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THE NILE BASIN BY 2050

Strategic Foresight on the
Nile Basin Water Governance



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SCENARIO PLANNING FOR EFFECTIVE WATER GOVERNANCE:

Strategic Foresight on the Nile Basin Water Governance

The paper explores whether participatory scenario construction in the form of stories can contribute to strategic foresight on benefit sharing. The Nile Basin discourse has largely focused on water sharing. This discourse is embedded in prevailing short-term institutional planning that leads to limited perspectives of future benefits and risks of cooperation or non-cooperation. Benefit-sharing as opposed to water sharing has been proposed as the solution to changing the current discourse and consequently resolving the water security deadlock. There has been a lot of talk within the Nile Basin on the need to adopt the benefit-sharing principle; with very little guidance on how riparian states can make this paradigm shift. The shift from water to benefit sharing requires an institutional change from short to both short and long-term planning and thinking. Long-term planning can only be effective if strategic foresight is incorporated into the planning process.

The scenarios were developed following the methodology as developed by RAND Corporation in the 1950s and later popularized as 'Shell-scenarios.' Four scenarios were developed, namely: Kazuri, Miskeen, Umoja and EjoHeza. The 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. The scenario logic is illustrated in figure 1. The scenario workshop was held in Jinja Uganda, 11-13 February 2014. It was organized by Nile Basin Discourse and sponsored by Both Ends. 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.

Each of the four scenarios is an illustration of the potential benefits and the potential negative consequences of possible futures for the basin. Each scenario has its own benefits and negative consequences that emerge as a result of external events leading to a certain development path. What is important are the trade-offs being made across the scenarios to realise certain benefits and what are the negative consequences of these trade-offs. This is discussed in detail in the full paper.

One key strategic foresight is the power of legitimacy in shaping the Nile Basin futures. Legitimacy seems to be emerging as a key pre-condition to trans-boundary cooperation. In the past, there has been so much focus on basin and sub-basin cooperation. However, the foundation of this basin-wide cooperation seems to stem from national legitimization of the existing state. It is evident that countries that are struggling with legitimacy issues at the national level are the least willing to cooperate. There is need for more in depth studies on the power of legitimacy and how this power can be harnessed to foster Nile Basin Cooperation.

The paper concludes that scenarios in the form of stories proved to be an effective tool in contributing to strategic foresight on benefit sharing. In addition, the benefit sharing principle was found to be a feasible approach to effectively manage Nile Basin water resources amidst complexity, scarcity and deep uncertainty. The scenarios communicated a consistent plausible story on the danger of not recognizing or giving priority to the less tangible benefits like a healthy ecosystem. Future work will entail analyzing the uptake of the scenarios to resolve deadlocks and enhance cooperation through benefit sharing.

1. INTRODUCTION

The Nile Basin is characterised by high levels of hydro-dependencies that transverses political boundaries. This dependency is increasing while fresh water availability is shrinking. Most of the Nile Basin riparian states have been ranked as “water scarce” by 2050. The current Nile basin water uses are not allocated equitably and reasonably thereby threatening the sustainability of the water resources [1]

Biggs (2013) has argued that a nation can experience severe water insecurity, despite the existence of adequate water supplies. Biggs attributes this to the lack of prioritization of effective governance and equitable access [2]. Since the Nile River is shared by 11 riparian states, decisions of water allocation are further compounded at the basin-wide level where the interests and uses are amplified. How can effective governance and equitable access be prioritized? How do you facilitate these nations to effectively deliberate on prioritizing equitable access and effective governance; while avoiding reaching a deadlock?

Deadlocks are highly dependent on the approach of the water discourse [3]. 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 [4]. Therefore, gains to one riparian state have been equated to losses to other basin states. This discourse structure leads to a deadlock because there is no middle ground on which the divergent arguments can interact [3]. 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 [3].’

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 [5]. Later, through the works of Pierre Wack from the Royal Dutch/Shell, there was an emergence of a

new dimension to the use of scenarios. Wack redefined scenario planning to discover “the original entrepreneurial power of creative Foresight in the context of accelerated change, greater complexity and genuine uncertainty.” [6].

Scenario planning is deemed to be a unique strategic foresight technique; this is because it addresses uncertainty and not risk. It largely contrasts from other strategic foresight techniques such as forecasting or analogical reasoning. These other techniques only operate in an environment where there is a high knowledge reserve to support anticipation of important future events and decision making [7]. Scenarios are increasingly being used as an approach to describe plausible futures. In the recent past diverse concepts and methodologies have been used to develop scenarios in the area of environmental governance and management [8]. What is common in all these different approaches is the use of the story approach to develop plausible and consistent futures in relation to a particular system[9].

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 genuinely high [5-7, 10]. 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 [11] and their utility as negotiation tools [12].

Yaakov (2008) illustrates three main uses of scenarios that were utilised in this particular scenario planning exercise. First, scenarios may not only lead to changes in explicit knowledge but can also shape the cognitive landscape by broadening the mental model on effective water governance and equitable and reasonable water use. A single image created by the stories has proven to have the capacity of changing frames of mind [13]. 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 [8].

Third, scenarios are useful as 'boundary-spanning' artifacts [8, 14, 15]. A participatory scenario development workshop brings together a multi-disciplinary team of experts, practitioners, decision makers and other stakeholders. Through their interactions, different social worlds are linked. This may be the natural and social scientists, the water resource managers and the policy makers and even the different sub-disciplines within the natural or social sciences. This is because even though these different social world look at the same system from different angles, the scenario development process creates a platform where their differing expertise, interests and ideas are expressed, negotiated and reviewed to a more mediated position. Shackley and Wynne (1996) explain the value of boundary spanning objects to bridge the gap between policy and scientific worlds thus increasing the robustness of the scenarios and reducing inconsistencies and uncertainty [16]. Boundary spanning improves strategic foresight and increases the uptake of scenarios by decision-makers.

Despite the usefulness of scenarios, there is limited, fragmented and conflicting empirical evidence on the impact of scenarios on water governance decision-making [17-21]. There exists a big divide between scenarios and decision-making [17, 22-24]. 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 [10]. 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 [11].

There is very limited literature on the usage of scenarios for strategic foresight or the role of scenarios in promoting strategic foresight [25]. Foresight is also not a new concept. It has been in existence since time immemorial. Human beings have always been concerned about the future and the effects of their actions on these futures. The ancient methods of strategic foresight have proven wanting. They

focused heavily on individual foresight with no opportunity for the use of this individual foresight in a collective and participative manner. To respond to current complexities that are emerging so fast in a deeply uncertain world, there is new form of foresight that has recently emerged. It is the use of individual foresight in a collective and participatory manner [5].

Coates (2010) defines foresight as an end state. It is not an approach, tool or the process of getting to that particular end state. He specifically states that foresight is "an image, an insight, a picture, a concept about some future state or condition". He further elaborates that this future normally comprises of a timeline of five or more years. Strategic foresight is distinguished from the normal operational planning by the breaking point of five years [25]. The value of strategic foresight is: it broadens and enriches the traditional planning process; supports the process of adapting despite deep uncertainties; helps to better anticipate unexpected circumstances; stimulates creative thinking and broadens the number of futures and possible actions.

Strategic foresight has not been used by many basin organizations. Most basin organizations are tied to the three and five year development and strategic plans [26]. However, with the many changes facing water resources managers and decision-makers, there is need to move away from short-term towards medium and long-term thinking and planning so as to effectively prepare for the future. However, the increase or decrease in use of strategic foresight will largely depend on whether the insights are being utilized by the relevant organizations and if used, whether the strategic foresight helped in making better long-term plans and decisions [25]. A recent study by Vechiatto (2011) explored how strategic foresight has been used by big international industries (Royal Dutch Shell, Nokia, BASF and Phillips) in coping with environmental uncertainty[27]. After a thorough analysis of these industries, the paper concluded that the fundamental contribution of foresight to these industries was not to predict the future but to prepare the managers in these industries to be well prepared to cope with the future.

In this paper we explore whether scenarios in the form of stories can contribute to strategic foresight on Nile Cooperation. The research question that we seek to answer is: What are the benefits and risks of plausible future changes in the Nile Basin by 2050 and how these benefits and risks will affect Nile Cooperation? To answer this question, we will analyse how scenarios of the plausible futures of the Nile Basin can contribute to strategic foresight on plausible Nile Cooperation benefits and risks. Although the conclusions apply to the Nile Basin and cannot be juxtaposed on other river basins; we know that the issues that the paper addresses are generally recognized in various river basins. It is our hope that this article will contribute to developing a better understanding of the extent to which scenarios can be used in river basin governance to sharpen strategic foresight.

Further studies will involve analyzing the uptake of the scenarios to resolve deadlocks and enhance cooperation through benefit and risk sharing. This will entail analyzing the pre-conditions for water resources managers and decision-makers to move away from short-term towards medium and long-term thinking and planning so as to effectively prepare for the future. There will also be a further analysis of whether the insights produced from the Nile basin scenarios are utilized by the Nile Basin institutions and if the strategic foresight has helped in making better long-term plans and decisions on effective governance and equitable and reasonable utilization.

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 km² is shared amongst 11 countries¹. This basin area is 10% of the African surface area and contributes 60% of the riparian states' GDP [28]. Due to its large expanse, the basin is sub-divided into nine (9) sub-basins².



Fig. 1: Nile River basin Map. Encyclopædia Britannica Online: <http://www.britannica.com/EBchecked/media/204/The-Nile-River-basin-and-its-d...>

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.

In 2009, the basin bare soil, shrub-lands and woodlands comprised over 68% of the basin land use [28]. 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 livelihood³. The population in the basin is projected to increase by 52% in 2030 [28, 29]. A large percentage of this population is highly dependent on the Nile as its freshwater source [28]. This rising population continues to put extreme pressure on the quantity and quality of the Nile water resources⁴. 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 [30] [31]. This has increased food insecurity in the basin [32]. The hydropower potential in the basin is 28GW, of which only 26% is currently tapped. Less than 10% of basin residents have access to electricity.

In addition to the above challenges, Paisley (2013) highlights a number of Nile Basin governance challenges as follows:

“... The negotiation of the CFA (Cooperative Framework Agreement) has been excruciatingly slow and seemingly unsuccessful... Second, relatively little appears to have been done about problematic water use by certain Nile riparian’s ... Third, the process of negotiating the NBI and CFA has arguably not been sufficiently inclusive... and opportunities for public involvement have not been substantial. Fourth,

³ 78% of the Nile waters at Aswan High dam is utilized in the agricultural sector

⁴ The forest area in the basin has shrunk by 18% from 2005 to 2009. A significant number of watersheds and ecosystems have been highly degraded thereby drastically reducing the water flow from rivers and springs. Up to late 1980s poaching was very high in the basin and even though it is currently under control the drastic decline of wildlife and extension of some species in protected areas has not been recovered. Egypt, Uganda and Tanzania produce large fish quantities but the basin resources are showing signs of over-fishing

... the Grand Renaissance Dam brings a new chapter in the long, bellicose history of debate on the ownership of the Nile waters, and its effects on the entire region could be profound ... Fifth, Sudan, South Sudan and now 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. This uncertainty has led to a science policy divide which is threatening the future of Nile Cooperation. Scenario planning was proposed to bridge the science policy gap and thereby inform decision-making.

3. THE CONCEPTUAL FRAMEWORK

The strict interpretation of the principle of state sovereignty and non-interference has been one of the major drawbacks to Nile cooperation [4]. Sovereignty according to the 1648 Peace of Westphalia is a “state’s exclusive and indivisible authority within specified territorial boundaries [33-35]. Many scholars have questioned the principle of state sovereignty and non-interference [36, 37].

According to Liftin (1997), sovereignty consists of three elements – autonomy, control and legitimacy. Autonomy is defined by Alam (2009, pg. 91) as “the independence to act. “This independence is limited when the Nile Basin states participate in bilateral, sub-basin and basin-wide agreements and institutions. Alam (2009, pg. 91) defines control as “a state’s ability to effect the resources within its borders and manage any external processes that it may regard as a threat.” He further defines legitimacy as “having the right to make rules. “Compliance to these rules by a state’s citizenry and acknowledgement of these rules by other riparian states confers legitimacy on the nation state.

In a water sharing environment, states prefer non-cooperation to be able to maximize their water allocations outcomes [38]. However, these outcomes are mainly maximized in the short-term. Liftin (1999), proposes a shift from unilateral action towards collective action. He further elaborates that collective action is ‘sovereignty bargains.’

These bargains take the form of a trade-off between limiting autonomy, control and legitimacy in exchange for negotiated shared benefits [33, 35, 39].

To answer the two above questions, we used the conceptual framework developed by Alam (2009) and by Sadoff (2002) [40]. Alam's conceptual framework is illustrated in the Figure 2 and 3.

	Sovereignty	
	Juridical (Westphalian imagining)	Operational (Sovereignty bargains)
Infrastructure		
Institutional	↑ <i>Autonomy</i> , ↑ <i>Control</i> , ↔ <i>Legitimacy</i> ^a : Shun membership of basin organisation	↓ <i>Autonomy</i> , ↑ <i>Control</i> , ↑ <i>Legitimacy</i> : Join basin organisation
Physical	↑ <i>Autonomy</i> , ↑ <i>Control</i> , ↔ <i>Legitimacy</i> : Unilateral development of shared water resources	↓ <i>Autonomy</i> , ↑ <i>Control</i> , ↑ <i>Legitimacy</i> : Cooperative development of shared water resources

^a ↑ means 'increase'; ↓ means 'decrease'; ↔ means 'maintain';

Fig. 2. Interplay between sovereignty and infrastructure, Alam (2009)

	Sovereignty	
	Juridical (Westphalian imagining)	Operational (Sovereignty bargains)
Infrastructure		
Institutional	↑ <i>Autonomy</i> , ↑ <i>Control</i> , ↔ <i>Legitimacy</i> ^a : Shun membership of basin organisation	↓ <i>Autonomy</i> , ↑ <i>Control</i> , ↑ <i>Legitimacy</i> : Sign and ratify an international agreement, creating a basin organisation
Physical	↑ <i>Autonomy</i> , ↑ <i>Control</i> , ↔ <i>Legitimacy</i> : Unilaterally build infrastructure within own territorial jurisdiction.	↓ <i>Autonomy</i> , ↑ <i>Control</i> , ↑ <i>Legitimacy</i> : Cooperative development of shared water resources

^a ↑ means 'increase'; ↓ means 'decrease'; ↔ means 'maintain';

Fig. 3. Implementing agreements on international rivers, adopted from Alam (2009)

Alam (2009) highlights two cautions to the above conceptual framework. First, he cautions that one should distinguish between the sovereignty bargains made by states rhetorically and in practice. A nation state can rhetorically sign and ratify an agreement or join the basin organisation as a member state so as to increase its legitimacy but in practice continue to unilaterally develop water resources. This is because a juridical imagining is perceived by that state to be faster and produces instantaneous benefits. Figure two illustrates this dichotomy with sections that are highlighted with a darker background demonstrating the choices that nation states can make rhetorically and in practice.

Second, Alam (2009) also cautions that the conceptual framework on sovereignty bargains does not give an rationale for cooperation. From the framework, we could not identify what these Nile riparian's were cooperating about. That is the reason why we chose to use another conceptual framework to understand what these countries are cooperating about – a conceptual framework on the benefit sharing principle.

The benefit-sharing principle is a departure from the old principle of water sharing that was found to create a zero-sum, win-lose environment, which is not conducive to cooperation. Benefit sharing is defined as the "cooperative development of water in its optimal locations and the equitable and reasonable allocation of the benefits across a drainage basin"[33]. Benefit sharing principle has been proposed so as to manage and develop water resources at the basin-level while incorporating elements of scarcity and international limits to territorial sovereignty. Ownership and possession of water takes a totally new dimension under the benefit sharing principle. Ownership and possession is joint and unilateral water resources management and development is not encouraged. Joint ownership and management leads to equitable and reasonable utilization and cooperative development in optimal basin locations.

Dinar (2013, p. 14) [41] undertook a study on the distributional considerations of international water resources under externality with a focus on the Blue Nile. He made the following concluding remarks which support the benefit sharing principle:

"We conclude that if a basin-wide solution is sought ...there is need to find an issue linkage that will extend the negotiated scope beyond just water. Since our model included all water related benefits (irrigation, hydropower, abatement of siltation) "beyond water" means literally introducing issues that are of reciprocal interest to the parties, which can create the linkage effect. The most known linkage effect is a regional trade zone ... additional potentially linked issues could include climate related projects that would consist of taking advantage of one country's capacity and natural endowments

to benefit other countries in exchange for water-related activities. Since the prolonged status quo in the Nile Basin does not advance the region in terms of water welfare, local policy makers could get out of the gridlock by trying such other options. The analysis in this paper suggests that indeed focusing only on traditional ineffective set of water issues has to be abandoned.”

A few scholars have attempted to classify the benefits [40, 42]. Sadoff (2002) elucidates four types of benefits. First, benefits to the river. This comprises of the benefits that are derived from the healthy eco-system (ecological benefits). Second, benefits from the river. These are the benefits that are enjoyed by a particular community from the utilization of the water resources (economic benefits). There are numerous studies that confirm that the economic benefits have always been given preference to other forms of benefits [33, 40, 43, 44]. Third, benefits because of the river. These are the benefits that are enjoyed as a consequence of equitable and reasonable utilization of the water resource (social-cultural, political benefits). Fourth, benefits that extends beyond the river. These are benefits that emerge as a result of cooperation, joint management and regional integration (inter-basin cooperation benefits). Phillips (2006) proposes the model Inter-SEDE which adopts Sadoff’s classification of benefits with the exclusion of the last group: benefits that extend beyond the river[42] .

This paper adopts the categorization of benefits by Sadoff (2002) because it is broad enough to acknowledge the basin, inter-basin and international institutions as key players who have power to influence member states and foster cooperation. The paper further analyses the application of the benefit sharing principle in the context of the Nile Basin scenarios. Two sub-questions that the paper seeks to answer are: First: why do Nile States cooperate? Second; what the cooperation is about?

4. METHODOLOGY

1.1. The Rationale and Overview

The scenarios were developed following the methodology as developed by RAND Corporation in the 1950s [45] and later popularized as ‘Shell-scenarios,’ by undertaking an analysis of the effects of driving forces on the Nile Basin water system so as to derive the plausible system outcomes. 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.

1.2. The 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.

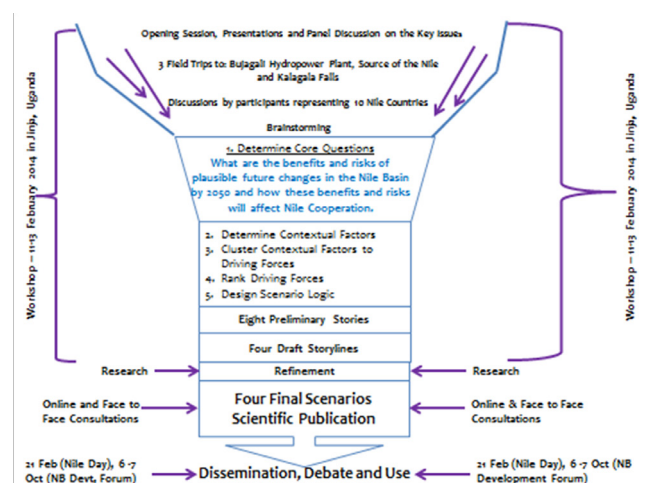
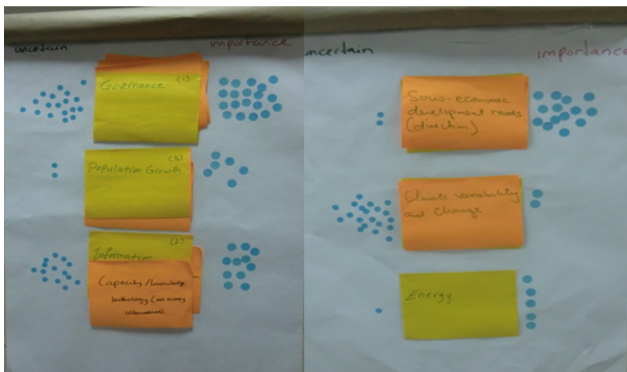


Fig.4. The Scenario Development Process

The workshop was facilitated by Mrs Onencan (NBD), the Regional Manager of NBD and Dr. Enserink of the Delft University of Technology. The summary of the entire scenario development process is illustrated in Figure 4. An

their scenario logic on these three key driving forces: governance, climate change and information. Climate change was preferred over socio-economic development needs as the uncertainty of the impacts of climate change was considered more important.

Fig. 7: Ranking Driving Forces



1.2.5. STEP 5: DESIGNING THE SCENARIO LOGIC

Governance	Non responsive Not adaptive				Responsive Adaptive			
	Non-resilient		resilient		Non-resilient		resilient	
Climate Change resilience								
Information sharing	No	Yes	No	Yes	No	Yes	No	Yes
decision	Worst case				Implausible		Implausible	Best case
	OUT	IN	IN	IN	OUT	IN	OUT	OUT

Table 1: Selection of the candidate scenarios

For clarity, all the different plausible futures were specified as illustrated in Table 1. The best and worst case scenarios were not selected because the participants wanted to further defines a future which is consistent and plausible. Two other scenarios that were eliminated incorporated responsive governance and weak information sharing. This was found by the participants not to be consistent because one key component of responsive governance is a strong and functional information management system.

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 8.

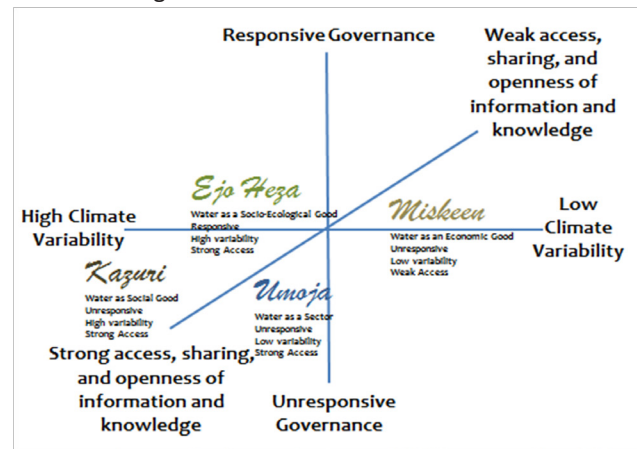


Fig. 8: The Scenario Logic

1.2.6. 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 detailed scenarios are found in Annex 1. The four scenarios are structured around the rationale, methods and drivers that are described in detail in this paper. 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.

1.2.7. 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. Considering the (inter-) cultural and political sensitivities when working with a diverse multidisciplinary and multinational team in a time constrained process, we are very content with the results and the evaluation outcomes. Just below you find a citation of one of the participants mails send to us after the workshop:

“It is great pleasure that I write to you all to appreciate the wonderful NBD meeting we had in Jinja, Uganda. I am very happy to have been part of the meeting and would like to sincerely thank the organizers for assembling a much focussed team with the ability to deliver. The choice of participants was great, the venue and the logistics were wonderful and the facilitation really encouraged healthy participation. Thank you all for the great work you did as a team and let us plan for our development and successful management of our great basin, The Nile Basin.”

The initial storylines were edited and detailed by the workshop facilitators (Onencan and Enserink) and further detailed in cooperation with the workshop participants. In this way the workshop participants stayed involved in the process of thinking about the future cooperation in the Nile basin. 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.



5. SOVEREIGNTY TRADE-OFFS & RATIONALE FOR COOPERATION

The conceptual framework as illustrated in figure 2 and 3; is based on two major arguments. First, if a Nile riparian state follows the juridical visualisation or image of sovereignty, the state will endeavour to increase its autonomy and control over the portion of the Nile Basin water resources that is within its territorial limits. This state will increase its autonomy and control through acts of omission and commission. It will refuse to commit acts of omission by refusing to sign an international or basin-wide agreement creating a Nile River Basin Commission and refuse to join the Nile Basin Initiative or any other basin-wide institutional arrangement that limits its autonomy. Acts of omission will include the unilateral development of water infrastructures within its territory. In the juridical image of sovereignty, legitimacy is not changed.

Second, if the Nile Riparian state follows the operational visualisation or image of sovereignty, the state will endeavour to increase its control through trading its autonomy over the portion of the Nile Basin water resources that is within its territorial limits in exchange for joint control of the shared Nile water resources with the other Nile riparian's. This will include the collective development of water infrastructures within the basin. This state will increase its legitimacy through signing international or basin-wide agreements creating a Nile River Basin Commission or joining the Nile Basin Initiative or any other basin-wide institutional arrangement that limits its autonomy in exchange for increased control and legitimacy. Figure 9 is derived from figure 2 and 3; with a focus on the Nile, using the information derived from the four scenarios.

Scenario	Autonomy	Control	Legitimacy	
Miskeen	↑	↑	↔	Shuns membership of basin agreements (institutional)
Kazuri	↑	↑	↔	Unilateral development of shared water resources (physical)
Umoja	↓	↑	↑	Sign and Ratify Agreement Creating Basin Organization
Ejo Heza	↓	↑	↑	Joint Basin Organization Cooperative development of shared water resources

Fig. 9: Sovereignty and Basin Agreements

NB: Through Kazuri the concept of legitimacy is questioned. Kazuri operates in a citizen dominated country where there is a failed state. The state creates an enabling environment for the citizens to make rules and these rules are recognized. Therefore internal legitimacy increases but this legitimacy is not recognized at the sub-basin, basin and international level.

Figure 9 above, clearly illustrates that each scenario took an extremely divergent approach to sovereignty tradeoffs. Therefore the future sovereignty bargains cannot be predicted. But with the plausible futures, we can better prepare for any of the possibilities.

In the case of Miskeen and Kazuri, sovereignty tradeoffs were not relevant. That is because the state had become a failed state and had no intention of increasing its legitimacy at the basin-level when it had completely lost legitimacy at the local level. From these two scenarios it is clear that when a Nile Basin nation state is facing extreme internal legitimacy issues, it will not seek to cooperate at the basin level. Such a state would prefer to use the scarce resources to increase its control and autonomy instead of trading its autonomy for increased legitimacy. A key lesson learnt is for Nile Cooperation to work, there must be concerted efforts to increase riparian states legitimacy at the national level.

Legitimacy at the national level is a key pre-condition to trans-boundary cooperation. As Weber (1899/ 1980) asserts that the governing system will be more vigilant in increasing its legitimacy, if the society perceives the governing system to be legitimate [46]. On the contrary, with a failed state where the government has no reputation with its citizens, the government will not be encouraged to increase its legitimacy.

But does the governing system need to be limited to the government? Should a citizen uprising against its own failed state be legitimated. Based on Cuppen's (2012, p. 64) definition of legitimacy, it is clear that if this citizen uprising is reviewed by the prevailing governance system based on already established societal norms and values that have given authority to this governance system and the result is a positive judgment then governance system established by the uprising is legitimated[47].

The relocation of state power to the community in the Kazuri scenario also raises a second question: How can community-based governance be legitimated at the basin-wide level? This is because if it was legitimated, then the scenario would have had more positive outcomes. If the governance system established by the communities under

Kazuri was officially recognized, then the legitimating would impose responsibilities on this new governance system to manage the shared resources and ensuring equitable utilization. Kazuri brings to fore the need to move away from the narrow definition of legitimacy, which confines legitimacy to government towards legitimating of governance (Cuppen 2012, p. 12).

Umoja and Ejo Heza sovereignty bargains seem the same; but they are not the same. The differences stem back to legitimacy. Both governance systems are legitimate because they have been able to maintain within their respective societies the reputation that they are the most appropriate governance modes for that particular society. In Umoja, legitimacy is enhanced when the Nile Basin citizens continue to derive benefits from the United Nile Republic. In Ejo Heza, legitimacy is enhanced when the Greening the Nile River Commission creates an enabling environment for the active participation of the Nile citizens in the management and development of the Nile water resources. From an analysis of the two scenarios, it is clear that legitimacy is sustained over long periods of time when the society participates actively in shaping its future rather than passively benefiting from the decisions made by a few elite.

One key strategic foresight is the power of legitimacy in shaping the Nile Basin futures. Legitimacy seems to be emerging as a key pre-condition to trans-boundary cooperation. There has been so much focus on basin and sub-basin cooperation. However, the foundation of this basin-wide cooperation seems to stem from national legitimating of the existing state. It is evident that countries that are struggling with legitimacy issues at the national level are the least willing to cooperate. There is need for more in depth studies on the power of legitimacy and how this power can be harnessed to foster Nile Basin Cooperation.

6. POTENTIAL BENEFITS AND NEGATIVE CONSEQUENCES OF THE SCENARIOS

Each of the four scenarios is an illustration of the potential benefits and the potential negative consequences of decisions to pursue a particular trajectory as set out in each of the four scenarios (see figure 10 below). Each scenario has its own inherent benefits and negative consequences that emerge as a result of choosing to follow a certain development path. What is important at this stage are the trade-offs being made across the scenarios to realise certain benefits and what are the negative consequences of these trade-offs.

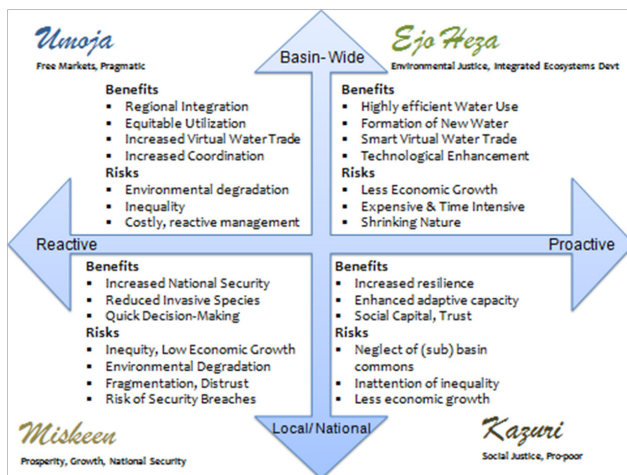


Fig. 10: The Benefits and Risks of the Four Scenarios

To better understand the trade-offs, we will focus on the second question: what is the cooperation about? We have used the Sadoff and Grey (2002) definition of the benefits to better understand what these nation states are cooperating about. This is illustrated in figure 11.

Scenario / Benefits	To the River	From the River	Because of the River	Beyond the River
Miskeen	↓	↑	↓	↓
Kazuri	↓	↓	↑	↓
Umoja	↓	↑	↑	↑
Ejo Heza	↑	↑	↑	↑

Fig. 10: Rationale for Non/ Cooperation

NB: For Miskeen and Kazuri, the benefits only increase for resource rich areas since the issue of equity is not addressed in these scenarios. It is also important to note that when the resource rich areas deplete the resources, they also reduce for these resource rich areas.

In Kazuri and Miskeen, the states are not cooperating. This is because non-cooperation enables them to maximize their water allocations outcomes [38]. However, these outcomes are maximized in the short-term and ultimately diminish. It is important to note that states who take the narrow definition of benefits of cooperation to only encompass economic benefits from the river, are the ones who rarely cooperate. This means that for there to be a shift from unilateral action towards collective action, there must be a shift in the mental model in regard to what the cooperation is about. Efforts should be invested in capacity development and scenario development exercises aimed at changing the mental models of decision makers from the narrow mind-frame of viewing cooperation benefits and economic benefits from the river only. Their scope should be widened so that they realise that there are many other benefits that call for a deeper consideration of collective action as opposed to unilateral action.

The decision of Miskeen and Kazuri not to cooperate, as illustrated in figure 10 translates to more negative consequences than benefits. From figure 10, it is evident that even though these states refused to cooperate because they derived greater economic benefits from non-cooperation. The result was they never attained the economic freedom they were seeking. They benefited from increased security, social capital, resilience and many other benefits. But when the water resources were depleted due to poor regulation and inequitable utilisation, even the benefits they are enjoying are at risk of not being realised in the future. An example is the benefit of security enjoyed by Miskeen. Once Miskeen had depleted the Nile water resources within its territory, it was at a serious risk of water wars with its neighbour. Therefore the benefit of security was no longer assured.

The benefits derived in Ejo Heza are more sustainable than Umoja as illustrated in figure 10. Figure 11 explain this further. Ejo Heza focuses on increasing the ecological benefits together with all the other benefits. Umoja's main focus is increasing economic benefits. From this analysis it can be concluded that for a benefit sharing model to be sustainable, there should be a strong emphasis on ecological benefits. This is because ecological change has a significant influence on society and economies and ecological change affects scenario outcomes.

7. CONCLUSION

Scenarios in the form of stories proved to be an effective tool in contributing to strategic foresight on benefit sharing. In addition, the benefit sharing principle was found to be a feasible approach to effectively manage Nile Basin water resources amidst complexity, scarcity and deep uncertainty. The scenarios communicated a consistent plausible story on the danger of not recognizing or giving priority to the less tangible benefits like a healthy ecosystem.



ANNEX 1: THE FOUR SCENARIOS

A. UMOJA

Scenario Designation: Umoja (Unity)		
Governance	Climate Change	Information/Knowledge sharing and use
Non-responsive; non-adaptive	Low Variability	Free Media
Bad and fragile	Low or No impacts	Good education system Well-equipped and grounded expertise

By 2050, we are one.

Umoja depicts a representative governance mode that is driven by monopoly governance approaches. The focus is on the supra-national level of governance with little attention paid to the local and national level governance. In Umoja, social organization is encouraged but stifled by the adopted governance approach. Knowledge management focuses on information technology capital with restrictions on information access.

By 2050, the United Nile Republic has been institutionalized. It has been operating for 20 years, then. The Nile Basin citizens are enjoying the benefits of having a single currency, one Government managing the entire basin and one passport. There are no restrictions on trade. Movement of persons and goods within the basin is seamless. The borders have finally been dismantled.

From 1999 to 2015 the Nile Basin raised significant investments in hydro-power generation plants and interconnection lines. Before that, only 26% of the hydro-power generation potential has been tapped. Through PIDA, there was an acceleration of the construction of regional and continental infrastructure projects in transport, energy, information communications and technology (ICT), and trans-boundary water. Within a period of 10 years the whole Nile Basin was connected through hydro-power inter-connections lines and trading immensely in hydro-electric power. There were further connections to other regions in Africa like South Africa through the Grand Inga. In addition, to promoting regional trade and exportation, a master plan for regional port capacity for the Nile Basin Community was developed. In addition to the power projects, the ICT component of PIDA created trans-boundary ICT infrastructure. This project connected Africa and the Nile Basin and made internet communications much easier, faster and cheaper. By 2025 the Nile Basin road transport was well developed through the Northern, Central, North-South and Pointe Noire Multimodal Corridors and the Lamu Gateway Development. Since the superhighways connecting the 11 countries have been concluded, the Nile Basin joint tourism programs are flourishing.

In 2029 the 11 riparian states, all agreed unanimously to establish the United Nile Republic. The objective was to unite the 11 Nile riparian states, so as to improve the social and economic well-being of the Nile Basin citizens and to protect and enhance the basin's public goods and services. The Nile River Basin Commission once constituted, adopted the traditional approach to water governance that views water as a sector. It is also known as the blue agenda. However, the blue approach came with major shifts in the manner which the Nile River Basin Commission (NRBC) operated as a river basin. Water as a sector meant that the mandate of the Nile River Basin Commission (NRBC) was to focus on downstream water supply and sanitation. This approach led to the industrial users being given the largest share of the water resource so as not to hamper any current and future investment projects. Because of the blue approach, the Nile River Basin Commission (NRBC) marshaled extremely large investments and employed millions of workers all over the basin. The Nile River Basin Commission (NRBC) is growing significantly every day. Many have requested that the Commission also

addresses issues of equity. But with the blue approach, issues of equity are really not its main concern. The primary focus of the Commission still remains - regulating the tariffs for different water services. Equity was found to be anomalous and could not be easily computed in the tariff structure.

The NRBC hosts the Nile Basin Decision Support System which is shared by all the 11 riparian states. The DSS is where all the information about our past, current and future investment projects are incorporated. Even though the NRBC has the state of the art decision support system, it is ill- prepared in case there are ecological surprises.

At the end of 2050, there are extensive irrigation schemes in the Basin. Most of the Nile basin population has been moved to the cities to pave way for large scale agricultural investments. Food security is assured for the Nile Basin for the next century. However, with the increase the usage of fertilizers and chemicals so as to increase production and fight agricultural pests, these chemicals and fertilizers have contaminated the basin's surface and ground water. The basin also suffers from very high salinity and toxicity levels that have been building up for years, in many parts of the basin soils; threatening human lives, crops and animals. Unknown water –related infectious diseases seem to be emerging that the decision support system never forecasted. The amount of money utilized to address these life-threatening water borne diseases has increased significantly.



B. MISKEEN

Scenario Designation: Miskeen (Miskeen in Amharic, Arabic; Maskeen in Swahili means poor, poorly nurtured)		
Governance	Climate Change	Information/Knowledge sharing and use
Non-responsive; non-adaptive	Low Variability Low or No impacts	Not accessible; not applied; actions not informed by knowledge

By 2050, we are poor.

Miskeen depicts an authoritarian governance mode that is driven by the elite and monopolies, within a knowledge management environment that focuses on information technology capital. In Miskeen, negotiations by the elite, crisis and conflict management are critical components for resolving common problems.

During the negotiations aimed at establishing a Nile River Basin Commission, the 11 riparian states, developed the Cooperative Framework Agreement (CFA). The Cooperative Framework Agreement lays the framework, through which these states can continue to cooperate. By 2012, the process of ratification of the CFA starts. Kenya, Uganda, Rwanda, Burundi, Ethiopia and Tanzania had signed the instrument. By 2015, the Nile River Basin Commission (NRBC) is established. Seven instruments of ratification had been deposited with the African Union: Kenya, Uganda, Rwanda, Burundi, Ethiopia South Sudan and Tanzania. DRC is still struggling with internal security issues. Egypt and Sudan have still not acceded to the CFA.

NRBC's efforts to merge the Nile Basin Initiative (NBI), ENTRO and NELSAP into the new Nile River Basin Commission (NRBC), fail. NBI, NELSAP and ENTRO continue to operate parallel to the Nile River Basin Commission. The legal tussles between NRBC, NBI, NELSAP and ENTRO become ferocious that donors quickly withdraw funding from all these institutions. NRBC together with NBI, NELSAP and ENTRO slowly collapse. With the collapse of the NRBC, NBI, NELSAP and ENTRO, the basin citizens are frightened by the possible escalation of water wars. The basin citizens support state initiatives to invest more public resources on security. As a consequence, riparian states dedicate most of their resources in securing and protecting national borders and their natural resources.

To effectively address this new change of direction; the national governments quickly adopted the brown agenda to water governance. Primary focus is given to markets and the private sector has autonomy to manage water resources. This they accomplish through privatization. The private sector establishes private water boards to manage our water resources. The private water boards have full autonomy to manage the water resources and make decisions on water allocation at the national level. Water is seen as a commodity that one can derive income – an economically viable good. The main focus of the private water boards is drainage, sanitation, recycling and reuse. These private water boards became monopolies with the freedom to determine water pricing and vary it; with no restrictions. As a consequence, the poor could not afford water and a significant amount of water was allocated for other uses: energy production, industry and commercial greenhouse farming. Large amount of the price in water was used to repair broken pipes; these pipes were broken by frustrated citizens who had threatened to go to civil war over water.

Because there was no regional body to manage the shared water resources, the riparian states enjoyed the benefits derived from the Nile water resources that are within their geographical borders with no restrictions. The riparian states believed that with the advanced technology, any problem created as a result of their over-indulgence, would be resolved. There were many environmental lobby groups that complained that the flora and fauna species are drastically declining. There was fear that some would become extinct. In response, national strategies aimed at slowing down the extinction of endangered species were developed.

With the significant reduction in donor support and the rapidly increasing population in the Basin, the Nile Basin communities resorted to cut down trees and cultivate in land designated for forests. This led to significant land degradation; especially in upstream countries. The streams and rivers that were once permanent became seasonal. Slowly they began to dry up. The forest cover reduced drastically. By 2030, the Nile Basin is characterized by soil loss, massive flood events, and long spells of droughts; decline in flora and fauna species including fisheries; amongst many other negative impacts. This has led to increased internal civil strife and increased migration of the Nile Basin citizens.

Looking back in 2050, there is despair. The basin citizens wonder how unethical their leaders were under the guise of pursuing national interests. The Nile Basin leaders were not strategic in their decision-making. Lack of a long-term perspective led the basin into this disparate state. The riparian states have become so inward looking, compartmentalized and very short-sighted. The peace, security and well-being of the Nile citizens is in grave danger.



C. KAZURI

Scenario designation: Kazuri(Small but beautiful)		
Governance	Climate Change	Information/Knowledge sharing and use
Non-responsive; non-adaptive	High Variability High impacts	Accessible, shared, applied

In 2050, we are small but beautiful.

Kazuri represents a democratic, participative and competitive governance system, comprising of fluid actor networks in highly variable climatic conditions. Kazuri automatically moves away from focusing on central government with more focus on communities and local government. In Kazuri, relationships, dialogue, negotiation and capacities are critical components for resolving common problems. Kazuri seeks to attain collective action and erode the belief that one single institution can steer all the actors to achieve sustainable human development. Kazuri depicts many centers of decision making that are formally independent of each other; even though they take each other into account; in competitive relationships.

In 2030, the Nile Basin is witnessing a rise in temperature by 2 - 5oC [32]. This has consequently reduced run-off by 3.5 percent, increased evaporation and led to approximately 15 per cent reduction in the Nile water flow; compared to 2012. Overall there is a reduction in basin water resources [48]. Water security is a major issue all over the Basin as more than 50% of the population is lacking access to safe drinking water and adequate sanitation. "Flying toilets" were condemned in the past when they emerged in the Kenyan Kibera slums but now they are the safest option for many Nile Basin citizens. There is no water to maintain the modern toilet facilities.

Agriculture, the main income earner for over 60% of the Nile Basin citizens; is the most affected sector. There are significant increases in incidences of malnutrition and poverty. More than 90% of the Nile Basin farming land used to be under rain fed farming systems. But this has reduced to less than 50%. This has been attributed to the rising desertification and the erratic climate. Many farmers have abandoned their lands and migrated to the cities to look for other sources of income. Crop productivity in these Nile Basin irrigation schemes has declined by 50%.

The length and veracity of droughts has significantly increased. In 2012, 1.34 million square kilometers of the Nile Basin is arid and hyper-arid land. This is mainly in the Sahara, Sahelian and coastal deserts. By 2030 the arid and hyper-arid land has doubled. The Sahara woodlands and steppe as an eco-region no longer exists. It has been replaced by Sahara desert. There is a drastic increase in crop and animal pests and diseases and there is persistent food insecurity. Nile Basin citizens have lost confidence in scientific and government efforts to forecast and mitigate climate change.

To improve community resilience, more power and finance is devolved to the local governments. Families start planning together with the initial aim of accessing the decentralized finance. By 2030, so many families and clans had formed very strong family ties, to manage the climate change scrounge. These families and clan units start managing their own water resources. They determine what crops to cultivate. Farming becomes a communal effort. They utilize the indigenous knowledge to build small reservoirs, remodel their communal homes so as to tap the run-off more effectively and produce more crops and increase production with the limited available land. Since water is intrinsically a human right; communities manage their own water resources at the local level through water boards, with no state regulation. Many community water users associations emerged to help manage this scarce resource. They are also represented in the water board. There is a mushrooming of community: schools, health centers, libraries, recreational centers, boreholes,

roads; the list is endless. By 2040, no taxes are being remitted to the central government. After several years of non-payment, the central government reluctantly gives in. Amidst a changing climate; there were emerging signs of recovery. Not only of the ecosystem but the social fabric that managed it. People were able to secure food and also make their own energy from their own homesteads.

Kazuri is a citizen-based collective intelligence knowledge hub and an early warning advisory. The platform teaches Nile Basin citizens to reduce their energy intensive lifestyles and focus on renewable sources of energy. Cutting down trees for charcoal and firewood has significantly reduced. Each family is developing their own solar panels, biogas unit, small wind turbine and many other innovations using the very simple technologies. Each family has a small fish pond in their garden to cater for their protein needs. It is powered by solar panels. Through Kazuri, farmers start creating markets for their excess crops, in small scale.

However, Kazuri also had negative impacts. Richly endowed natural resource regions became richer as the poorer regions become poorer. The central government is not strong enough to control use and reallocate to the dryer regions of the country. Regional imbalance and inequities increase tensions. The worst tensions are water tensions between upstream and downstream communities. With failed states, the roles and responsibilities in trans-boundary and regulatory issues are blurred. But Kazuri has become extremely powerful that the nation states are not sure how they can claim back the lost power and authority.



D. EJO HEZA

Scenario Designation: EjoHeza (Tomorrow is Bright)		
Governance	Climate Change	Information/Knowledge sharing and use
Responsive; adaptive	High Variability High impacts	Accessible; applied; actions informed by knowledge

By 2050, we are optimistic.

EjoHeza depicts an inclusive, network focused and reflexive governance system that focuses on social capital to manage its information, amidst a highly variable climate. EjoHeza leads to a bright future because it perceives water as a shared resource that is intrinsically linked to the society, territory and the ecosystems that depend on it. EjoHeza's decision making takes into account the complex inter-relationships between people, plants, trees, animals, fish, birds, micro-organisms, water and soil, in a particular ecosystem. The EjoHeza decision making model not only takes into account the voice of the economy, but also the voice of markets, human beings and nature. The voice of human beings also incorporates the voice of the minority.

Looking back in 2020, the Nile Basin was experiencing high temperatures, sea level rises, salt water intrusions, loss of our ground water resources, increased level of water scarcity and our desert area cover was increasing at a very alarming rate. The crop productivity in the Northern parts of the Nile Basin (Egypt and Sudan) had immensely decreased. This led to large import of food, malnourishment and millions dying due to lack of food. The high climate led to many vectors breeding in basin citizens homesteads and infecting families with life-threatening vector borne diseases. The beautiful waterfalls were drying. Numerous streams, rivers, lakes, forests, wetlands, woodlands and even soils are waning.

At the end of 2020, "Greening the Nile Commission" was established. Its role was to spearhead the quick recovery process and restore our Nile Basin ecosystems back to where it was in the 1800's. This Commission perceived water as a Socio-Ecological Good. This meant that water is not only a human right but also a right for the living beings. It focused more on public – private partnerships that were either market or community led or a combination of both.

In the water sector, the commission focused on ground water resources that have not been tapped and the use of new, climate proof sources of water for the Nile. The focus was on condensation of water from the atmosphere, reuse of waste water and desalination of sea water. By 2025, the Commission had secured financing and started implementing many of the innovative solutions, all over the basin. In the agriculture sector, the Commission focused on joint projects that enhance: rainwater harvesting, soil and water management, agro-forestry, fishery and livestock management projects. The Commission also focused on green agricultural practices, such as post-harvest loss reduction, organic farming, and fish farming. In the Energy sector, the Commission changed focus towards targeted clean energy solutions for households and institutions. This included investments in renewable energy resources. The investments in renewable energy focused on geothermal, solar, wind and biofuel energy.

Greening the Nile Commission realized in 2020 that the inland transport and trade links between the 11 riparian states were very weak. There were many land-locked countries that were relying on road transportation. Then, it was so expensive. There was no North-South transportation link. Therefore the Commission embarked on a three-pronged strategy. First, a comprehensive bulk cargo transportation system that is cost-effective was developed. Second, the inland navigation potential of the river Nile was developed. Third, the Lake Victoria navigation was improved.

There is a transformation of the Basin into a home where numerous water resources experts and entrepreneurs are choosing to locate their start-up consultancy firms or companies. The Commission has facilitated the development of business incubators. In these incubators, the Commission trains people to develop business plans and helps to kick-start these plans. The business incubator sites are based in all the 11 Nile Basin countries. By 2050, these incubator sites had provided office space and support to over 5,000 businesses and raised over \$3 billion in private capital. From a small percentage of the technology hub profit, the Commission established the Nile Basin public-private fund. The purpose of the fund was to provide technology start-ups with early-stage capital. The Commission also partnered with many Universities and research institutions so as to increase graduate programs in Nile Basin water resources management and governance.

By 2050, the quality and quantity of Nile waters has significantly improved. This is because of the great leadership of the Greening the Nile Commission. The initial pressures that were on the Nile water resources have been minimized, through the green agenda. Agriculture, livestock, climate change, urbanization, mining, natural disasters, invasive species and bushfires have been effectively managed. The Nile Basin protected areas in the wetlands, wildlife reserves, national parks, game reserves and forest reserves are secured. The Commission has identified and addressed all the root causes of the rapid basin degradation including managing the population growth rate. The Nile basin is getting greener as more land is being reclaimed from the desert lands.



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one Nile - one family

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