# Nile Basin Scenario Construction

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**Abstract**

The Nile river traverses eleven countries in Africa. It is the source of life for millions of people and its aquifers, tributaries, lakes, and surface waters provide valuable nature (wetlands), drinking water, hydropower and it provides large areas of arid soils with irrigation water. Rapid urbanization, overexploitation and the construction of dams are leading to changes in the water regime and affect the quality of the ecosystems services. A participatory scenario building exercise was held in Jinja Uganda in 2014. This approach resulted in four scenarios for the future of the basin presented to the Ministers at the Nile Basin Development Forum in 2015. In this paper the scenario method, the resulting four scenarios and their impacts are presented.

Summary Statement: Rapid changes in the water regime affect the quality of the ecosystems services in the Nile basin. A participatory scenario building exercise resulted in four scenarios for the basin's future.

## 1. Introduction

The Nile Basin is characterised by high levels of hydro-dependencies that transverses political boundaries, while fresh water availability is shrinking. The current Nile basin water uses are not allocated equitably and reasonably thereby threatening the sustainability of the water resources [1] Since the Nile River is shared by 11 riparian states, the interests and conflicting uses are amplified. How do you facilitate these nations to effectively deliberate on prioritizing equitable access and effective governance; while avoiding reaching a deadlock?

Historically, the Nile Basin discourse has adopted a zero-sum approach. The presumption has been that there is a fixed amount of water to be divided amongst the riparian states [3]. Therefore, gains to one riparian state have been equated to losses to other basin states. This discourse structure has lead to a deadlock because there is no middle ground on which the divergent arguments can interact. As noted by Van Eeten (1999) fruitful deliberation can only be reached if a new agenda is defined that addresses the structural properties of the deadlock [2].'

Scenarios can define a new agenda by inducing changes in issue domains and acting as a bridge that links different social worlds. Scenarios are defined by Saritas (2012) as "narratives of alternative futures." Scenario construction is an ancient skill, with earlier usage by Herman Kahn with his colleagues at the RAND and the Hudson Institute in the 1960s [4]. Scenarios describe plausible futures and is deemed to be a unique strategic foresight technique because it addresses uncertainty and not risk. Scenario construction was selected for the Nile basin context because the Nile basin water governance context is increasingly becoming complex. In addition, the factors being considered are numerous, the available knowledge to anticipate future events is low and the degree of uncertainty about the future of Nile water governance, is high [4, 5, 6]. In addition, scenarios were selected so as to be interwoven with the Nile Basin models and as a consequence increase the resilience of the scientific models [7] and their utility as negotiation tools [8].


Fig.1 Nile River basin Map. Source: Encyclopaedia Brittannica Online

Yaakov (2008)[9] illustrates three main uses of scenarios that were utilised in this particular scenario planning exercise. First, scenarios lead to changes in explicit knowledge and shape the cognitive landscape by broadening the mental model on effective water governance and equitable and reasonable water use. Second, scenarios have been used to build trust, strengthen social capital and facilitate dialogue. When there is a deadlock that is reinforced by short-term planning and thinking, long-term strategic foresight in the form of scenarios may been used to build consensus through shaping the shared understanding and re-framing the contested issues and available policy options [9]. Third, scenarios are useful as `boundary-spanning' artifacts [9, 10] and help bridge the gap between policy and science.

There is, however, limited, fragmented and conflicting empirical evidence on the impact of scenarios on water governance decision-making [6, 12, 13]. There exists a big divide between scenarios and decision-making [6, 14, 15]. A lot of effort has been invested in predicting futures rather than understanding how the current system may behave in the future so as to be better prepared to take robust long-term strategic decisions [6]. In addition, many people fall into the trap of enhancing the technical sophistication of the scenarios while leaving out the most important portion: the simple narrative that brings to bear the social scientific perspectives [7].

## 2. The Nile Basin

The Nile is the longest river in the world with a length of 6,695 km and a navigable length of 4,149 km. The basin area of 3,176,543 km$^2$ is shared amongst 11 countries[1]. This basin area is 10% of the African surface area and contributes 60% of the riparian states' GDP [16]. Due to its large expanse, the basin is sub-divided into nine (9) sub-basins.[2] In 2009, the basin bare soil, shrub-lands and woodlands comprised over 68% of the basin land use [16].There is immense basin potential in expanding the under-utilised land into forests and agricultural land. The main constraint is water availability. Water governance decisions have an immense impact on the basin land-use and determine whether the basin will move more towards desertification or towards greening. 54% of the 437 million riparian state population lives within the basin area. 72% of this population lives in the rural areas and relies on agriculture not only for food but for their livelihood[3]. The population in the basin is projected to increase by 52% in 2030 [16, 17]. A large percentage of this population is highly dependent on the Nile as its freshwater source [16]. This rising population continues to put extreme pressure on the quantity and quality of the Nile water resources. The declining water quality is resulting in declining numbers of fish and increased water borne diseases.

In addition, the basin is susceptible to climate change impacts including climate induced water scarcity [18] This has increased food insecurity in the basin [19]. The hydropower potential in the basin is 28GW, of which only 26% is currently tapped. However, less than 10% of basin residents have access to electricity. Paisley (2013) [18] added to the list: the negotiation of the CFA (Cooperative Framework Agreement) seems unsuccessful while the Grand Renaissance Dam has raised tensions on the ownership of the Nile waters, and

[1]Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, South Sudan, Sudan, Tanzania and Uganda
[2]Main Nile, Atbara (Tekezze), Blue Nile (Abay), White Nile, Baro-Pibor-Sobat, Bahr el Ghazal, Sudd (Bahr el Jebel), Victoria-Albert Nile and Lake Victoria.
[3]78% of the Nile waters at Aswan High dam is utilized in the agricultural sector

Sudan, South Sudan and Egypt have been undergoing unusually strong political turmoil. These social – economic and governance challenges have led to high uncertainty of the future of the Nile Basin. Scenario planning was proposed to bridge the science policy gap and thereby inform decision-making.

## 3. Scenario methodology

The scenarios developed were contextual scenarios of the Nile Basin water system by 2050. The scenarios were developed by undertaking an analysis of the effects of driving forces This process is defined in detail in the subsequent sub-section.

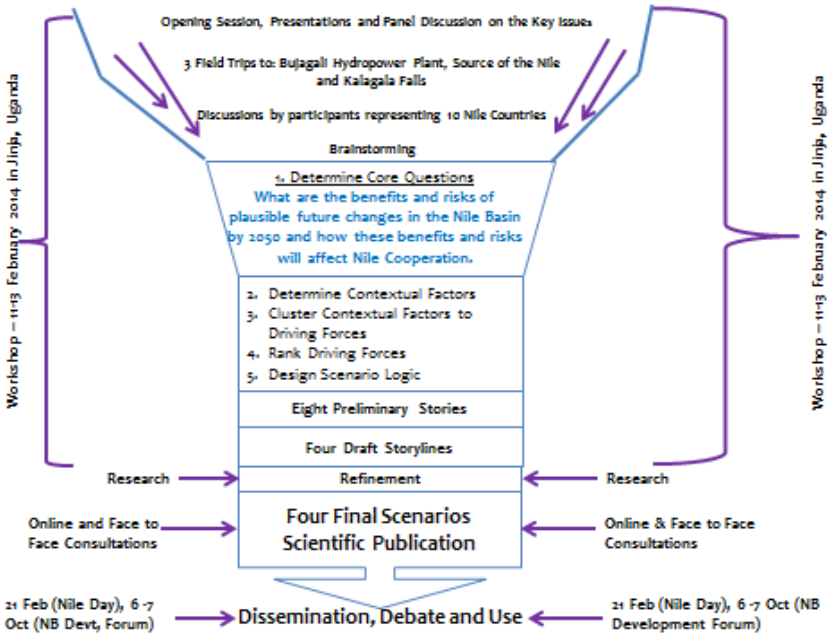


Fig.2. The Scenario Development Process

The scenario workshop "Futures planning for the restoration of ecosystem services through participatory Nile basin scenario construction" was held in Jinja Uganda, 11-13 February 2014. It was organized by Nile Basin Discourse and sponsored by Both Ends. The specific workshop objective was to develop storylines of plausible futures for the Nile Basin by 2050. The Workshop participants represented the ten riparian states and formed a multi-disciplinary group of experts and stakeholders from regional and national organizations with a spread of expertise around the various sectors and issues, local actors, as well as international partners. The scenario development process is illustrated in Figure 2. An important secondary objective of this four days workshop was to facilitate dialogue and to act as a bridge that links different social worlds.

**Step 1: Determining the Core Questions**

To determine the core question politicians and scientists elaborated their views to set the scene. These sessions were critical in engaging all the participants actively in determining the core question. The main question identified by the participants that the workshop was aimed at answering was: What are the benefits and risks of plausible future changes in the Nile Basin by 2050.

**Step 2: Determining the Contextual Factors**

In the short intensive afternoon session the participants worked in four groups on brainstorming individually and collectively on factors impacting the system (the Nile and its ecosystems services) and then organizing and naming factors, leading to a joint list of contextual factors influencing the governance of the Nile basin.

**Fig. 3: The Contextual Factors**

**Step 3: Clustering the Contextual Factors into Driving Forces**

The contextual factors influencing water governance in the Nile basin were the starting point of the next day of the workshop. Through different sequential steps, reaching consensus after each step, the list of contextual factors were scrutinized and reduced and then the groups discussed what would be the driving forces behind the changes in these factors. Causal relations were distinguished and sources of change identified. Six main driving forces were agreed upon as the main drivers for change: Governance; Population growth; Information/capacity/knowledge; Socio-economic development needs; Climate variability

and change and Energy. Figure 5 elaborates on the causal linkages identified between the contextual factors and the six main drivers of change.

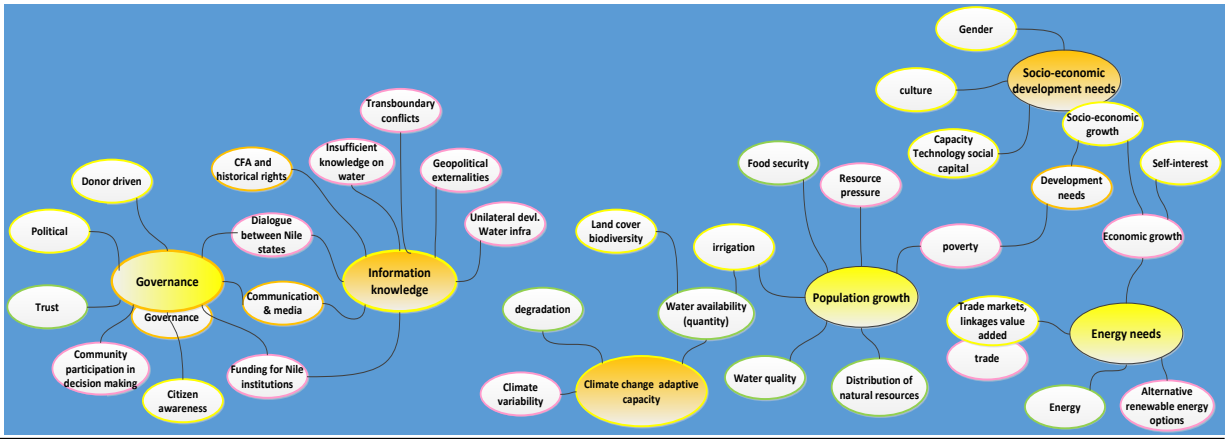


Fig. 4: Deconstruction of the scoping process: 89 factors >38 clusters of factors > 6 forces driving change

**Step 4: Ranking of Driving Forces**

The six main driving forces were then ranked according to their importance / relative impact on the Nile Basin system and also in terms of their uncertainty. Governance was found to be the most important, followed by socio-economic development needs and consequently by information, population growth and energy. Climate change was considered to be the least important driving force. However, in terms of uncertainty climate change was ranked the 2nd most uncertain driving force. The first most uncertain driving force was governance and the third information. The participants agreed to focus their scenario logic on these three key driving forces: governance, climate change and information.

**Step 5: Designing the Scenario Logic**

Two axes stood out from the rest: "Governance" (from non-responsive/non-adaptive to responsive and adaptive), and "Information sharing and knowledge" (from not shared/restricted to shared and applied). As a third axes the participants included "Climate change:" (from high variability to low variability). There was significant time spent on agreeing on the axes and the definition of terms and finally consensus was reached on the axes of the scenario logic and the definition of terms. Based on the above selection, the scenario logic was constructed as outlined in Figure 5.

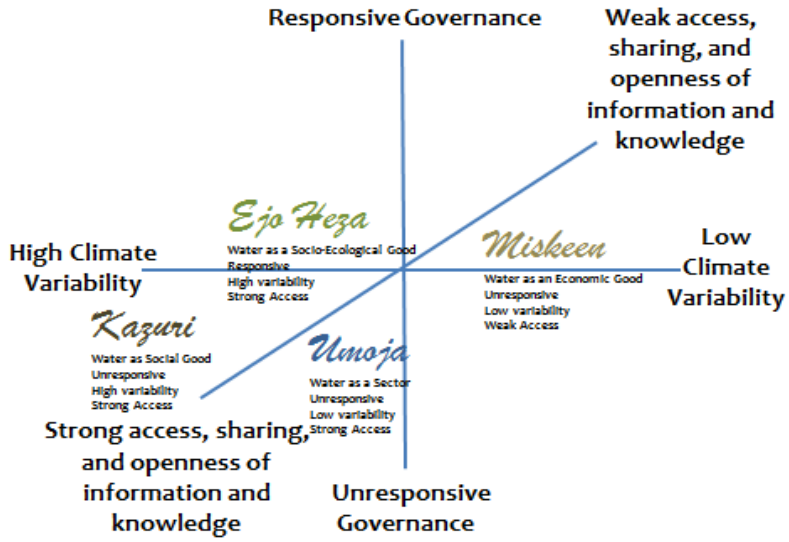


Fig. 5: The Scenario Logic

**Step 6: Detailing the Scenarios**

By having short pitches during the story writing the groups were able to come to a set of matching names and rudimentary storylines. The four scenarios were named: Kazuri, Miskeen, Umoja and EjoHeza. The four scenarios are not the best or the worst case scenarios but all represent some emerging potential opportunities, strengths, weaknesses and even threats that the Nile Basin may face in the near future.

**Step 7: Evaluation and Dissemination**

As indicated, the team of 24 active participants from the 10 Nile Basin countries were challenged to step out of their comfort zone, to be creative, critical, constructive and logical. In doing so, they learned a lot about each other's perceptions and biases. The initial storylines were edited and detailed by the workshop facilitators and further detailed in cooperation with the workshop participants. The participants were also regularly updated about the dissemination activities, like publications in the Nile Voices and future conferences. The outcomes were presented in the regional press and broadcasted in the national media in Uganda. At the opening session six members of the press including four camera teams were present.

The next big step in the dissemination of the results was the presentation to the Water Ministers at the Nile Basin Development Forum in October 2014 in Nairobi, where a special plenary session was dedicated to 'Exploring Possible Futures for the Nile'. The session set the scene for dialogue on possible and desirable futures of the Nile Basin, and on how to achieve the future we want/prevent unwanted futures. Out of the three presentations, the first focussed on the science of scenario construction as a means for stakeholder engagement and policy planning. This was followed by two presentations on results of recent scenario construction exercises for the Nile. The engaged discussion led to a political consensus that non-cooperation would be detrimental to the basin's future. The Conference Proceedings summarize as follows: "The political commitment to Nile Basin cooperation is TOTAL! Scenarios show that cooperation is a prerequisite for sustainable Nile Basin management and development."

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