World Habitat Cooperation Center

Dipartimento di Ingegneria Civile Edile e Ambientale

Sapienza Università di Roma

UICCA 2

Urban Impact of Climate Change in Africa

Planning with Scant Information

2nd International Conference

November 13, 2013, 9:00-14:00; *Caccia*, *Colonne* and *Zodiaco* Halls, Politecnico di Torino, Viale Mattioli 39- Turin

THE USE OF BACKCASTING SCENARIO FOR PLANNING ADAPTATION TO CLIMATE CHANGE IN DAR ES SALAAM

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BACKGROUND

Planning for climate change (CC) adaptation is a major urban challenge due to increasing levels of **future uncertainly** and complexity in socio-economic, environmental and climatic systems. This is even more pronounced in rapidly expanding **sub-Saharan cities**, which are particularly exposed to extreme climatic events, and highly dependent on the direct exploitation of natural resources.

RESEARCH FRAMEWORK

Assumptions

Firstly, adaptation planning should not be aimed exclusively at reducing the **potential impacts of CC**. It should also identify **transformative social projects oriented to sustainability**.

Secondly, **scenario analysis methods** are useful in anticipating and shaping the future for highly uncertain and difficult to control situations.

Overall Objective

By analyzing the two main scenario building approaches (**forecasting** and **backcasting**), evaluated in relation to their capacity to promote a transformative process (*BOX 1*), the research intents to understand if and how scenario analysis can contribute to adaptation planning in the sub-Saharan urban context and promote systemic societal transition to sustainability targets.

Hypothesis

Participatory backcasting can support communities and local authorities in the definition of socially shared adaptation objectives, alternative livelihoods, potential agents of change and possible systemic transformative actions.

Participatory Backcasting Methodological Features

1 - Create community vision for future development
(future vision as analytical and social construct)

2 - Stakeholder involvement and learning
(importance of the process over the outcome)

3 - Develop future-present pathways
(continuous feedback between future visions and present actions)

How Backcasting can assist communities and local authorities in CC adaptation

Define societal adaptation objectives
Maintain a systemic perspective in reading the key features of natural and human systems and the different ways in which CC can impact them

Promote a learning process through social interaction, thus broadening the space for actions, behavioural alternatives and agents of change
Incorporate the values and preferences of different stakeholders into adaptation strategies

Highlight the possible need for system transformative actions
Avoid the autonomous adaptation practices that can lead to maladaptation

BOX 1. EVALUATION OF THE MAIN SCENARIO BUILDING APPROACHES
Moving towards a Normative Scenario Approach for CC Adaptation on a Local Scale

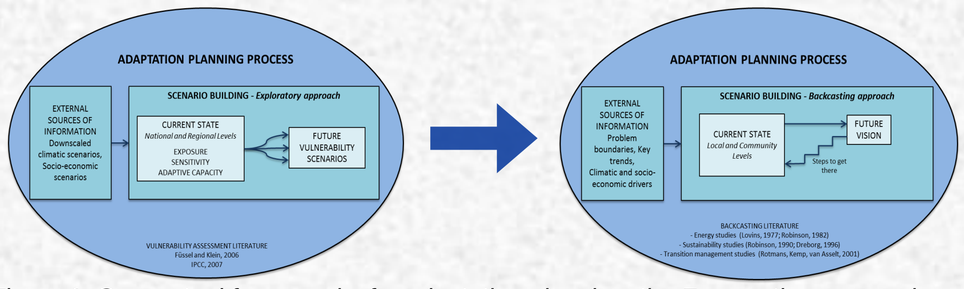

Figure 1. Conceptual frameworks for adaptation planning: the Forecasting approach and the Backcasting approach

FORECASTING vs. BACKCASTING
Reflecting on the role and implications of the use of scenario analysis for adaptation

FORECASTING APPROACH Exploratory scenario (*What could happen?*)	BACKCASTING APPROACH Normative scenario (*How can a specific target be reached?*)
Dominant role in informing CC impacts and vulnerability assessments for adaptation, especially at the national and regional levels	Its use in adaptation planning has not yet been widely experimented
Articulate different plausible societal developments Explore present-future pathways and possible societal consequences of a given phenomenon Understand problem boundaries, key trends and drivers	Generate desirable future visions Explore future-present pathways Individuate strategies, including system change actions, for achieving the desired future
The future, though uncertain, is strongly influenced by the current mechanisms Vulnerability is considered as an intrinsic individual characteristic that heavily influences the person's future trajectory Not suitable to support transformative planning processes, as it is based on dominant trends that may not apply in a specific local context Generate conservative adaptation objectives, i.e. extrapolated from the present conditions of vulnerability	The future is envisioned as a utopia, a desirable horizon beyond the current situation Vulnerability is considered as a contextual characteristic, determined by the complex system of relationships that the individual develops with society and the environment Suitable to support transformative planning processes, as it considers the present as just a starting state, thus detaching from the current drivers of vulnerability Can generate potentially transformative adaptation objectives
More suitable for the investigation of path-dependent systems, such as biophysical ones	More suitable for addressing the problem of decision-making when faced with highly uncertain systems whose trajectory depends on human choice

CASE STUDY: DAR ES SALAAM (TANZANIA)

The implications of using participatory backcasting when planning adaptation on a local scale is explored through a **community scenario exercise**, carried out in a peri-urban settlement of Dar es Salaam (Kigamboni), utilizing the **Theatre of the Oppressed** (TDO) as a participatory tool. As the research is still underway, only the scenario methodology developed and the preliminary results of the community scenario exercise are presented here (*BOX 2*).

The analysis focuses on **access to safe groundwater**, which is an emerging problem for Dar es Salaam's coastal communities, due to the growing level of **aquifer salinization**.

The **scenario methodology** aims to support local authorities in preparing long-term adaptation strategies for fighting groundwater salinization in a perspective of water resource conservation.

FUTURE DEVELOPMENTS

The feasibility of using a participatory backcasting approach for planning adaptation to CC will be assessed by exploring its strengths and weaknesses when applied in the urban sub-Saharan context, and in relation with the proposed research hypothesis.

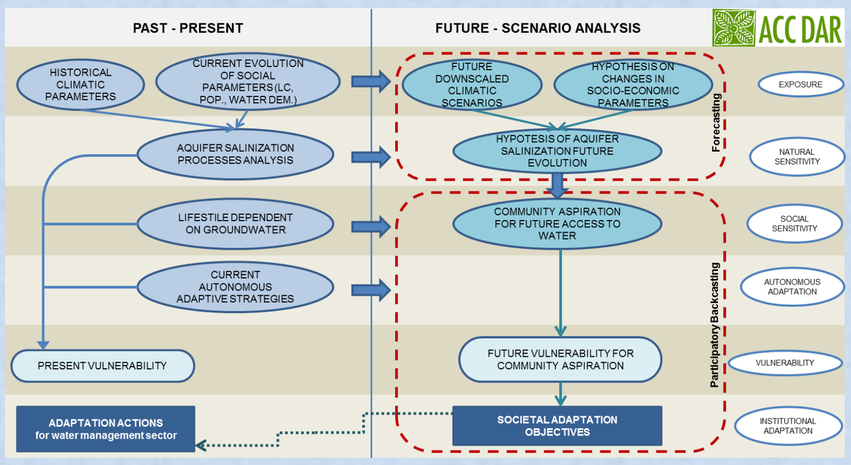

Figure 3. The ACC Dar Workflow Activity Diagram

BOX 2. SCENARIO EXERCISE: PARTICIPATORY BACKCASTING IN KIGAMBONI AREA

BACKCASTING SCENARIO METHODOLOGY
Combining Participatory Backcasting with the TDO Method

Step 1 Development of a shared future vision as regards access to water
Community Scenario Workshop

Step 2 Identification of the challenges (and obstacles) in achieving the vision
Community Scenario Workshop

Step 3 Preparation of a theatrical representation that stages the vision and the challenges that emerged during the Workshop

Step 4 Search for alternative actions and strategies to overcome challenges
Forum Theatre in different zones of Kigamboni

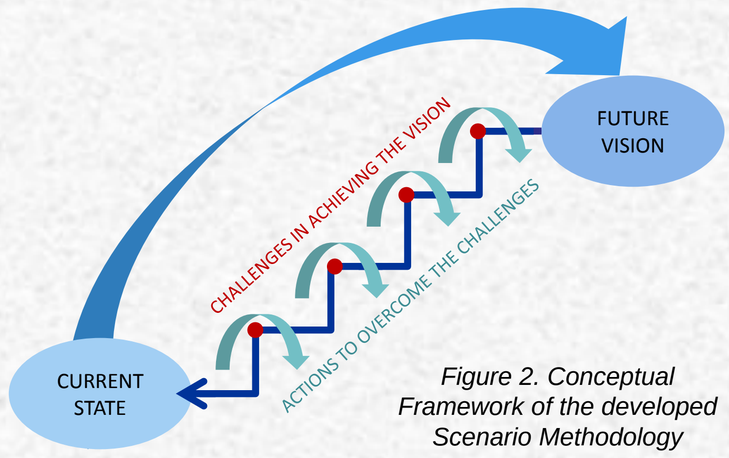

Figure 2. Conceptual Framework of the developed Scenario Methodology

PRELIMINARY FINDINGS OF THE SCENARIO EXERCISE

Current State	*Water access* - Lack of access to the municipal water supply system; Saltwater from private and community shallow wells; Freshwater purchased locally from street vendors (high cost of water) or in other areas (medium cost of water) and transported by women for many km *Use of water* - Mainly for domestic purposes
Future Vision	*Water access* - Diversification of water sources: Deep Community Borehole + Connection to the municipal water supply system. Other possible options: Rain water collection; Water Harvesting *Use of water* - Domestic and agricultural purposes
Challenges Identified	*Social challenges* - Difficulties in reaching an agreement within the community due to disillusion, disorganization, and low public participation *Economic challenges* - Low access to credit, due to scarcity of public funds and difficulties in returning private loans *Political challenges* - Corruption of politicians; Lack of communication between the community and political leaders (at the ward and district level) *Technical and environmental challenges* - Low technical support when building a borehole; Difficulties in designing the water supply scheme; Lack of communication between different sectors of the local authorities; Water pollution
Actions Proposed	Create a Community Water Association with a well defined project in terms of economic (e.g., collecting donations and searching for other private and public source of funding; sharing payment of water rates) and technical aspects (e.g., technical surveys; and security of the technical instruments purchased). Arrange a specific team that fosters community participation in the water issues. This team will try to get detailed information from the local Water Committee and brings them back to the community, in order to have more negotiating power with the political leaders. Raise awareness of laws, current budget, and implemented plans in the water sector, in order to understand the allocation of responsibilities among different local and municipal authorities. Demonstrate against local authorities and vote for a different leader at the next ward election. VS. Perform subversive actions (e.g., break a private pipe in order to draw water for free; force the ward leader to resign). Ask for more direct communication between community, politicians and technicians from different sectors (water, urban planning and design, energy).

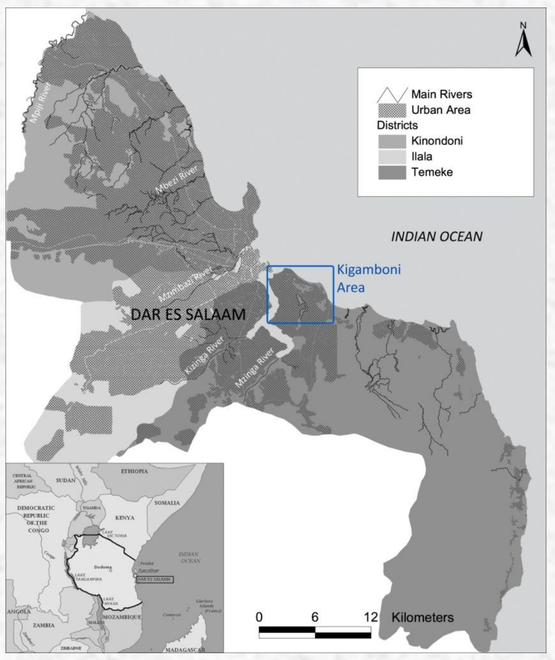

Figure 4. Study Area

The Conference is organized within the Research Project of National Interest (PRIN)
"Assessing, Planning and Managing the Territory and the Evironment Locally in Sub Saharan Africa"
developed by DIST-Politecnico di Torino (prof. Maurizio Tiepolo) and DICEA-Sapienza University of Rome (prof. Silvia Macchi)