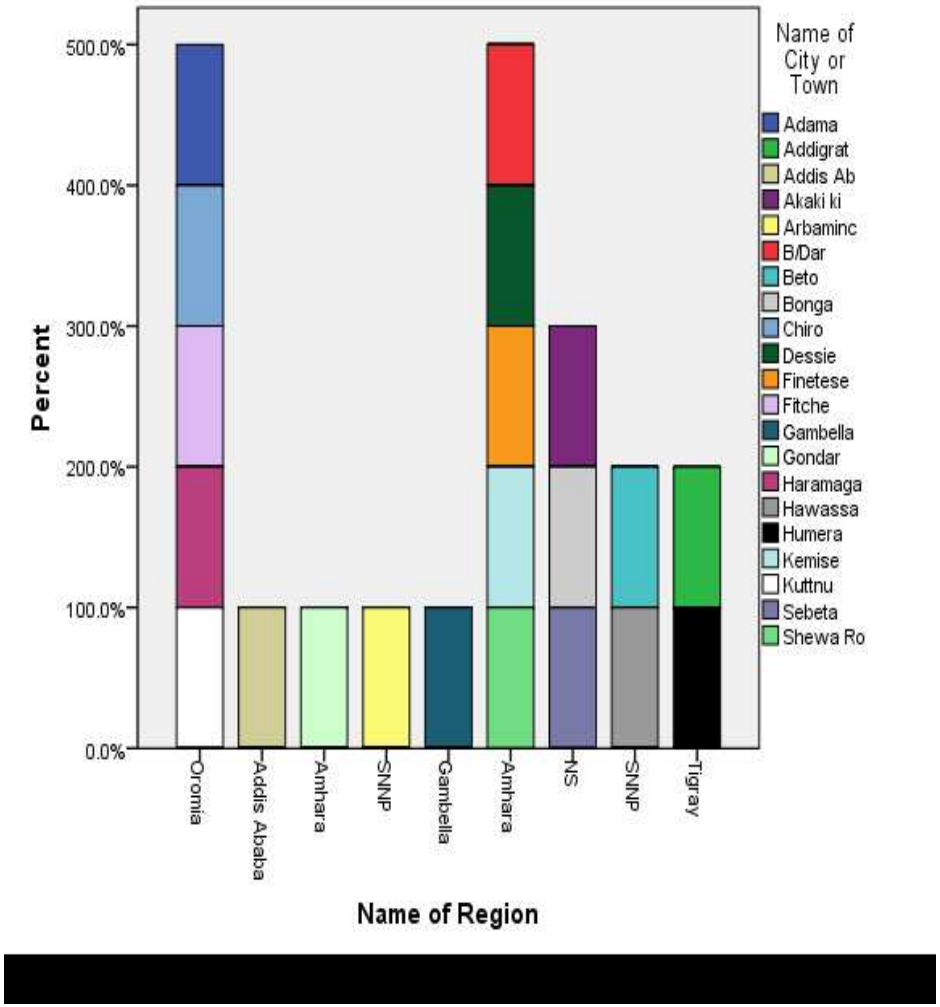
- Ethiopia has a relatively low water resource development infrastructure (Seleshi, 2006). The Ethiopian nation has a population of about 77 million people.
- On average Ethiopians walk about 4km to get water and are consuming 15 litres of water per day.
- It is argued that Ethiopia needs about £300 million pounds to meet MDG targets on water and sanitation (DFID-Ethiopia, 2007).
- The United States and Australia have 100 times more storage per head than Ethiopia (Winpenny, 2003). Approximately one-third of Ethiopia's water supply systems are non-functional at any given time (MoWR, 2007).
- lack of spare parts, a weak water governance system and lack of support from water sector offices have rendered Ethiopia's water sector ineffective (Deneke and Abebe, 2008).

Policy interventions

- The Ethiopian government launched the Universal Access Plan (UAP) – a big ambitious plan which seeks to ensure access to safe water and sanitation for all by 2012.
- Capital investment in the water sector has doubled over the past four years (MoWR, 2008).
- The Ethiopian government's national Water, Sanitation and Hygiene (WASH) programme is supported by external donors including the World Bank, the African Development Bank, UNICEF and various NGOs.
- In 2007, DFID committed financial resources worth £75 million pounds into a 5 year WASH project through a number of initiatives, including the improvement of water infrastructure for 37 small towns of Ethiopia.

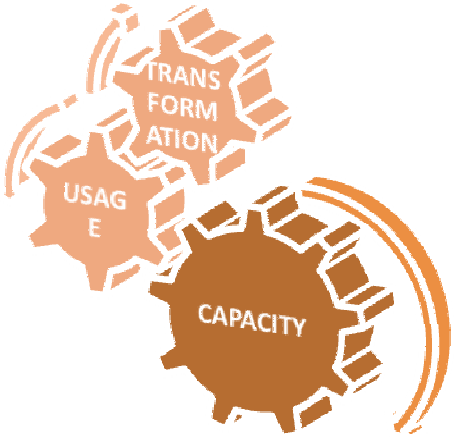
Materials and Methods

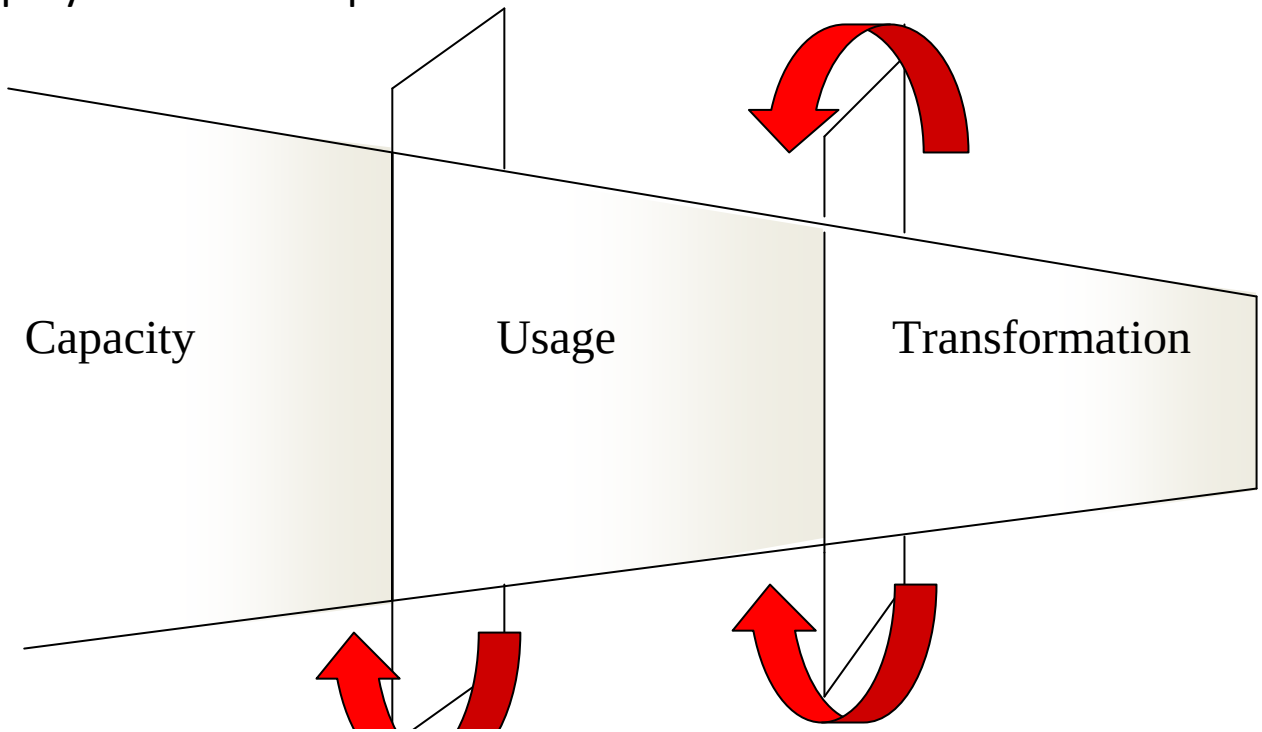
- Empirical evidence was gathered from a Delphi study that pooled together expert opinion from 61 officials drawn from Ethiopia's water sector.
- Such officials were largely water and sanitation experts drawn from 21 cities and / or towns found in ethiopia's 8 regional states (refer to figure).
- In addition, case study material from several Ethiopian towns and cities was utilized to complement the analysis. Ethiopia is a federal state that is divided into a number of regional states.
- Further empirical evidence was gathered through a review of government and municipal policy documents.



Adopted analytical framework

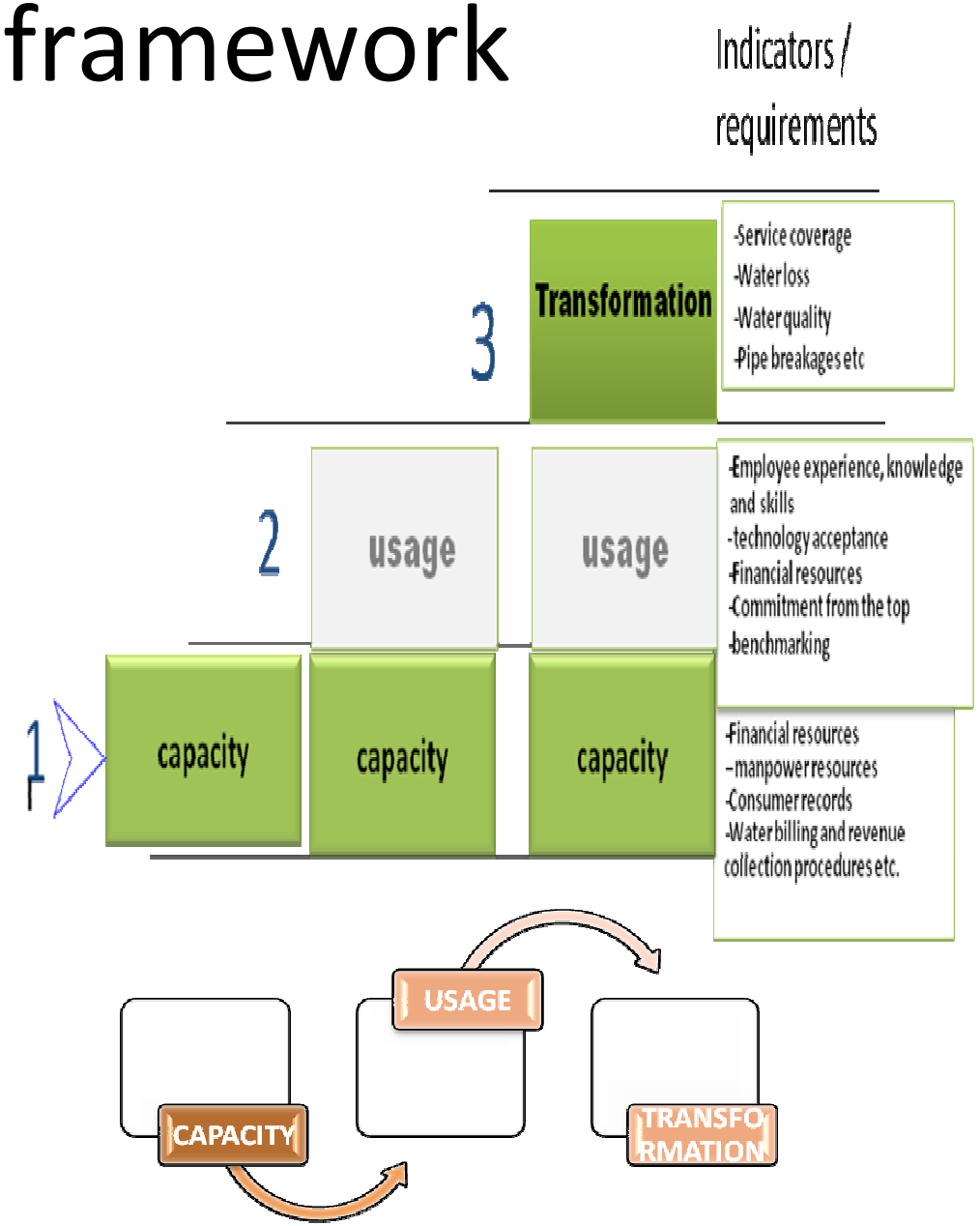
- The study adopted the Capacity, Utilization and Transformation (CUT) framework proposed by the Economic Commission of Africa (UNECA, 2008) to assess the uptake of new technologies for impoved water utilities asset management.
- Such a framework was found to be a credible tool in taking stock of technological achievements and deficiencies that characterize any municipal asset management programme.
- In this analysis it permitted the identification of apprpriate capacity, utilization and transformation indicators against which to benchmark the extent of water asset management deployment in Ethiopia's water sector.





The CUT framework

- Capacity dimension seeks to measure the level and extent of the development and deployment of new asset management technologies and other resources.
- Utilization (usage) indicators are aimed assessing and measuring the extent of usage of capacity and related resources by local authority employees.
- Transformation or impact indicators are targeted at measuring the impact of the deployment and usage of water asset management technologies.
- In the absence of a previous similar study, the analysis employed a host of indicators often mentioned in water utilities literature and other related disciplines to guage capacity, usage and transformation.



Results and discussion

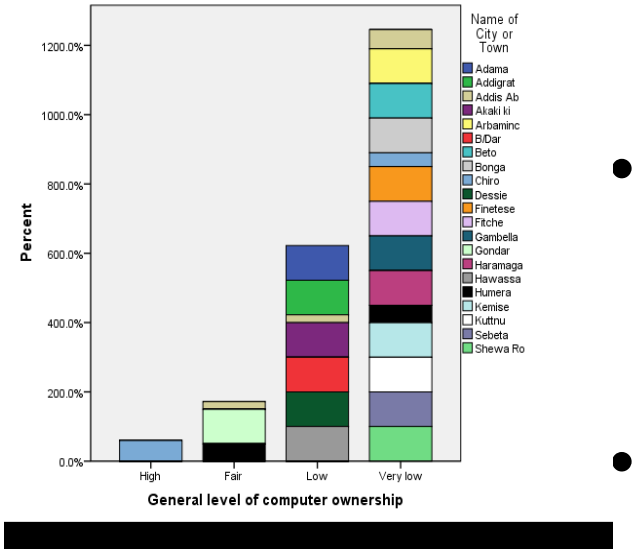
- Water utility reforms in Ethiopia and elsewhere have done well in increasing the much needed stock of water utility assets (Urquhart and Busch, 1999; Kaganova *et al*, 1999; Kaganova and Stone, 2000).
- Such an asset building move has however remained unmatched with the extistence of credible asset management plans that would see the operations of water utility assets managed on a sustainable basis.
- Water authorities in Ethiopa barely know what and how much stock of water utulity assets they own. It is also currently difficult to discern the asset life of such assets, and knowing when repairs are needed.

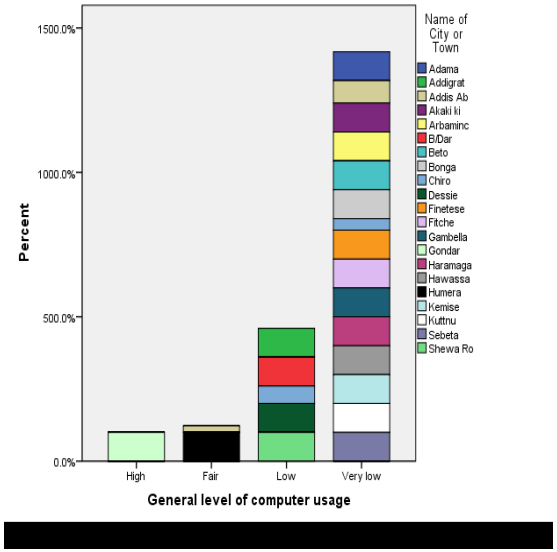
Does the LA have an Asset Management Plan?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	13.1	13.1	13.1
	Yes, but	22	36.1	36.1	49.2
	No, not at all	21	34.4	34.4	83.6
	No, but plans underway	4	6.6	6.6	90.2
	Dont know	6	9.8	9.8	100.0
	Total	61	100.0	100.0	

To what extent do you know about the following about water utility assets in your town / city?	Proportion of sample officials (n = 61)				
	To a very lesser extent	To a lesser extent	To a large extent	To a very large extent	Not sure
What do you own?	45.9	27.9	9.8	9.8	6.6
What is it worth?	45.9	23.0	24.6	-	6.6
What is the deferred maintenance?	53.2	37.7	3.3	-	6.6
What is its condition?	41.0	29.5	3.3	13.1	13.1
What is the remaining service life?	54.1	29.5	3.3	-	13.1
What do you fix first?	52.5	31.1	6.6	-	9.8

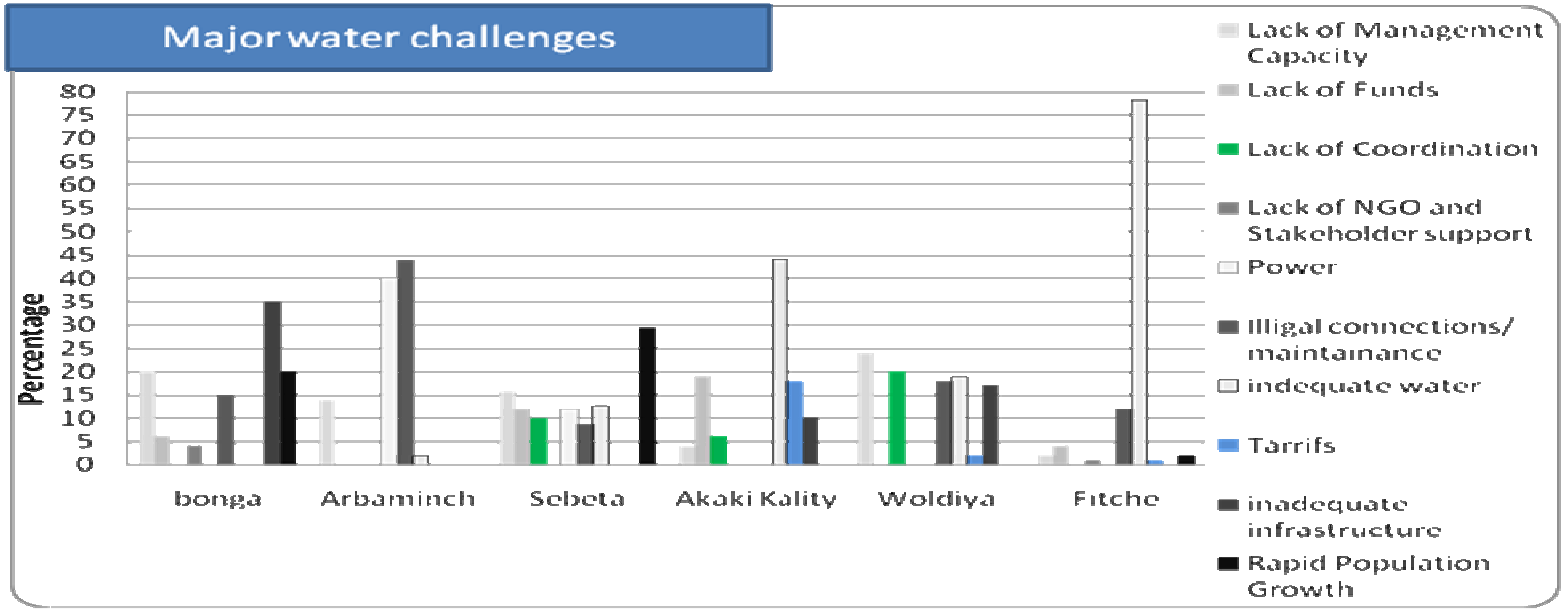

Process
Efficiency
Effectiveness
Input
Output
Business Strategy
Implementation / Operational Plans
• Business Process / Best Practices
• Capabilities
• Value Added
• Environmental Influences
People
Processes
Technology
Infrastructure Management and Maintenance
LEADERSHIP
ORGANIZATION
TECHNOLOGY
LEARNING
Enterprise Enabling
Business Drivers



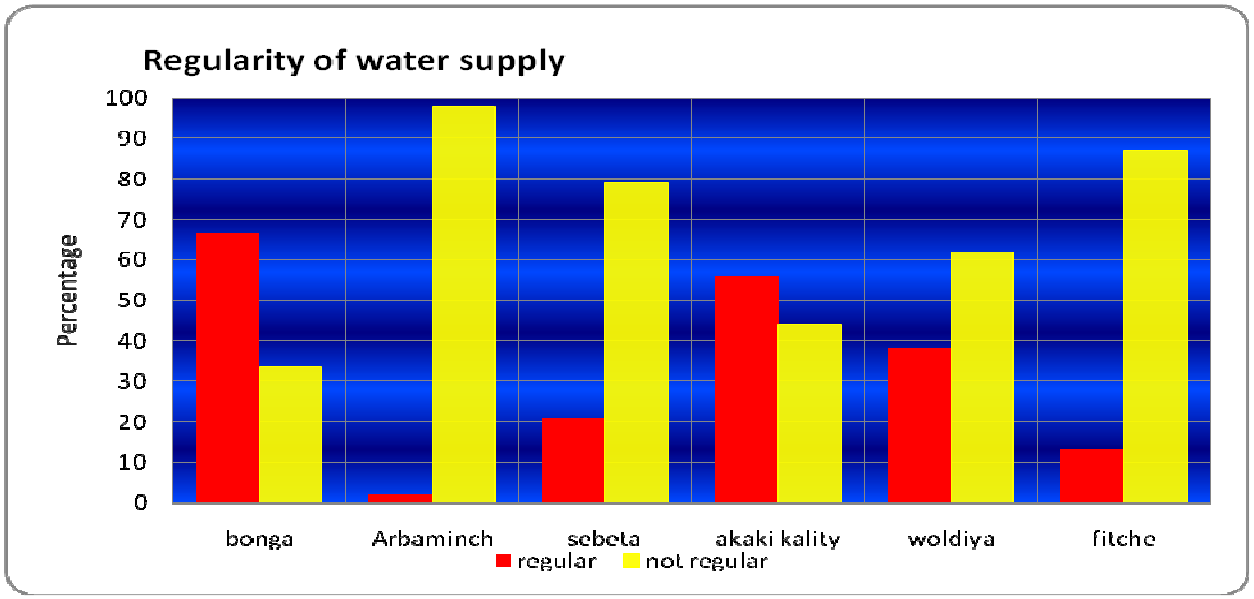


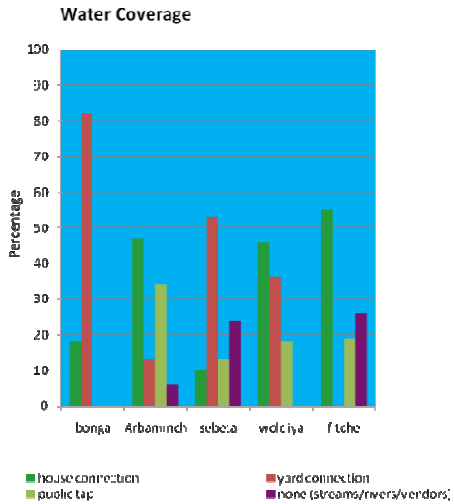
- The water situation is further compounded by the non adoption of new technologies for managing water utility assets.
- Most water authorities in Ethiopia lack capacity to acquire and utilize the much needed infrastructure asset management technologies
- Capacity challenges include limited financial resources to procure hardware and software resources, absence of skilled personel and the generally weak water billing and tarrif collection practices – factors that have traditionally constrained many other countries in sub Saharan Africa in the last decade or so (Mwanza, 2004; Schwartz, 2008).

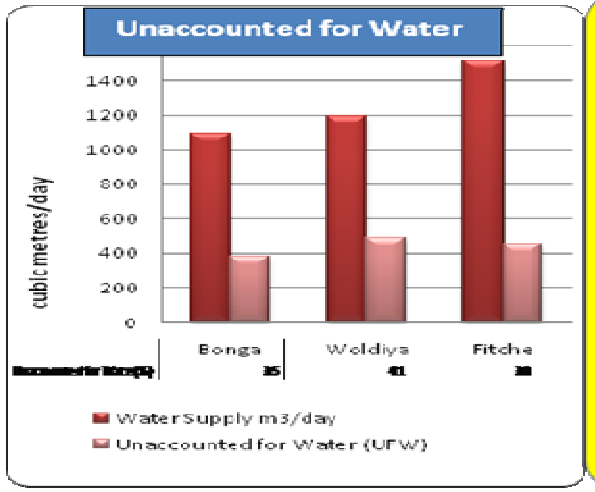
- Utilization of the asset management technologies has also been constrained by a myriad of other factors that have traditionally characterised most water services accros the globe.
- These include among others lack of manpower resources (Uchegbu, 2009), lack of benchmarking and a the absence of required levels of financial committment and government will.
- Empirical evidence drawn from elsewhere have discerned a positive association between the extension of appropriate levels of financial committment, government support and improvements in the water sector (Mwoga, 2004; UN-WATER, 2006; Schwartz, 2008).
- The argument is that such factors help to create a certain level of autonomy that will foster a conducivive evironment for the adoption and implementation of innovations (Worls bank, 1992).

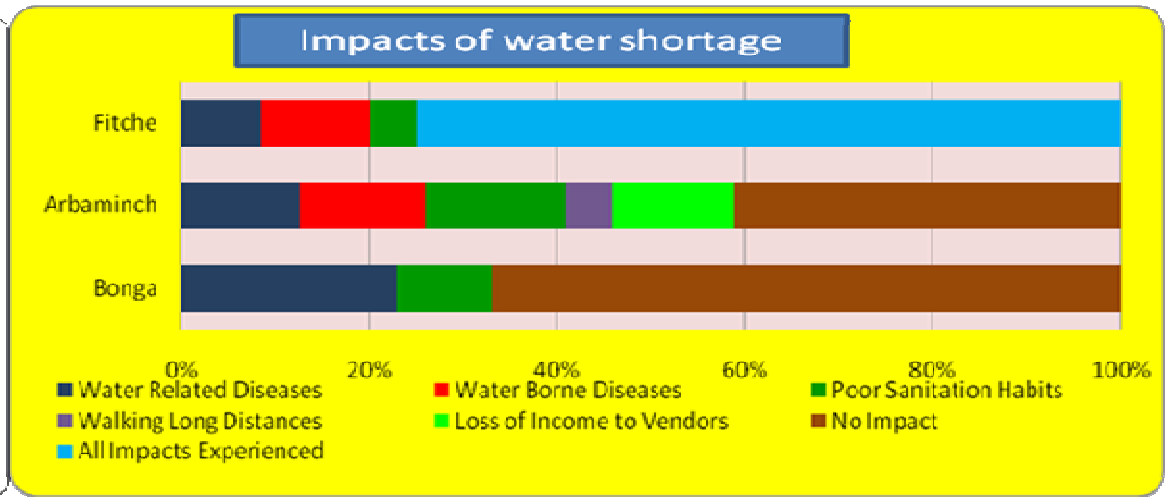


- Technologies for managing water utility assets have not been able to foster the much needed transformation in Ethiopia's urban water services sector.
- Water coverage has continued to be low, water losses through pipe breakages and pilfirage among other factor have constrined service coverage and quality.
- Overally, this has had dire health, social and economic consequences









conclusion

- This analysis has revealed that the water asset management plan that currently characterize the majority of towns and cities in Ethiopia can be dismissed as one of constrained capacity, utilization and transformation.
- Lack of financial resources, technical expertise and appropriate organizational strategy among other factors has constrained the adoption and application of system software for effective asset management in many towns and cities.
- The effective deployment of water asset management technologies would require that such challenges are overcome .
- An appropriate organizational strategy that would translate into organizational value and subsequently into the much needed organizational change is indispensible in this respect.

THANK YOU FOR YOUR ATTENTION!!!