



“Design Determinants for a Nile River Basin Organization (NRBO)”

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Abstract

The riparian countries of the Nile Basin have experienced an evolutionary process of water-related cooperation beyond compare. After a long period of bilateral regime building, they finally jointly recognized that the best way to protect, manage and use the water resources of the Nile is through close cooperation. The Nile Basin Initiative (NBI) reflects this effort because it can be described as an inter-governmental organization that seeks to manage and develop the shared water resources of the Nile Basin in an equitable and sustainable manner. The NBI was and is however only a transitional arrangement without legal binding status and therefore does not completely show the characteristics of a full-fledged River Basin Organization (RBO). In addition, it rather can be questioned if this institution actually has the full potential to efficiently promote transboundary water cooperation between the riparian states of the Nile.

This study seeks to contribute to the growing literature around the cooperative management of transboundary water resources in the Nile Basin. Based on the assumption that the current status quo limits the potential for cooperation in this region, this paper aims to propose design determinants for a Nile River Basin Organization (NRBO). More specifically, this thesis attempts through a web based survey targeted at transboundary water professionals to identify the major problems that can be associated to transboundary water cooperation in the Nile Basin, to assess the regional capacity to make measures against these problems and to determine the resulting desired NRBO services.

The insights, which have been acquired by the results of survey and literature review, indicate that there is a need for a NRBO to be created in order to efficiently and effectively promote transboundary water cooperation between the riparian states of the Nile. The survey results also revealed that the questioned transboundary water professionals considered ‘lack of political will’, ‘insufficient cross-border exchange of information and data’, ‘no commonly accepted and agreed legal frameworks’, ‘insufficient benefit-sharing arrangements’, ‘lack of confidence between disputing parties’ and ‘prior agreements’ as the most important problems to such cooperation. The findings further indicate that the respondents of the survey generally requested those services, which would be required to address the identified problems. In this relation, ‘sharing and exchange of information and data’, ‘performing joint research planning and management’, ‘basin-wide access to knowledge and tools’, ‘ability to enforce agreements’, ‘encouraging political engagement’ and ‘design of dispute settlement procedures’ were determined to be the most desired NRBO services to improve transboundary water cooperation in the Nile Basin.

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Abbreviations

CFA	Cooperative Framework Agreement
EN-COM	Eastern Nile Council of Ministers
ENSAP	Eastern Nile Subsidiary Action Program
ENSAPT	Eastern Nile Subsidiary Action Program Team
ENTRO	Eastern Nile Technical Regional Office
HYDROMET	Hydrometeorological Survey of the Equatorial Lakes
ICCON	International Consortium for Cooperation on the Nile
IRBM	Integrated River Basin Management
IWRM	Integrated Water Resources Management
NBI	Nile Basin Initiative
NBI-ISP	Nile Basin Initiative Institutional Strengthening Project
NBTF	Nile Basin Trust Fund
NEL-COM	Nile Equatorial Lakes Council of Ministers
NEL-CU	Nile Equatorial Lakes Coordination Unit
NELSAP	Nile Equatorial Lakes Subsidiary Action Program
NEL-TAC	Nile Equatorial Lakes Technical Advisory Committee
NILE-COM	Nile Council of Ministers
NILE-SEC	Nile Basin Initiative Secretariat
NILE-TAC	Nile Technical Advisory Committee
NRBAP	Nile River Basin Action Plan
NRBC	Nile River Basin Commission
NRBO	Nile River Basin Organization
RBO	River Basin Organization
SAPs	Subsidiary Action Programs
SVP	Shared Vision Program
TECCONILE	Technical Cooperation Committee for the Promotion of the Development and Environmental Protection in the Nile Basin
TFDD	Transboundary Freshwater Dispute Database
TWG	Transboundary Water Governance
TWRM	Transboundary Water Resources Management

1. Introduction

This study has been prepared for the purpose of fulfilling the requirements of a Master of Sciences (M.Sc.) Thesis in Technology and Resources Management in the Tropics and Subtropics (TERMA) at the Cologne University of Applied Sciences, Germany. The aim of this paper is to propose design determinants for a Nile River Basin Organization (NRBO), that are considered as appropriate to improve transboundary water cooperation between the riparian states of the Nile.

1.1 Problem Statement

Water is essential and the basis for life. Especially for human societies in the 21st century the social, economical and industrial development hinges on water availability. Therefore, it has to be seen alarming that due to increasing climate variability, intense population dynamics and socio-economic developments, water is becoming an increasingly competitive resource in many parts of the world. As a result, water has the potential to become the fuel of certain conflicts, especially in those regions where the misuse of water resources continues among states, which share the same water bodies. In the light of this situation, it is understandable that since the eighties literature has identified shared water resources for potentially being the next major source of conflict across the globe (see, e.g., Homer-Dixon 1994; Remans 1995; Samson/Charrier 1997). Recent literature, in contrast, underlines the possibility that water, as a resource, has become much more an opportunity for cooperation than a source of conflict because it can provide incentives for riparian states to collaborate, even when disputes are waged over other subject matters (see, e.g., Salman/ Chazournes, 1998; Yoffe et al. 2003; Wolf et al. 2003).¹

A very promising concept for fostering cooperation between states that share a common water resource can be seen in the Nile Basin Initiative (NBI). The NBI is an inter-governmental organization initiated and led by the riparian states of the Nile River that aspires to create international applicable conditions to develop the river in a cooperative manner, share the socioeconomic benefits and foster regional peace and security. In order to recognize their common concerns and interest, the NBI member states started in 1999 with a participatory course of dialogue, which resulted in a shared vision, “*to achieve sustainable socio-economic development through the equitable utilization of and the*

¹ The largest empirical study concerning water conflict and cooperation underscores the second opinion. The so called Transboundary Freshwater Dispute Database (TFDD) is a dataset of every reported cooperative or conflictive interaction between two or more states, which involved water as a scarce and/or consumable resource or as a quantity to be managed. The results of the study show, that between 1950 and 1999 cooperative events occurred twice as often as conflictive events. In this connection, there were 1.228 cooperative (67%) and 507 conflictive events (28%), which appeared during this timeframe (Yoffe et al. 2003; Robertson 2004).

benefits from, the common Nile Basin water resources” (NBI 2011: 2 f.). Nevertheless, promoting transboundary water cooperation within this region has to be seen as very complex, as the NBI has to establish consensus among differing political and socio-economic minded riparian states that are almost all characterized by extreme poverty, food insecurity, environmental degradation, water scarcity, national, but also international conflicts, as well as intense population dynamics (for more detail see section 2.4.1). This already challenging situation is accompanied by a series of shortcomings that occur on the organizational level of this institution. In this connection and besides general problems that affect the overall performance of the NBI (e.g. procedural and policies conflicts, lack of coordination etc.), attention must be particularly paid to one aspect: The NBI was and is only a transitional arrangement without legal binding status and therefore does not completely show the characteristics of a full-fledged River Basin Organization (RBO) (for more detail see section 2.4.2) (Belay et al. 2009). Consequently, the NBI solely can be described as an interim institution binding together the NBI member states to move forward into a Nile Cooperative Framework Agreement (CFA), which would “*pave the way to the establishment of a permanent River Nile Basin Organization*” (Mekonnen 2010: 428). Even though the negotiations over the CFA were concluded in April 2010, continuing disagreements among states caused that the CFA has yet to be finalized, agreed upon fully and ratified (Mekonnen 2010).

Despite the remarkable progress attained by the NBI in the various fields of transboundary water resources management, the NBI’s ambitious goals for establishing regional cooperation and mutually beneficial relationships among all Nile Basin countries have to be questioned. Thus new ways for improving transboundary water cooperation between the riparian states of the Nile need to be developed in order to face the very challenging situation of turning the NBI’s shared vision into reality.

1.2 Research Question and Objectives

This paper attempts to shed a new light on transboundary water cooperation in the Nile Basin. Based on the assumption that the current status quo limits the potential for cooperation between the riparian states of the Nile, the purpose of this study is to propose design determinants for a Nile River Basin Organization (NRBO). More specifically, this thesis attempts to identify through expert experiences the major problems that can be associated to transboundary water cooperation in the Nile Basin, to assess the regional capacity to make measures against these problems and to determine the resulting desired NRBO services. In this context, the author hopes that the people who will be responsible for shaping the future of transboundary water cooperation in the Nile Basin will consider the findings of this thesis. It is further intended that the findings of this paper may support

the NBI in their effort to identify some of the missing services, which could help to achieve its ambitious goals and to improve the likelihood to foster transboundary water cooperation between the riparian states of the Nile. In this relation, the study is guided by the following research question:

Research Question:

- *What criteria and elements should be considered for the design of a Nile River Basin Organization (NRBO) in order to efficiently and effectively improve transboundary water cooperation between the riparian states of Nile?*

The associated research and sub-objectives of this thesis are to:

Research Objective:

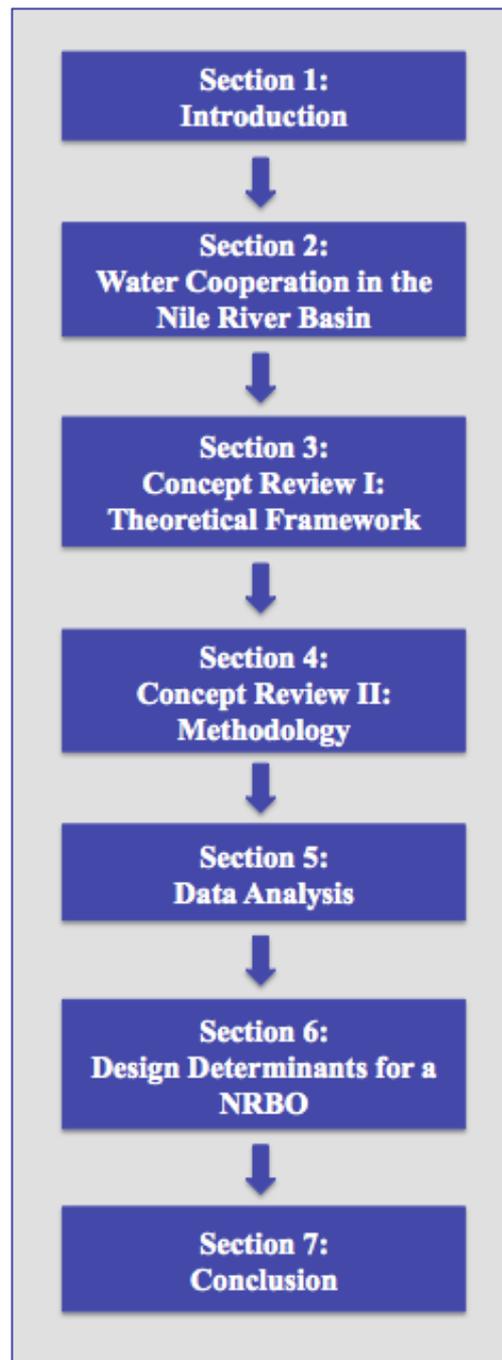
- *Propose design determinants for a Nile River Basin Organization (NRBO), which have the potential to improve transboundary water cooperation between the riparian states of the Nile.*

Subobjectives:

1. Analyse and identify the major problems to transboundary water cooperation in the Nile Basin.
2. Assess the existing regional capacity to take measures against these problems.
3. Identify the most desired NRBO services in order to improve transboundary water cooperation in this region.
4. Assess the demand and desire for creating such a NRBO.

1.3 Outline of the Thesis

As illustrated on the right, the paper is divided into seven sections and is structured in the following way: The first section has briefly introduced the research problem and the associated research question and objectives, which are driving this study. This section will also briefly describe the key terms of this research. The second section of this thesis gives an overview on the Nile Basin and offers relevant insights into the evolution of transboundary water cooperation in this region. It further describes the characteristics of the Nile Basin Initiative and provides a detailed look on the most prevalent obstacles to water cooperation within this basin. In addition, this part of the thesis will serve as a prerequisite to understand the complex nature of this subject matter. Section three deals with the theoretical framework, which has been derived from an extensive literature research. Based upon lessons learned from international river basins, this part will describe those concepts, which should be considered by river basin organizations in order to promote transboundary water cooperation efficiently and effectively. Subsequently, section four will explain the methodological approach, taken to execute this research. Here, the research methods as well as the strategies and instruments for the data collection are mentioned and reasoned. The fifth section will then focus on the presentation and analysis of the outcomes of the empirical study. At this point, the author will depict the issues relating to the subject matter studied, which include the characterization of respondents, the assessment of transboundary water cooperation in the Nile Basin (identification of problems and capacity) and the determination of the resulting desired NRBO services. Through the results of the survey and literature review the section six then will propose design determinants for NRBO. In the end, the seventh section discusses the significance and findings of this thesis in relation to the research question and finally draws a conclusion.



(Figure 1: Outline of the Thesis)

1.4 Terminology

The following definitions of concepts used in this study are provided below in order to clarify the specific focus of this research.

- **Capacities:** For the purpose of this paper, capacities “*can be seen as the knowledge, skills and other faculties, in individuals or embedded in procedures and rules, inside and around sector organizations and institutions*” (UNESCO-IHE 2008: 6). In this connection, capacity building refers “*to a process that supports only the initial stages of building or creating capacities and alludes to an assumption that there are no existing capacities to start from*” (UNDP 2008: 5). In comparison, the more comprehensive term capacity development is defined as “*the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time*” (UNDP 2008: 4).
- **Conflict:** “*A (...) conflict arises when: 1) at least two parties interact in an incompatible way; 2) at least one of the involved parties intends or ignores the negative impacts on the other party stemming from the interaction; and 3) at least one of the involved parties experiences damage from the interaction*” (Coser 1956: 8). In this study, the term water conflict will be used to describe a conflict that relates to the access to water resources within a river basin, which emerges, “*when the downstream nation is militarily stronger than nations upstream, and the downstream nation believes its interests in the shared water resource are threatened by actions of the upstream nations*” (Kameri-Mbote 2007: 3)
- **Cooperation:** In general cooperation is defined “*as a process through which human beings and groups may move up from one level of social development to the next, richer and more stimulating one*” (Bogardus 1964 quoted by Dinar 2004: 2). In this study, the term international cooperation is used to describe “*a process by which two or more developing countries initiate and pursue development through the cooperative exchange of multi-dimensional knowledge, resources, skills and technical know how*” (UNDP 2007: 3).
- **Riparian:** This term is “*relating to or living or located on the bank of a natural watercourse (as a river) or sometimes of a lake or a tidewater*” (IPCC 2012). In this study, riparian states refer to the countries of the Nile Basin.

- **River Basin:** In the present use, a river basin (also called catchment, watercourse, or sometimes watershed) will describe “*the geographical area contained within the watershed limits of a system of streams and rivers converging towards the same terminus*” (Molle et al. 2007: 587). In this relation, an international river basin is a catchment area, which “*crosses the political boundaries of two or more nations*” (Wolf et al. 1999: 389).
- **Stakeholder:** The term stakeholder is defined as “*any group or individual who can affect or is affected by the achievement of the organization’s objectives*” (Freeman 1984: 27).
- **Transboundary Waters:** For the purpose of this research transboundary waters are defined “*as freshwater resources shared by two or more states and comprising rivers, lakes and aquifers*” (Vollmer et al. 2009: 3).

2. Water Cooperation in the Nile River Basin

The following section of this paper briefly provides general information about the Nile Basin and offers relevant insights into the historical development of water cooperation in this region. It further describes the Nile Basin Initiative (NBI) and some problems, which have been identified by the current literature to be the major obstacles to transboundary water cooperation between the riparian states of the Nile. This step will give the reader the informational basis to follow the subsequent parts of the thesis in a comprehensible way.

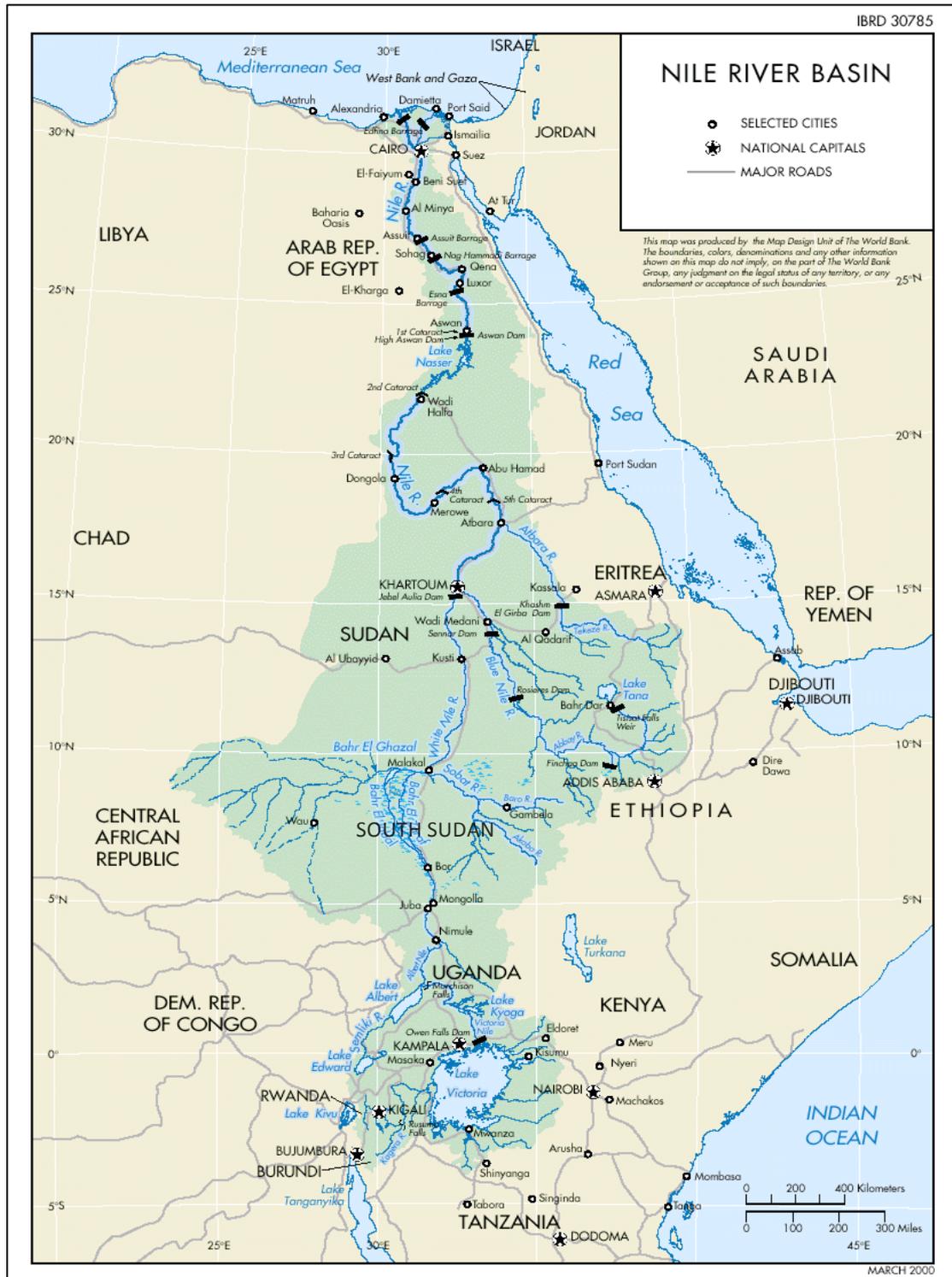
2.1 General Information

The Nile Basin possesses diverse geo-physical characteristics along its path to the Mediterranean Sea. It is the longest river worldwide with a length of 6.650 km and a catchment area of about 3.260.000 km² (Kirby et al. 2010). In terms of freshwater quantity, however, the Nile is only considered as a middle-range basin because it only holds 2% of the water mass of the Amazon and not more than 20% of the Mekong (Menniken 2008). For this reason, the Nile River can be distinguished from other great rivers of the world due to the fact that around 50% of its course flows through countries with no effective rainfall. In addition, nearly all the water of the Nile is generated on an area that only comprises 20% of the total basin area. The rest of the basin is located in arid or semi-arid regions where water supply is very limited and where evaporation and seepage losses are very high (Karyabwite 2000). Despite the dry climate, the very limited water supply is further a result of the situation that no tributary joins the Nile on the last 3000 km of its journey. A study that compared the population and the available runoff of five world regions (China, South Asia, Southeast Asia, West Africa and the Nile region) came to the conclusion that *“the Nile region is by far the most water scarce”* (Varis 2000: 627).

From the highest point at 5.120 m above mean sea level in the Ruwenzori mountain range to the Quattarah Depression at 159m below mean sea level, the Nile Basin consist of several drainage catchments and lakes that are presently linked by steep channels or flat reaches. In addition, important geo-physical features of this area include mountains, high and low altitude wetlands, sub-tropical and tropical vegetation and some of the driest areas in the world as well as some of the largest inland water bodies. Therefore, along its length and breadth, the Nile Basin can be divided into several geographical zones with characteristic features of elevation, topography and land cover. The north-south orientation of the Nile Basin, which extends over 36 degrees of latitude, further causes extreme climate variability between the extremes of the basin. That is why its climate range varies between aridity in the north and tropical rainforest in the south (Nicol 2003). In this context, the Nile Basin in Sudan and Egypt is rainless during the northern winter, whereas the Ethiopian Highlands, as well as the southern parts of the basin, experience heavy

rainfall during the northern summer (Karyabwite 2000). Furthermore, most parts of the basin fall under the influence of the northeast trade winds, which are causing a prevailing aridity between October and May. As a result, the precipitation regime of the Nile Basin can be characterized as irregular, which varies widely from season to season, from year to year and from region to region. Starting from the south, the streams of the Nile River flow towards north and expand over eleven countries: Burundi, DR Congo, Kenya, Rwanda, Tanzania, Uganda, Eritrea, Ethiopia, South Sudan, Sudan and Egypt (see Figure 2).

Figure 2: The Nile River Basin



(Source: WB 2000, edited by author)

Two major tributaries form the Nile: the *White Nile* and the *Blue Nile*. Although it has several sources, the White Nile originates from the Luvironza River in south-central Burundi and flows into the Kagera River, which in turn runs into Lake Victoria, the world's second largest freshwater lake. From the outlet of Lake Victoria, at an elevation of 1.150m in Jinja/Uganda, the Nile water then travels downwards through the Great Lakes Region into Southern Sudan, where the Sobat joins it. Afterwards the river continues to flow northwards and traverses a massive natural swamp system (8000 km²) called the Sudd. At this point the White Nile is dramatically slowed down and significantly loses up to 60% of its original flow to evaporation. This is the main reason why the White Nile merely delivers 30% of the Nile Waters as measured at Aswan High Dam in Southern Egypt.

The bulk of the Nile's waters comes from the Blue Nile, which has its springs in the Ethiopian Highlands at 1.800 m above mean sea level. From the upland plateau of the Ethiopian Highlands the river flows down towards Sudan and displays huge hydropower potential in that region. This situation can be related to the fact that the Blue Nile drops to 500 m in elevation on its first 1.500 km (Menniken 2008). The flow of the Blue Nile is determined through the seasonality of rainfall over its origin, the Ethiopian Highlands and significantly fluctuates between 10 million m³ in April and 500 million m³ in August. Despite the seasonal variation of flow volumes, the Blue Nile is by far the biggest water supplier to the river system of the Nile. In addition, with its average annual flow of 48,6 km³, the Blue Nile contributes over 60% to the long-term river flow of the Nile (Nicol 2003).

North of Khartoum in Sudan, the two major tributaries merge together and continue to flow northwards. Below the Blue Nile and White Nile confluence, the Atbara River is the last tributary that joins the river system of the Nile.² From this point on the Nile flows through Lake Nasser, one of the largest man-made lakes in the world and continues its way as a single river through a desert-like area for almost 3.000 km (Menniken 2008). Afterwards, just north of Cairo in Egypt, the Nile finally splits up into two major distributaries, the Damietta and the Rosetta, before it runs into the Mediterranean Sea. South of the Atbara-Main Nile confluence, the long-term river flow of the Nile, measured at Aswan, is estimated at around 85 km³ (Droogers/Immerzeel 2009).

² The Atbara originates in the Ethiopian Highlands north of Lake Tana and flows northwestwards until it joins the major tributaries of the Nile. In relation to the water budget of the Nile it has to be pointed out, that the Atbara is a highly seasonal river. This relates to the fact, that the Atbara's average annual flow contribution of 11,1 km³ is mainly restricted to the flood period (Sutcliffe/Parks 1999).

Holding the confluence of the White and Blue Nile, former Sudan (South Sudan and Sudan) has by far the largest portion of the total Nile Basin area (63,6%), followed by Ethiopia (11,7%), Egypt (10,5%) and Uganda (7,4%), leaving less than 7% for the remaining six riparian countries (Karyabwite 2000).³ In this context, Table 1 illustrates the Nile Basin repartition, as well as the dependence on water from upstream catchments to downstream states, and shows how much water the riparian countries of the Nile receive externally against internal renewable water resources. As a consequence of the extreme dependence on external flows, it is not surprising that since the beginning of the 20th century especially Egypt but also Sudan have executed several supply-side structures in order to capture and regulate the Nile River's flows (e.g. Aswan High Dam, Roseires Dam, Sennar Dam etc.). Nevertheless, all Nile Basin riparian countries have in common that over 85% of the total water amount available is used in the agricultural sector. Hence, water for irrigation has been and still is the major concern for them, followed by hydropower development and ecosystem maintenance as well as utilizing water for domestic and industrial purposes (Nicol 2003).

Table 1: The Nile Basin Repartition and Water Resource Availability

Country	Country Area in (km ²)	Area within the Nile Basin (km ²)	% of the total Nile Basin Area	Internal Renewable Water Resources (km ³ /year)	Actual Renewable Water Resources (km ³ /year)	Dependency Ration in %
Burundi	27.835	13.260	0.4	3.6	3.6	0.0
DR Congo	2.345.410	22.143	0.7	935.0	1019.0	8.2
Egypt	1.001.450	326.751	10.5	1.7	58.3	96.9
Eritrea	121.320	24.921	0.8	2.8	8.8	68.2
Ethiopia	1.127.127	365.117	11.7	110.0	110.0	0.0
Kenya	582.650	46.229	1.5	20.2	30.2	33.1
Rwanda	26.340	19.876	0.7	6.3	6.3	0.0
Sudan (former)	2.505.810	1.978.506	63.6	35.0	88.5	77.3
Tanzania	945.090	84.200	2.7	80.0	89.0	10.1
Uganda	236.040	231.366	7.4	39.2	66.0	40.9
Total	8.919.072	3.112.369	100.0	-	-	-

(Source: Karyabwite 2000: 10 ff., edited by author)

³ South Sudan attained independence from Sudan on 9th of July 2011. Nevertheless, due to the lack of present scientific and technical data, it has to be pointed out here, that this section uses the term "Sudan (former)" to describe both countries, Sudan and South Sudan.

The potential and range in utilizing the water resources of the Nile are significantly differing from country to country. For this reasons, the following section briefly describes the importance of the Nile for the respective riparian country:

- Egypt heavily depends on water that originate outside its borders. About 95% of the Nile water that flows through Egypt comes from regions further upstream. Furthermore, about 97% of the water, which is used in Egypt, is taken from the Nile. The very arid conditions within the country further makes it necessary that 98% of Egypt's total cropland needs to be irrigated. Consequently, the majority of the Nile waters (86%) are used for agricultural purposes. However, much more than the other riparian countries, Egypt also utilizes the Nile water for hydroelectric power generation and for domestic and industrial purposes (Menniken 2008). As a logical consequence of the above-mentioned aspects, Egypt is by far the nation that is most dependent upon the Nile. Therefore it has always claimed rights on the waters of the Nile and above the remaining riparian nations. In this relation, it is necessary to state that Egypt, as the economically and militarily most powerful nation of this region, was and still is capable of imposing their interests.
- Hosting the confluences of the Blue and the White Nile, gives Sudan in geophysical terms an outstanding status. Even so, it is somewhat less dependent upon the Nile, due to its rainfed agricultural areas within its borders (Waterbury 2002). However, because of its low level of socio-economic development and its very poor political performance, which is also a result of the conflict in Darfur (2003–2010), Sudan's momentarily main interest is to attain food security followed by a modest expansion of hydropower. In relation to its dependence on agriculture, it should be further pointed out that the most reliable production areas are located in the Nile Basin (Menniken 2008).
- Although endowed with rich natural and fossil resources, South Sudan remains comparatively very underdeveloped primarily resulting from the struggle for independence. Therefore South Sudan currently mainly depends on rainfed agriculture, as it receives sufficient rain in most parts of the country (Guvele 2003). At present, the country is not dependent upon the Nile, but it would like to be. This relates to the announced plans to build a hydropower dam at Wau, a city that is located next to a tributary (Jur River) of the White Nile (Ferrie 2011).
- For Ethiopia the most important interest is to attain food security. Because of that, the country sees the Nile as a crucial resource for irrigated agriculture. Moreover, due to the vast potential of hydropower in the Blue Nile basin, it is becoming increasingly

interesting for the country to generate electricity through the use of dams (Menniken 2008).⁴ So far the exploitation has been unfairly denied by the prevailing regime in the basin. The regime, which has been established by Egypt and Sudan, is a result of the fear that any additional Ethiopian water-use projects will alter the flow of the Nile and therefore cause significant impacts on the nations water availability.⁵ Nevertheless, a potential alliance between Sudan and Ethiopia in a joint effort to develop and utilize the waters of the Blue Nile has been described by Waterbury as “*Egypt’s worst nightmare*” (Waterbury 2002: 172).

- Eritrea’s interest in the Nile is limited to the management of two seasonal streams (Gash and Setit River), which both flow into Sudan. Furthermore, there has been a periodic understanding between the two countries in how to use these flows. Just in the other basin riparian countries, the main interest is to use the water of the Nile for agricultural production in order to supply the population with sufficient food.
- In company with Egypt, Sudan and Ethiopia, Uganda can be regarded as the fourth major stakeholder in the Nile Basin. Uganda is primarily interested in the generation of hydropower because it does not need surface irrigation or additional surface water for its agricultural cultivation practices (except in the semi-arid northeast) (Waterbury 2002). Here, it is necessary to mention that for a long time Egypt has kept Uganda from the implementation of new hydropower development projects. This can be explained by Egypt’s aversion to share its technical expertise on hydropower development projects. As explained before, this situation is caused by the fear of Egypt that any upstream hydropower or water supply structures would probably alter the flow of the Nile further downstream (Menniken 2008). Anyhow, the Owen Falls Dam, which was constructed to generate power and regulate the flow from Lake Victoria, is operated in direct cooperation with Egypt. In relation to the operation of the dam, Uganda is bound to Egypt by a treaty (Owen Falls Agreement) (Waterbury 2002).

⁴ 60% of the total hydropower potential is located in the Blue Nile Basin. According to its enormous quantum of precipitation, especially in the highlands, Ethiopia is further described as the “Water Tower of Africa”, generating approximately 112-billion m³ surface runoff per year. In this connection, it has been estimated that about 85% of the Nile waters are originating in Ethiopia. In addition, the potential of hydropower is estimated up to 20.000 MW, of which only 400 are already exploited (Waterbury 2002; Menniken 2008).

⁵ Ethiopia recently officially started at the Blue Nile with the construction of the Grand Millennium Renaissance Dam (formerly know as the Grand Millennium Dam), a hydroelectric power project that is going to be the largest on the African continent. Even though Ethiopia is the world’s second biggest recipient of foreign aid, international funders have not shown any interest so far in supporting the project. The reason for that is the potential conflict, which could arise between Ethiopia, Sudan and Egypt. That is why the Ethiopian government stated, that the dam will be fully financed by Ethiopia itself (International Rivers 2011).

- Besides water for irrigated agriculture, the remaining Nile riparian countries individually do not have any major stake in issues of water use. Anyhow, they play a significant role for the development of the common pool resource around Lake Victoria and are indispensable partners in the Nile Basin cooperation process. Kenya and Tanzania, which both can be characterized as very dry countries with frequently occurring droughts, rely on the resources of Lake Victoria. In addition, they seize the Nile water for agriculture and fishery as well as for tourism, especially in the western zones of their countries. Burundi and Rwanda, in contrast, have high and regular rainfall so that their interests on the Nile are confined mainly on hydropower generation. Together with Kenya, Tanzania and partly Burundi, they have a certain transboundary hydropower potential. Congo has not paid much attention on the Nile so far, but it has shown some interest in shipping and fishing rights next to Lake Albert (Waterbury 2002; Menniken 2008).

2.2 Evolution of Transboundary Water Cooperation

Although the current cooperation process among the riparian states of the Nile seems to be different at first sight, there are certain behavioural patterns and logic of actions in transboundary water cooperation that cannot be fully understood without reconstructing their evolutionary appearances.

The first half of the 20th century can be characterized as an era of hegemonial steered basin-wide collaboration in the interest of the British Empire, which first conceptualized the Nile Basin as a political and hydropolitical-planning unit (Menniken 2008). Under the British-Egyptian condominium, a shortage of cotton on the world market brought pressure on Egypt and Sudan to cultivate this summer crop. The consequent need for summer water and flood control therefore induced an intense phase of water development along the Nile Basin with disputes between supporters of Egyptian and Sudanese interests concerning whether the focus for development should be located further upstream or downstream. Two measures, which both occurred in 1920, underline the hydropolitical attitude of Britain: the Nile Projects Commission and the Century Storage System. The Nile Projects Commission, which was formed through representatives from India, Britain and the US, was a response to Britain's awareness that any regional Nile Basin development plans had to be regulated with a formal agreement on water allocation. In this relation, the Commission estimated that the water needs of Egypt would be 58 billion cubic meters per year. For comparison, the rivers average annual flow was estimated at 84 billion cubic meters. Despite the fact that the Nile flow fluctuates significantly, they also recommended that Sudan would be able to meet its irrigation requirements alone from the Blue Nile. However, the findings of the Commission were never brought into action. During the same

year, Britain also published the Century Storage Scheme, so far the most extensive concept for water development along the Nile. The plan included designs for a water storage facility next to the Ugandan-Sudanese border, a dam at Sennar, which was located south of Khartoum, and a dam on the White Nile in order to store summer floodwater for Egypt. During that time, the scheme was far too ambitious to be implemented because of political, technical and natural reasons. Egypt was also worried that these major storage systems would be located outside of the Egyptian area of influence (Wolf/Newton 2007).

When the riparian countries of the Nile Basin consecutively became independent from colonial powers, riparian disputes on water allocation, especially between Egypt and Sudan, became more contentious. After the formal declaration of independence of Egypt (1922), a new commission made suggestions that were based on the 1920 Nile Projects Commission's estimates and finally resulted in the 1929 Egyptian-Sudanese Nile Waters Agreement. This agreement, which fixed quantities of water to be allocated to each country, was signed on the 7th May 1929 between Egypt and Britain, with Britain acting on behalf of Sudan and other East African colonies. Based on the Nile's mean annual discharge of 84 billion cubic meters, of which 32 billion cubic meters were lost to evaporation and seepage, the agreement included that 4 billion cubic meters were annually allocated to Sudan. A relatively small amount due to the fact that the entire time flow from January to July (dry season) and a total amount of 48 billion cubic meters per year was reserved to Egypt (Kameri-Mbote 2005).

A key clause of the agreement reads as follows:

“Save with the previous agreement of the Egyptian Government, no irrigation or power works or measures are to be constructed or taken (...), which would, in such a manner as to entail prejudice to the interests of Egypt, either reduce the quantity of water arriving in Egypt, or modify the date of its arrival, or lower its level” (Nile 1929: 2).

This obviously imbalanced distribution reflects the power equation at that time, the British-Egyptian hegemony, and shows in essence that the agreement prohibited upstream countries from undertaking any kind of major water works without the consultation of Egypt. Consequently, it was binding on all Nile Basins countries which had been under British administration at that time. For being inequitable the agreement that indeed placed priority on Egypt's water needs, was latter challenged by upstream states and has been repudiated by Tanzania, Uganda, Kenya and Sudan after gaining their independence. Another bilateral agreement, which also reflected the British long-term interest in securing water for Egypt, was the Owen Falls Agreement of 1953. In this connection, Egypt and Britain, with Britain acting on behalf of Uganda, agreed to construct the Owen Falls Dam

in order to generate electricity for Uganda and control the outlet of Lake Victoria. However, irrigation in Egypt and Sudan remained the priority area of Britain's hydropolitics. That is why the flow regulations of this dam had to be approved by an Egyptian technical committee in order to control that Ugandan water utilization would not negatively impact Egypt's interests (Wolf/Newton 2007).

As a result, Uganda was allowed to:

“take action at Owen Falls which it may consider desirable provided that the action does not entail any prejudice to the interests of Egypt in accordance with the Nile Water Agreement of 1929” (Nile 1949: 2).

Due to the aspects mentioned above, it is worth noting that in relation to its water needs Egypt has benefited from the English occupation. Although Egypt was already the strongest Nile Basin's riparian country at that time, it would have never been able to assert such demands to the other riparians without the assistance of Great Britain (Menniken 2008). The situation changed after World War II because many of the British colonial territories attained their political independence. The uncertainty, which came along with the political changes at that time, made it necessary for Egypt to establish new bi- and multilateral agreements, especially with the military regime of Sudan that gained power in 1958 (Okoth 2009). Besides the new political climate in this region, this new strategy of Egypt was also caused by the need to obtain funding (mainly from the World Bank) to construct the Aswan High Dam. This dam, with a project storage capacity of 156 BCM/yr, was another attempt of Egypt to solidify its hydropolitical hegemony in the Nile Basin and to secure its coming water demands. After the Egyptian revolution in 1952, the construction of the Aswan High Dam, therefore, became one of the key objectives of the Egyptian government. In order to receive funding from international donors, Egypt was consequently adopting a more conciliatory tone to its neighbour. The result was the adoption of the 1959 Egyptian-Sudanese Agreement for the Full Utilization of the Nile Waters (1959 Nile Water Treaty). This mutual agreement, which in the widest sense comprised water allocation and harm mitigation, had following key provisions:

- The average annual flow of the Nile was estimated to be 84 billion cubic meters, whereas evaporation and seepage losses were considered to be 10 BCM/yr., leaving 74 BCM/yr. to be divided.
- The related acquired rights were described to be 48 BCM/yr. for Egypt and 4 BCM/yr. for Sudan. The remaining benefits of approximately 22 BCM/yr. were allocated by a ratio of 7.5 for Egypt (7.5 BCM/yr.) and 14.5 for Sudan (14.5 BCM/yr.) In addition, the total allocations equalled 55.5 BCM/yr. for Egypt and 18,5 BCM/yr. for Sudan.

- Establishment of a Permanent Joint Technical Committee in order to resolve disputes and jointly review claims of other riparian states.
- Any increases in average yield further would be divided equally, whereas, any significant decreases would be taken up and addressed by the Joint Technical Committee.
- In order to prevent a drop in Egypt's water level, all countries located further south must receive a permission from Egypt to utilize the waters of the Nile for irrigation or hydroelectric projects.
- Egypt and Sudan concluded that any claims would be faced by one unified Egyptian-Sudanese position.

(Source: Wolf/Newton 2007)

In relation to these provisions, it is necessary to mention that ever since the signing of the 1959 Nile Water Treaty, the two parties have held on to the allocation conditions until the present. Therefore, the treaty can be rated as the first important bilateral hydro-political agreement between Egypt and Sudan. Furthermore, no riparian country, except of Ethiopia, have ever exercised a legal claim to the conditions in how the water is allocated in this treaty. Anyhow, the condition that any country south of Egypt must get Egypt's approval has frequently caused tensions between Egypt and other countries (Kameri-Mbote 2005). Ever since the signing of the 1959 Agreement, a series of cooperative but rather ineffective activities to manage the river have been taken place between the riparian countries of the Nile. The situation changed with the implementation of HYDROMET (Hydro-meteorological Survey of the Equatorial Lakes.), a project that has been supported from 1967 to 1992 by the United Nations Development Programme (UNDP) and the World Meteorological Organisation (WMO). The project was launched to collect hydro-meteorological information within the basin in order to explain the unpredicted increase in precipitation, which caused a dramatic rise of the water level in Lake Victoria and the other equatorial lakes. Despite the competitive political environment that was caused by the Cold War, all Nile Basin states participated from the beginning, except of Ethiopia and Congo, which joined as observers in 1971 and 1977. In addition, catchment surveys and models of rainfall and runoff patterns were carried out between 1967 and 1981. To outline the importance of HYDROMET, it has to be noticed, that the project can be seen as an early approach to manage transboundary resources in an equal manner, because for the first time all gathered information were shared among the participating riparian states (Menniken 2008).

The End of the Cold War, but also the growing awareness within the Nile Basin that upcoming development efforts would require an more strategic and cross-sectorial thinking, led to a new era of negotiations. In 1993, the Nile Council of Ministers

(NILECOM) launched the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin (TECCONILE), an initiative that had been established for the purpose to create an informal dialogue between the riparian countries. By the support of the Canadian International Development Agency (CIDA), the TECCONILE initiative then resulted in 1995 in the Nile River Basin Action Plan (NRBAP), a basin-wide plan which included integrated water resources planning and management, capacity building, training, regional cooperation, as well as environmental protection and enhancement (Nicol 2003). At the same time, a series of Nile conferences (Nile 2002 series) began in 1993 bringing together mainly technical, but also legal, political and institutional information from all Nile Basin countries in order “*to provide an informal mechanism for riparian dialogue and the exchange of views between countries, as well as with the international community*” (Ssebuggwawo 2006: 3). Even the successful outcomes of the NRBAP and the Nile conferences were considerable caused by the distance to any decision-making level, it significantly contributed to reduce the mistrust among the Nile riparian countries and therefore improved the ground for continuing and enhancing transboundary water cooperation in this region (Menniken 2008).

Resulting from favourable environment that had been created by TECCONILE and the Nile 2002 conference series, CIDA, the UNDP and the World Bank started in 1997 to encourage and facilitate the dialogue between the Nile Basin’s riparian countries. In this connection, in 1998, all riparian countries of the Nile, except for Eritrea, started negotiation with the aim of forming a regional partnership to manage and develop the Nile Basin in a better way. As a result of this dialogue, a transitional mechanism for cooperation was established by NILECOM in 1999. This mechanism, which internalizes the understanding that a cooperative approach in the development and management of the Nile waters holds the best opportunities of bringing mutual benefits to this region, is known today as the Nile Basin Initiative (NBI) (Guvele 2003; Wondwosen 2008).

2.3 The Nile Basin Initiative

The NBI, which can be characterized as a re-emergence of the NRBAP, unified both tracks of Nile diplomacy, the institutional TECCONILE and the informal Nile 2002 Conferences, and describes itself as “*an inter-governmental organization dedicated to equitable and sustainable management and development of the shared water resources of the Nile Basin*” (NBI 2010a). The current nine member states of the NBI include Burundi, DR Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda, as well as Eritrea and South Sudan as observers. Focusing on a process-oriented approach, the NBI firstly started after its opening in 1999 with a participatory course of dialogue among the Nile basin states, which resulted in a shared vision “*to achieve sustainable socio-economic*

development through the equitable utilization of and the benefit from the common Nile Basin water resources” (NBI 2011: 2 f.). In respect of the common vision, the NBI developed a set of policy guidelines that identified the following parameters as overarching objectives of the NBI:

1. To develop the Nile Basin water resources in a sustainable and equitable way to ensure prosperity, security, and peace for all its peoples.
2. To ensure efficient water management and the optimal use of the resources.
3. To ensure cooperation and joint action between the riparian countries, seeking win-win gains.
4. To target poverty eradication and promote economic integration.
5. To ensure that the program results in a move from planning to action.

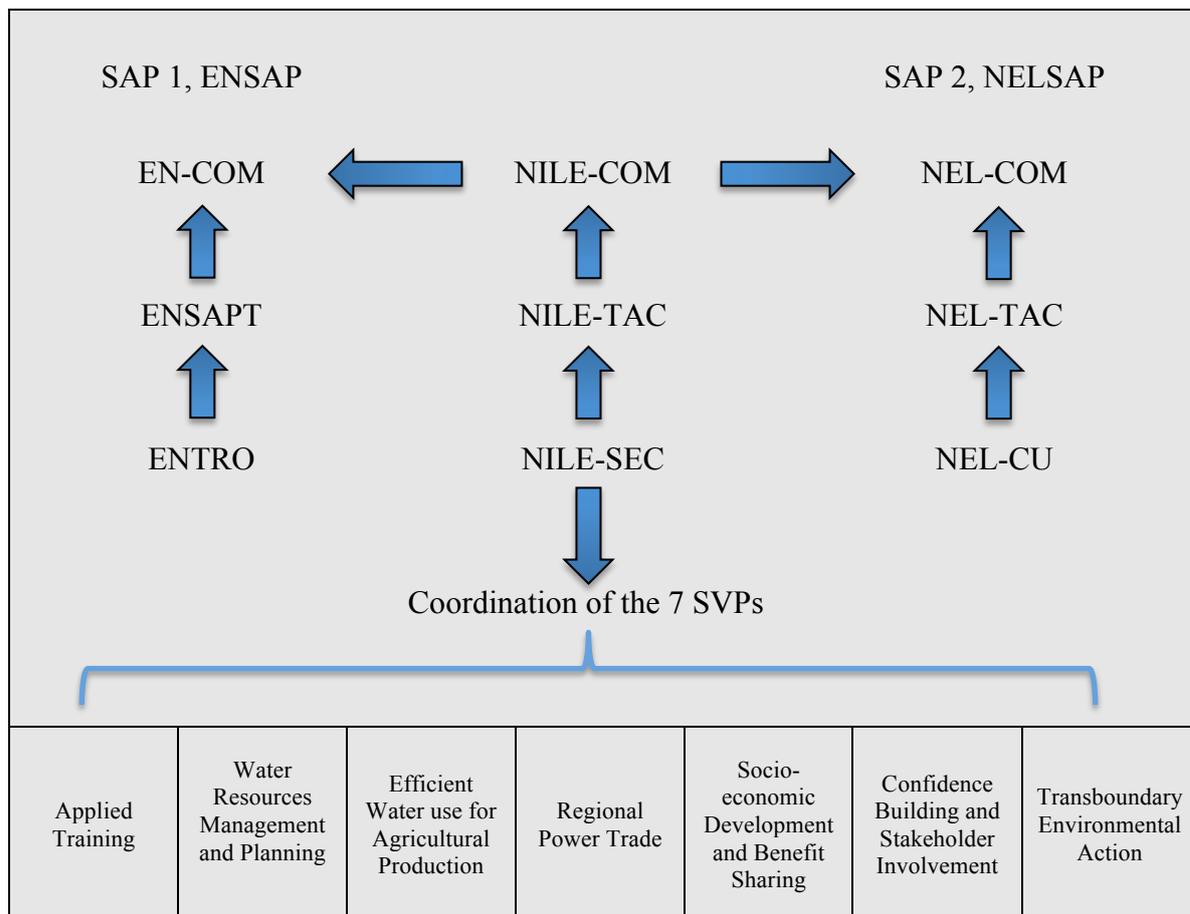
(Source: NBI 2010a)

In relation to the objectives mentioned above, it is necessary to underline that the NBI is a *“transitional arrangement until a permanent legal and institutional framework is in place”* (NBI 2000 quoted by Nicol 2003: 25). Consequently, the initiative “just” can be described as a transitional mechanism to coordinate and encourage cooperative efforts between the riparian states of the Nile. That is why the NBI is currently undergoing an institutional strengthening process (2008-2012), which has the objective to explore and design an appropriate long-term institutional structure (NBI 2011). In practice, however, this should not hide the fact that the NBI is a de facto river basin organization that is only lacking in the legal status of an independent international body. Therefore, it can be expected that the institutional set-up of NBI, which is described in Figure 3 on the next page, is likely to be taken over, once a river basin organization is established (Menniken 2008).

The highest decision-making and governing body of the NBI is the council of ministers, NILECOM, consisting of one minister per riparian country. It is supported by a Technical Advisory Committee (NILETAC), which is responsible to offer technical support and advice to the NILECOM on matters that can be related to the management and development of the Nile waters. Therefore, NILETAC comprises two technical senior professionals from each member state. The Nile Basin Initiative Secretariat (Nile-SEC), which is located in Entebbe, Uganda, carries out the administrative, financial and logistical services of the NBI and supports the activities of the NILECOM and NILETAC. The riparian countries themselves finance the functions of the Nile-SEC through annual dues and further provide funds for all NBI projects (NBI 2010b). The absence of international funding in Nile-SEC, however, should not neglect the fact that since its formation the NBI's operations have been supported by multilateral and bilateral donors. In this connection, NILECOM requested assistance from the World Bank to coordinate donor

involvement. Together with the United Nations Development Programme (UNDP) and the Canadian International Development Agency (CIDA), they established an International Consortium for Cooperation on the Nile (ICCON) in 2001 where the development partners committed around US \$130 million to the NBI. Most of the funds were placed into a World Bank managed Nile Basin Trust Fund (NBTF), a multi-donor trust fund, which has been established in 2003 to finance the preparation and implementation of NBI projects and programmes (NBI 2010a).⁶ These financed activities, which were aiming to achieve the NBI's shared visions, are reflected in the Strategic Action Plan, a program that is composed of two complementary components: a basin-wide Shared Vision Program (SVP) and the Subsidiary Action Programs (SAPs). In this context, the SVP is focusing in the widest sense on grant-based activities in order to build trust and cooperation in this region, whereas the SAPs are trying to engage the Nile Basin countries in concrete activities for sustainable- and regional development and economic growth (Guvele 2003).

Figure 3: Institutional Structure of the Nile Basin Initiative



(Source: Menniken, 2008, edited by author)

⁶ The major contributors to the NBTF include: Canada, Denmark, the European Commission (EC), Finland, France, the Netherlands, Norway, Sweden, the United Kingdom (UK), UNDP and the World Bank. However, the circle of bilateral and multilateral development partners has been rapidly expanding the last few years and further comprise: the African Development Bank (AfDB), the Global Environmental Facility (GEF), Germany, Italy, Japan, Switzerland and the United States etc. (UNDP 2011).

- **Shared Vision Program:**

The SVP, which is designed to create an enabling environment for a basin-wide framework, is acting on a macro-level and is composed of eight programs: applied training, water resources planning and management, efficient water use for agricultural production, regional power trade, socio-economic development and benefit sharing, confidence building and stakeholder involvement, transboundary environmental action and shared vision coordination (for more detail see Table 2). According to the World Bank, the SVP is a basin-wide program that:

“focuses on building institutions, sharing data and information, providing training and creating avenues for dialogue and region-wide networks needed for joint problem-solving, collaborative development, and developing multi-sector and multi-country programs of investment to develop water resources in a sustainable way” (NBD 2011: 9).

Even if these programs have been established in different riparian states, the SVP is not particularly concentrating on implementing projects for financial investments. It should be rather regarded as an instrument to organize workshops, to gather information, to harmonize the relations between stakeholders and to build trust and confidence among the riparian states (Menniken, 2008). Most of the SVP projects gradually came to an end by December 2009. The only former SVP activities, which are still continuing under the auspices of the NBI's Institutional Strengthening Project (NBI-ISP), are water resources management and planning, as well as regional power trade (NILEIS 2011). The NBI-ISP, which started 2008 and will end in 2012, is a process to strengthen the NBI's foundation for institutional sustainability, enhanced capacity and harmonized cooperative management in order to deliver programs and projects more efficient and effectively (WB 2008). During this period, the NBI is also concentrating on analysing and mainstreaming the outcomes of the SVP, as well as on integrating them into national plans (NBI 2010c).

Table 2: Informative Summary of the Eight SVP Projects

- **Applied Training Project:** The project concentrated on strengthening the individual capacity, as well as the institutional capacity of the Nile Basin riparian states, especially in relation to integrated water resources management. The project, for example, offered courses for practitioners with the objective to enhance their knowledge and skills or hosted a forum (Nile Net) aimed at fostering cooperation between professionals across the basin.
- **Water Resources Management and Planning Project:** The project focused on supporting the development and protection of the Nile Basin water resources, but also on promoting socio-economic development within the region. In addition, it aimed to improve national water policies through the use of good practices and integrated water resources management. It further developed a Nile Basin Decision Support System in order to exchange information, support dialogue and identify investments projects more efficiently.

- **Efficient Water Use for Agricultural Production Project:** The project paid attention on developing a forum for all stakeholders concerning the efficient water use in agricultural production. The objective were to promote regional dialogue, disseminating best practices and fostering national capacity.
- **Regional Power Trade Project:** The project aims to facilitate the development of regional power markets with a special focus on technical assistance, as well as, on developing infrastructure to reduce poverty in the Nile Basin by facilitating access to reliable low cost power.
- **Socio-Economic Development and Benefits Sharing Project:** The project concentrated on developing a network across the Nile Basin, comprising economic planning, research institutions, public and privates sector technical experts, sociologist, academics, community groups and NGOs. The overall goal was to identify alternative development plans and benefit-sharing ideas.
- **Confidence-Building and Stakeholder Involvement Project:** The project's objectives were to encourage participation within the NBI, to outline examples which presented the benefits of regional cooperation, and to offer regional activities for fostering cross-border cooperation. In this connection, the four main elements of the project were: regional, sub-regional and national implementation, public information, stakeholder involvement and confidence building.
- **Transboundary Environmental Action Project:** The NBI's largest project concentrated on several fields of activities, such as: increasing basin-wide community action, strengthening regional cooperation in relation to environmental and water management, strengthening capacity to face transboundary water quality threats etc. The project consisted of five components: institutional strengthening, community-level conservation, environmental education, water quality monitoring and wetlands and biodiversity.
- **Shared Vision Coordination Project:** This project has been undertaken by NILE-SEC and has been established for the purpose to observe the implementation of the other seven projects. The major objective was to increase the NBI's capacity to carry out basin-wide programs and providing effective coordination and supervision.

(Source: UNDP 2011, edited by author)

• **Subsidiary Action Programs (SAPs)**

The second component of the NBI's Strategic Action Plan, the two SAPs, are related to the implementation of joint development projects and investments on the sub-basin level and are focusing on the realization of the fifth objective "move from planning to action". On the one hand there is the Eastern Nile Subsidiary Action Program (ENSAP), which focuses on the Eastern Nile region and comprises Egypt, Sudan and Ethiopia. On the other hand there is the Nile Equatorial Lakes Subsidiary Action Program (NELSAP), which concentrates on the Nile Equatorial Lakes region and encompasses Burundi, DR Congo, Kenya, Rwanda, Tanzania and Uganda. The reason why these two SAPs are treated in a differential manner can be related to the prevailing geophysical and hydropolitical conditions of the basin (see section 2.1). This circumstance is also reflected in their program-structure. ENSAP, which office is located in Addis Ababa, Ethiopia, has to face the conflict-prone upstream-downstream constellation between Egypt, Sudan and Ethiopia

and therefore pays big attention to integrated water resources management, drainage and watershed management, flood management and irrigation (Menniken 2008). NELSAP, whose office is based in Kigali, Rwanda, in contrast, rather aims to facilitate sound economic development and therefore focuses on water resource management, investments in power development project, management of lakes and fisheries, transmission of interconnection and trade, and agricultural development. Nevertheless, like the NBI's main corpus, both programs consist of a minister's meeting (ENCOM, NELCOM), a technical support team (ENSAPT, NELTAC) and a secretariat, or in this case a regional office and a coordination unit (ENTRO, NELCU) (WB 2007).

The NBI's Strategic Action Plan and its two complementary components, the SVP and SAPs, show that the riparian countries of the Nile Basin have experienced an evolutionary process of transboundary water cooperation beyond compare (for more detail see Table 3). After a period of hegemonial and bilateral regime building, the Nile Basin States finally jointly recognized that the best way to manage, use and protect the water resources of the Nile is through close international cooperation, whereby the interests of upstream and downstream states are tried to be considered. The NBI reflects this effort because it has developed a strong foundation for the Nile riparian states to engage in concrete activities for sustainable development, integrated water resources management, natural resources conservation, economic growth and regional integration. The various executed NBI programmes and projects further show a joint commitment and obligation of the Nile Basin states to put the recommendations of Agenda 21 into practice because they try to address all potential problems that occur at the people-environment and development interfaces of this region. In this context, Belay et al. (2003) concludes, *“that the NBI represents the most comprehensive and complex management plan ever attempted for sustainable development of international transboundary rivers”* (Belay et al. 2003: 15 f.).

Nevertheless, as mentioned earlier, the NBI is not immune from challenges, weaknesses and threats due to the situation that this institution has to establish consensus among differing political and socio-economic minded riparian states that all have to face a wide range of environmental, societal, political and economical problems. For this reason, the subsequent section will devote its attention to the major obstacles to transboundary water cooperation in the Nile Basin.

Table 3: Historical Overview of Water Cooperation in the Nile Basin

1920	Nile Projects Commission formed and offers allocation scheme for Nile Basin countries. Findings were not acted upon. Century Storage Scheme was published and emphasized upstream projects.
1929	Commission's study leads to Nile Waters Agreement between Egypt and Sudan.
1953	Owen Falls Agreement between Egypt and Uganda
1959	Agreement for the Full Utilization of the Nile Waters (Nile Waters Treaty) signed between Egypt and Sudan.
1967-1992	Launch of HYDROMET a project for collecting and sharing hydrometeorological data (supported by UNDP).
1993	Establishment of TECCONILE (Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin).
1993	First of ten Nile 2002 Conferences in order to foster dialogue and discussion between Nile Basin countries and the international community (supported by CIDA)
1995	Establishment of NRBAP (Nile River Basin Action Plan) within TECCONILE framework (supported by CIDA).
1997-2000	Nile Basin countries create an official forum for legal and institutional dialogue (supported by UNDP). Representatives (legal and water resource experts) from each country and other experts draft a Cooperative Framework in 2000.
1997	Formation of NILECOM, the council of ministers from each of the riparian countries.
1998	First meeting of the NILE-TAC, the Nile Technical Advisory Committee.
1999	Nile Basin riparian countries (excluding Eritrea) establish the Nile Basin Initiative (NBI) in order to develop and manage the Nile in a sustainable way.
1999-2009	Implementation of the NBI's Strategic Action Plan, comprising the Shared Vision Program (SVP) and the Subsidiary Action Programs (SAPS).
2008-2012	Implementation of NBI's Institutional Strengthening Project (NBI-ISP) to explore and design an appropriate long-term institutional structure, as well as, gathering, analysing and mainstreaming the products of the gradually completed SVP, as well as integrating SVP activities into national plans.

(Source: Wolf/Newton 2007; NBI 2010c, edited by author)

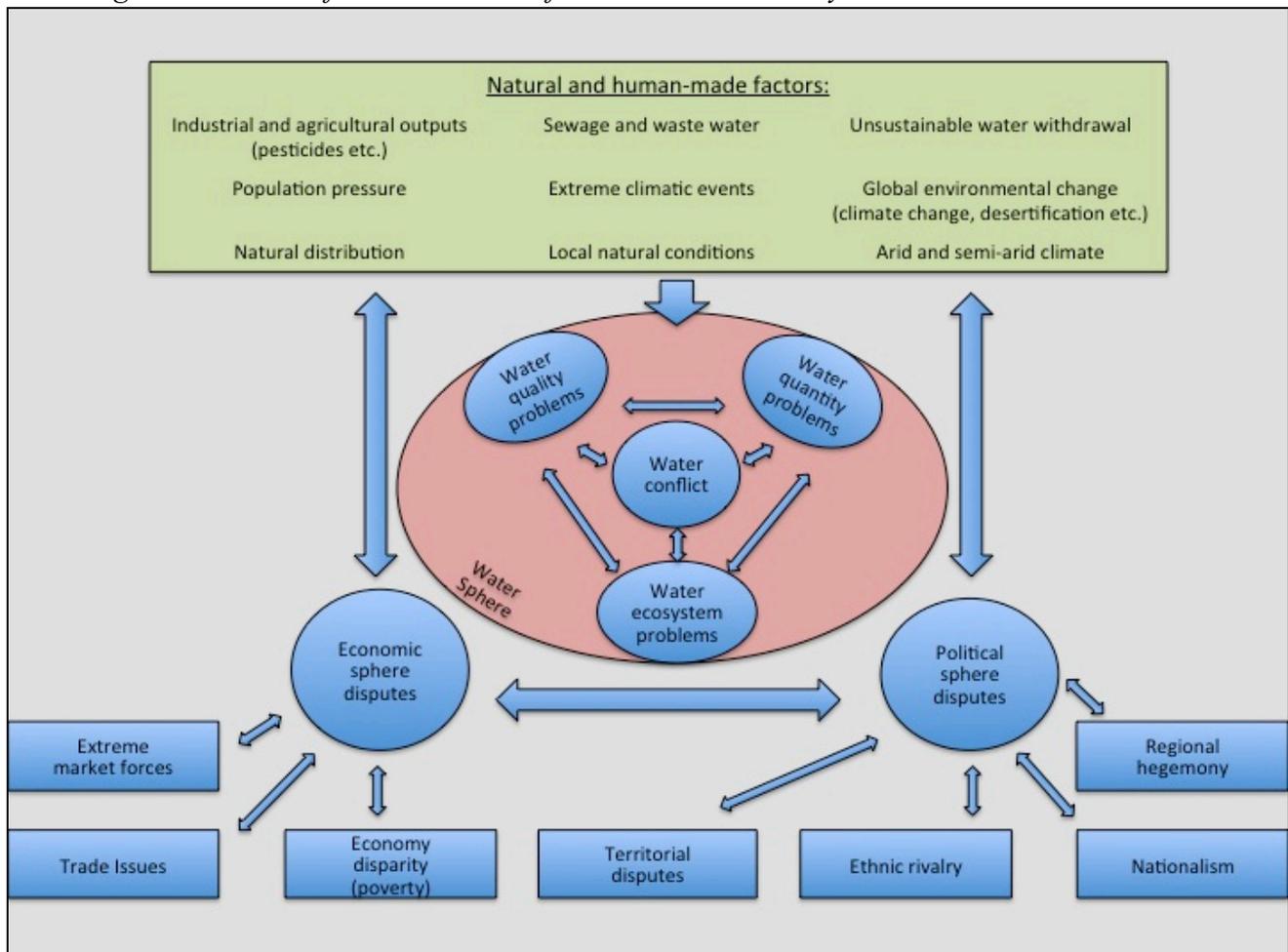
2.4 Obstacles to Transboundary Water Cooperation

In order to specify the way in which a Nile River Basin Organisation (NRBO) should be shaped to adequately address the needs and expectations of the Nile riparian states, the obstacles that can be associated to transboundary water cooperation within this region have to be described first. In addition, the next part will outline the regional threats and challenges as well as the organizational weaknesses of the NBI.

2.4.1 Regional Threats and Challenges

The environmental, socio-economic, political and legal conditions, which are prevalent in the Nile Basin, can be identified as potential regional threats and challenges, which are able to obstruct the Nile Basin riparian countries to move forward towards increased cooperation. The potential causes of freshwater conflicts that might arise when countries share a common water resource are illustrated in Figure 4. That these causes are in fact applicable to the Nile region will be demonstrated in the following section.

Figure 4: Causes of Freshwater Conflicts in Transboundary River Basins



(Sources: Le-Huu 2001, edited by author)

- **Environmental Conditions:**

The imbalanced spatial and temporal distribution of natural resources within the Nile Basin can cause political tensions and conflicts, especially if the water qualities and quantities change in respect to the available supply and demand (see section 2.1). Water quantities and qualities can be externally affected by natural (e.g. arid and semi-arid climate, droughts) or human-made factors, like unsustainable water withdrawal or population pressure. In addition, decreases in water quantity and quality can have severe impacts on the natural systems of the Nile Basin and are able to create a multitude of other negative externalities (see Table 4). On the national level, these difficulties could be faced through monitoring and data analysis etc. However, when it comes to transboundary water resources management, these issues will become significantly more complex because cooperation between the riparian states of the Nile Basin is not always achieved as a result of social, economical, political or technical reasons (Robertson 2004). The aspects mentioned above can be demonstrated with the following example: Egypt and Sudan, which both can be characterized as very water scarce countries, have recognized upstream water storage facilities as an issue of national security threat. They therefore threatened upstream countries (mainly Ethiopia) with political and economical consequences because they fear that any additional major dam projects will significantly affect the countries water supply (Menniken 2008). The resulting possible impacts of water allocation, like a lower flow regime or degraded stream water quality, thus caused that this two countries still insist on the compliance of the colonial-era treaty regime (Nile Basin Water Treaty of 1929 and 1959). This status quo already interfered several times in the process of improving transboundary water cooperation in this region because it can be seen as one of the major causes why Egypt and Sudan so far did not fully agree upon the CFA (Mekonnen 2010).

Another important problem, which is closely interlinked to this situation, is that both transboundary and national water resources management is often restricted on surface water. In addition, groundwater, green water, virtual water and other related aspects are often not taken into consideration. This situation limits the scope of cooperation, as well as the number of alternatives, to form successful and cooperative partnerships among the states concerned. Transboundary water resources management further needs to consider administrative borders and not hydrological ones. This also poses a challenge to transboundary water cooperation in Nile Basin because, as a consequence of non water-related conflicts or agreements, these administrative borders themselves can be subjects to change over time (e.g. South Sudan separation). Consequently, this complicates the management of transboundary water resources because countries might develop their own strategies to deal and solve issues of planning, developing, allocating and protecting their water resources (Robertson 2004).

Table 4: Basin-wide Common Causes and Priority Environmental Threats

Common Causes of Environmental Threats:	
Basin-wide causes	Policy, governance, institutional and capacity constraints, insufficient environmental education and awareness, limited access to environmental knowledge and information (including relevant scientific data), unclear tenure and inadequate access to resources for local stakeholders, inadequate management of protected areas and other environmental hot spots
Priority Environmental Threats by Country:	
Burundi	Deforestation, soil erosion, degradation of rivers banks and lake shores, mining, wildlife hunting.
DR Congo	River and lake pollution, deforestation, soil erosion, wildlife hunting
Egypt	Water and air pollution, filling of wetlands, desertification, water logging and soil salinity, sanitation, river bank degradation
Ethiopia	Deforestation, overgrazing, soil erosion, desertification, sanitation, loss of biodiversity (including agro biodiversity) floods, drought
Kenya	River and lake pollution (point and non-point source), deforestation, desertification, soil erosion, sedimentation, loss of wetlands, eutrophication and water weeds
Rwanda	Deforestation, soil erosion, degradation of river banks and lake shores, desertification, wildlife hunting, overgrazing
Sudan (former)	Soil erosion, desertification, pollution of water supplies, wildlife hunting, floods, droughts, sanitation, deforestation, (sedimentation /siltation)]
Tanzania	Deforestation, soil degradation, desertification, river and lake pollution, poaching and shortage of portable water
Uganda	Draining of wetlands, deforestation, soil erosion, encroachment into marginal lake shore and riverine ecosystems, point and non-point pollution

(Source: Guvele 2003, edited by author)

- **Socio-Economic Conditions:**

Great ethnic, religious and cultural heterogeneity that cuts across national as well as basin boundaries with neighbouring watersheds characterizes the human geography of the Nile Basin and creates opportunities but also threats for the socio-economic conditions of the Nile Basin (Nicol 2003). The states that comprise the basin host approximately 300 million people, of which around 150 million people live within the Nile Basin itself (NBI 2007). Besides the fact that interpretations about demographic dynamics of the Nile region are varying significantly from each other, there is a consensus in the scientific discussion that the population will grow continuously in the near future. However, according to Menniken (2008), a realistic assessment of the Basin's population has been made by Varis (2000), who estimates that the population within the Nile Basin is expected to grow to 360 million by 2025 (Menniken 2008).

In terms of socio-economic aspects, the riparian countries of the Nile Basin are extremely heterogeneous and significantly differ from each other. Due to its industrializing economy and with average income levels that amount to 1.490 US\$ per capita, Egypt has by far the strongest economy. In comparison, the other countries, which are predominantly agricultural economies with 80-90% of labour force involved in the agricultural sector, average income levels vary between 100 US\$ and 360 US\$ per capita (NBI 2007). In addition, for large parts of the population in the basin, the level of socio-economic development is extremely low. All of the basin countries, except for Kenya and Egypt, are among the 50 poorest countries in the world (Kameri-Mbote 2007). External shocks, like fluctuating world market prices, droughts, national and international conflicts, led to the situation that all countries except of Uganda and Egypt have to face severe food shortages every year. Nevertheless, all riparian countries of the Nile Basin put a priority on achieving economic growth in order to avoid or break the spiral of poverty and underdevelopment. Together with a considerable population growth, which mutually correlates with the prevalent poverty in this region, this economic expansion will increase water demands in the coming decades and therefore could cause intense competition as well as non-equitable distribution of natural resources (Menniken 2008).

- **Political Conditions:**

The socio-economic problems described above are referable to a series of political shortcomings in this region. In this connection, poor governance, competing political systems, internal and international conflicts already have created several hazards for transboundary water cooperation in the Nile Basin. Furthermore, it should be taken into account that the Nile Basin appears to be *“a kaleidoscopic procession of civilizations and cultures [with] an almost infinite range of political systems and types of rule [and] striking differences in political and administrative organisation”* (Tvedt 2004 quoted by Menniken 2008: 205). This means that, the Nile basin as a whole can be characterized as highly heterogeneous with a wide range of size, cultural and religious backgrounds, population, political systems, military power, GDP and population. Some countries are characterized by a federal administrative structure with sub-national states that govern territories formed along ethnical boundaries (e.g. Ethiopia, Tanzania). Other riparian states instead have a centralized administrative structure with sub-national provinces or governorates (e.g. Egypt, Kenya). These divergent administrative structures are able to affect decisions for integrated water resources management that might arise on the international, national and sub-national level (NBI 2007). Similar to the geo-physical conditions, two different pictures emerge if the Western Nile Basin is dissociated from the Eastern Nile Basin. The riparian states of the Western Nile Basin have in common that they are very poor, conflict prone, unstable, pseudo-democratic, militarily negligible and donor dependent.

Nevertheless, they also share a common-pool resource extending around Victoria and therefore have a certain potential for water-related cooperation in this region. The Eastern Nile Basin, in contrast, host socio-economically and politically disparate countries with one socio-economic, as well as militarily (Egypt) and one geo-physical (Ethiopia) hegemony. This given situation has the potential to generate divergent interests that might collide. Whether these interests will bring about an act of reconciliation or an escalation of disputes depends on the institutional cooperation mechanisms in place (Menniken 2008). Consequently, establishing a common base for managing and developing the transboundary water resources of the Nile in a cooperative manner, can become especially difficult with the different political systems and their associated various interests, prior bilateral agreements and legal frameworks (the failure to develop a legal framework will be discussed later, see section 2.4.2). Combined with a lack of political will and the vulnerability to national and international conflicts, this again can significantly complicate the way to find a common ground for transboundary water cooperation.

Emerging questions in the field of regional threats and challenges:

The above-mentioned aspects show that the current environmental, socio-economic and political conditions that are prevalent in this region can significantly interfere in the effort to improve transboundary water cooperation between the riparian states of the Nile. In order to identify through expert experiences those criteria and elements which should be incorporated in the design of a NRBO to face these difficult issues in an efficient manner, it is therefore necessary to raise the following questions:

Table 5: Questions Raised I

- 1) How much importance do water-experts, who are working within or related to the Nile Basin attach to promoting cooperation between the riparian states of the Nile?
- 2) Resulting from the regional threads and challenges within the Nile Basin, what are the greatest problems that the water experts associate with transboundary water cooperation?
- 3) What are the existing regional capacities to take measures against these problems (are they considered to be sufficient, or not)?
- 4) If not, what services would be needed to effectively and efficiently address these problems?
- 5) What services are most desired and thus are considered to improve transboundary water cooperation in the Nile Basin?

(Source: Own Table)

2.4.2 Performance Obstacles of the Nile Basin Initiative

Negotiating the terms of cooperation is often a very complex and lengthy process that can demand significant human, financial, technical and legal resources, especially when the already discussed regional threats and challenges are continuing to increase. Due to the prevailing conditions within this basin, it has to be pointed out that these resources are often limited or not available. Despite the remarkable achievements attained by NBI, this situation therefore has created a number of organizational obstacles for this institution, which makes it very difficult to manage and develop the waters of the Nile in a sustainable and generally accepted way. The organizational conditions, which are considered to significantly interfere in the process to foster transboundary water cooperation in the Nile Basin, will be described in the subsequent part of this section.

- **Legal Framework:**

The failure to develop a strong and clear legal framework that is agreed upon by all member countries can be seen as one of the most serious obstacles, why the transitional NBI has not been replaced by a full-fledged RBO, yet. This relates to the fact that the states concerned so far could not reach an agreement on how the waters of the Nile are going to be allocated in a mutual accepted manner. Even if the so-called “Nile Cooperative Framework Agreement” (CFA) has already been signed by six Nile Basin states (Ethiopia, Kenya, Rwanda, Tanzania, Uganda and Burundi), continuing disagreements among states caused that the CFA has yet to be finalized and ratified (Mekonnen 2010). In this connection, the CFA has to be regarded as a new treaty indented to rearrange the colonial-era water rights and usage regime on the Nile River (see 1929 and 1959 Nile Water Treaties). That is why Egypt and Sudan, so far, have been vehement opponents to the CFA (mostly to Article 14)⁷, due to fact that:

“the CFA will undermine Egypt and Sudan’s long-standing claims that the Nile has already been apportioned according to a 1959 treaty in which the two nations allocated around 90% of the river’s waters to themselves. It would also contravene Egypt’s persistence that it holds a veto right over all upstream hydro projects under a 1929 agreement with Britain” (Eckstein 2001).

⁷ The text of Article 14, which has been adopted by Nile-COM, reads as follows: “Having due regard for the provision of Articles 4 and 5, Nile Basin states recognize the vital importance of water security to each of them. The States also recognize that cooperative management and development of the waters of the Nile River System will facilitate achievement of water security and other benefits. Nile Basin states therefore agree, in a spirit of cooperation: a) to work together to ensure that all States achieve and sustain water security; b) not to significantly affect the water security of any other Nile Basin State” (Mekonnen 2010: 428).

The problems related to CFA are further strengthened by the situation that the NBI is accused to delay this very controversial issues. In this relation, Lemma states: *“It is not a secret that the unwritten but real strategy of the NBI is to secure the consensus of all the riparian countries on the less controversial issues by postponing the key but difficult issues of the Nile to a future date”* (Lemma 2001). It therefore can be assumed that the longer the current situation persists, riparian countries, especially those who are most dependent upon the Nile, might relinquish their role as a NBI member. Furthermore, it would likely increase mistrust and misunderstandings between the riparian states of the Nile (Shema 2009).

Another obstacle that is closely linked to the problems mentioned above is the failure to establish sufficient ratifications of the 1997 UN Watercourses Convention, the only global convention in place (but not yet into force) that governs the utilization, management and development of shared water resources for non-navigational purposes. In addition, most riparian states of the Nile, which had been present at the adoption for the Convention, abstained during the election process. In this relation, there were seven states of the Nile Basin, which took part in this session. Four of them, Ethiopia, Rwanda, Tanzania and Egypt, desisted from voting for the benefit of the convention. Burundi voted against and Kenya as well as Sudan voted in favour of it. Uganda, DR Congo and Eritrea were absent (Abdo 2003). The overall voting results illustrate the problematic situation in gaining a consensus on the principles of the Watercourses Convention. Both upstream and downstream states claimed that there is an imbalance in the Convention's provisions between the rights and obligations of upstream and downstream states (Eckstein 2002). The reaction of the Nile Basin states towards the Convention, consequently, can also be related to the different hydropolitical attitudes concerning colonial-era water rights and usage regime.

This lack of unity concerning the CFA and the UN Watercourse Convention indicates that it has to be seen as very challenging for the NBI to settle down disputes among the riparian states, which are related to the allocation, management and use of water resources. Furthermore, states could interfere in the process of establishing a NRBO, due to the apprehension that those principles where they disagree with might be reflected in it's services. The presence of a legal framework, however, is a crucial element for improving transboundary water cooperation and resolving water-related disputes in any basin. The 1997 UN Watercourses Convention, therefore, could be used as a good starting point for the Nile riparian states, in terms of searching for a legal framework that potentially would have the capacity to efficiently face the problems mentioned above.

- **Financing:**

The lack of economic infrastructure, the low levels of investments and the socio-economic and geo-physical as well as political heterogeneity are challenging barriers to the economies of the Nile Basin. This current status, therefore, can create a number of problems for the NBI to finance its activities. Some of these problems include poor cost recovery, lack of public funds, the uncertain political climate or the vulnerability to conflicts that might end up in the hesitation of donors to invest in regional projects. Further problems are the lack of mechanisms and instruments to manage funds, the shortage of long-term commitments that would be necessary to develop trust and cooperation between the countries concerned, and the inadequate legal framework, which makes it very difficult to create a favourable investment environment for private and public investors (Robertson 2004; SIWI 2007).

The NBI programs currently are preparing to undertake investments in the order of 3-5 billion US\$. In order to develop and implement these complex projects, it will be necessary to create financing instruments and sources of finance that are beyond the current capacity. Furthermore, the size of the envisioned Nile Basins projects, as well as raising and structuring the necessary finances for the projects, will pose significant challenges to the host countries because most of them cannot afford to incur much more debts than already. Due to inadequate country specific financing mechanisms to support such NBI projects, most of the Nile Basin's countries may favour national projects that would increase the probability to generate immediate benefits. This attitude may originate from the perception that this is less risky than investing large amounts of money in preparing complex and long-term projects, which often include several countries, different sectors and on-going costs. In an economic sense, the projects realization, therefore, will depend upon NBI's ability to raise soft financing, such as grants that make it possible to realize such large-scale projects (e.g. hydropower development projects, increase reservoir capacity etc.). The international community with its implementing agencies (UNDP, World Bank etc.) thus have to play a significant role by providing financial and technical assistance to the Nile Basin's riparian countries. This could significantly improve the investment climate and would help to reduce the risks taken by public and private investors, who otherwise would be unwilling to participate in such complex projects (SIWI 2007).

Another problem results from the funding conditions that are defined by the international donors of the NBI, mainly by the World Bank. In this context, the World Bank outlines *"the World Bank's Operational Policy 7.50 requires consent from all riparian countries potentially affected by a project on an international river before funding is granted"* (WB 1994 quoted by Shema 2009: 27). The Nile Basin riparian states themselves are thus not

able to secure funding for projects if no consensus of the entire basin, or at least of the countries concerned, is achieved. Under the current structure of the NBI this fact can be seen as a great obstacle for financing NBI projects, because countries, like Egypt, are able to effectively veto the development efforts of other countries (e.g. Ethiopia.) (Shema 2009).

- **Capacity and Coordination:**

Another issue, why the NBI's ambitious goals of establishing regional cooperation and mutually beneficial relationships among all riparian countries should be questioned, is its lack of capacity and coordination. In many parts of the Nile Basin there is insufficient capacity in terms of facilities, information, trained manpower and funding. The NBI's projects in place are therefore often inadequate to address integrated water resources management issues effectively. This also relates to the small number of staffs which are currently unable to sufficiently respond to the increasing and emerging demands that are placed on the institution (e.g. strategic planning, resource mobilization etc.) (Belay et al. 2003). The uneven distribution of capacity among the Nile basin states further complicates this situation. For example, due to the differing ability to address technical, institutional and financial aspects, there is a great disparity between Burundi and Egypt to implement information and data sharing agreements (e.g. lack of capacity to handle regional databases and share water resource information) (Hearns et al. 2010). The problems mentioned above are accentuated by a lack of coordination among water professionals, sub-organizations and other regional institutions. In this connection, it should be outlined that the NBI so far did not clearly establish sufficient coordination mechanisms with other regional institutions, like the Lake Victoria Basin Commission. Furthermore, the lack of coordination among NBI institutions, like ENTRO and NELSAP-CU, also created long-term challenges for the operational integration across the basin because these programs have evolved independently from each other (Belay et al. 2003).

- **Stakeholder and Public Participation:**

It is generally accepted that public participation and stakeholder involvement, especially in the water management decision-making processes, has become an integral component for making transboundary water projects more successful. That is why this mechanism is regarded as one of the key principles for IWRM, due to the fact that participation helps to build awareness, confidence and trust among stakeholders and governments, to reduce conflicts, to create ownership and increase the likelihood that cooperation is carried from the international level down to the local level (Newton 2006). Therefore, there are certain concerns that public participation has lagged far behind in both, in understanding what the NBI does and about how to influence major development processes. One reason for this

problematic situation is the NBI's insufficient structure to engage local stakeholders, as well as to involve interest groups outside the government departments (particularly women, the youth and the civil society). Due to the fact that most of them are highly depended on the water resources of the Nile, it has to be seen as very conflictual that their needs so far have not been sufficiently reflected on the international level and in the implementation of actions (Hearns et al. 2010; NBD 2012). The failure to involve civil society in NBI's decision-making processes also has been claimed by the Nile Basin Society (NBS), a non-profit organization which aims to involve all stakeholders in water resources management. In this context, NBS states that, under the current work of the NBI, important water resources management and irrigation projects are solely decided at the highest governmental levels. They argue that the civil society in general is excluded from these projects. Additionally, the simple existence of the NBS can be used as an indication that the NBI currently does not sufficiently include the public in its decision making processes (NBS 2009).

Emerging questions in the field of performance obstacles of the Nile Basin Initiative:

The performance obstacles named above show that it has to be very challenging for the NBI to efficiently address those questions, which have been outlined in the previous section concerning the regional threats and challenges. The lack of a legal framework and the difficulties emerging in the fields of financing, coordination and public participation further indicate that a number of services still are required. A NRBO should therefore be shaped in a way that it incorporates those services, which so far have been failed materialize in this region. To accomplish this, following questions need to be addressed:

Table 6: Questions Raised II

- 1) Within the performance obstacles of the NBI, what are the problems, which the water professional consider to be most severe?
- 2) Since the NBI has been established, did these problems change over time or are they still persistent? Did new problems have emerged more recently?
- 3) Is the regional capacity within the Nile region sufficient enough to compensate the performance obstacles of the NBI, or are there some issues, which still need to be addressed?
- 4) If yes, what services would be most desired in order to promote transboundary water cooperation between the riparian states of the Nile more efficiently? How could these identified services be provided through a NRBO?
- 5) Based on the service demands, is there a desire for creating such a NRBO?

(Source: Own Table)

3. Concept Review I: Theoretical Framework

This section will pay attention to those concepts that are considered to be suitable for addressing the objective of this study. The theoretical framework will firstly concentrate on how transboundary water resources in shared river basins can be managed effectively. Afterwards, the key characteristics of RBOs to implement effective integrated river basin management will be outlined. This is followed by a short description of mechanisms that should be considered in the design of a NRBO in order to improve transboundary water cooperation in a river basin.

3.1 Transboundary Water Resources Management in Shared River Basins

The next part of this paper will outline some important aspects for improving transboundary water resources management in shared river basins, due to the fact that these concepts have to be considered in the design of a NRBO. Besides the relevant literature on this subject matter (Hooper 2005/2006a; GWP-TAC 2000; GWP 2009; UNESCO 2010), particular attention will be paid to a promising conceptual framework, developed by Zaag and Savenije (2000a). The reason for the consideration of their “*Conceptual Framework for the Management of Shared River Basins*” is based on the fact, that it addresses the problems outlined in section 2.4.1 (Regional Threats and Challenges).

At the conference of the European Union (EU) and South African Development Community (SADC) on shared river basins, Zaag and Savenije presented a paper, where the metaphor of a classical temple was used as a conceptual framework to clarify the complex nature of the management of shared river basins (see Figure 5). In this relation, their temple is based on a foundation of integrated water resources management and consists of three pillars supporting the roof of sharing international waters. The central pillar represents technical cooperation and is also called the operational pillar. The other two pillars are the political pillar responsible for creating an environment of political will and commitment to international cooperation, and the institutional pillar dealing with the institutional, legal and regulatory aspects of the management of international rivers (Zaag/Savenije 2000a). It is important to keep in mind that a NRBO should have the capacity to strengthen the different sections of the temple in order to manage the shared water resources of the Nile efficiently and effectively. The different components of the temple and the associated aspects which are going to be considered in the design of the NRBO, are explained in the subsequent part of this paper:

Figure 5: *The Classic Temple of Sharing International Water Resources*



(Source: Zaag/Savenije 2000a)

3.1.1 *The Foundation: Integrated Water Resource Management*

The integrated water management approach, which incorporated the principles of Dublin and Rio as key concepts, is the foundation in supporting the management of shared river basins and helps to manage and develop water and related natural resources in a balanced and sustainable way with a view to optimize social and economic welfare in an equitable manner.⁸ This approach therefore considers the total water cycle with all its natural aspects and recognizes the various interests of water users in the different sectors of a society or an entire region. With an holistic water management and development approach, IWRM consequently seeks to face the most serious water-related challenges of the 21st century, like securing water for people and food production, protecting vital ecosystems, dealing with the variability or scarcity of water, managing risks, creating awareness and

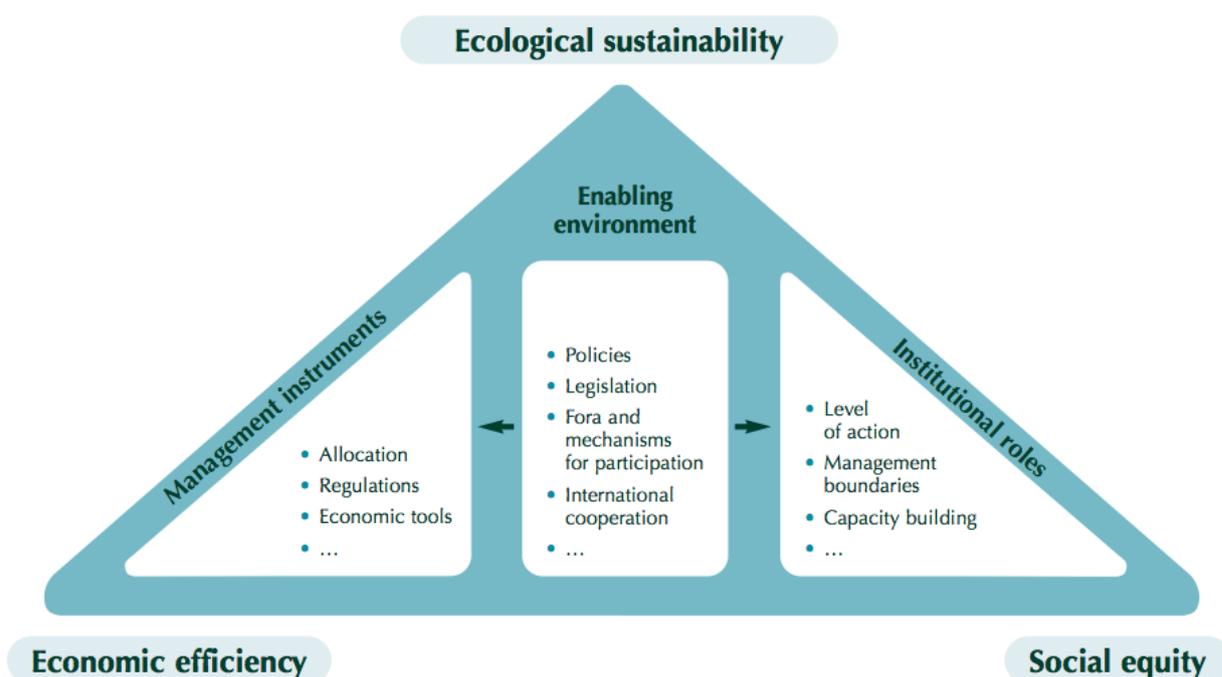
⁸ The participants of the International Conference on Water and the Environment (ICWE) that took place in Dublin, Ireland in 1992 formulated the “Dublin Statement on Water and Sustainable Development”, also known as the Dublin Principles, in order to face the increasing scarcity, use and overuse of water. The principles are: Principle No. 1: Freshwater is a finite, vulnerable and essential resource, essential to sustain life, development and the environment; Principle No. 2: Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels; Principle No. 3: Women play a central part in the provision, management and safeguarding of water; Principle No. 4: Water has an economic value in all its competing uses and should be recognized as an economic good (UNESCO 2010a).

understanding, promoting collaboration and cooperation across sectors and boundaries etc. Because of the heterogeneity of river basins and their differing environmental, political and socio-economic systems, however, IWRM has to be seen as very complex as well as highly debated, due to the fact that regional and national institutions have to develop their own IWRM practices (Zaag/Savenije 2000a). As a result, the Global Water Partnership (GWP) initiated as a response to human induced water scarcity and pollution, developed the following definition of IWRM, in order to provide a collaborative framework, that can be applied regionally but also globally:

IWRM is “a process that promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in a equitable manner without compromising the sustainability of vital ecosystems” (GWP 2009: 18).

According to the above-mentioned definition, IWRM has to be seen as a cross-sectoral policy approach, considering natural and human systems, as well as spatial and temporal scales, like geographical variation in water availability over time and the related upstream-downstream interactions etc. IWRM thus should be rather regarded as an adaptable long-term and forward moving process than an inadaptable or fragmented one-shot approach. This is also reflected in the IWRM framework of GWP, which takes into account that the complementary elements of an effective water resources management system have to be developed and enhanced concurrently. In addition, the three basic complementary elements of IWRM are described below (see Figure 6).

Figure 6: General Framework of Integrated Water Resources Management



(Source: GWP-TAC 2000)

- 1) **Enabling environment** – the general framework of suitable national policies, regulations and legislation, as well as information for stakeholders and the public in general.
- 2) Integration of **institutional roles**, and functions of the different administrative levels and stakeholders.
- 3) Set-up operational **management instruments**, which are demanded by the institutions that are involved. This includes effective regulation, monitoring and enforcement that allow decision-makers to make adequate choices. These choices need to be based on agreed policies, available resources, environmental impacts and the social and economic consequences in place (GWP-TAC 2000).

A subset of IWRM is Integrated River Basin Management (IRBM), which is regarded by Hooper (2006) “*as the tool, perhaps the most appropriate tool, to deliver IWRM at the basin scale*” (Hooper 2006a: 11). According to this, IRBM can be defined as an integrated and coordinated approach, which focuses on the collaborative planning and management of natural resources within a river basin and seeks to encourage the stakeholders to consider a wide range of social and environmental interconnections in a watershed context. The importance of implementing water resources management at a basin-scale is also reflected in two very popular concepts, which both are characterized by an integrated approach, the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the European Framework Directive (Hooper 2006a). Nevertheless, just as IWRM, the implementation of IRBM also requires an adaptive behaviour to the specific context where it applied. In this relation, Hooper (2006a) provides a list of key requirements that RBOs should incorporate in order to implement IRBM in their respective area of operation (a detailed description about the key characteristics of RBOs implementing effective IRBM can be found in section 3.2):

Table 7: Key Requirements of RBOs to implement IRBM

- | | |
|--|---|
| <ul style="list-style-type: none"> • Engagement of and ownership by relevant decision makers • Application of diverse institutional arrangements • Strong river basin advocacy • Integrating functions for collaboration • Accountability | <ul style="list-style-type: none"> • Improved river basin management design • Clear definition of role and structure of RBO • Prioritizing actions • Local government partnerships for effective implementation |
|--|---|

(Source: Hooper 2006, edited by author)

3.1.2 *The Three Pillars of Managing Water Resources in Shared River Basins*

- **The political pillar for creating an enabling environment:**

In relation to IWRM or IRBM, the riparian countries of a river basin have to face a two-dimensional problem: firstly, they have to manage the river basin and its resources holistically; secondly, they have to share the water resources internationally. In order to achieve that the water resources are shared in an equitable and sustainable manner, it is therefore the responsibility of states to create conditions for an enabling environment, which make inter-sectoral and international cooperation and planning possible. Moreover, mutual economic interdependencies have to be established in a way that they create incentives to strengthen the overall interest, but also the political will for sharing transboundary water resources, as well as to form sustainable relationships. In addition, Savenije and Zaag (2000a) describe four aspects, which might be used to strengthen the political pillar of transboundary water cooperation:

1) ***Good neighbourliness:*** In the field of international environmental law, most states subscribe to the international principles of good neighbourliness in order to reconcile their interests with the interest of neighbouring countries. In this connection, the countries have recognized that they are mutually dependent from one another and therefore have taken steps, signed agreements or developed institutional bodies, through which emerging problems can be prevented or resolved.

2) ***Recognition of riparian interests:*** When mutual respect has been developed, a suitable strategy needs to be carried out that urges all riparian states concerned to acknowledge the varying interests in using the water of a river basin. Consequently, the attention of countries to exclusively follow their own and maybe competing interests could probably shift to a situation, where the other's perspectives are considered and accepted too. Such an approach has the potential to be worthwhile, especially when the riparian states realize that not all interests are incompatible.

3) ***Developing joint activities:*** The formulation of concrete and well-defined activities, programs or projects, which are mutually beneficial to all riparian countries, can also foster international cooperation in water resources management. Nevertheless, to be successful, it is indispensable that the parties involved include subject matter experts in order to fully understand the complexities of water resources processes occurring in the entire basin.

4) ***Turning crisis into opportunities:*** There are several examples of natural or man-made disasters throughout the world that have turned from crises into opportunities for international cooperation. The Sandoz incident of 1986, for example, where large amounts

of chemicals, which flowed into the Rhine in Switzerland, directly affected all riparian countries further downstream. This environmental disaster, which also could have caused international political conflicts, formed the basis for the 1987 Rhine Action Programme, a project that significantly contributed to accelerate the cleaning of the river (Zaag/Savenije 2000a).

- **The legal and institutional pillar:**

Depending on the purpose and context, countries first have to decide on an appropriate legal and institutional framework because the riparian states of a river basin cannot start to share the water resources in a mutual manner, when they do not agree on some important legal aspects. Especially resolving disputes between two or more riparian countries, international law has gained popularity to guide decisions that can be associated with the use, allocation and management of water resources.⁹ Even though the 1997 UN-Convention had not yet entered into force, it can provide riparian states with guiding principles for developing sound rules and principles that only have to be adapted and applied to the specific situation of a particular river basin.

In this context, the 1997 UN Convention *“is a framework convention that aims at ensuring the utilization, development, conservation, management and protection of international watercourses, and promoting optimal and sustainable utilization thereof for present and future generations”* (Salman 2007: 632).

It consequently provides a legal framework for cross-border cooperation on international watercourses and can be used by countries as a legal instrument for resolving their water disputes (Zaag/Savenije 2000a). It should be outlined that through the Convention certain core principles have emerged which aim to provide guidelines to share transboundary water resources. These principles comprise, for instance, the principle of equitable and reasonable utilization, the principle of territorial integrity or the obligation not to cause significant harm (see Table 8).

Note: For more detail see UN (1997): Convention on the Law on the Non-Navigational Uses of International Watercourses: <http://www.un.org/law/cod/watere.htm>

⁹ The development of international water law started in 1966 with the Helsinki Rules (Helsinki Rules on the Uses of the Water of International Rivers), an international guideline that had been established for the purpose to regulate the use of transboundary watercourses. It was then complemented through 1986 Seoul rules (Complementary Rules Applicable to International Water Resources), which extended the application of the Helsinki rules to transboundary aquifers. Besides other treaties (e.g. 1989 Bellagio Draft), the 1997 UN-Convention (Convention on the Law of the Non-Navigational Uses of International Watercourses) and the 2004 Berlin Rules (The Berlin Rules on Water Resources) then had been developed (Salman 2007).

Table 8: Important Principles of the 1997 UN-Convention

Article 5:	Watercourse States shall (...) utilize an international watercourse in an equitable and reasonable manner. (...) Water course States have the right to utilize the watercourse and the duty to cooperate in the protection and development thereof (...).
Article 7:	Watercourse States shall, in utilizing an international watercourse (...), take all appropriate measures to prevent the causing of significant harm to other watercourse States.
Article 8:	Watercourse States shall cooperate on the basis of sovereign equality, territorial integrity, mutual benefit and good faith in order to attain optimal utilization and adequate protection of an international watercourse.
Article 10:	In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses. In the event of a conflict between uses of an international watercourse, it shall be resolved with references to articles 5 to 7 (...).

(Source: UN 1997, edited by author)

Resulting from different customary practices and interests, however, countries have generally created their own strategies in solving matters of planning, managing, developing, allocating, and protecting their water resources. Furthermore, they also define their water rights individually (e.g. riparian rights, public allocation, prior rights etc.). In order to harmonize the different national water laws and regulations between the riparian countries of a basin, it is necessary to bring national agreements and legislation in coherence with international agreements and common law (Zaag/Savenije 2000a). In this connection, Vollmer et al. (2009) and Savenije/Zaag (2000a/2000b) provide a list of recommendations for action:

1) The establishment of a RBO often either comes in conflict with already existing administrative arrangements or is not easily compatible with them. Tasks and responsibilities related to water in general are fragmented and can be found at the different administrative levels within a country (e.g. state-, provincial level etc.). A legal framework, therefore, clearly needs to determine how coordination between new and existing structures can be done and how new forms of governance will be implemented. Consequently, a RBO requires a strong financial and political commitment on the part of the member states. With an approach of flexibility and adaption to changes, the legal framework of an RBO has furthermore to unmistakably define the duration, tasks, procedures and responsibilities of organizations, institutions and stakeholders involved.

- 2) National laws and regulations have to be harmonized with international conventions that have been signed and ratified by the states concerned. In order to avoid fragmentation and the overlapping of responsibilities, which could be resulting from a lack of inter-ministerial coordination, it is advisable to establish a national water council or coordination committee. This would increase the probability that the different interests of ministries and other stakeholder would likely to be reconciled.
- 3) Legal frameworks of RBOs also should be equipped with means of enforcement, but this is very often missing. This means that the principles, which have been agreed on the international level are difficult to be implemented on the national, regional or local level. Consequently, the objectives of formal agreements, which have been decided by the parties, should be made measurable.
- 4) During the policy making process, practical aspects also need to be taken into consideration. In addition, the governments, but also other important stakeholders who are entrusted with the implementation, have to be taken into account in order to ensure that they will not develop divergent attitudes concerning the legislation (Vollmer et al. 2009). Besides the fact that transboundary water resources management necessarily involves negotiations between states, it is further important to recognize that the public within the riparian countries also should be well informed about the negotiations and on how the expected outcomes could potentially affect them (Zaag/Savenije 2000b).
- 5) One major development gap within legal agreements of transboundary water resources management is the insufficient recognition of groundwater (just recently started). RBOs therefore should start to consider it in their legal and policy processes. Thus, institutional capacity development and context-specific solutions would be required to adequately integrate groundwater into their activities and management strategies (Vollmer 2009).
- 6) There is a consensus that decisions related to water resources management should be made at the lowest appropriate level. That is why water resources development and management have shifted from a centralized management system type towards a decentralized, flexible and demand driven way. Nevertheless, if the decision-making power is always commissioned to lower levels, it could probably negatively affect or threaten transboundary water cooperation within shared river basins. Thus, the process of decentralization should also delegate negotiating responsibilities to higher levels due to the fact that some decisions are most usefully made at the basin level, whereas others should be made at lower levels (e.g. sub-catchment).

7) As mentioned before, the most suitable geographical unit for water resources management and planning is at basin-scale, where surface and groundwater is included at best. However, experiences in this area have shown that the policy- and strategy-level responsibilities should be disconnected from executive actions. In addition, two types of organizations or sub-organizations could emerge, which are mutually supportive: one on the policy level and another on the implementation level (Zaag/Savenije 2000a).

- **The operational pillar for technical cooperation:**

Negotiating legal agreements is normally resulting from political will and technical cooperation. Water professionals and technical experts, thus, have to play a crucial role in drafting legal arrangements. Having already recognized the legal and institutional aspects it is also necessary to examine the operational pillar for technical cooperation due to the fact that it is a central component for achieving sustainable transboundary water resources management in shared river basins. Technical cooperation establishes mutual trust and confidence as well as reliable information after which legal, institutional and political progress can be made. That is why Savenije and Zaag (2000a) describe the operational pillar as “*the centerpiece of the structure sustaining cross-boundary river management*” (Zaag/Savenije 2000a: 31). The subsequent part will present a number of technical issues that already facilitated transboundary water cooperation:

1) **Information exchange:** Information, which are based on well-organized measurement networks and monitoring programmes, are a crucial preconditions for identifying problems and assessing water-related cooperation possibilities because they form the ground for policy decisions occurring on the local, national and international level. One of the first duties of a RBO therefore should be to share relevant information and data (e.g. rainfall, dam operations etc.) in order to avoid conflicts, which could have been generated by defuse or controversy information. Joint databases and information exchange between riparians can further help to efficiently face challenges like floods, droughts or pollution etc.

2) **Crises procedures:** Procedures for managing crises like monitoring, early warning or evaluation plans also need to be established in order to handle natural or human-induced disasters as good as possible.

3) **Human resources development:** Cross-country learning and educational training through technical experts enables individuals, organizations and institutions, who are working within the fields of transboundary water resources management, to enhance their capacities and knowledge. In addition, the workforce of one country, for example, could

follow relevant courses in neighbouring countries and vice versa. In doing so, the exchange of knowledge would help to balance the capacities in managing water resources between the riparian states and therefore could generate conditions for improving cooperation.

4) **Joint research:** When educational connections exist, the conception, development and implementation of joint research projects could help to strengthen the cooperative management of transboundary water resources. Topics for joint research on international river basin management, for example, could be: cost-benefit analyses, efficient and sustainable use of land and water resources, regional strategies for mitigation of disasters, harmonizing legal and regulatory systems at different levels etc.

5) **Joint plans and ventures:** Another important task related to transboundary water resources management is the establishment of joint plans, which can include compatible strategies for water conservation, demand management or water pricing etc. because they lead to greater effectiveness than plans which have been developed by one country alone. Operation rules for large hydropower development projects, for instance, could be jointly prepared in order to assess the impacts of dams on more than one riparian country. If the interests of the riparian states have been harmonized or try to achieve a common objective, the development of joint ventures between two or more countries also presents a possible solution for managing and developing water resources in shared river basins. Nevertheless, joint ventures, which have been established just by a few countries should not affect or threaten the other riparians of a river basin (Savenije/Zaag 200a).

Having acknowledged how political, legal, institutional and technical aspects, as well as IWRM/IRBM, can significantly increase the likelihood that transboundary water resources are shared in a commonly accepted manner, Zaag and Savenije (2000a) consider following functions as essential to be included in international river basin organizations (see Table 9). Thus, it can be assumed that those functions also should be reflected in the process of developing design determinants for a NRBO.

Table 9: Essential Functions of International RBOs:

- | | |
|--|---|
| <ul style="list-style-type: none"> • Reconciling and harmonizing the interests of riparian countries • Technical cooperation • Standardization of data collection • Enforcing agreements • Dispute resolution | <ul style="list-style-type: none"> • Development of concreted actions programmes • Submission for examination and approval of proposed activities, schemes or plans which could modify the quantity of waters • Monitoring water quantity and quality • Exchange of information |
|--|---|

(Source: Savenije/Zaag 2000a, edited by author)

3.2 Key Characteristics of River Basin Organizations

After it has been outlined, how water resources within shared river basins can be managed efficiently and effectively, it is now necessary to briefly outline the different types of RBOs, their functions, as well as on how their performance can be measured. This step is necessary in order to identify those services for a NRBO, which would increase the likelihood that the cooperative management of transboundary water resources between the riparian states of the Nile is fostered.

In the field of international river basin, IWRM/IRBM has recently been gaining popularity in the scientific research for being a paradigm for sustainable transboundary water resources management and water conflict prevention. This concept, therefore, is increasingly regarded as an appropriate instrument to foster transboundary water cooperation between the riparian states of a river basin (UNESCO 2010b). Taking into account issues of cooperation and the context where it is applied, Millington et al. (2006) distinguished in a recent World Bank paper on IRBM between three different types of RBOs in which new joint bodies can be grouped in: the river basin commission, the river basin authority and the river basin coordinating committee/council (see Table 10). Here it should be noticed that these types of RBOs are “*assumed to play an important role to bring cooperation about*” (Priscoli/Wolf 2009 quoted by Morissette 2009: 17).

Table 10: Types of RBOs

River Basin Commission	<p>Adequate when significant development options are still to be considered in the river basin, conflicting uses are significant, information and policies still need further development, and water resource planning and management practices are not well detailed. A commission is formally constituted and comprised of a management board or group of commissioners who set objectives, goals, policy and strategic direction, are supported by technical staff, and possibly complemented by a presiding Ministerial Council. It is characterized by equal partner-ships among member governments and may include other stakeholders.</p>
River Basin Authority	<p>Can either be a large multi-disciplinary organization with specific development tasks (e.g. hydropower development) or an organization that absorbs virtually all the water resources functions of other agencies in the basin. While in some countries authorities are being transformed into commissions or coordinating committees/councils (see below), this model is adequate, for example, in some African basins because of their relatively low degree of water resources development. However, it is not suitable for historically, geographically, and politically very complex basins.</p>

River Basin Coordinating Committee/ Council	<p>Based on the assumption that existing agencies are operating effectively, most of the important data networks are in place, most of the high priority water projects have been constructed and competition for resource use has been resolved. This comprises ministers or senior representatives of main water-related agencies, meeting regularly; it has no executive power and is legally based on letters of agreement from the participating agencies. This category, however, is more common in the national context and serves to complement joint bodies on a higher level.</p>
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(Source: Vollmer et al. 2009, adopted from Millington et al. 2006, edited by author)

Under consideration of the aspects illustrated above and resulting from the status quo prevailing within the Nile region, it becomes clear that the Nile Cooperative Framework Agreement seeks to establish a permanent Nile River Basin Commission (NRBC) through which the riparian states will act together to manage and develop the water resources of the Nile (Mekonnen 2010).

While it can be expected that the concept of a River Basin Commission is likely to be taken over as appropriate type, the specific roles and functions of RBOs further need to be considered in the design of a NRBO because they are indicative of why the organization was formed and for what purpose. In this context, it has to be outlined again, that RBOs always will evolve as the particular conditions in a certain region dictate. Millington et al. (2006) and Hooper (2006a) therefore come to the conclusion that many of them experience a different evolutionary path. That is why both authors divide the stage of RBOs development into five functional groups (see Table 11 on the next page). The functions of the first group are crucial to any RBO, as they are a precondition for managing water allocations and usage, as well as natural resource protection. Group 2 activities can be rather related to traditional responsibilities of RBOs in developing countries, as they reflect the interconnections between regional planning and new water infrastructure. The remaining functions of the other groups may evolve concurrently or differently. This is mainly a result of the varying set of priorities, as the case of the Rhine Commission in Europe shows. In this connection, the commission started with the functions of group 1 and then included group 5 functions, followed by an integration of group 3 functions. In the end, the commission incorporated the functions of 1, 5, 3 and 4 (functions of group 2 were never included) (Millington et al. 2006).

Table 11: Functional Stages in the Evolution of a RBO

Functions:	Initial RBO	Adult RBO (auto-adaptive)	Mature RBO (auto-adaptive)
Group 1: Water (and natural resource) data collection and processing, systems modelling, water and natural resources planning, stakeholder consultation & issue clarification.	✓	✓	✓
Group 2: Project feasibility, design, implementation, operation and maintenance, raising funds, on-going community consultation and awareness raising.	✓	✓	✓
Group 3: Allocating and monitoring water shares (quality and quantity and possible natural resources sharing), cost sharing principles.		✓	✓
Group 4: Policy and strategy development for economic, social and environmental issues, community awareness and participation.			✓
Group 5: Monitoring water use and shares, monitoring pollution and environmental conditions, oversight and review role for projects promoted by RBO partners, monitoring and assessing the health of the basin's natural resources, monitoring the sustainability of resource management.			✓

(Source: Millington et al. 2006; Hooper 2006a, edited by author)

The functional groups in the evolution of a RBO show that adaptable RBOs are more dynamic than initial RBOs and therefore are more appropriate to respond to the changing conditions within a river basin over time. This is also reflected in the Nile Basin Initiative because its various programmes and projects indicate that the NBI in somehow already evolved from inception to maturation (e.g. Socio-Economic Development and Benefit-Sharing Project, see section 2.3). However, resulting from the already illustrated “Obstacles to Transboundary Water Cooperation” (e.g. lack of capacity or disagreements concerning the CFA, see section 2.4), it should rather be questioned if these functional stages really have been mastered sufficiently. In order to become a mature and auto-adaptive RBO, a NRBO therefore should be shaped in a way that it provides such services that so far have not been or could not be sufficiently provided in this region. But how to decide, which services are required and which not?

There exist several approaches in the current literature that try to evaluate and address the performance of RBOs. These are ranging from the traditional focus on efficiency and effectiveness of organizations (Lane 2000; Pollit/Bouckaert 2004) to newer forms, like Hooper's key performance indicators of RBOs (Hooper 2006a). Other approaches, that

also try to evaluate the performance of RBOs, particularly concentrate on a stakeholder perspective (Folz 2004) or include the Dublin principles as a benchmark of performance etc. (CAP-Net 2008). What is particularly interesting about Hooper's approach is its wider perspective on performance. Based on concepts of IWRM/IRBM and performance assessment, his approach goes beyond the traditional criteria of effectiveness and efficiency because it also incorporates various good governance indicators, as well as activities which are considered as critical for achieving good performances (e.g. training, research etc.). On the basis of extensive literature review, experiences on IRBM and on inputs from sector experts, Hooper developed 115 general key performance indicators, which he used to assess the performance of a RBO (Hooper 2006a; Cap-Net 2008).¹⁰ These key performance indicators were applied in 2006 on 20 studies concerning the ability of RBOs to implement IWRM. The outcomes of the studies were summarized in the "Twenty benchmarks of mature, auto-adaptive river basin organizations implementing effective integrated river basin management" (see Table 12) (Hooper 2006b).

Consequently, it becomes apparent that a NRBO should sufficiently consider these benchmarks in its design in order to pave the way that effective IRBM within the Nile Basin can be implemented. In doing so, this would increase the likelihood that transboundary water resources management and water conflict prevention between the riparian states of the Nile is improved, as the aforementioned three basic complementary elements of IWRM/IRBM (ecological sustainability, economic efficiency and social equity) would flourish and start to become an integral component for transboundary water cooperation within this region

¹⁰ For more information regarding the assessment of RBO performance, see:
Hooper 2006: <http://www.iwr.usace.army.mil/docs/iwrreports/2006-VSP-01.pdf>
Cap-Net 2008: <http://cap-net.org/sites/cap-net.org/files/RBO%20Performance.doc>

Table 12: The Twenty Benchmarks of Mature, Auto-adaptive RBOs

Decision-making	
1.	Decision-making by the river basin organization occurs within a national framework of natural resources management objectives and investments
2.	Decision-making is consensual and coordinates across sectors in the basin
3.	Decision-making is reflected in the river basins organisation's business plan, is prioritized, focuses on efficiency, links vertically to governments and provides stakeholder access to government
Goals, Goal Shift, and Goal Completion	
4.	An IWRM approach is agreed to and practiced by the river basin organization
5.	Objectives are specified in and articulated through feasible options in a river basins management plan
Financing	
6.	River basin management is financed through cost-sharing
7.	Financing is on-going, guaranteed adequate, linked to national and state priorities
8.	Ex-ante and ex-post economic assessments of management options are practiced
9.	Water pricing and alternative demand management are practiced
River Basin Commission Functions	
10.	Stable democratic conventions exist to provide stability to the institutional setting
11.	The river basin organization's functions are co-ordination driven and realistic
Law	
12.	On-going laws exist to enact natural resource management relevant to basin management
13.	The roles and responsibilities of the river basin organization are clearly specified in both national water policy and law
Staff Training	
14.	The river basin organization has a program in place to improve staff quality for management skills, leader-ship communication
Information and Monitoring	
15.	The River basin organization has its own, or joint access to, a well developed, accurate, up-to-date information and monitoring systems
16.	Science informs the river basin organization through modelling and spatial representation of options, which are costed and linked to the river basin organizations decision system: options which are delivered through strategic planning and decision-making process
17.	The information management system reports on how the basin is being managed and resources are consumed and protected
Coordinated Management With Stakeholders	
18.	Public involvement processes are effective, providing joint decision-making and conflict resolution
19.	The roles and responsibilities of stakeholders are specified and understood
20.	The river basin organization uses joint ventures and coordinates strategic decisions between partners.

(Source: Brouce/Hooper 2006b, edited by author)

3.3 Mechanisms to Improve Transboundary Water Cooperation

It has already been shown (see section 2.4) that there exist several obstacles to transboundary water cooperation in the Nile region, which can considerably complicate the way towards achieving a hydro-political consensus between the riparian states, particularly in terms of sharing their water resources. After it has been described, how water resources within shared river basin can be efficiently and effectively managed and how the required services for RBOs can be assessed, it is now necessary to describe those mechanisms that are considered to foster cooperation. In this context, UN-Water (2008) has identified seven pillars for transboundary water cooperation, which are considered as basic requirements in order to achieve long-term, sustainable and reliable cross-border cooperation within a river basin (see Table 13).

Table 13: Pillars for Transboundary Water Cooperation

<ul style="list-style-type: none"> • Legal Instruments • Institutional Structure and Capacity Building • Participatory Approach • Financing 	<ul style="list-style-type: none"> • Integrated Approach • Exchange of Information and Joint Monitoring and Assessment • Benefits and Cost-Sharing
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(Source: UN Water 2008, edited by author)

Note: Due to the fact that some of these pillars have been already explained previously (see sections 3.1, 3.2), the following will solely concentrate on those issues, which have not been sufficiently addressed, yet.

- **Institutional Structure and Capacity Building:**

An appropriate institutional structure at the local, regional, national and international level is necessary to achieve sustainable transboundary water resources development and management. At the river-basin level, joint bodies, such as river basin commissions, have to be equipped with strong enforcement capacity to enable that close collaboration between all parties concerned (e.g. different ministries, local stakeholders, research institutions etc.) is ensured (UN Water 2008). This is a precondition in order to achieve that a basin-wide approach and the principles of IWRM are being implemented. In this connection and comparable to the organizational structure of the NBI, the institutional structure of a RBO should include following elements: conferences of parties, a plenary, delegation of parties, delegations, a chairperson, a secretariat, working groups, auditing commission, a consultative group of donors, information centre, a training centre, national offices, observers etc. In order to ensure stability, continuity and the consistency of activities, a

RBO therefore should at least have decision-making bodies, executive bodies and working or subsidiary bodies. The associated RBO major functions to promote transboundary water cooperation between the riparian states of a river basin have been outlined in an UN (2009) paper (“River Basin Commissions and other Institutions for Transboundary Water Cooperation”) and are presented in Table 14:

Table 14: Major Functions of RBOs to Promote Transboundary Water Cooperation

- **Coordination and advisory function**, which includes coordination of and assistance to riparian States in their activities to implement the agreement.
- **Executive function**, which includes direct activities for a joint body to implement the agreement.
- **Control of implementation and dispute settlement function**, which includes monitoring of implementation, reporting on implementation, and settling differences and disputes.

(Source: UN 2009, edited by author)

In this relation, the UNECE-Water Convention (1992) reflects these three major functions, as it describes the following tasks as essential to be included in a RBO (see Table 15). The coordination and advisory functions are reflected through the tasks 1, 4, 5, 6, 8, 9. The executive functions are represented by the tasks 2, 3, 7, 10 and the control of implementation and dispute settlement function is partially presented in task 4.

Table 15: Essential Tasks of RBOs

- 1) Collect, compile and evaluate data in order to identify pollution sources likely to cause transboundary impact.
- 2) Elaborate joint monitoring programmes concerning water quality and quantity.
- 3) Draw up inventories and exchange of information on the pollution sources likely to cause transboundary impact.
- 4) Elaborate emission limits for waste water and evaluate the effectiveness of control programmes.
- 5) Elaborate joint water-quality objectives and criteria, and to propose relevant measures for maintaining and, where necessary, improving the existing water quality.
- 6) Develop concerted action programmes for the reduction of pollution loads from point sources and diffuse sources.
- 7) Establish warning and alarm procedures.
- 8) Serve as a forum for the exchange of information on existing and planned uses of water and related installations that are likely to cause transboundary impact.
- 9) Promote cooperation and exchange of information on the best available technology as well as to encourage cooperation in the scientific research programmes.
- 10) Participate in the implementation of environmental impact assessment relating to transboundary water, in accordance with appropriate international regulations.

(Source UN 2009 adopted from UNECE 1992, edited by author)

Regarding the aspects mentioned above, it has to be taken into account that these RBO functions and tasks just can be adequately implemented and performed, when sufficient financial, institutional and human capacities are available. At the national and local levels, for instance, the staff of RBOs should be characterized by broad competences and interdisciplinary skills in order to ensure that public participation and stakeholder involvement can take place. In this context, negotiations, diplomacy and conflict resolution skills also should be developed and improved. In parallel, the institutional and financial capacity to implement projects, policies, laws, and enforcement mechanisms has to be increased because they form the base for internal and external funding arrangements etc.

- **Participatory Approach:**

Public participation plays a significant role in the various fields of transboundary water cooperation and is one of the key principles of IWRM. It further enhances transparency and decision-making, creates ownership and facilitates the acceptance and enforcement of decisions, agreements and policies. In addition, public participation helps to improve the mutual understanding between the various stakeholders and therefore serves as a useful instrument for conflict prevention and risk reduction, which is especially important when large infrastructure development projects are going to be conducted (UN Water 2008). In recent times, it is consequently understandable that RBOs have gained considerable expertise in this field. In this connection, they have developed a number of mechanisms for public and stakeholder involvement (e.g. stakeholder databases for network interaction, river forums, stakeholder conferences or public hearings etc.) ensuring that from the beginning active participation of all relevant groups concerned is possible. The most experienced and progressive RBOs in the field of public participation have summarized their experiences in a UNEP (2000) publication (“Water Management: Guidance on Public Participation and Compliance with Agreements”) that suggests to consider the following aspects described below:

Table 16: Fostering Public Participation and Transparency

- Based on reasonable criteria, which should be clear to the public, riparian states and RBOs should invite non-voting NGOs to participate in meetings as observers.
- Riparian states and RBOs should establish procedures so that the public can have an oversight role in the conduct of transboundary cooperation.
- Riparian states shall ensure public participation in the development of international document plans and programmes for specific catchment areas.
- Riparian states are encouraged to invite the public in the preparation of international water agreements.
- RBOs should have the opportunity to receive and consider information from the public. The public should be given the opportunity to submit inquiries in writing to the RBO. RBOs should develop a public communication strategy and establish focal points.

(Source: UN 2009 adopted from UNEP 2000, edited by author)

- **Financing:**

There is no doubt that the effective transboundary water cooperation requires adequate financing. In order to develop a legal framework, as well as institutions and sufficient capacities to implement projects and programmes, sustainable investments are needed that optimize the management, equitable use and protection of shared water bodies. Furthermore, it has to be outlined that transboundary water resources management is generally supported by a mixture of finance mechanisms and through various sources of financial resources. These include, for instance, national budgets, external bilateral or multilateral donors or private public partnerships. Anyhow, investment requirements, especially within developing countries, often exceed the available financial resources of the riparian states. Thus, various financing mechanisms have to be developed and installed. In this connection, international development banks or specialised development funds have already successfully tested a number of innovative approaches, such as strategic partnerships comprising regional funds. Other mechanisms for financing transboundary water management institutions sustainably could be regional revolving funds, payments for ecosystem services, inter riparian financing and cost recovery of water services or payments of polluters. Nevertheless, all these financing schemes require political support, good governance and appropriate institutional structures. This relates to the situation that most RBOs are characterized through a limited financial autonomy because their budget often depends on the allocation from government sources (UN Water 2008).

- **Benefit- and Cost Sharing:**

In the past, transboundary water management concentrated almost on the allocation of water shares between two or more countries. For this reason, finite water allocation potentially trapped riparian countries in so-called win-lose situations with little space for compromises for basin wide cooperation (Sadoff et al. 2008). In comparison to the allocation of water itself, the use of water therefore provides by far a better scope for identifying mutually cooperative actions because it can produce incentives to explore alternatives being more beneficial. In this context, Sadoff and Grey (2002) presented a very promising concept that identifies four different types of cooperative benefits:

- 1) Cooperation between the riparian states can enable a better management of the watershed ecosystem as a whole and therefore produce *benefits to the river*.
- 2) Rivers are economic and physical systems. Cooperative management can yield major *benefits from the river*.
- 3) Rivers have political relevance, particularly when they are shared between states. Tensions between co-riparian states are prevalent to a greater or lesser extent and those

tensions generate costs. Cooperation can reduce these costs and hence create *benefits because of the river*.

4) By generating benefits from the river and reducing cost because of the river, cooperation can lead to better economical and political relations between states, which can be described as *benefits beyond the river*.

The benefits, which are described above, aim to extend the range of perceived benefits in order to create incentives for riparian states to cooperate. In this connection, it would be the role of a NRBO to assist the riparians states in their effort to identify these benefits (see Table 17).

Table 17: Types of Cooperative Benefits on International Rivers

Types	Challenges	Opportunities
1) Generating benefits to the river	Degraded water quality, watersheds, wetlands, and biodiversity	Improved water quality, river flow characteristics, soil conservation, biodiversity and overall sustainability
2) Producing benefits from the river	Increasing demands for water, suboptimal water resources management and development	Improved water resources management for hydropower and agricultural production, flood-drought management, navigation, environmental conservation, water quality and recreation
3) Reducing costs because of the river	Tense regional relations and political, economy impacts	Policy shift to cooperation and development, away from dispute /conflict; from food (and energy) self-sufficiency to food (and energy) security; reduced dispute/conflict risk and military expenditure
4) Increasing benefits beyond the river	Regional fragmentation	Integration of regional infrastructure, markets and trade

(Source: Sadoff/Grey 2002, edited by author)

For the purpose of this thesis, a number of selected services that a NRBO could potentially offer to promote transboundary water cooperation in this region are provided in Table 18. It has to be mentioned that these services have been derived from the different sections of the theoretical framework and have been further compared and complemented through some services being outlined in a paper (see Robertson 2004) that evaluated how transboundary cooperation within a river basin can be promoted (“Design Considerations for an International Facility to Promote Cooperation Between States Sharing a Common Water Resource”). The list is not comprehensive, but the reason why these services have been chosen is their accurate reference to the problems, which have been identified as the major obstacles for improving transboundary water cooperation within the Nile Basin. In

addition, these services will form the base to address study sub-objective number three of this thesis identifying the most desired NRBO services that have the potential to improve transboundary water cooperation in this region.

Table 18: Potential Services to Improve Transboundary Water Cooperation

<p><i>Direct Assistance:</i></p> <ul style="list-style-type: none"> • Design of dispute settlement procedures • Performing joint research, planning and management • Basin-wide access to knowledge and tools • Identifying and implementing cost-sharing arrangements • Ability to enforce agreements • Impartial third party advice and mediation • Sharing and exchange of information and data • Assistance in accessing financial resources • Assisting in convening parties • Participation and stakeholder identification • Creating joint development ventures • Best practice analysis and cooperation identification • Designing, implementing and adapting legal frameworks • Assess dispute situations and needs • Implementing agreements • Identifying benefit-sharing schemes
<p><i>Training and Public Outreach/Awareness Building:</i></p> <ul style="list-style-type: none"> • Capacity building • Education and advanced training • Organize and assist community advisory committees • Organize and assist stakeholder advisory committees • Encouraging political engagement

(Source: Own Table adopted from Robertson 2004, edited by author)

3.4 Synthesis

The previous sections of the theoretical framework outlined different approaches that the researcher considered as important concepts for promoting transboundary water cooperation between the riparian states of the Nile. In this connection, it is assumed, that a NRBO should have the potential to efficiently manage transboundary water resources (see section 3.1). Furthermore, it can be expected that cooperation between the riparian states of the Nile can only be sufficiently achieved if the key characteristics of RBOs (see section 3.2) and the mechanisms to improve transboundary water cooperation (see section 3.3) will be adequately reflected in the design of a NRBO. It should be considered here that in the beginning Hoopers (2006) benchmarks of mature and auto-adaptive RBOs appeared to be a suitable concept for proposing design determinants for a NRBO. Nevertheless, the downside of such a comprehensive framework was that the efforts, which were required to

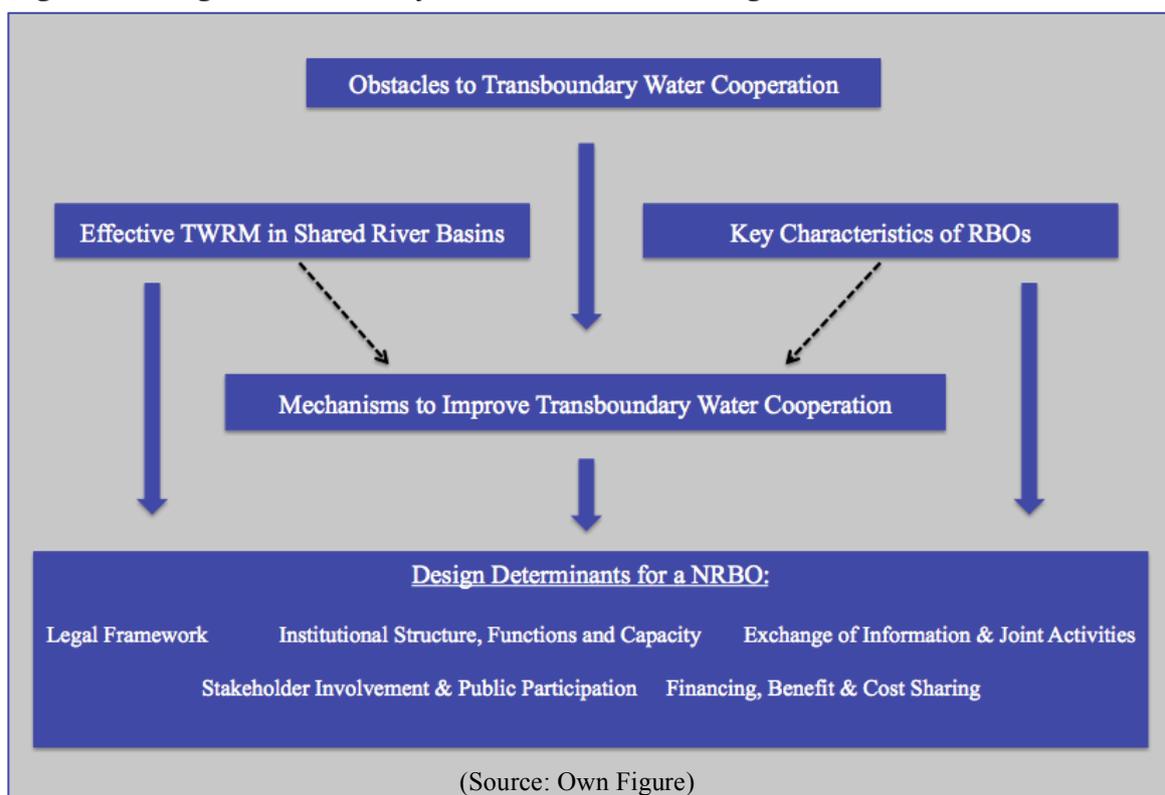
apply the framework, would have been significant. Due to the limited time frame to complete the thesis, it was decided that Hoopers findings are adapted to the recommendation made by UN Water (2008) (see section 3.3, Table 13). In addition, it is intended to use these pillars of transboundary water cooperation as a starting point to develop design determinants for a NRBO. Consequently, the approach which is used in this study, will examine the following design dimensions:

- Legal Framework
- Institutional Structure, Functions and Capacity
- Exchange of Information and Joint Activities (Joint Research, Monitoring etc.)
- Stakeholder Involvement and Public Participation
- Financing, Benefit and Cost-Sharing

The reason why these design dimensions have been selected as important determinants for a NRBO, are based on the following considerations (see Figure 7):

- 1) The literature analyses described them as some of the major obstacles to improve transboundary water cooperation in the Nile Basin (see section 2.4).
- 2) They are crucial elements for achieving effective transboundary water resources management in shared river basins (see section 3.1).
- 3) They are some of the key characteristics and benchmarks of mature and auto-adaptive RBOs to implement effective IWRM (see section 3.2).
- 4) They are considered to be important mechanisms to improve transboundary water cooperation between the riparian states of a river basin (see section 3.3).

Figure 7: Design Determinants for a Nile River Basin Organization

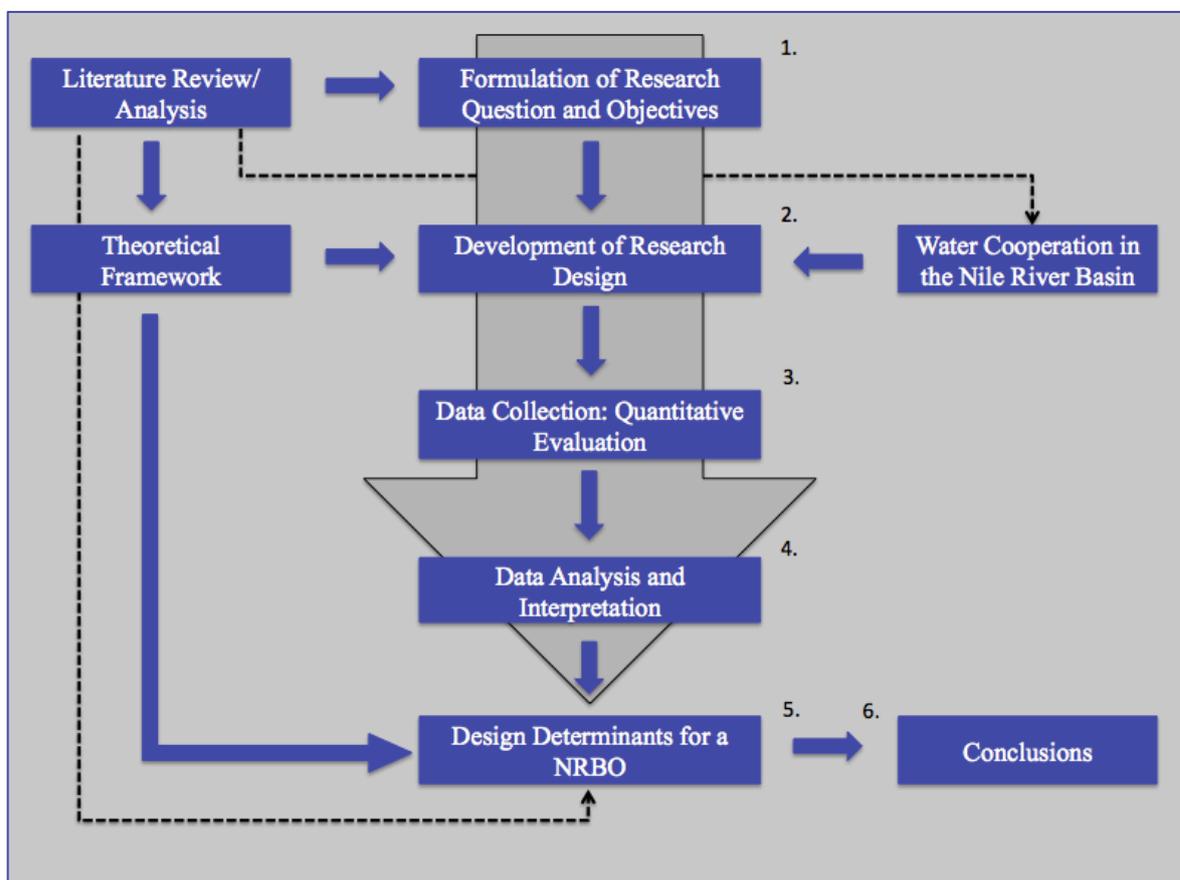


4. Concept Review II: Methodology

4.1 Methodological Conception

The research underlying this thesis used the following methodological approach in order to propose design determinants for a NRBO (see Figure 8). Based on an online survey targeted at transboundary water professionals, this study aimed to identify through expert experiences the criteria and elements that should be considered for the design of a NRBO to improve transboundary water cooperation between the riparian states of the Nile in an efficient and effective way.

Figure 8: Methodological Approach



(Source: Own Figure)

Based on an intensive literature review, that comprised issues such as IWRM/IRBM, transboundary water governance and cooperation, international water law, capacity building, institutional design of RBOs, as well as several water-related topics, which particularly concentrated on the Nile Basin and its riparian countries, the research question and objectives were formulated at the start of the research project (phase 1). The second step was to develop an adequate theoretical framework for addressing these objectives.

With the aid of this theoretical basis and under consideration of the status quo of water cooperation within this region, the project's research design then had been developed (phase 2). The third phase comprised the data collection process. In this connection, an internet-based questionnaire had been developed in order to address the research question of this study: *“What criteria and elements should be considered for the design of a Nile River Basin Organization (NRBO) in order to efficiently and effectively improve transboundary water cooperation between the riparian states of Nile?”* Altogether, the questionnaire had been designed for the purpose to gain new, valuable and relevant information from experts in order to:

1. Identify those issues that are considered to be the major problems for improving transboundary water cooperation in the Nile Basin (Subobjective 1).
2. Assess the existing regional capacity to take measures against these problems (Subobjective 2).
3. Determine the most desired NRBO services that are considered to improve transboundary water cooperation in this region (Subobjective 3).
4. Assess the demand and desire for creating such a NRBO (Subobjective 4).

***Note:** The full questionnaire (web-based version and pdf-version) and the selected set of indicators can be found in the Attachment (1,2,3).*

Taking into account the findings of the survey and literature review (phase 4), the research objective: *“Propose design determinants for a NRBO, which have the potential to improve transboundary water cooperation between the riparian states of the Nile”*, then has been addressed in the fifth phase by reconsidering the aforementioned design dimensions (legal framework; institutional structure, function and capacity; exchange of information and joint activities; stakeholder involvement and public participation; financing, benefit and cost-sharing). In this phase it is aimed to describe within each design dimension those aspects that could potentially improve transboundary water cooperation in this region. In this relation, it has to be mentioned that the suggestions and recommendations, which have been acquired from the theoretical framework (see Hooper 2006; UN_Water 2008, UN 1997; UN 2009; Hearn et al. 2010), will be used to determine the resultant cooperation promoting criteria and elements (see research question). Finally, a conclusion concerning the research questions and objectives has been made (phase 6).

4.2 Survey Design

The survey of this thesis has been carried out as a personalized internet-based questionnaire (also named web-based quantitative survey or pop-up survey) and has been developed by the use of EFS-Survey of Unipark (see <http://www.unipark.info>). The content of the questionnaire has been partly adopted from the questionnaire created by Robertson (2004) and has been further complemented through the findings of Hooper (2005/2006), GWP (2009), UN (2009) and UN-Water (2008). In this context, Robertson (2004) evaluated on a global-scale the condition under which cooperation between states that share a common water resource could be promoted. Due to the fact, that this thesis exclusively concentrated on the Nile Basin it was therefore important to transform and modify the questionnaire to the specific conditions of this region. With a view to provide this guarantee, four experts have been consulted to review and revise the content and structure of the survey. Thus it was possible to receive an additional feedback before the questionnaire was provided to the target audience. Another challenge resulted from the assumption that the respondents were frequently confronted with a number of surveys and interviews. Therefore, it was necessary to create the questionnaire as short and simple as possible. That is why during the design phase of the survey, special attention was given to acceptance, clarity, comprehensibility and personal addressing. The criteria of acceptance have been taken into account by placing the university's as well as the institute's logo on the different pages of the questionnaire. Moreover, the contact information of the researcher also could be found there in order to enable individual inquiries. Under consideration of the complexity of the subject matter, the time requirements to complete the questionnaire have also been considered by limiting the duration of response to ca. 20 minutes. An optically recognizable progress bar at the edge of the questionnaire further allowed that the respondents were able to consider their individual processing stage as well as the remaining time to complete the questionnaire. In doing so, it could be expected that the respondents were motivated to quickly finalize the questionnaire. Besides these aspects, the "One-Question-One-Page" principle was used in order to provide clarity and comprehensibility, as well as to avoid the necessity to scroll between the different pages of the questionnaire. In this connection, option buttons, check boxes (for multiple responses) and some text-boxes (for open responses) were used as the main formatting elements.

In the beginning the researcher aspired to combine the internet-based questionnaire (quantitative evaluation) with specific interviews (qualitative evaluation). This mixed-method design, which combines qualitative and quantitative data and therefore overcomes the weaknesses of both research methods, seemed to be the most appropriate way to examine the complex nature of this subject matter (Diekmann 2002). Nevertheless, great difficulties emerged during the time of establishing contacts for the qualitative evaluation because the feedback and response of the selected interview partners had to be rated as

very low. For this reason and because of the limited time frame to carry out the research, it was decided to exclusively focus on performing a quantitative evaluation. The reasons why an internet-based questionnaire was chosen as the appropriate quantitative survey instrument have resulted from the situation that traditional standardized surveys, like written questionnaires, would require considerable logistical, financial and temporal efforts, especially if the respondents are geographically located in different regions and diverse countries. Another advantage of the internet-based questionnaire was that it provided much faster and easier the required information. This related to immediate accessibility of data and the possibility to automatize the associated evaluation processes (Kühl et al. 2009).

4.3 Selection of Respondents

The target audience of this survey has been formed through contact information available on the web sites of organizations that could be associated to transboundary water issues and were operating within or related to the Nile Basin (e.g. NBI, UNESCO, UNDP, GEF, GWP, governmental organizations, like SIDA and GIZ, NGOs, as well as universities and research institutions etc.). Due to the fact, that there was no available list of water experts who were particularly concentrating on improving transboundary water cooperation in the Nile Basin, a special challenge was the necessity to develop conditions under which the water professionals could be identified. Therefore, some criteria had to be established in order to determine the main target audience of this survey. The respondents of the questionnaire included professionals, who:

1. Focusing their area of activity on the Nile Basin and are working within the fields of transboundary water resources management.
2. Promoting cooperation or water-related conflict prevention/resolution between the riparian states of the Nile.
3. Offering third-party assistance within the Nile Basin and in relation to the subject matters mentioned above.
4. Would have the authority to request the services of a NRBO.

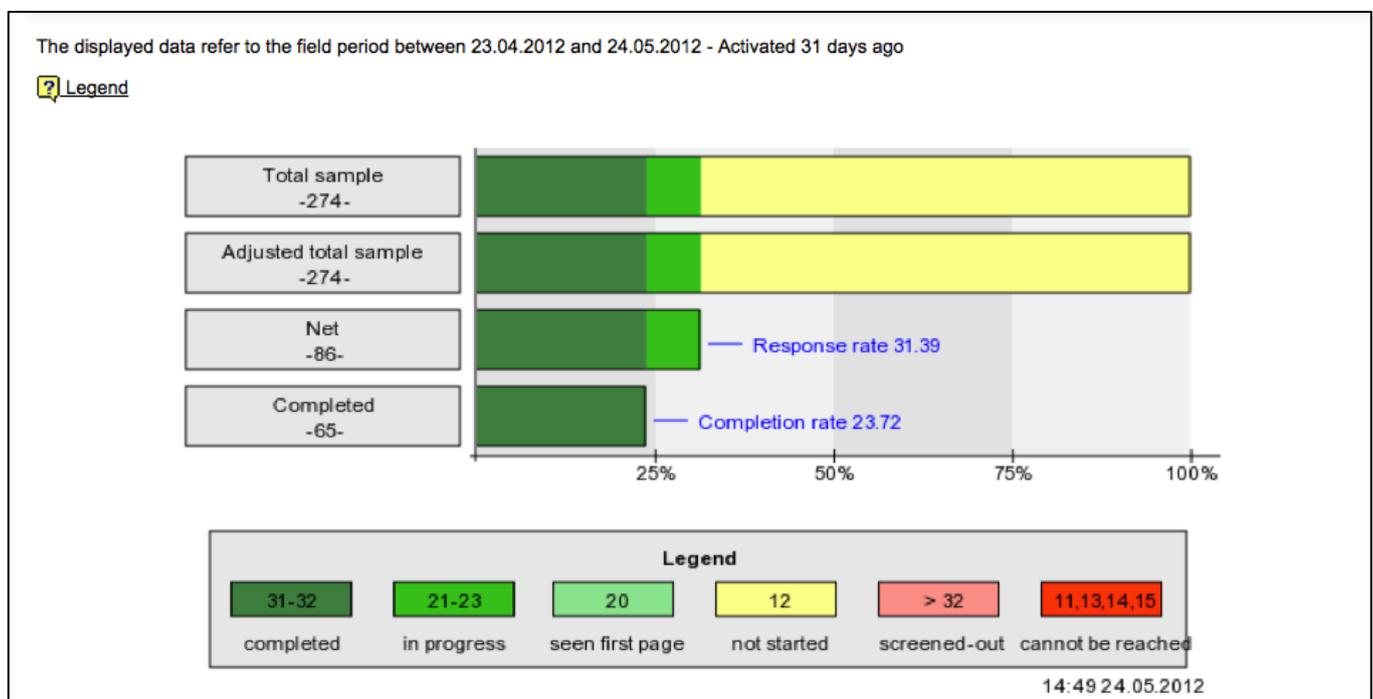
It should be mentioned, that the web pages of the organizations concerned have been carefully reviewed and systematically evaluated in order to identify the specific contact partners within each institution. In this way, it was possible to achieve the highest possible degree of personal addressing. Moreover, the official, serious and scientific character of the survey was highlighted to minimize the risk, that the invitation and reminder emails were considered to be a spam. In order to avoid distortive effects through the intensive

participation of individuals, it was further decided to provide individual access codes to the respondents. Besides the structural factors underlying the survey, the interest of acquiring new insights within this subject area also constituted favourable initial conditions for motivating the professionals to participate. After the complementation of the survey, the prospect of receiving an extensive report of results was therefore held out. The applicability of results for the individual professional practice thus created an incentive for participating in the study.

4.4 Response Rate

By an individual email and at intervals of eight days, the target audience was asked three times to participate. The invitation email to take part in the online survey was sent in the middle of the week (Start: Wednesday the 23th of April 2012; End: Thursday the 24th of May). In the first email, no indications about the duration of the field phase have been made in order to flexibly respond to the development of the rate of return. In the second email, the participants were friendly reminded to fill out the questionnaire and the third email further outlined the end of the survey (the email templates can be found in Attachment 1). Altogether, the field phase lasted 4 weeks.

Figure 9: Field Report



(Source: Own Survey with EFS-Survey Software)

In total, 274 identified professionals were requested to share their opinion concerning transboundary water cooperation in the Nile Basin, of whom 86 (=N) partially and 65 (=n) fully responded. Consequently, a relatively low response rate of 31% and a completion rate of 24% could be achieved (see Figure 9) (Cook et al. 2000). This makes a comparison of results challenging because the outputs of the survey have to be interpreted with great cautions. Nevertheless, from a student position over a limited time frame and due to the complexity of the subject matter, as well as resulting from the very high workload of experts consolidated, the response rate could be regarded as quite suitable because it allowed to identify trends and to compare the statistical data available. The survey data received was processed and summarized with the integrated evaluation programme of EFS-Survey and has further been analysed with the spreadsheet software Microsoft EXCEL.

5. Data Analysis

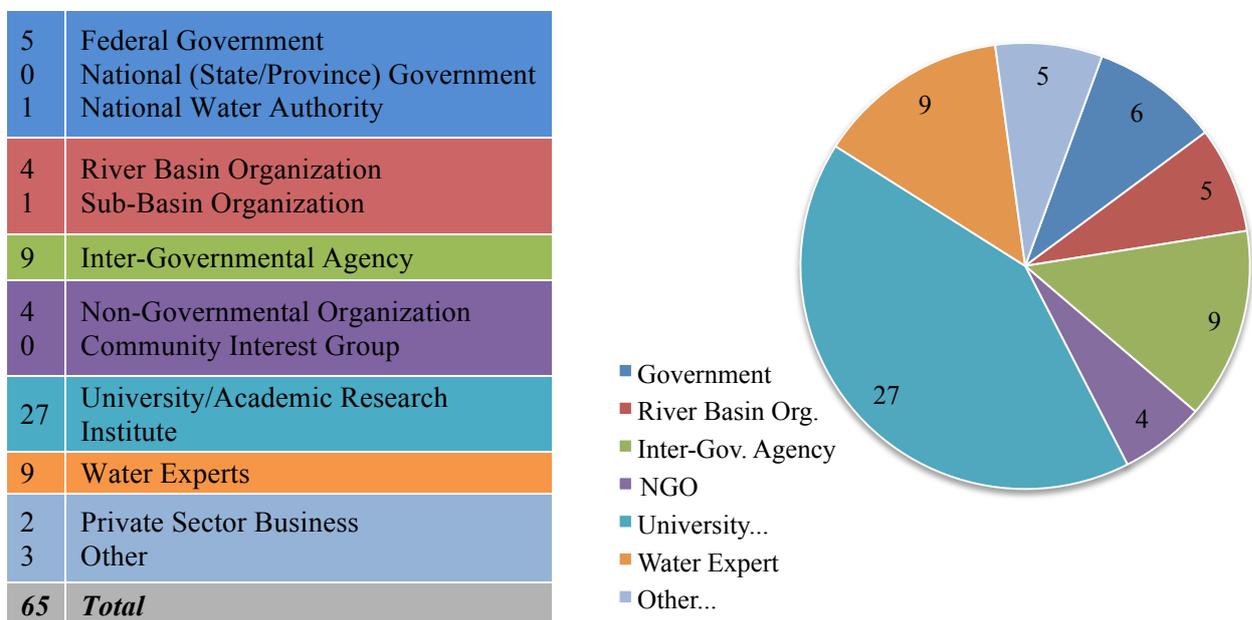
The subsequent part of this paper will present the outcomes of the web-based survey, which has been developed for the purpose to address the research question of this study: *“What criteria and elements should be considered for the design of a Nile River Basin Organization (NRBO) in order to efficiently and effectively improve transboundary water cooperation between the riparian states of Nile?”* The questionnaire aimed to 1) analyse and identify the major problems to transboundary water cooperation in the Nile Basin, 2) assess the existing regional capacity to take measures against these problems, 3) identify the most desired NRBO services in order to improve transboundary water cooperation in this region, 4) assess the demand and desire for creating such a NRBO. For ensuring a better clarity, the internet-based questionnaire has been divided into three sections: (1) characterization of respondents, (2) assessment of transboundary water cooperation in the Nile Basin, and (3) determination of desired NRBO services. The findings are further verified or falsified through the literature analysis done previously (see section 2 and 3). In order to receive viable and comparable results, it also needs to be considered here that the following analysis has solely included those respondents who fully and completely replied to the whole questionnaire.

5.1 Characterization of Respondents

At the end of the survey phase, 65 fully replied questionnaires were received. Consequently, insights, experiences and comments from water professionals could be accumulated, which ensured to gather comprehensive and profound knowledge about transboundary water cooperation in the Nile Basin. In addition, Figure 10 illustrates the distribution and categorization of responses that relate to question 1: *“Please mark with a*

cross, which classification best represents your organization". Replies from the category "Other" included two from national (governmental) research institutions and one consultant for institutional development. In the interest of simplification, the following will include the two responses from the 'Private Sector Business' within the category 'Other'. Nevertheless, due to the influence of uneven distribution of responses received by the consulted organisation's representatives, certain aspects need to be considered. Within the identified target audience, responses from experts of universities and academic research institutions were considerably represented in the survey, whereas responses from national (state/province) governments and community interest groups were missing. Even though various attempts have been performed to motivate the missing groups to participate in the survey, no replies could be acquired. As a result of the imbalanced distribution of organisations responding, some potential biases arose which may have distorted the results of this study. Therefore, it was decided not just to simply present the overall response results of the total target audience, but also to provide a detailed overview about the response results within each determined group. The impact of the uneven distribution of responses from the experts of the different organizations will further be discussed during the examination of the survey data received.

Figure 10: Distribution and Categorization of Respondent's Organizations



Note: The author himself has carefully compiled all the figures and tables that will be illustrated and explained in this section. For practical reasons, it was therefore decided not to make reference to these sources.

In order to see if the identified persons were in the relevant target audience for answering the questionnaire extensively and competently, question 2-4 of the survey have been asked to characterize the respondents in more detail. In addition, around 70% of the respondents stated that they worked more than 15 years in the water related field (see Figure 11, 12).

Figure 11: Years Worked in the Water-related Field

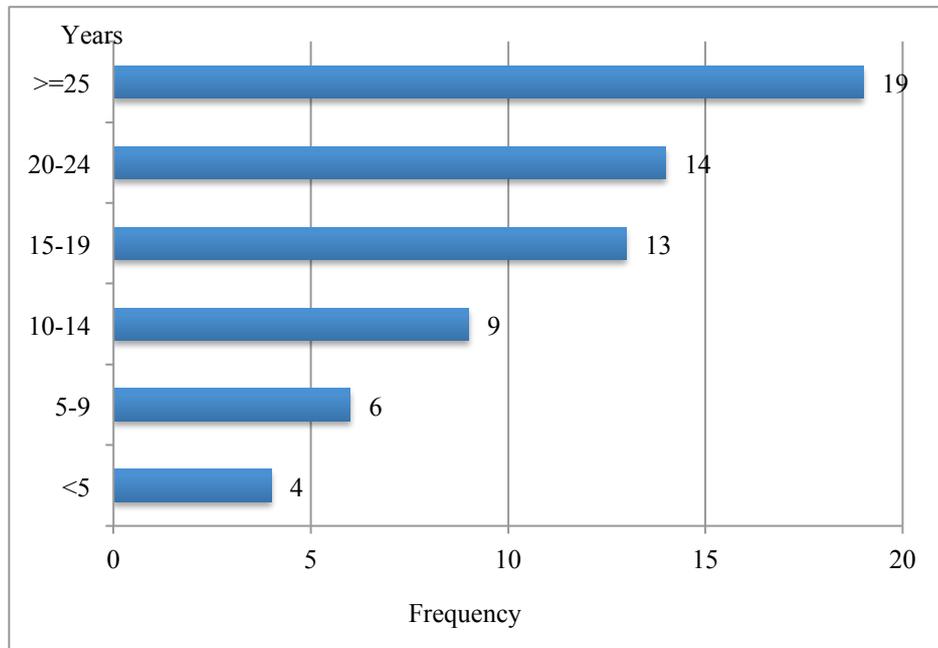
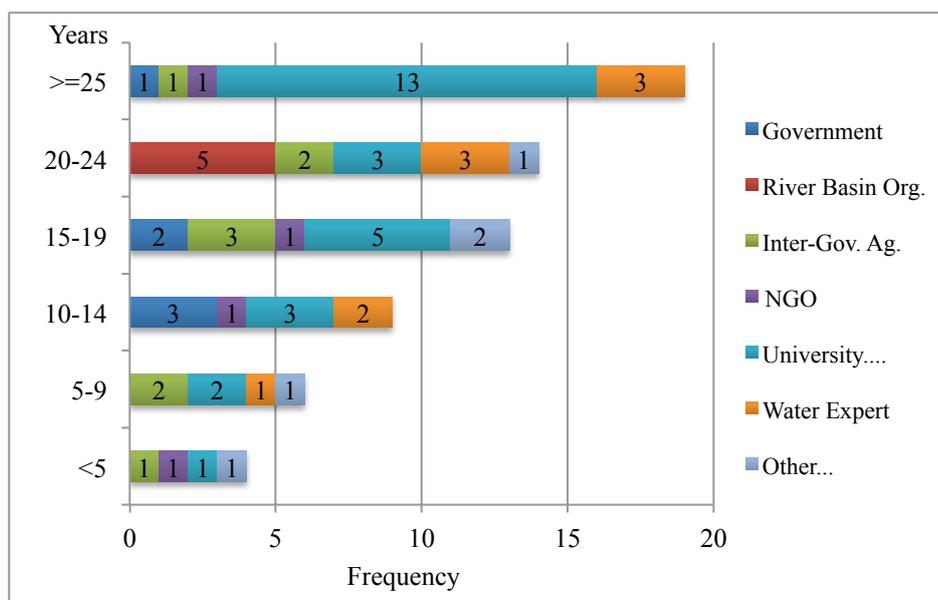
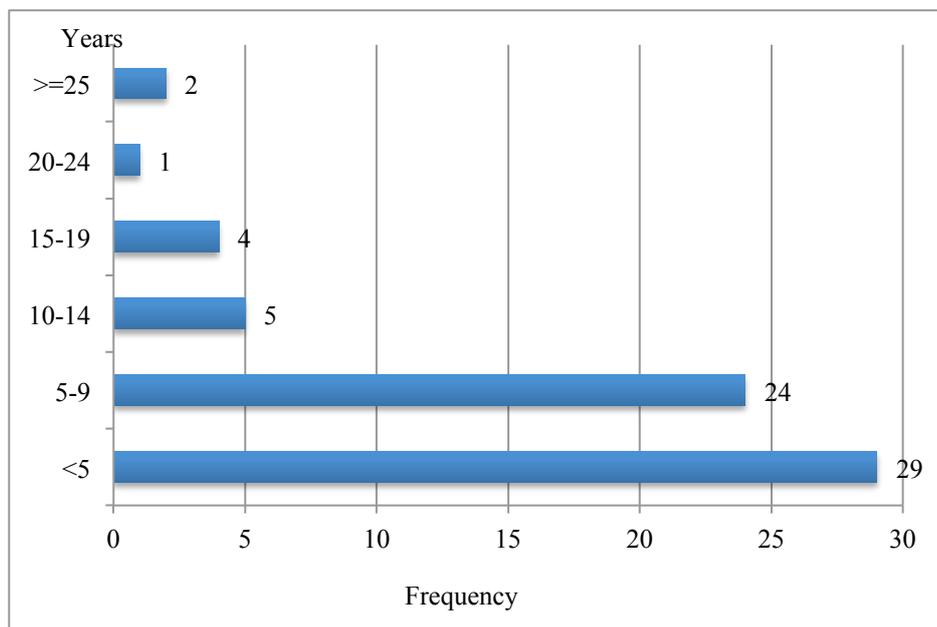


Figure 12: Years Worked in the Water-related Field (Distribution per Type of Organization)

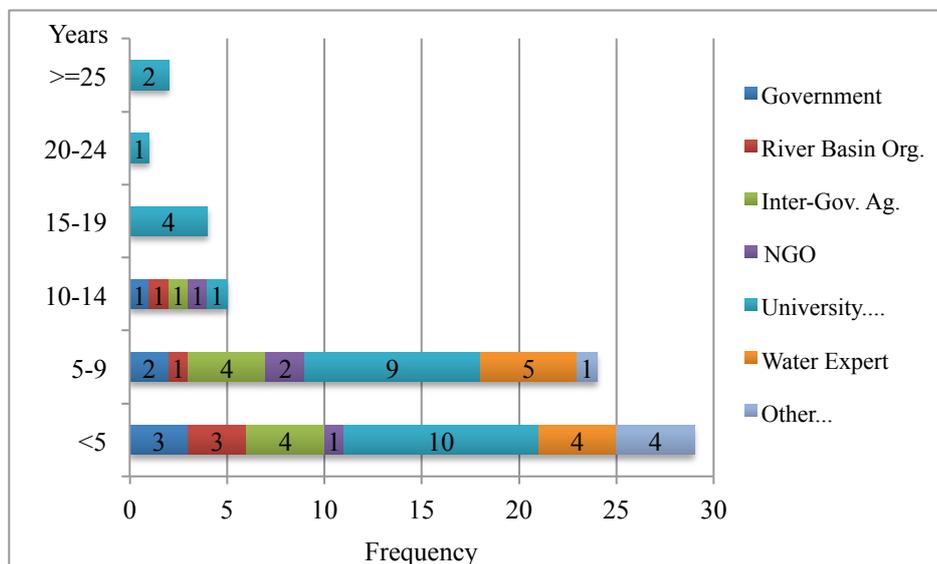


A different picture emerged when the respondents should indicate how long they have been working in promoting cooperation between the riparian states of the Nile in order to anticipate, prevent or resolve water related disputes in this region. In this context, the great majority declared that they worked 9 or fewer years in this subject area (see Figure 13, 14). Even if the Nile Basin countries have experienced a long history of (mostly bilateral) water-related cooperation these results are not too surprising due to the fact that fostering transboundary water cooperation with a basin-wide approach has only relatively recently evolved with the development of the NRBAP and the 2002 Nile conferences (see section 2.2).

Figure 13: Years Worked in Promoting Cooperation in the Nile Basin



*Figure 14: Years Worked in Promoting Cooperation in the Nile Basin
(Distribution per Type of Organization)*



Based on a five-point Likert rating scale, four questions were used to specify the involvement of experts in promoting transboundary water cooperation between the riparian states of the Nile (see Table 19).

Table 19: Expert Involvement in Promoting Transboundary Water Cooperation

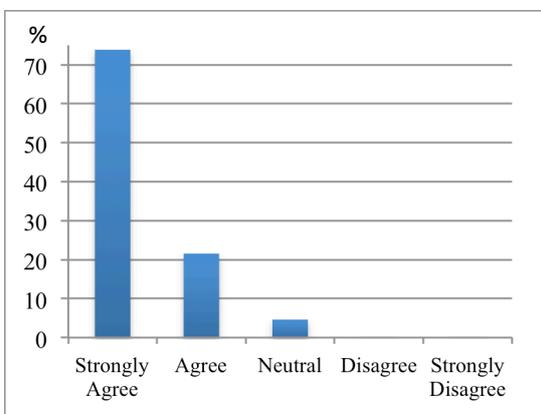
(N=65; n=65)	Strongly Agree 1	2	3	4	Strongly Disagree 5	Total
a) Improving cooperation between the Nile Basin's riparian states is one of the most important transboundary water resources management challenges in this region:	73.85% (48)	21.54% (14)	4.62% (3)	0.00% (0)	0.00% (0)	100% (65)
b) In relation to managing transboundary water resources, your work is very much involved in improving cooperation between the riparian states of the Nile	29.23% (19)	36.92% (24)	21.54% (14)	9.23% (6)	3.08% (2)	100% (65)
c) Your organization's ability to make/influence decisions, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources is high:	15.38% (10)	35.38% (23)	23.08% (15)	15.38% (10)	10.77% (7)	100% (65)
d) Your personal ability to make and/or influence decisions within your organization is high.	18.46% (12)	43.08% (28)	26.15% (17)	7.69% (5)	4.62% (3)	100% (65)

The first question asked if the respondents believed that improving cooperation between the riparian states was one of the most important transboundary water resources management challenges in this region. The results suggested that the great majority of the questioned persons believed that improving cooperation was highly required in the Nile Basin (see Figure 15a). Under consideration of managing transboundary water resources, the second question aimed to determine the expert's involvement in improving cooperation between the riparian states of the Nile. In this context, the questioned persons outlined that they were much involved in this process (see Figure 15b). In order to evaluate the expert's and organisation's ability to make and/or influence decision, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources question three and four were raised. In this case it was pointed out that the respondents generally had the opinion that they work for an organisation, which had the ability to improve cooperation efforts within this region (see Figure 15c). Furthermore, they indicated that their personal authority to make and/or influence decision within their organisation was high (see Figure 15d). The overall results consequently show that the experts, who were previously identified as potential respondents for answering the

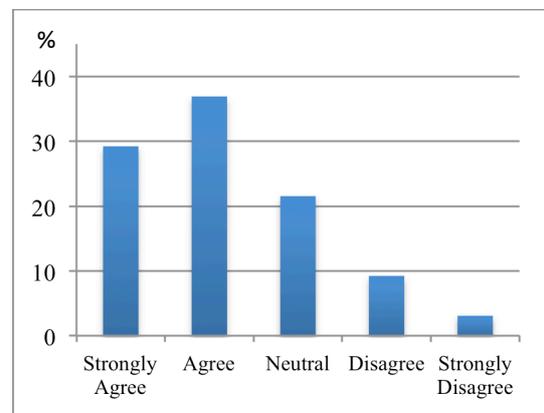
questionnaire, were within the desired target group, as the majority of them indicated that they were both being involved in improving cooperation between the riparian states of the Nile and holding the view that they and their respective organizations relatively had the ability to make/influence decisions, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources.

Figure 15: Expert Involvement in Promoting Transboundary Water Cooperation

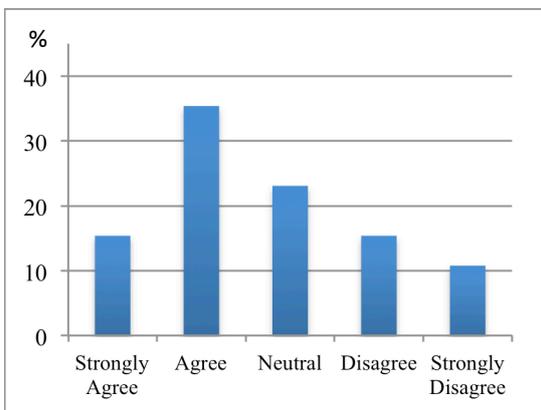
a) Improving cooperation between the Nile Basin's riparian states is one of the most important transboundary water resources management challenges in this region:



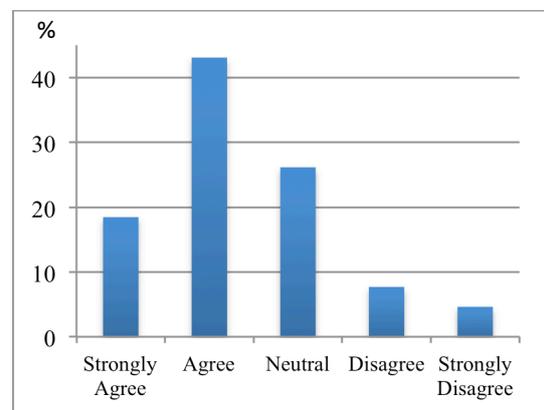
b) In relation to managing transboundary water resources, your work is very much involved in improving cooperation between the riparian states of the Nile:



c) Your organization's ability to make, influence decisions, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources is high:



d) Your personal ability to make/influence decisions within your organization is high:



5.2 Assessment of Transboundary Water Cooperation in the Nile Basin

In order to receive concrete indications about those criteria and elements which so far have not been sufficiently provided in the Nile region and thus should be considered in the design of a NRBO, the second section of the survey was aiming to evaluate the status quo of transboundary water cooperation in the Nile region. In addition, the most important problems, which were considered to significantly interfere in the process of improving transboundary water cooperation in the Nile Basin and the current existing regional capacity to take measures against these problems, were assessed.

Based on an extensive literature analysis, a list of nineteen problems were provided as possible options to identify the five most important problems that are prevalent in the Nile Basin and can be associated to transboundary water cooperation in this region. Taking into account that other problems, which so far have not been taken into consideration, could also have an impact, a textbox named ‘Other’ was also available. In this connection, a total of 325 responses were chosen (each of the 65 respondents has been asked to select five possible options). The related research results expressed in percentage and the responses per type of organization are summarized on the following pages of this paper (see Figure 16, 17; see Table 21). In addition, the five, or in this case six, most important problems to improve transboundary water cooperation in the Nile Basin were identified to be:

- 1) Lack of political will (68%)
- 2) Insufficient cross-border exchange of information and data (52%)
- 3) No commonly accepted and agreed legal frameworks (51%)
- 4) Insufficient benefit-sharing arrangements (42%) and
Lack of confidence between disputing parties (42%)
- 5) Prior agreements (37%)

Here it is interesting to note that the limited responses of some of the sub-categories and the large representation of universities and academic research institutions probably have influenced the overall results of the survey. Thus, it was unexpected that the respondents within each organizational category almost all rated similar problems for being responsible to mostly interfere in promoting transboundary water cooperation in this region (see Table 21). However, seven respondents also made use of the provided textbox ‘Other’ and suggested to consider:

Table 20: “Other” Transboundary Water Cooperation Problems

• Lack of regional markets	• Lack of enabling environment for trade between riparian states
• Low institutional capacities	• Lack of head of state summit
• Non-democratic nature of the regimes	• Risks as perceived by key players outweigh benefits
• Colonial influence	

Figure 16: Problems to Transboundary Water Cooperation in the Nile Basin

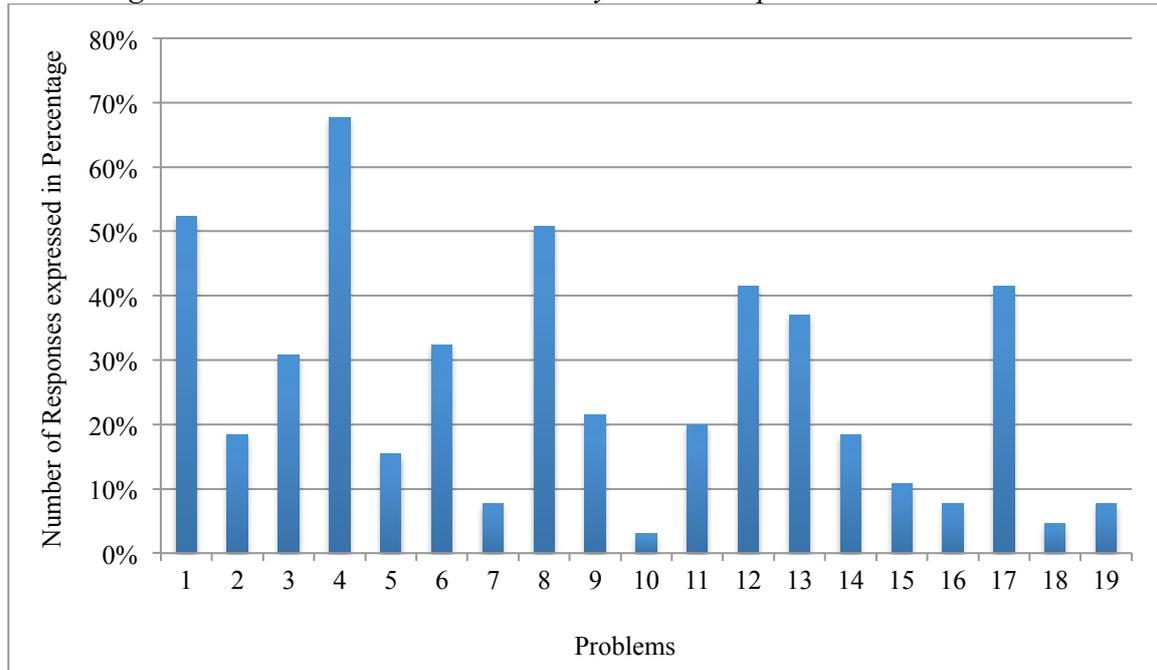
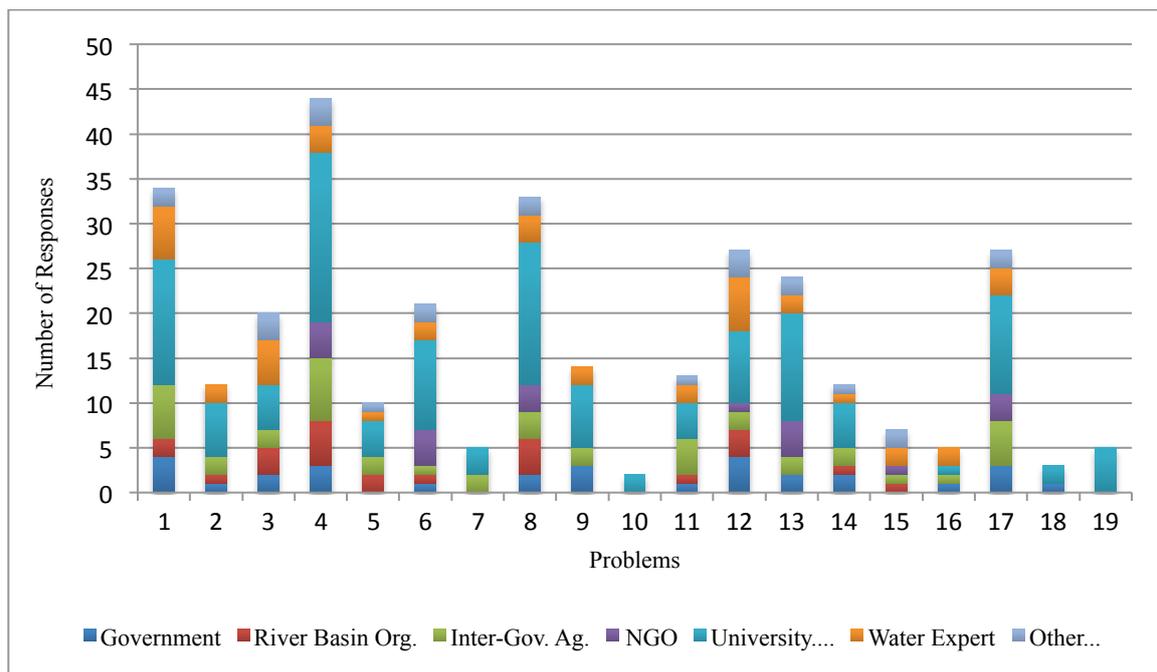


Figure 17: Problems to Transboundary Water Cooperation in the Nile Basin
(Distribution per Type of Organization)



1. Insufficient cross-border exchange of information and data (second ranked)
2. Lack of stakeholder participation across borders
3. Inadequate financing mechanisms
4. Lack of political will (first ranked)
5. Lack of joint development ventures
6. Insufficient capacity building across all Nile Basin states
7. Lack of dispute resolution mechanisms
8. No commonly accepted and agreed legal frameworks (third ranked)
9. Joint research, planning and management
10. Insufficient education and advanced training
11. Basin-wide monitoring of water quality and quantity
12. Insufficient benefit-sharing arrangements (fourth ranked)
13. Prior agreements (fifth ranked)
14. Insufficient common data-base for accessing basin-wide knowledge and tools
15. Inadequate institutions to devolve decision-making to lower levels
16. Insufficient cost-sharing arrangements
17. Lack of confidence between disputing parties (fourth ranked)
18. High turnover of key staff
19. Insufficient ability to enforce agreements

When the similarities and differences between the determined sub-categories are compared with each other in regard to the most important problems to transboundary water cooperation in the Nile Basin, it becomes apparent that governmental actors ranked ‘lack of political will’ relatively lower, while river basin organizations, NGOs, intergovernmental agencies, and universities/academic research institutions indicated that this issue was the most severe (see Figure 18). The same is true for ‘no commonly accepted and agreed legal frameworks’ and ‘prior agreements’, both options that referred to the still persistent and critical legal status quo of allocating the waters of the Nile in an mutual accepted manner. These different outcomes may be explained through the ‘lack of confidence between disputing parties’ and the ‘insufficient cross-boarder exchange of information and data’ because government representatives are rather not willing to cooperate when there is neither confidence nor sufficient information exchange among them. Furthermore, it is very interesting to see that most of the survey respondents gave a relatively low priority to ‘lack of stakeholder participation across borders’, ‘lack of joint development ventures’, ‘lack of dispute-resolution mechanisms’, ‘insufficient education and advanced training’, ‘inadequate institutions to devolve decision-making to lower levels’, ‘insufficient cost-sharing arrangements’ and ‘high turn-over of key staff’; all issues, which have been previously identified to be some of the important obstacles to transboundary water cooperation in the Nile Basin (see section 2.4). In addition, it was also surprising to see that professionals from NGOs were the only persons who rated ‘insufficient capacity building across all basin states’ as a very important aspect to be considered.

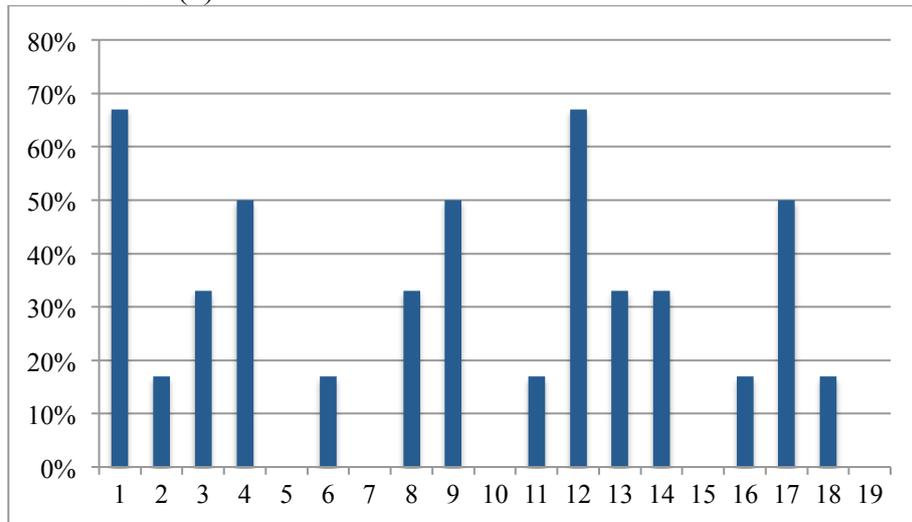
***Note:** Even if most of the respondents generally agreed upon the most important problems that can be associated with transboundary water cooperation in the Nile Basin, the findings of the survey always have to be regarded in relation to the relative low response rate and the influence of the uneven distribution of responses, which were received by the consulted organisation’s representatives.*

Table 21: Problems to Transboundary Water Cooperation in the Nile Basin

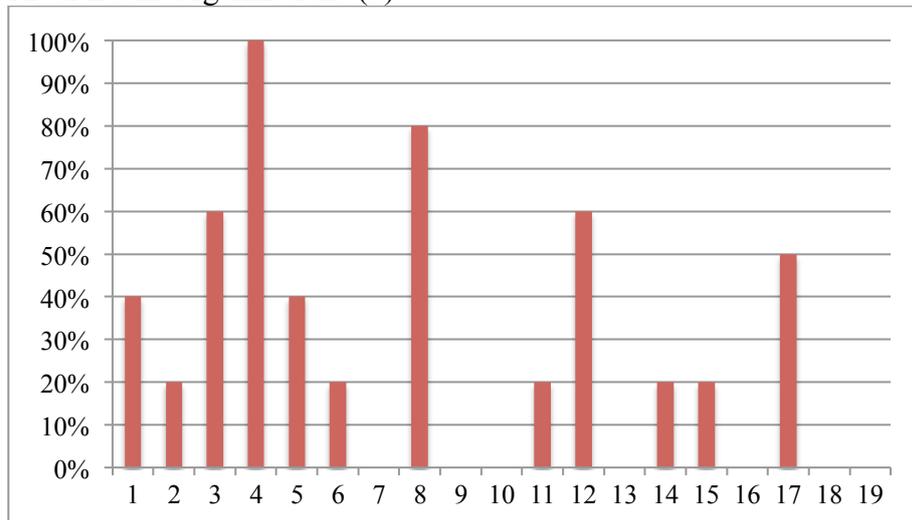
	Total (65)	Government (6)	River Basin Org. (5)	Inter-Gov. Ag. (9)	NGO (4)	University... (27)	Water Expert (9)	Other... (5)
1. Insufficient cross-border exchange of information and data	34 52%	4 67%	2 40%	6 67%	0 0	14 52%	6 67%	2 40%
2. Lack of stakeholder participation across borders	12 18%	1 17%	1 20%	2 22%	0 0	6 22%	2 22%	0 -
3. Inadequate financing mechanisms	20 31%	2 33%	3 60%	2 22%	0 -	5 19%	5 56%	3 60%
4. Lack of political will	44 68%	3 50%	5 100%	7 78%	4 100%	19 70%	3 33%	3 60%
5. Lack of joint development ventures	10 15%	0 -	2 40%	2 22%	0 -	4 15%	1 11%	1 20%
6. Insufficient capacity building across all Nile Basin states	21 32%	1 17%	1 20%	1 11%	4 100%	10 37%	2 22%	2 40%
7. Lack of dispute resolution mechanisms	5 8%	0 -	0 -	2 22%	0 -	3 11%	0 -	0 -
8. No commonly accepted and agreed legal frameworks	33 51%	2 33%	4 80%	3 33%	3 75%	16 59%	3 33%	2 40%
9. Joint planning and management	14 22%	3 50%	0 -	2 22%	0 -	7 26%	2 22%	0 -
10. Insufficient education and advanced training	2 3%	0 -	0 -	0 -	0 -	2 7%	0 -	0 -
11. Basin-wide monitoring of water quality and quantity	13 20%	1 17%	1 20%	4 44%	0 -	4 15%	2 22%	1 20%
12. Insufficient benefit-sharing arrangements	27 42%	4 67%	3 60%	2 22%	1 25%	8 30%	6 67%	3 60%
13. Prior agreements	24 37%	2 33%	0 -	2 22%	4 100%	12 44%	2 22%	2 40%
14. Insufficient common data-base for accessing basin-wide knowledge and tools	12 18%	2 33%	1 20%	2 22%	0 -	5 19%	1 11%	1 20%
15. Inadequate institutions to devolve decision-making to lower levels	7 11%	0 -	1 20%	1 11%	1 25%	0 -	2 22%	2 40%
16. Insufficient cost-sharing arrangements	5 8%	1 17%	0 -	1 11%	0 -	1 4%	2 22%	0 -
17. Lack of confidence between disputing parties	27 42%	3 50%	0 -	5 56%	3 75%	11 41%	3 33%	2 40%
18. High turnover of key staff	3 5%	1 17%	0 -	0 -	0 -	2 7%	0 -	0 -
19. Insufficient ability to enforce agreements	5 8%	0 -	0 -	0 -	0 -	5 19%	0 -	0 -
20. Other	7 11%	0 -	1 20%	1 11%	0 -	1 4%	3 33%	1 20%
Number of responses/number of respondents = 5 possible options per person	325/65=5	30/6=5	25/5=5	45/9=5	20/4=5	135/27=5	45/9=5	25/5=5

Figure 18: Organizational Perspective (Problems to Transboundary Water Cooperation)

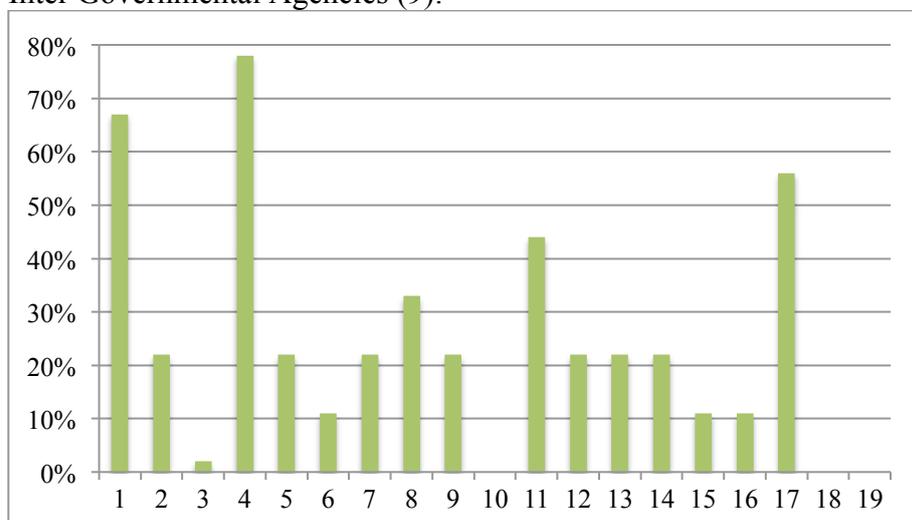
Government (6):



River Basin Organizations (5):

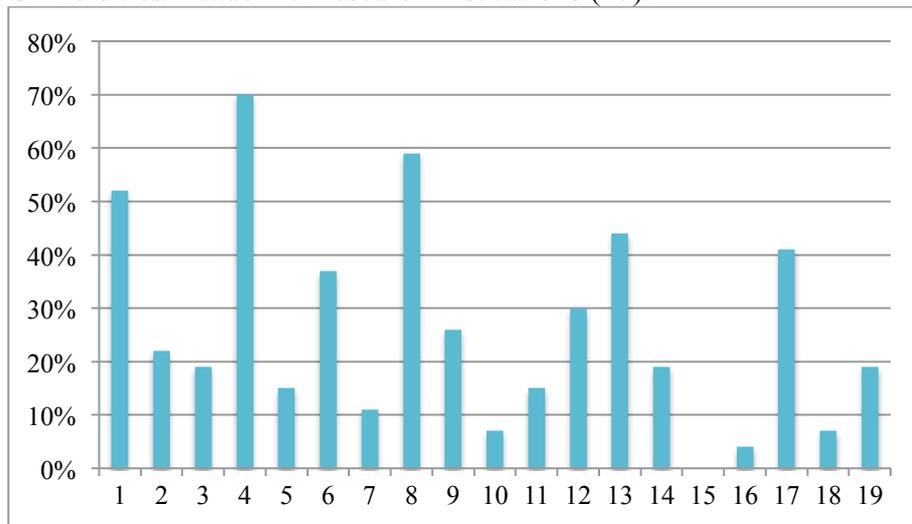


Inter Governmental Agencies (9):

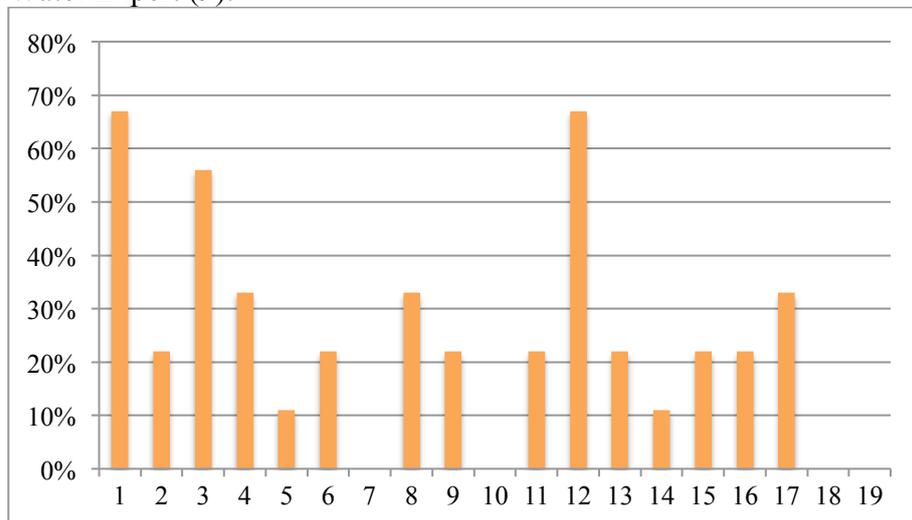


1. Insufficient cross-border exchange of information and data
2. Lack of stakeholder participation across borders
3. Inadequate financing mechanisms
4. Lack of political will
5. Lack of joint development ventures
6. Insufficient capacity building across all Nile Basin states
7. Lack of dispute resolution mechanisms
8. No commonly accepted and agreed legal frameworks
9. Joint planning and management
10. Insufficient education and advanced training
11. Basin-wide monitoring of water quality and quantity
12. Insufficient benefit-sharing arrangements
13. Prior agreements
14. Insufficient common database for accessing basin-wide knowledge and tools
15. Inadequate institutions to devolve decision-making to lower levels
16. Insufficient cost-sharing arrangements
17. Lack of confidence between disputing parties
18. High turnover of key staff
19. Insufficient ability to enforce agreements

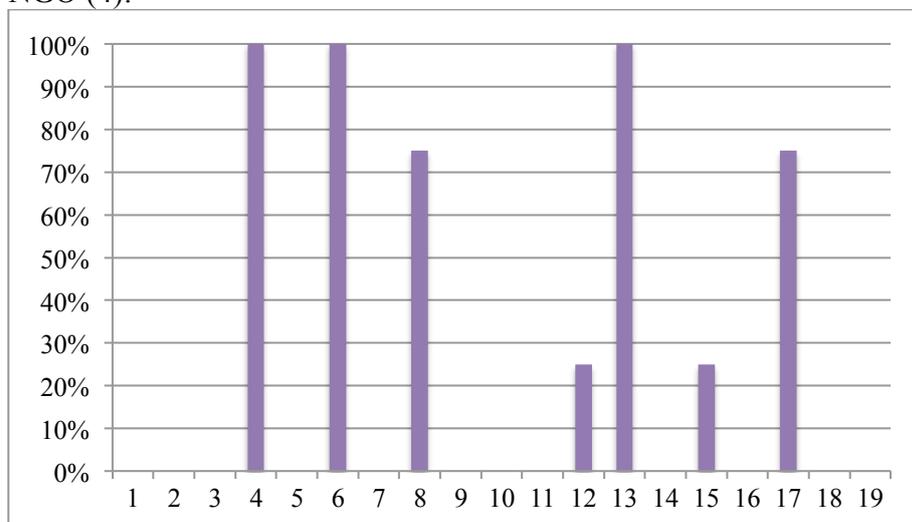
Universities/Academic Research Institutions (27):



Water Expert (9):

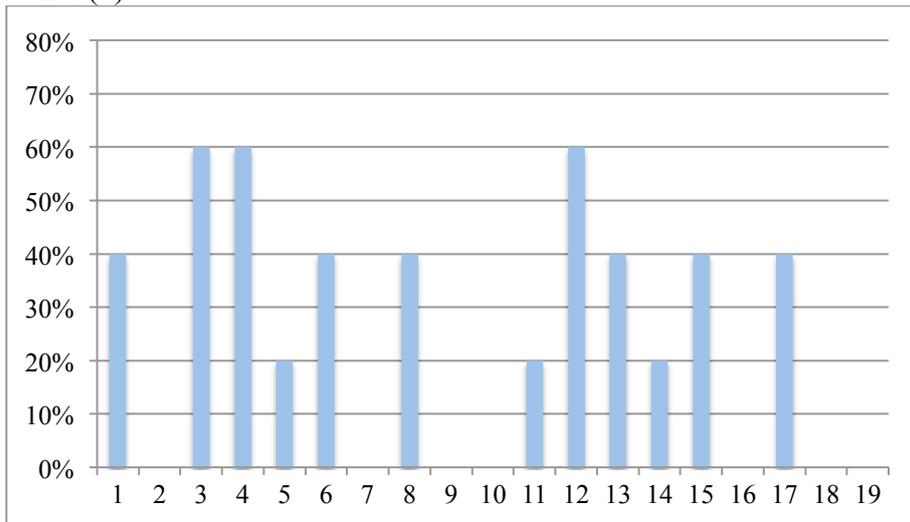


NGO (4):



1. Insufficient cross-border exchange of information and data
2. Lack of stakeholder participation across borders
3. Inadequate financing mechanisms
4. Lack of political will
5. Lack of joint development ventures
6. Insufficient capacity building across all Nile Basin states
7. Lack of dispute resolution mechanisms
8. No commonly accepted and agreed legal frameworks
9. Joint planning and management
10. Insufficient education and advanced training
11. Basin-wide monitoring of water quality and quantity
12. Insufficient benefit-sharing arrangements
13. Prior agreements
14. Insufficient common database for accessing basin-wide knowledge and tools
15. Inadequate institutions to devolve decision-making to lower levels
16. Insufficient cost-sharing arrangements
17. Lack of confidence between disputing parties
18. High turnover of key staff
19. Insufficient ability to enforce agreements

Other (5)



After the most important problems to transboundary water cooperation in the Nile Basin were determined, Question 6 of the survey was questioning if an organization, which is operating within or related to Nile Basin, is currently providing those services that are considered to improve cooperation within this region and thus would have the potential to face this challenging situation in an efficient and effective manner. The aim of this question was to assess the existing regional capacity to take measures against the problems mentioned above and to analyse if an organization already provides the services that a NRBO aimed to offer. Thus, a list of twenty-one services, which were considered to improve transboundary water cooperation in the Nile Basin, was provided to the respondents of the survey. As mentioned earlier, it is important to note that due to the complexity of the subject matter, the list of services was by far not comprehensive, but the reason why the related services were chosen as appropriate measures related to the former and current situation of the Nile Basin (see section 2.1, 2.2 and 2.3) as well as to the associated problems (see section 2.4). In addition, the respondents were requested to choose for each service listed between the following options:

- a) Your organization and/or a regional organization that you know provide the service within the Nile Basin (please mark with a cross at yes).
- b) The service that you know is not performed or is unavailable within the Nile Basin (please mark with a cross at no).
- c) You are unsure or do not know if the service is provided in the Nile Basin.

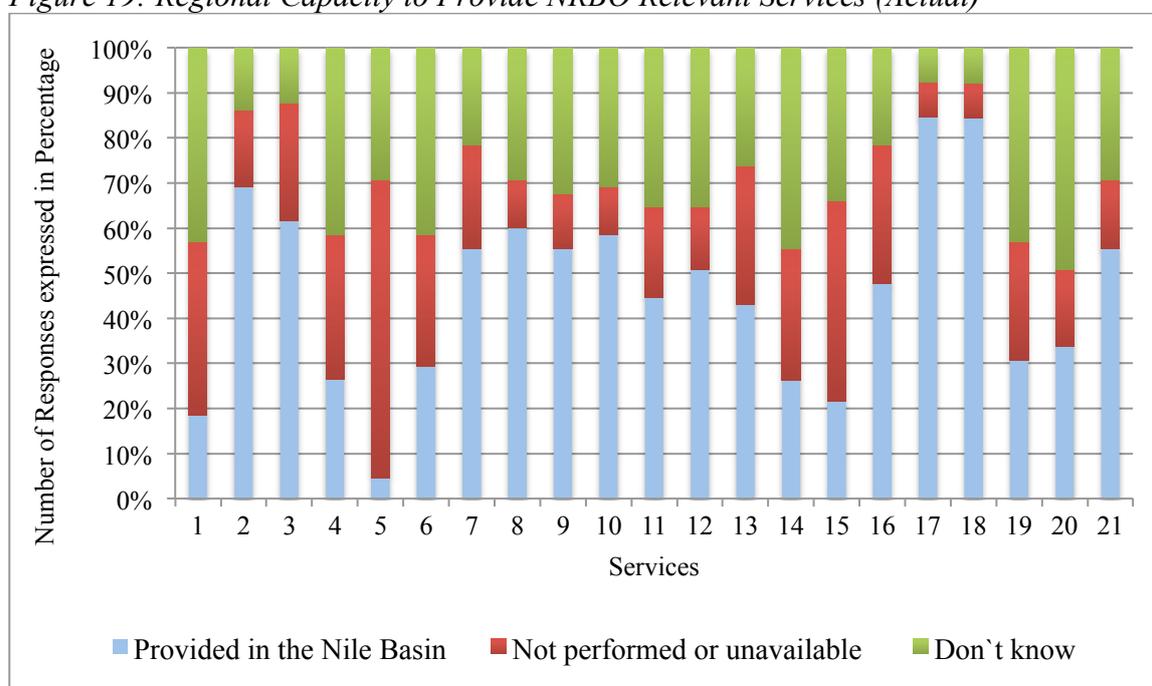
By comparing the number of 'yes' answers with the number of 'no' answers it was possible to evaluate whether or not a service was considered to be accessible within the Nile Basin. This quick and easy method of grouping did not provide detailed results about the amount of capacity needed, nor in which particular part of the basin it would be actually required, because knowing if a service was available is certainly different from whether or not and where it is actually performed. Consequently, the findings of this question were used for the single purpose to determine the frequency if the listed services to improve transboundary water cooperation within the Nile Basin were believed to be available or not. Another challenge emerged from the response behaviour of the persons, who fully replied to the survey. Many respondents (30%) indicated that they are unsure or do not know if the service was provided in the Nile Basin. Thus, it could be assumed that this question was either formulated too broad, general or difficult because some of the respondents commented that they feel unfamiliar or not competent enough to adequately and satisfactorily give their opinion about each option listed. Together with the already mentioned relative low response rate, it was therefore decided to solely concentrate on a presentation of the summarized survey results. In addition, a presentation of results per organizational sub-category has been consequently neglected, as the number of responses were too low for a meaningful comparison. Anyhow, this uncertain response behaviour also could be used as an indication, that mechanisms for improved coordination (e.g. information and data sharing, common databases etc.) are required in order to increase the understanding about what the different organizations actually do and which working areas they cover.

Besides the difficulties that emerged as a consequence of the aspects mentioned above, this question offered relevant and interesting insights into the respondent's general perception about whether or not a service, was considered to be available within the Nile Basin. In this connection, Table 22 and Figure 19 present the actual results of the regional capacity to provide NRBO relevant services. Furthermore, Table 23 and Figure 20 show the modified results of the regional capacity in order to better illustrate which services were considered to be unavailable or not performed in the Nile Basin. Here, the different relative frequency of responses for each service listed was presented without the category 'don't know'.

During the analysis of the results it became apparent that for each service to improve transboundary water cooperation in the Nile Basin at least three respondents believed that the related service was available in this region. In respect to the actual regional capacity, 46% of the respondents generally indicated that most of the services listed were available, whereas 24% suggested that they weren't (30% selected 'don't know'). A slightly different picture emerged by the use of the modified regional capacity. 65% of the respondents

outlined that they believed that the services were available. For this reason, it could be assumed that for both cases the majority of respondents indicated that most of the services to improve water-related cooperation between the riparian states of the Nile were available. Nevertheless, this should not hide the fact that especially one option ('enforcing agreements') was considered to be unavailable in this region (see Table 22). When the results of the survey were modified, other services, like 'design of dispute settlement procedures', 'identifying and implementing cost-sharing arrangements' or 'impartial third party advice and mediation', 'assess dispute situation and needs' and 'implementation of agreements', further could be identified to be insufficiently available in the Nile Basin because they also had a potential respondent uncertainty which was higher than 50% (see Table 22).

Figure 19: Regional Capacity to Provide NRBO Relevant Services (Actual)



- | | |
|---|---|
| 1. Design of dispute settlement procedures | 12. Best practice analysis and cooperation identification |
| 2. Performing joint research, planning and management | 13. Designing, implementing and adapting legal frameworks |
| 3. Basin-wide access to knowledge and tools | 14. Assess dispute situations and needs |
| 4. Identifying and implementing cost-sharing arrangements | 15. Implementing agreements |
| 5. Enforcing agreements | 16. Identifying benefit-sharing schemes |
| 6. Impartial third party advice and mediation | 17. Capacity building |
| 7. Sharing and exchange of information and data | 18. Education and advanced training |
| 8. Assistance in accessing financial resources | 19. Community advisory committees |
| 9. Convening parties | 20. Stakeholder advisory committees |
| 10. Participation and stakeholder identification | 21. Political engagement |
| 11. Creating joint development ventures | |

Table 22: Regional Capacity to Provide NRBO Relevant Services (Actual)

(N=65; n=65)		Yes	No	Don't Know
1.	Design of dispute settlement procedures	18,46% (12)	38,46% (25)	43,08% (28)
2.	Performing joint research, planning and management	69,23% (45)	16,92% (11)	13,85% (9)
3.	Basin-wide access to knowledge and tools	61,54% (40)	26,15% (17)	12,31% (8)
4.	Identifying and implementing cost-sharing arrangements	26,51% (17)	32,31% (21)	41,54% (27)
5.	Enforcing agreements	4,62% (3)	66,15% (43)	29,23% (19)
6.	Impartial third party advice and mediation	29,23% (19)	29,23% (19)	41,54% (27)
7.	Sharing and exchange of information and data	55,38% (36)	23,08% (15)	21,54% (14)
8.	Assistance in accessing financial resources	60,00% (39)	10,77% (7)	29,23% (19)
9.	Convening parties	55,38% (36)	12,31% (8)	32,31% (21)
10.	Participation and stakeholder identification	58,46% (38)	10,77% (7)	30,77% (20)
11.	Creating joint development ventures	44,62% (29)	20,00% (13)	35,38% (23)
12.	Best practice analysis and cooperation identification	50,77% (33)	13,85% (9)	35,38% (23)
13.	Designing, implementing and adapting legal frameworks	43,08% (28)	30,77% (20)	26,15% (17)
14.	Assess dispute situations and needs	26,15% (17)	29,23% (19)	44,62% (29)
15.	Implementing agreements	21,54% (14)	44,62% (29)	33,85% (22)
16.	Identifying benefit-sharing schemes	47,69% (31)	30,77% (20)	21,54% (14)
17.	Capacity building	84,62% (55)	7,69% (5)	7,69% (5)
18.	Education and advanced training	83,62% (54)	9,23% (6)	7,69% (5)
19.	Community advisory committees	30,77% (20)	26,15% (17)	43,08% (28)
20.	Stakeholder advisory committees	33,85% (22)	16,92% (11)	49,23% (32)
21.	Political engagement	55,38% (36)	15,38% (10)	29,23% (19)

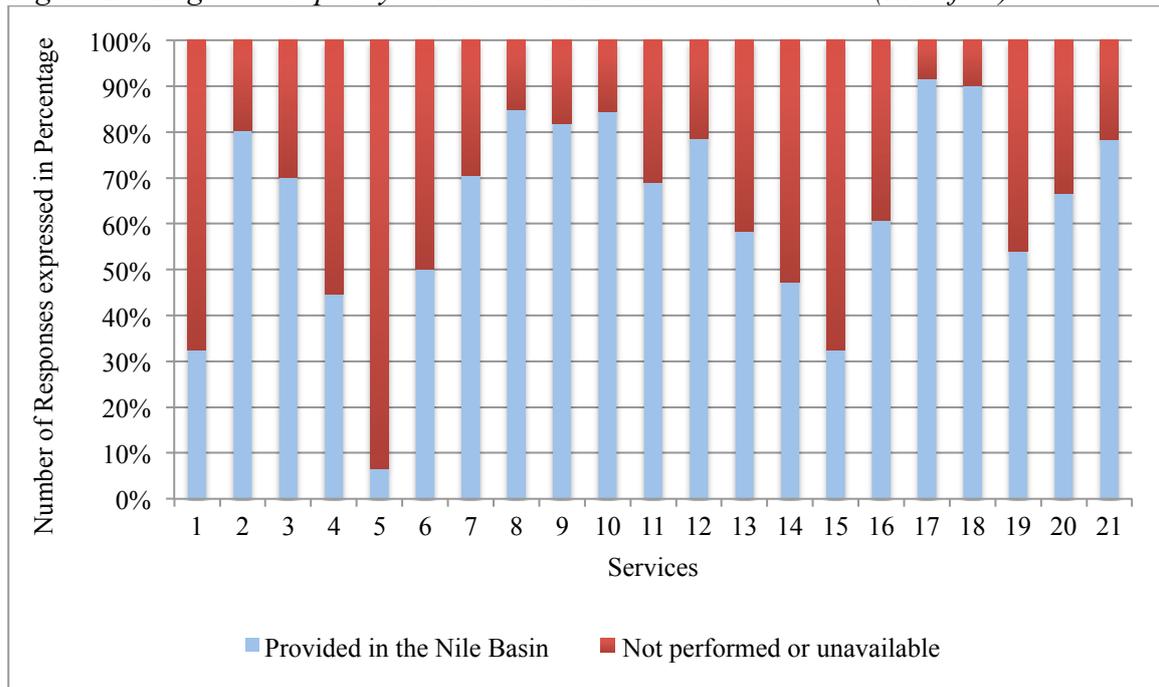
Note: The services, which have a response rate of 50% or higher and were considered to be not performed or unavailable in the Nile Basin are highlighted.

Table 23: Regional Capacity to Provide NRBO Relevant Services (Modified)

(N=65; n=65)		Yes	No	Number of Responses per service (n)
1.	Design of dispute settlement procedures	32,43% (12)	67,57% (25)	100% (37)
2.	Performing joint research, planning and management	80,36% (45)	19,64% (11)	100% (56)
3.	Basin-wide access to knowledge and tools	70,18% (40)	29,82% (17)	100% (57)
4.	Identifying and implementing cost-sharing arrangements	44,74% (17)	55,26% (21)	100% (38)
5.	Enforcing agreements	6,52% (3)	93,48% (43)	100% (46)
6.	Impartial third party advice and mediation	50,00% (19)	50,00% (19)	100% (38)
7.	Sharing and exchange of information and data	70,59% (36)	29,41% (15)	100% (51)
8.	Assistance in accessing financial resources	84,78% (39)	15,22% (7)	100% (46)
9.	Convening parties	81,82% (36)	18,18% (8)	100% (44)
10.	Participation and stakeholder identification	84,44% (38)	15,56% (7)	100% (45)
11.	Creating joint development ventures	69,05% (29)	30,95% (13)	100% (42)
12.	Best practice analysis and cooperation identification	78,57% (33)	21,43% (9)	100% (42)
13.	Designing, implementing and adapting legal frameworks	58,33% (28)	41,67% (20)	100% (48)
14.	Assess dispute situations and needs	47,22% (17)	52,78% (19)	100% (36)
15.	Implementing agreements	32,56% (14)	67,44% (29)	100% (43)
16.	Identifying benefit-sharing schemes	60,78% (31)	39,22% (20)	100% (51)
17.	Capacity building	91,67% (55)	8,33% (5)	100% (60)
18.	Education and advanced training	90,00% (54)	10,00% (6)	100% (60)
19.	Community advisory committees	54,05% (20)	45,95% (17)	100% (37)
20.	Stakeholder advisory committees	66,67% (22)	33,33% (11)	100% (33)
21.	Political engagement	78,26% (36)	21,74% (10)	100% (46)

Note: The services, which have a response rate of 50% or higher and were considered to be not performed or unavailable in the Nile Basin are highlighted.

Figure 20: Regional Capacity to Provide NRBO Relevant Services (Modified)



- | | |
|---|---|
| 1. Design of dispute settlement procedures | 12. Best practice analysis and cooperation identification |
| 2. Performing joint research, planning and management | 13. Designing, implementing and adapting legal frameworks |
| 3. Basin-wide access to knowledge and tools | 14. Assess dispute situations and needs |
| 4. Identifying and implementing cost-sharing arrangements | 15. Implementing agreements |
| 5. Enforcing agreements | 16. Identifying benefit-sharing schemes |
| 6. Impartial third party advice and mediation | 17. Capacity building |
| 7. Sharing and exchange of information and data | 18. Education and advanced training |
| 8. Assistance in accessing financial resources | 19. Community advisory committees |
| 9. Convening parties | 20. Stakeholder advisory committees |
| 10. Participation and stakeholder identification | 21. Political engagement |
| 11. Creating joint development ventures | |

5.3 Determination of Desired NRBO Services

The final section of the questionnaire aimed to identify the most desired services that a NRBO could potentially provide. It was further attempted to assess the respondent's interest of having such a NRBO and to evaluate if they share the perception that this institution would be actually demanded by the stakeholders of the Nile Basin. Similar to previous sections, a list of twenty-one services was provided to the respondents of the survey as possible options to identify the most desired services, which, for this reason, should be considered in the design of a NRBO. In addition, the respondents were asked to answer to Question 7:

“According to the assumption that a Nile River Basin Organisation would be created, what do you think would be the most desired services in order to improve transboundary water cooperation in this region”?

The provided services were derived from section 3 (see Concept Review I) of this paper and have been chosen as appropriate measures to face the problems that have been outlined in section 2.4 (Obstacles to Transboundary Water Cooperation). Considering that other services might also be required, an additional space for comments and a textbox for 'Other' services were available. In this context, a total of 325 responses were selected (like Question 5, the respondents had to chose five possible options). Two respondents made use of the option 'Other' and indicated that a joint open database development and the perception of key players to identify risks and benefits should also be considered. The summary of research results of the 65 full-survey respondents and the responses per type of organization, which both are expressed in percentage, are illustrated in Figure 21 and 22 as well as in Table 24. The following five, or in this case six, NRBO services were most desired:

- 1) Sharing and exchange of information and data (55%)
- 2) Performing joint research, planning and management (52 %)
- 3) Basin-wide access to knowledge and tools (51%)
- 4) Ability to enforce agreements (32%) and
Encouraging political engagement (32%)
- 5) Design of dispute settlement procedures (31%)

Figure 21: Desired NRBO Services

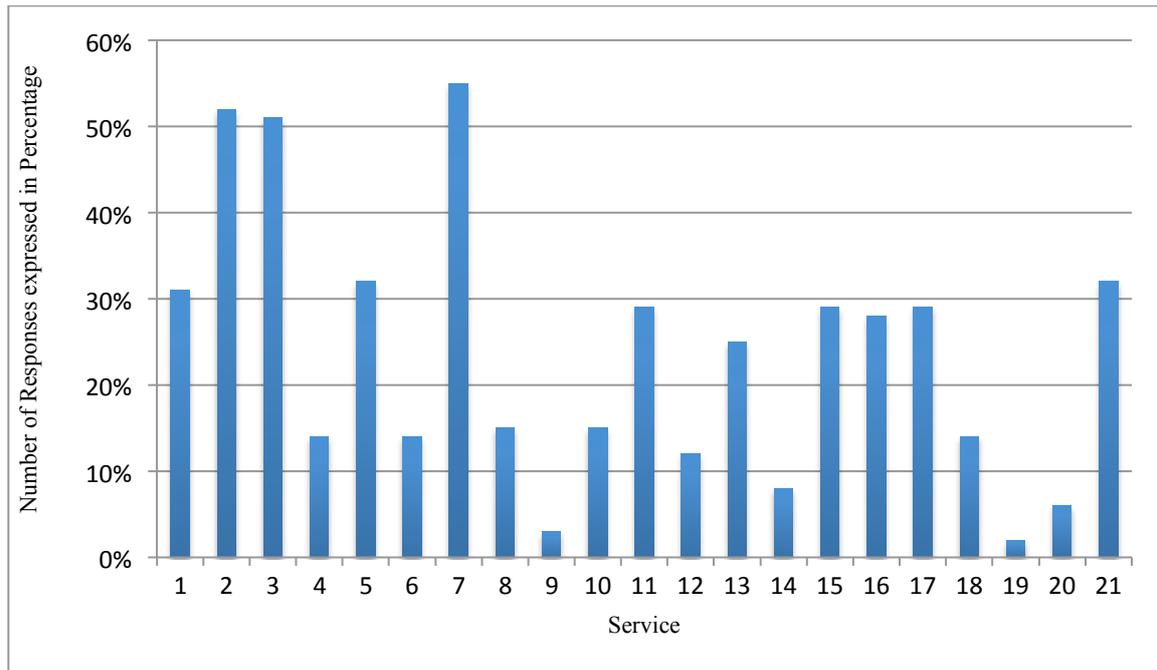
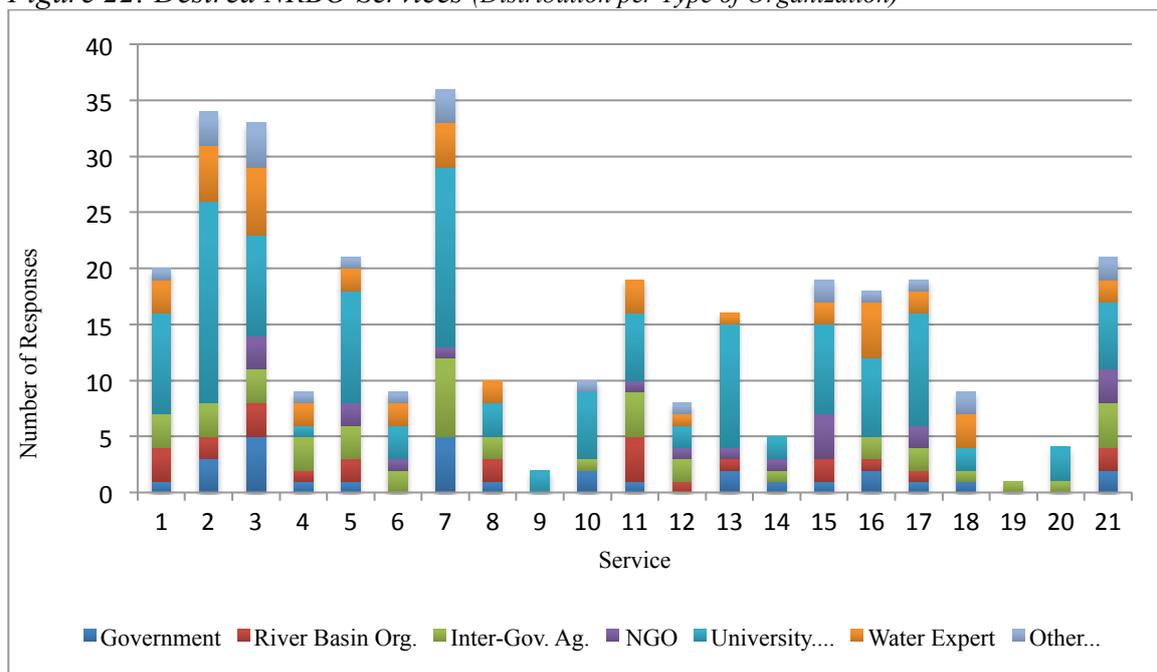


Figure 22: Desired NRBO Services (Distribution per Type of Organization)



1. Design of dispute settlement procedures (fifth ranked)
2. Performing joint research, planning and management (second ranked)
3. Basin-wide access to knowledge and tools (third ranked)
4. Identifying and implementing cost-sharing arrangements
5. Ability to enforce agreements (fourth ranked)
6. Impartial third party advice and mediation
7. Sharing and exchange of information and data (first ranked)
8. Assistance in accessing financial resources
9. Assistance in convening parties
10. Participation and stakeholder identification
11. Creating joint development ventures
12. Best practice analysis and cooperation identification
13. Designing, implementing and adapting legal frameworks
14. Assess dispute situations and needs
15. Implementing agreements
16. Identifying benefit-sharing schemes
17. Capacity building
18. Education and advanced training
19. Organize and assist community advisory committees
20. Organize and assist stakeholder advisory committees
21. Encouraging political engagement (fourth ranked)

If the findings of the most desired services are compared with the previously outlined most important problems of transboundary water cooperation in the Nile Basin, it becomes apparent that the respondents of the questionnaire generally requested those services which would be required to address the identified problems. The options, ‘sharing and exchange of information and data’ (first ranked) and potentially also ‘basin-wide access to knowledge and tools’ (third ranked) might have been requested to face the ‘insufficient cross-border exchange of information and data’ (second ranked). ‘Performing joint research, planning and management’ (second ranked) and also ‘design of dispute settlement procedures’ (fifth ranked) may have been chosen to address the ‘lack of confidence between disputing parties’ (fourth ranked). The selected ‘ability to enforce agreements’ (fourth ranked) probably resulted from the situation that ‘no commonly accepted and agreed legal frameworks’ (third ranked) have been developed yet and the same also applies to ‘prior agreements’ (fifth ranked). The issue of ‘encouraging political engagement’ (fourth ranked) that also received great attention, would likely help to address the most highly rated problem, ‘lack of political will’ (first ranked). In comparison to ‘insufficient benefit-sharing arrangements’ (fourth ranked) it should be considered that ‘identifying benefit-sharing schemes’ (28%) was only moderately requested by the respondents. It was further interesting to notice that those services received the lowest priorities which had been included in the survey as a measure to face the ‘lack of stakeholder participation across borders’ (18%), a problem that has been outlined by other analyses to be a major obstacle in this region (see section 2.4.2: Stakeholder and Public Participation). In this context, ‘organize an assist community advisory committees’ (2%), ‘organize and assist stakeholder advisory committees’ (6%) and ‘assistance in convening parties’ (3%) were rarely requested. The same holds true for financial aspects (see section 2.4.1) because ‘identifying and implementing cost-sharing arrangements’ (14%) as well as ‘assistance in accessing financial resources’ (15%) were rated to be moderately required. Thus it can be assumed that the services, which had a low priority to the other services, were either considered to be less important/desired or to be already available in the Nile Basin. This is also reflected in the aforementioned analysis of the regional capacity to provide NRBO relevant services, because the results show that with the exception of ‘identifying and implement cost-sharing arrangements’ (44,74%), all of these services were regarded to be potentially available in this region. The relative priority of the different services identified was also visible when the responses of the different subgroups were compared with each other (see Figure 23). Nevertheless, due to the limited responses within the determined subgroups, it is advisable to notice that the large representation of universities and academic research institution may have influenced the overall results of the desired NRBO services. In this connection, it can be expected that especially the relatively high requested service ‘performing joint research, planning and management’ probably would have received a different prioritization. A reason for that could be that

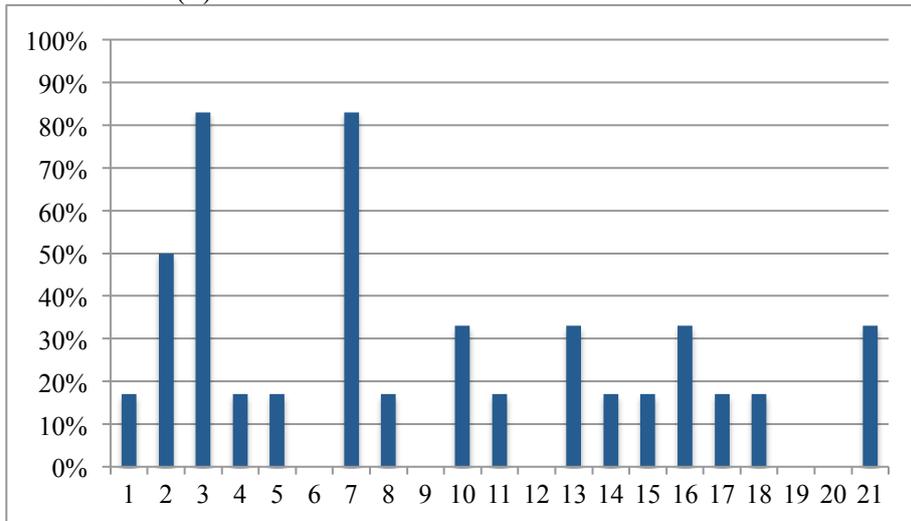
persons, who are working in this respective field, might tend to give high priority to those services they are familiar with (18 out of the 34 respondents (53%) who requested this service came from universities or academic research institutions) (see Figure 23).

Table 24: Most Desired NRBO Services to Improve Transboundary Water Cooperation in the Nile Basin

	Total (65)	Government (6)	River Basin Org. (5)	Inter-Gov. Ag. (9)	NGO (4)	University... (27)	Water Expert (9)	Other...(5)
1. Design of dispute settlement procedures	20	31%	1	17%	3	60%	3	33%
2. Performing joint research, planning and management	34	52%	3	50%	2	40%	3	33%
3. Basin-wide access to knowledge and tools	33	51%	5	83%	3	60%	3	33%
4. Identifying and implementing cost-sharing arrangements	9	14%	1	17%	1	20%	3	33%
5. Ability to enforce agreements	21	32%	1	17%	2	40%	3	33%
6. Impartial third party advice and mediation	9	14%	0	-	2	22%	1	25%
7. Sharing and exchange of information and data	36	55%	5	83%	0	-	7	78%
8. Assistance in accessing financial resources	10	15%	1	17%	2	40%	2	22%
9. Assisting in convening parties	2	3%	0	-	0	-	0	-
10. Participation and stakeholder identification	10	15%	2	33%	0	-	1	11%
11. Creating joint development ventures	19	29%	1	17%	4	80%	2	44%
12. Best practice analysis and cooperation identification	8	12%	0	-	1	20%	2	22%
13. Designing, implementing and adapting Legal frameworks	16	25%	2	33%	1	20%	0	-
14. Assess dispute situations and needs	5	8%	1	17%	0	-	1	11%
15. Implementing agreements	19	29%	1	17%	2	40%	0	-
16. Identifying benefit-sharing schemes	18	28%	2	33%	1	20%	2	22%
17. Capacity building	19	29%	1	17%	1	20%	2	22%
18. Education and advanced training	9	14%	1	17%	0	-	1	11%
19. Organize and assist community advisory committees	1	2%	0	-	0	-	1	11%
20. Organize and assist stakeholder advisory committees	4	6%	0	-	0	-	1	11%
21. Encouraging political engagement	21	32%	2	33%	2	40%	4	44%
22. Other	2	3%	0	-	0	-	0	-
Number of responses/number of respondents = 5 possible options per person	325/65=5	30/6=5	25/5=5	45/9=5	20/4=5	135/27=5	45/9=5	25/5=5

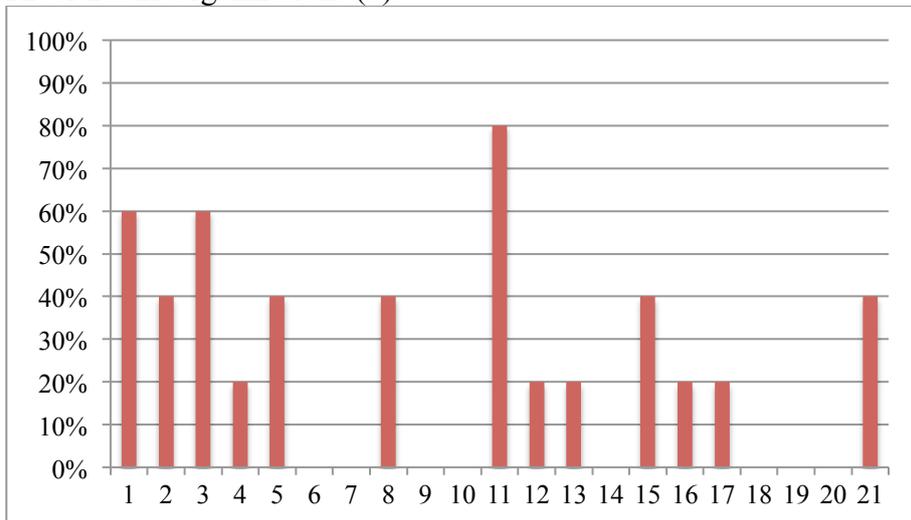
Figure 23: Organizational Perspective (Desired NRBO Services)

Government (6):

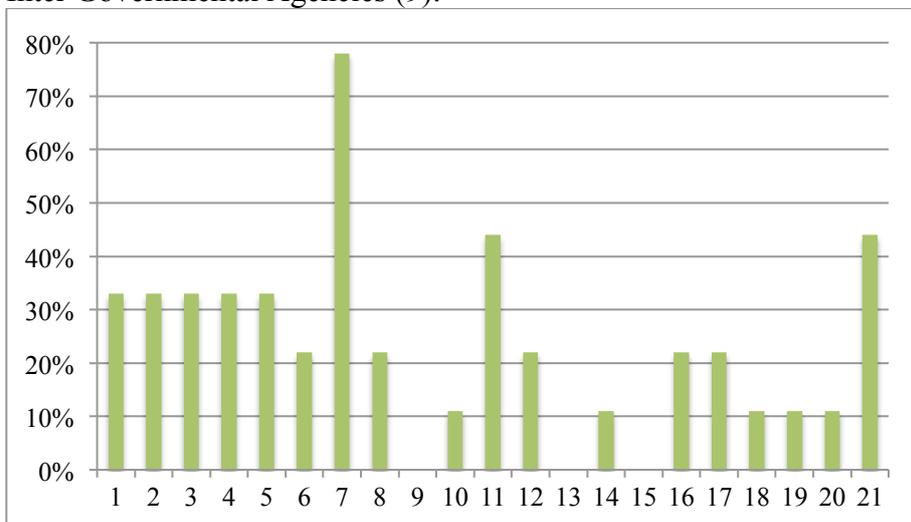


1. Design of dispute settlement procedures
2. Performing joint research, planning and management
3. Basin-wide access to knowledge and tools
4. Identifying and implementing cost-sharing arrangements
5. Ability to enforce agreements
6. Impartial third party advice and mediation
7. Sharing and exchange of information and data
8. Assistance in accessing financial resources
9. Assisting in convening parties
10. Participation and stakeholder identification
11. Creating joint development ventures
12. Best practice analysis and cooperation identification
13. Designing, implementing and adapting legal frameworks
14. Assess dispute situations and needs
15. Implementing agreements
16. Identifying benefit-sharing schemes
17. Capacity building
18. Education and advanced training
19. Organize and assist community advisory committees
20. Organize and assist stakeholder advisory committees
21. Encouraging political engagement

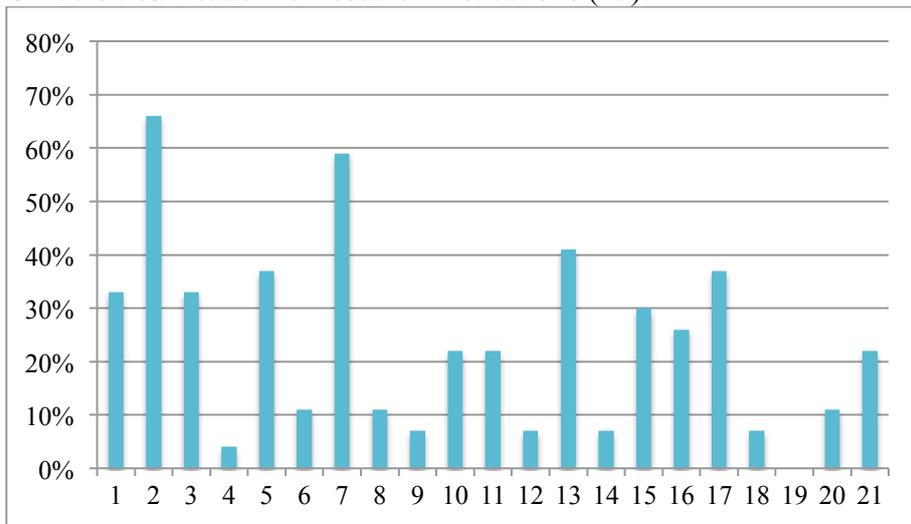
River Basin Organizations (5):



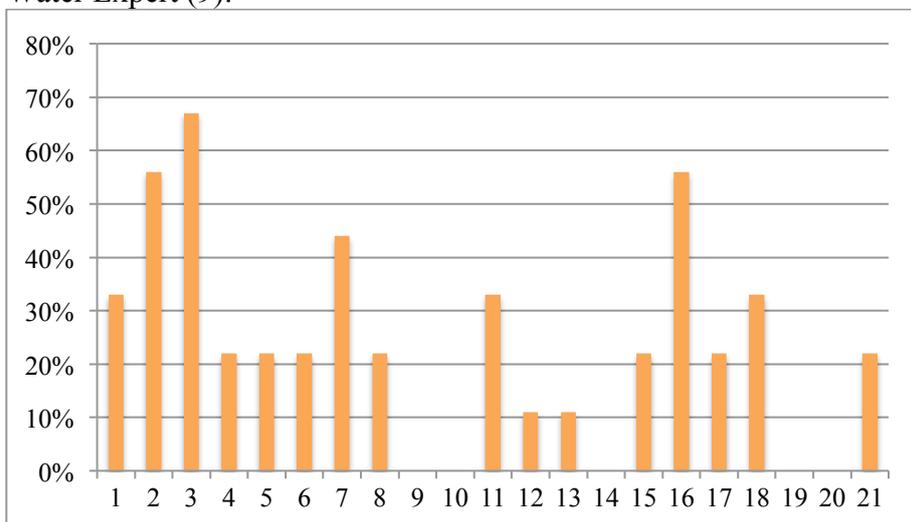
Inter Governmental Agencies (9):



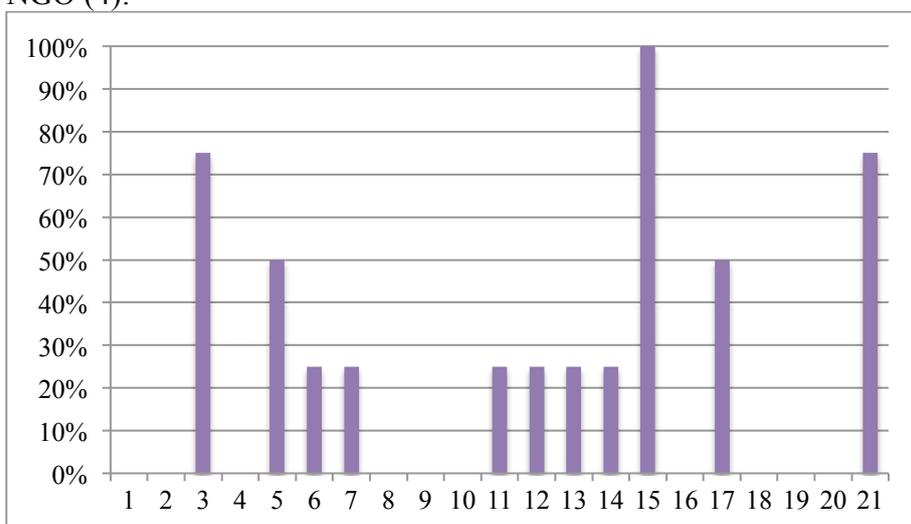
Universities/Academic Research Institutions (27):



Water Expert (9):

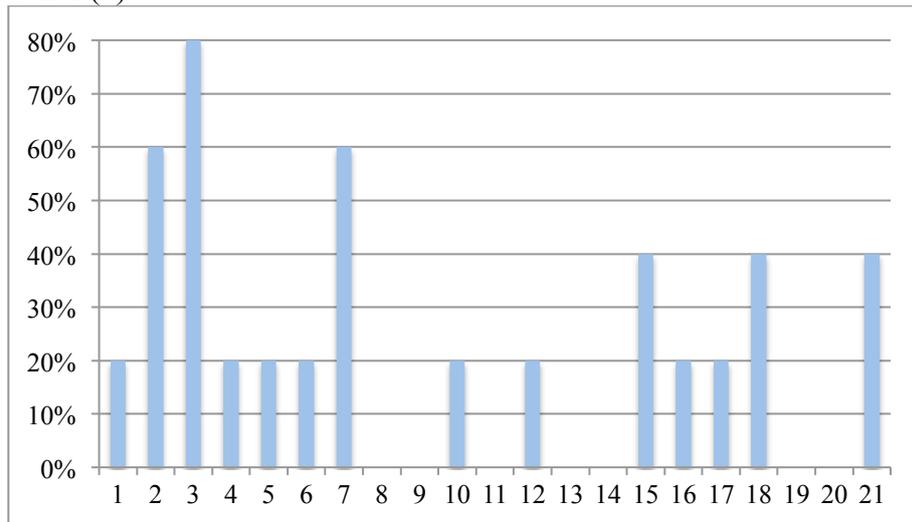


NGO (4):



1. Design of dispute settlement procedures
2. Performing joint research, planning and management
3. Basin-wide access to knowledge and tools
4. Identifying and implementing cost-sharing arrangements
5. Ability to enforce agreements
6. Impartial third party advice and mediation
7. Sharing and exchange of information and data
8. Assistance in accessing financial resources
9. Assisting in convening parties
10. Participation and stakeholder identification
11. Creating joint development ventures
12. Best practice analysis and cooperation identification
13. Designing, implementing and adapting legal frameworks
14. Assess dispute situations and needs
15. Implementing agreements
16. Identifying benefit-sharing schemes
17. Capacity building
18. Education and advanced training
19. Organize and assist community advisory committees
20. Organize and assist stakeholder advisory committees
21. Encouraging political engagement

Other (5):



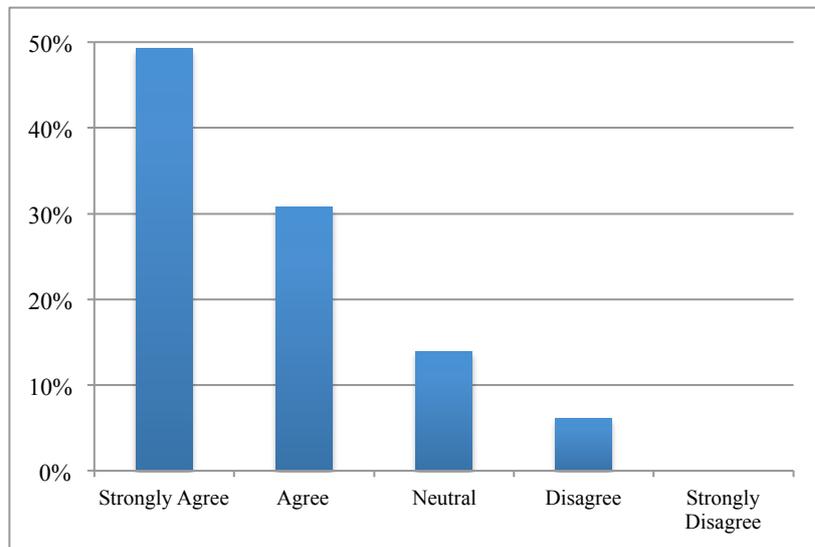
When the desired NRBO services were identified (see question 7), the respondents were asked to give their opinion about the need of creating such a NRBO, as well as if other service providers operating within this region already adequately provide the associated services. Therefore, they were requested to answer to question 8 of the survey: “Please indicate what is your opinion about the following statements that relate to the urgency of creating a Nile River Basin Organization in order to provide those services you indicated in Question 7”. The purpose of this question was to accumulate additional insights into the regional capacity of the Nile Basin. In addition, two Likert-Style questions have been used to address this issue. The related results are presented in Table 25 and in Figure 24. In this relation, a textbox for additional comments was also offered in order to increase the probability to gain a better and more rounded understanding of the respondent’s opinions.

Table 25: Need for a NRBO to be created

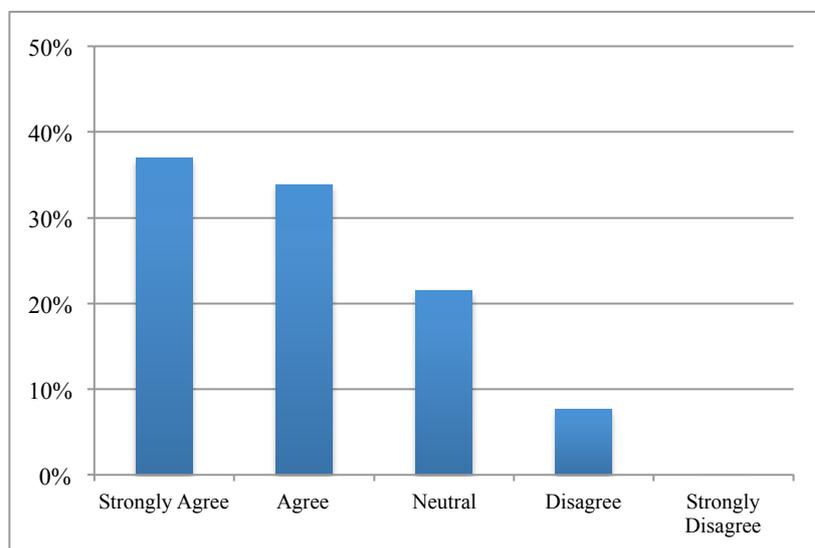
(N=65; n=65)	Strongly Agree					Strongly Disagree	Total
	1	2	3	4	5		
a) There is a need for a Nile River Basin Organization to be created in order to receive those services you indicated in Question 7.	49,23% (32)	30,77% (20)	13,85% (9)	6,15% (4)	0,00% (0)	100% (65)	
b) There is a need for a Nile River Basin Organization to be created due to the fact that other service providers operating in this region cannot adequately provide those services you indicated in Question 7.	36,92% (24)	33,85% (22)	21,54% (14)	7,69% (5)	0,00% (0)	100% (65)	

Figure 24: Need for a NRBO to be created

a) There is a need for a Nile River Basin Organization to be created in order to receive those services you indicated in Question 7.



b) There is a need for a Nile River Basin Organization to be created due to the fact that other service providers operating in this region cannot adequately provide those services you indicated in Question 7.



The findings show that a vast majority of the respondents (80%) agreed that a NRBO would be needed in order to adequately receive the services they selected. It is also obvious that the questioned water professionals (71%) believed that other service providers operating in the Nile Basin currently are not able to sufficiently provide those services they desired. Resulting from the aspects mentioned above, it therefore could be assumed that a

NRBO would be needed in order to improve transboundary water cooperation between the riparian states of the Nile, as it was believed that there was a lack of capacity in the provision of the most desired services.

Besides the assessment of the need to create a NRBO, the respondents of the survey were finally questioned if they share the perception that this institution would be actually demanded by the stakeholders of the Nile Basin. In addition, it was asked if the stakeholders of the Nile Basin would like to consider using such a NRBO immediately, in the near future (5-10 years), unlikely that they would use it or never. The results, which are illustrated in Table 26 and Figure 25, indicate that the great majority of respondents (78%) believed that the stakeholders of the Nile Basin would like to consider using a NRBO either immediately (29%) or even more in the near future (49%). Some of the persons who made use of the category 'Other' further suggested that it largely depends on the political will at all levels as well as on whether or not Egypt and Sudan would join in. Several respondents also made additional comments concerning the need and urgency of establishing a NRBO. Their opinions and suggestions are presented on the following page (see Table 28).

Table 26: Respondents Perception about the Urgency of Establishing a NRBO

(N=65; n=65)	(%)	(n)
Immediately	29,23%	(19)
In the near future (5-10) years	49,23%	(32)
Unlikely that they would use it	7,69%	(5)
Never	1,54%	(1)
Other	12,31%	(8)

Figure 25: Respondents Perception about the Urgency of Establishing a NRBO

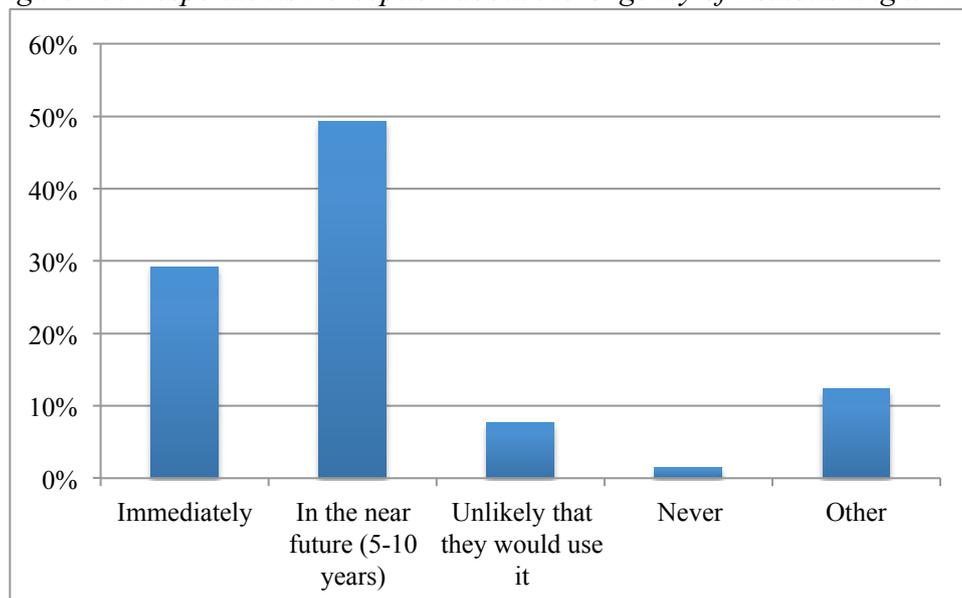


Table 27: Additional Comments:

- “In principle it is not in a name. It’s in the intention and political will to cooperate and to share benefits and risks. A formal RBO could imply the institutional framework (vision & mission, rules, procedures, dispute settlement, etc.) for collaboration (e.g. Mekong River commission) The risk of further institutionalising is the thread of a transnational molog that has no relationship anymore with reality” (University/Academic Research Institution).
- “It would be used if it adds value to the other political and economic processes ongoing and has a clear mandate and skills to support the countries to ensure that benefits would flow quickly to all riparians and citizens” (Water Expert).
- A NRBC would most likely be of little significance unless all the riparian states, especially Egypt and Sudan (as well as South Sudan) accept in deed and not in rhetoric, the equitable re-distribution of the Nile waters which is crucial for a peaceful and cooperative resource utilization in the Basin“ (University/Academic Research Institution).
- “NBI is a transitional organization and is now cannot be in a position to contract loans on its own or on behalf of countries. The investment projects currently being prepared may face challenges of funding if the NBC is not immediately formed” (RBO).
- “The Nile Basin Initiative has been a near complete failure. A new organization might succeed if given the financial and legal tools to draw basin states into its orbit” (University/Academic Research Institution).
- “Collaboration around water issues, where the riparian states have interdependency, could improve regional economic collaboration that will further enhance economic and later political collaboration” (Other).
- A new Nile Basin Organization needs to be framed in the rapidly changing political economy and have, I believe, a rather confined mandate focussing on key aspects of cooperation related to the functional aspects of transboundary water use” (Water Expert).
- “Nile Basin Initiative to be gradually developed into a fully fledged River Basin Organization that is based on an agreed set of agreements and formal procedures on prior consultation, data exchange etc.“ (Water Expert).
- “Eritrea and South Sudan must integrate the NBI for a better organization” (Government).
- “A number of key stakeholders in each country would like to see cooperation take place despite lack of will or insufficient clout in Ministries of water to drive cooperation. Business and NGOs are likely to explore opportunities and get their national institutions follow-up” ((Inter-Gov. Agency).
- “I wish that the NBI were replaced by the Nile Basin Commission” (Government).

6. Design Determinants for a Nile River Basin Organization

The following part of this thesis will propose design determinants for a NRBO by reconsidering the presented design dimensions: legal framework, institutional structure, functions and capacity, exchange of information and joint activities, stakeholder involvement and public participation, and financing, benefit- and cost sharing. Based on the survey results and the literature review (see Water Cooperation in the Nile River Basin and Concept Review I: Theoretical Framework), for each design dimension, it is aimed to describe the criteria and elements which could have the potential to efficiently and effectively improve transboundary water cooperation between the riparian states of the Nile.

6.1 Legal Framework

The second section of this thesis demonstrated why the NBI member states could not reach an agreement on how the waters of the Nile are going to be allocated in a mutually accepted manner. Resulting from their divergent interests, historic agreements, as well as different, but also shared socio-economic, environmental and political problems, they are still not able or unwilling to jointly agree on sound rules and principles to manage and develop the transboundary water resources of the Nile. By holding on to the 1929 and 1959 Nile Water Treaties, especially Egypt and Sudan have so far refused to agree on certain terms of the CFA, as well as to acknowledge the associated redistribution of the Nile waters on an equitable basis. This problematic situation is reflected through the NBI and its transitional character without a legal binding status. As a consequence, it becomes obvious that the NBI currently does not have the sufficient capabilities to perform several of the services, which had been outlined in this survey. Even if the NBI was never meant to be a permanent agreement, because it should, one day, give way to a full-fledged RBO, it was therefore understandable why the respondents of the survey identified 'lack of political will', 'no commonly accepted and agreed legal frameworks' and 'prior agreements', as some of the major problems to improve transboundary water cooperation in this region. The results further suggested that the existing regional capacity was considered to be insufficient to effectively address these issues (see 'enforcing agreements', 'design of dispute settlement procedures' etc.). For this reasons, there are grounds for the assumption that the development of a legal foundation for a NRBO probably also would either come in conflict with the already existing arrangements or would not be easily compatible with them. Anyhow, a permanent legal and institutional framework is of utmost importance for the activities of a RBO because it serves as a basic requirement for effective IWRM and TWG. Thus, it is crucial for the Nile Basin countries to find a consensus on the CFA, as they won't be able to share, manage and develop the water resources of the Nile in an

equitable, sustainable and cooperative way, when they did not mutually agree on some important legal aspects. Without a sufficient ratification of the CFA it rather has to be questioned that a NRBO will be established in the near future, as the following assumption of Mekonnen (2010) underlines:

“In the first place, the establishment of a permanent Nile River Basin Commission is by no means a matter of certainty as the CFA has yet to be finalized, agreed upon fully, and ratified” (Mekonnen 2010: 429).

In addition, it will be essential that Egypt and Sudan will sign CFA. Otherwise, it can be expected that the remaining riparian states will move ahead without them, and this would significantly reduce the relevance of a NRBO. It is also important that South Sudan and Eritrea will join the negotiation process because all riparian states should work together in order to enable the effective implementation of an integrated water management approach. Given the exclusion of South Sudan and Eritrea, the refusing attitude of Egypt, which still can be characterized as the most powerful and influential riparian country and the relative smaller strategic influence of the other members, a NRBO would most likely remain a club of the weak with negligible impact in changing the status quo.

But how to compensate the current situation when no binding basin-wide legal agreement is in place? A possible legal springboard, which could efficiently address the associated problems of the Nile Basin, could be the 1997 UN Water Course Convention because it already has been the basis for the adoption of several watercourse agreements. Even if not yet into force, the Convention therefore could potentially provide the riparian states of the Nile with guiding principles for developing sound rules under which a legal framework might evolve. Nevertheless, as outlined earlier, it needs to be noticed again that most of the Nile Basin countries did not agree upon the Convention because they saw an imbalance between the rights and obligations of upstream and downstream riparian states. The Convention, therefore, should rather be regarded as a very good starting point or an appropriate framework under which they could negotiate in order to reach an agreement. In this relation, it is recommended that at least following general principles of the Convention should be considered by the riparian countries of the Nile in order to efficiently face and, in the best case, harmonize their differing and sometimes antagonistic expectations, interests and claims (see Table 28). In addition, especially the compliance of Article 5, 6, 7, and 10 of the Convention could significantly help to improve transboundary water cooperation in this region, as they would encourage the Nile Basin states to resolve conflicts over the allocation, use and management of the transboundary water resources of the Nile and therefore help them in their effort to attain an agreement.

Table 28: Important Principles of the UN-Watercourse Convention to Improve Transboundary Water Cooperation in the Nile Basin

Article 5: Equitable and reasonable utilization and participation

1. Watercourse States shall in their respective territories utilize an international watercourse in an equitable and reasonable manner. In particular, an international watercourse shall be used and developed by watercourse States with a view to attaining optimal and sustainable utilization thereof and benefits therefrom, taking into account the interests of the watercourse States concerned, consistent with adequate protection of the watercourse.

2. Watercourse States shall participate in the use, development and protection of an international watercourse in an equitable and reasonable manner. Such participation includes both the right to utilize the watercourse and the duty to cooperate in the protection and development thereof, as provided in the present Convention.

Article 6: Factors relevant to equitable and reasonable utilization

1. Utilization of an international watercourse in an equitable and reasonable manner within the meaning of article 5 requires taking into account all relevant factors and circumstances, including:

- (a) Geographic, hydrographic, hydrological, climatic, ecological and other factors of a natural character;
- (b) The social and economic needs of the watercourse States concerned;
- (c) The population dependent on the watercourse in each watercourse State;
- (d) The effects of the use or uses of the watercourses in one watercourse State on other watercourse States;
- (e) Existing and potential uses of the watercourse;
- (f) Conservation, protection, development and economy of use of the water resources of the watercourse and the costs of measures taken to that effect;
- (g) The availability of alternatives, of comparable value, to a particular planned or existing use.

2. In the application of article 5 or paragraph 1 of this article, watercourse States concerned shall, when the need arises, enter into consultations in a spirit of cooperation.

3. The weight to be given to each factor is to be determined by its importance in comparison with that of other relevant factors. In determining what is a reasonable and equitable use, all relevant factors are to be considered together and a conclusion reached on the basis of the whole.

Article 7: Obligation not to cause significant harm

1. Watercourse States shall, in utilizing an international watercourse in their territories, take all appropriate measures to prevent the causing of significant harm to other watercourse States.

2. Where significant harm nevertheless is caused to another watercourse State, the States whose use causes such harm shall, in the absence of agreement to such use, take all appropriate measures, having due regard for the provisions of articles 5 and 6, in consultation with the affected State, to eliminate or mitigate such harm and, where appropriate, to discuss the question of compensation.

Article 10: Relationship between different kind of uses

1. In the absence of agreement or custom to the contrary, no use of an international watercourse enjoys inherent priority over other uses.

2. In the event of a conflict between uses of an international watercourse, it shall be resolved with reference to articles 5 to 7.

If the riparian states of the Nile Basin, however, will use the Convention as a foundation and guideline for their negotiation, it is inevitable that they bring their national agreements and legislation into coherence with the international law. In addition, it is advisable that they will establish (if they are not already available) or strengthen a national water council or coordination committee in order to avoid fragmentation and the overlapping of responsibilities. On the one hand this would help to reduce the lack of understanding regarding international law but also increase the likelihood that on the other hand from the sub-national to the national level, coordination between the different ministries is improved. Besides that, it is also essential to sufficiently inform the stakeholders and the public about the negotiation and on how the resultant outcomes could potentially affect them. In this field, politicians and other decision makers of the Nile Basin are requested to clearly show why decisions are being made and for what purpose. Consequently, better methods for awareness building should be considered in the design of a NRBO in order to support the politicians in their effort to enhance decision-maker understanding. In doing so, divergent attitudes concerning the legal framework might be reconciled or avoided. Besides the necessity to fully implement sound rules and principles for effective transboundary water resources management, another aspect also needs to be taken into account when a legal framework for NRBO would be established: the capability of enforcement. As mentioned earlier, the implementation and enforcement of water laws have remained weak in this region due to the lack of political will and the technical, financial and human resource limitations. It was therefore understandable why the respondents of the questionnaire selected the 'ability to enforce agreements' as one of the most desired services to improve transboundary water cooperation in this region. The responsible national authorities, and in the best case a NRBO, consequently should be equipped with an adequate mix of enforcement mechanisms (e.g. administrative fines, formal notice of non-compliance, financial penalties etc.) in order to assure that national, regional or local actors, which are failing to comply with laws and regulations, are brought back into line. In this connection, national and international partners are called upon to provide adequate assistance (financial, technical assistance etc.) in order to enhance the overall institutional capacity for designing, adopting and implementing enforcement measures and dispute resolution mechanisms (Abdo 2003).

6.2 Institutional Structure, Functions and Capacity

It has previously been outlined that an appropriate institutional structure at the local, regional, national and international level is a necessary precondition to achieve the sustainable management of water resources within a river basin. Due to the prevailing conditions of the Nile Basin, it becomes clear that a Nile River Basin Commissions (NRBC) has to be considered as the appropriate RBO type (see section 3.2). As already described, a river basin commission is adequate,

“when significant development options are still to be considered in the river basin, conflicting uses [are] significant, information and policies still need further development” (Vollmer et al. 2009: 9).

In this context, it can be expected that the institutional set-up of the NBI (see section 2.3) will be taken over if a NRBC would be established. Nevertheless, the lack of capacity and coordination among NBI institutions (e.g. ENTRO and NELSAP-CU) so far caused that some projects have been identified for being inadequate to address integrated water resources management issues efficiently. A NRBO consequently should be equipped with a strong implementation and enforcement capacity to ensure that improved coordination and collaboration between the different ministries and NRBO bodies is possible. Apart from them, other actors, like local stakeholders, community interest groups, donors and NGOs etc., also need to be involved, as cooperation just can be sufficiently achieved when the interaction between all levels and parties is ensured. In this context, section 3.3 of this thesis outlined three major functions that a RBO should incorporate in order to efficiently promote cooperation between states that share a common water resource. These were the coordination and advisory function, the executive function and the control of implementation and dispute settlement function. In addition, it becomes apparent that a NRBO should sufficiently consider these functions in its design in order to improve transboundary water cooperation between the riparian states of the Nile. In this connection, the literature analysis (e.g. UN 2009; Hooper 2006; UN 2008) described several tasks, which a NRBO might use to strengthen these different functions (see section 3). Here it is important to note that the following suggestions which are describe in Table 29, will especially consider the findings of the survey in order to adequately address the identified problems as well as the desired services to transboundary water cooperation in the Nile Basin.

Table 29: Potential NRBO Functions and Tasks

Coordination and advisory function:	<ul style="list-style-type: none"> • Coordinate the development of a unified information system under which cross-boarder information exchange and data sharing would be facilitated. • Serve as an information platform and forum to enhance stakeholder consultation, public participation, issue clarification and enable the basin-wide access to knowledge and tools. • With regard to transboundary water issues, provide assistance and advice, as well as draft proposals to improve the national legislation of the Nile riparian states as well as to bring national legislations into coherence with international law. • Compose, revise and approve training programmes for the personnel of the Nile riparian states. • Coordinate actions to prevent or mitigate floods, water quantity and quality deterioration, water pollution and other issues, which can have a transboundary impact.
Executive function:	<ul style="list-style-type: none"> • Negotiate with donors and other financiers to obtain financial and technical support, which is necessary for project implementation and maintenance. • Identification and implementation of benefit-sharing schemes and programmes to enhance the political will to cooperate and share the associated financial costs. • Setting up regimes for water reservoirs, especially for those that can significantly affect downstream countries. • Developing joint research, planning and management programmes to build trust and confidence between the riparian states of the Nile.
Control of implementation and dispute settlement function	<ul style="list-style-type: none"> • Adopting dispute settlement procedures from international agreements and apply them to the specific conditions of the Nile Basin. • Perform self-assessment, monitoring and reporting on the implementation and settling of differences and disputes. • Setting up of stakeholder and community advisory committees to inform all parties concerned about the state of the watercourse and about activities of the NRBO. • Use of neutral third party assistance (facilitation, mediation etc.) to ensure equity and thus building trust between parties. • Use of regional and joint fact finding mechanisms in order to make adequate recommendation that help to resolve disputes.

(Source: UN 2009; UN Water 2008, Hooper 2006, edited by author)

Particularly the control of implementation and dispute settlement function would require special attention, as the survey results indicated that the ‘design of dispute settlement procedures’ was one of the most desired NRBO services. The assessment of dispute situations and needs, for example, could help to promote mutual understating among the different interest groups and disputing parties concerned and therefore would serve as an instrument to build trust and confidence between them. Associated tools, under which a NRBO also would increase the likelihood that water related controversies are mitigated

and resolved could be additional research, interpersonal or inter-group communication, special meetings of stakeholder and community committees, impartial third party advice and mediation etc. (Hooper 2006). Further, appropriate and flexible rules of procedures, as well as terms of references for a NRBO need to be developed and shaped in a manner that they can be applied to the specific local, regional, national and international levels of this region. Here the riparian states are called upon to grant that a NRBO is given the permission and the right to establish rules of procedures on its own (UN 2009). Anyhow, all these aspects just can be realized if sufficient institutional and human capacities are in place, which is not always the case in the Nile Basin. It has been shown that there is insufficient capacity in terms of facilities, financing and trained manpower (e.g. small number of staff to handle regional database, a different ability to address technical, institutional, and financial aspects etc.). Together with a lack of coordination among water professionals, sub-organizations and other regional institutions, these conditions extremely complicate the way to improve transboundary water cooperation in this region. The riparian countries but also the international community are therefore requested to provide a NRBO with sufficient capacities to guarantee that cross-sectoral and cross-national coordination and cooperation is possible. Consequently, a NRBO should also have sufficient human capacities that are characterized by broad competences and interdisciplinary skills. As this is currently lacking, a NRBO could offer courses, where communications, negotiations, diplomacy and conflict resolution skills of the staff are developed and improved. In this context, it is recommended that the capacities of managers, which are operating at the national and local levels, should be strengthened to raise the awareness of the necessity to share transboundary water resources, but also to show what benefits can be generated through water-related cooperation. At the same time, it is also very important to increase the capacity to establish and implement policies and laws as well as relevant enforcement mechanisms in this region, because they form the base for internal and external funding arrangements (UN Water 2008)

6.3 Exchange of Information and Joint Activities

The third sections of this paper showed that information exchange is a very important precondition to achieve technical cooperation in transboundary water resources management because they form the basis for policy decision that occur on the local, national and international levels. It therefore is alarming that the survey results indicated that the ‘insufficient cross-border exchange of information and data‘ has been identified as one of the most severe problems within the Nile region. Thus it is understandable why the respondents of the questionnaire identified ‘sharing and exchange of information and data‘ as the most desired service. From the beginning, a NRBO therefore should seek to share

and exchange relevant data (e.g. rainfall, hydrology, dam operations, floods, pollution etc.) to avoid conflicts which might emerge through defuse or controversy information. In this connection, following five key elements should be considered by a NRBO when data and information exchange processes are developed and maintained. It needs to be mentioned here that these key elements have been derived from a workshop on building and managing transboundary water institutions in Africa:

1. Nile Basin countries have to agree on data sharing procedures.
2. Joint database need to be accessible to all parties concerned and the NRBO secretariat would be responsible to maintain and update the related information.
3. The technical advisory committees of the NRBO and it's sub-organizations should concentrate on data, that would involve committees of country officials, who are responsible for collecting information.
4. Quality control and quality assurance procedures, which can range from sensitive versus non-sensitive data.
5. Starting with the exchange of “easier” information in order to learn to work and cooperate with ministries and other institutions. Afterwards “tougher” issues like, water use and allocation, can be faced.

(Hearns et al. 2010)

Besides the key elements presented above, the workshop further outlined other important aspects that would support a NRBO in its effort to improve the basin-wide exchange of information and data. These suggestions are summarized and presented in the following table.

Table 30: Consideration to Improve the Exchange of Information and Data

- **Type of data** to be exchanged is important. There must be a clear tangible benefit to sharing data, otherwise it will be counter productive to cooperation. Greater information regarding economic and social benefits allows for a more complete analysis of benefit sharing and trade-offs to be developed, thus more equitable institutional frameworks to be developed.
- **Data and information as a confidence-building tool:** Some data may be sensitive or felt to be of national interest. Often there is sensitive and non-sensitive data, thus confidence can be built with disclosure/collection of the non-sensitive data first.
- **Data and information must focus on needs**, such as bilateral infrastructure agreements on dams will demand different types of information than pollution control or environmental protection agreements etc.

- **All sources of data can be useful:** these include sources such as local municipal, district level, academic, etc. Non-empirical data is important – it may not be published, but it is important to find a way to capture knowledge that people have. Assess current potential data sources and capabilities for data collection and analysis.
- **Financing of collection, analysis and dissemination.** Data must be generated before it can be exchanged – this should be integrated into agreements, as there is an issue of significant costs associated with generation and transfer.
- **Costs associated with data and information exchange** should be based on the needs and capacity of the countries to supply them. For instance, many agreements will suggest that ‘readily available data’ should be free of charge, while data that is requested and not readily available can be charged.
- **Data and information as leveraging tool.** Often richer countries will have greater data and thus have greater bargaining power. So efforts must be made to develop capacity in other countries.
- **Data and information as awareness tool.** The exchange of data and information can help lead to awareness building at the highest level and lead to more substantive agreements
- **Formal vs. informal mechanisms for data and information exchange.** In many cases, data and information that is readily available can be exchanged without a formal protocol, but rather as part of ‘projects’. Furthermore, data and information exchange should be seen as a technical necessity and technical people should be at the core of determining types, method of exchange, frequency, quality control, etc. Legal advice is clearly necessary to ensure consistency with international norms, deal with property rights issues etc.
- **Use existing technology where available?** Satellite imagery and remote sensing can be used to help supply data. Some of it may be in the public domain through third parties such as universities. Upload data to a central database that is accessible in real time by any of the member states. Because it’s so open and visible, member states trust the data more.
- **Exchange data that countries are willing to exchange.** Some countries do not want to do transboundary water analysis, but are willing to do transboundary environment analysis.

(Source: Hearn et al. 2010)

Other important elements that should be increasingly pursued by a NRBO are joint activities (joint research, planning, monitoring etc.) under which the riparian states of the Nile can establish mutual understanding for each other. Joint research across borders, for instance, enables individuals, organizations and institutions of the Nile Basin to enhance their capacities and knowledge, as well as to understand the various problems and needs that can be related to the water resources of the Nile. This would help to balance and strengthen the capacities of each riparian state and therefore could increase the likelihood that conditions for improved cooperation are formed. Joint actions further lead to greater effectiveness than efforts, which have been developed by one country alone. This is also reflected in the survey results of the questionnaire. Even when the capacities to perform

joint research, planning and management were considered to be sufficiently available in this region, the respondents of the survey still rated the related NRBO service ‘performing joint research, planning and management’ as one of the most important.

6.4 Stakeholder Involvement and Public Participation

The results of the survey showed, that stakeholder involvement and public participation received a low priority in comparison to other problems or services selected. It further has been evaluated that the regional capacity to provide public participation and stakeholder identification was considered to be adequately available in the Nile Basin. Anyhow, the obstacles to transboundary water cooperation described that, under the auspices of the NBI-programmes, public participation at the local level has lagged far behind because its structure so far did not sufficiently neither engage local stakeholders nor involve interests groups outside the government departments. Due to the fact that this problematic situation can significantly interfere in the various fields of transboundary water cooperation, a NRBO therefore should seek to strengthen those issues, which so far have been neglected in this region. In order to enhance transparency and decision-making, to reduce conflicts and risks, to create ownership and facilitate the acceptance and enforcement of decisions, agreements and policies a NRBO thus should seek to:

1. Provide information to the public in order to raise awareness about the Nile Basin and the potential goals of a NRBO.
2. Create local forums for educating and involving all parties concerned to understand their interests, worries and needs.
3. Recognizing the role of stakeholders through (transboundary) agreements that explicitly concentrate at stakeholder and local community involvement in order to foster their participation from the highest level.
4. Identification and reinforcing weaknesses that can be associated with stakeholder involvement and public participation (e.g. conducting an analysis for each NRBO project why and where the stakeholders are probably not engaged in order to determine which project parts need to be strengthened).
5. Enhancing awareness raising activities and education of decision makers and government officials to better understand the role of stakeholders at the local level.
6. Increased use of international stakeholder forums that would inform the NRBO secretariat about civil society and local interests.
7. Local stakeholder engagement on regional issues in order to develop local solutions, even across borders.

6.5 Financing, Benefit- and Cost-Sharing

It has been shown that the current and very heterogeneous socio-economic status of the different Nile Basin riparian states have created a number of problems to finance and thus address transboundary water issues. Once again and to mention only a few, some of these problems can be related to the uncertain political climate or to the vulnerability to regional, national or international conflicts, which might end up in the hesitation of donors to undertake long-term investments in this region. Others challenges arise from the inadequate legal framework, which makes it very difficult to form a favourable investment climate for private and public investors. The shortage of long-term commitments that would be strongly needed to develop trust and collaboration between the concerned countries, as well as the funding conditions of international donors (consent based project funding), like the World Bank, can also be listed. Sustainable and adequate financing mechanisms, however, are crucial and the key for managing the shared water resources of the Nile. In order to improve transboundary water cooperation, a NRBO therefore should incorporate a mixture of financing mechanisms, as well as various sources of financial resources. These include national budgets, external bilateral or multilateral donors or private public partnerships etc. Due to fact that the investment requirements will probably exceed the available financial resources of the Nile Basin riparian states, the international community with its implementing agencies thus have to play an important role providing financial assistance and support. This could significantly increase the likelihood that the investment climate within this region will be improved, as the risks taken up by public and private investors, who may otherwise be unwilling to provide financial support, will be reduced. By providing financial support they further have the possibility to determine cooperation as a prerequisite for accessing financial resources, which in turn could serve as an incentive for the riparian states of the Nile to collaborate (UN Water 2008).

Nevertheless, this should not hide the fact that a NRBO and its member states also has to develop and install sustainable and innovative financial mechanisms that will help to reduce the dependence upon donor support. These mechanisms, for instance, could be regional revolving funds, payments for ecosystem services, inter riparian financing and cost recovery of water services or payments of polluters. However, all these financing schemes require political support, good governance and an appropriate institutional structure. In this relation, especially the political will, which so far was considered to be lacking in the Nile Basin, has to be encouraged. A NRBO therefore should clearly identify and demonstrate the benefits of transboundary water resources management in order to create incentives for the riparian states to cooperate. Needless to say, that there is no right path or “one-size-fits-all” approach to achieve long-term, sustainable and reliable cross border cooperation. Nevertheless, riparian states are normally rather interested in the economic opportunities and ecosystem services which are linked to the access to water

than in water itself. Sadoff and Grey's (2002) concept of benefit sharing thus provides a more flexible framework with a wider range of cooperation possibilities as it offers several incentives and non-consumptive benefits, like hydropower generation or agricultural production. Through the identification of alternative development plans and benefit-sharing ideas, the riparian countries of the Nile would consequently have more possibilities to find mutually agreeable solutions concerning the challenging re-distribution of the Nile waters. However, the situation mentioned above can just be achieved if the physical locations of resources are separated from the distribution of benefits. This ideally happens by focusing first on identifying and creating basin-wide benefits, and secondly on distributing them in an equitable and fair way. Thus, mechanisms have to be developed which aim to locate energy, industry and agriculture at places where the level of productivity is highest and the impacts for the society and the environment is least disruptive. This has also been reflected by the results of the survey. Even if selected moderately, the respondents requested to foster the identification of benefit-sharing schemes. Here, it should be considered that related decisions sometimes include very difficult trade-offs and choices, especially when the amount of available water is limited (Sadoff et al. 2008). It therefore would be the role of a NRBO to assist and advice the riparian states of the Nile in identifying the potential benefits and to make adequate decisions on how they can create incentives for cooperation. Downstream states, for instance, could be compensated for the implementation and operation of additional storage facilities made by upstream states. This also might lead to the situation that upstream states are going to share a certain portion of their generated benefits, which in turn could generate possibilities to share the costs of these practices (UN-Water 2008). In this context, it is recommended that the riparian countries of the Nile Basin should concentrate on their comparative advantages in order to develop and enhance political will, economic interdependencies, mutual understanding and confidence building. Due to its hydropower development potential, Ethiopia, for instance, could focus on the generation of hydroelectricity that could also benefit downstream countries. Egypt, in contrast, could provide technical expertise and financial support to upstream countries, as this is significantly lacking in these areas. Sudan and other countries, which have a high potential in agriculture, can focus on the production of agricultural products, which then can be exported regionally. In order to extent the spectrum of benefits, it is also recommended that a NRBO should concentrate on the concept of virtual water as well as on the identification and assessment of groundwater resources, as these could assist the riparian states of the Nile to explore more transboundary water cooperation possibilities than the traditional focus on surface water. This situation, thus, could increase the scope of cooperation as well as the number of alternatives to achieve successful and longstanding cross-border cooperation within the Nile Basin.

Table 31: Design Determinants for a Nile River Basin Organization (NRBO) and Associated Elements to Improve Transboundary Water Cooperation

Dimensions	Determinants for a NRBO and Associated Elements
Legal Framework	<ul style="list-style-type: none"> • Clearly set out institutional arrangements • Clear enforcement and dispute mechanisms • Incorporate both water quality & quantity, climate change and societal values • Identify clear means to share benefits of water, not just water itself • Provisions for joint monitoring, info exchange and public participation • Mechanisms that promote joint economic development
Institutional Structure, Functions and Capacity	<ul style="list-style-type: none"> • Clear mandates for both regional and national bodies • Strong cross-sectoral coordination at national level • Strong political will & financial commitment • Involvement of appropriate range of stakeholders • Appropriate RBO rules of procedures and terms of reference • Staff - broad competencies and multi-disciplinary skills (negotiation, diplomacy, conflict resolution skills) • Provisions: coordination & advisory functions, executive functions, policy development and implementation, dispute settlement, monitoring & reporting
Exchange of Information and Joint Activities	<ul style="list-style-type: none"> • Accurate assessment info essential for informed decision-making & policy formulation • Need for comparable info between countries • Harmonized, compatible assessment methods & data systems, agreed terminologies • Information exchange essential – accidents, infrastructure, extreme events, hydropower & navigation operations, etc.
Stakeholder Involvement and Public Participation	<ul style="list-style-type: none"> • Enhance transparency & decision-making • Facilitate acceptance & enforcement of decisions/policies • Mechanisms for gaining common ground between stakeholders • Requires financial resources to be effective • Organize openly & transparently • Involve all relevant groups (stakeholder analysis)
Financing, Benefit- and Cost-Sharing	<ul style="list-style-type: none"> • Focus on use of water to generate benefits, not on allocation of water • Optimize generation of basin-wide benefits • Work to share the benefits equitably • Even under benefit sharing approaches, will often be difficult trade-offs and choices • Payments for benefits/compensation for costs can be integral element of cooperative arrangements • Payments for ecosystem services • Short and long-term financing essential for legal frameworks, new institutions, capacity building and investments • Innovative financing mechanisms (regional revolving funds, payments of ecosystem services, cost recovery for water services) • Require strong political support, good governance and effective institutions

(Source: UN Water 2009, edited by author)

7. Conclusion

This paper has sought to shed a new light on transboundary water cooperation in the Nile Basin. Based on the assumption that the current status quo has limited the potential for cooperation in this region, this thesis has been developed for the purpose to work out the criteria and elements that should be considered for the design of a Nile River Basin Organization in order to efficiently and effectively improve transboundary water cooperation between the riparian states of the Nile. More specifically, this thesis attempted to identify the major problems that can be associated to transboundary water cooperation in the Nile Basin, to assess the regional capacity to make measures against these problems, as well as to determine the resulting desired NRBO services. Consequently, the overall research objective was to propose design determinants for a NRBO.

The examination concerning water cooperation in the Nile Basin showed that the riparian countries of this region have experienced an evolutionary process of transboundary water cooperation beyond compare, but still have to face a myriad of complex issues. On the one hand it has been demonstrated that with the formation of the NBI, the riparian states have heralded a new era in governing and managing the waters of this region, as they jointly recognized that the best way to protect, manage and develop their water resources is through close cooperation, whereby all interests of upstream and downstream countries try to be considered. Resulting from their divergent interests, historic agreements, as well as different but also shared environmental, political and socio-economic problems, on the other hand it has been shown why the NBI member states so far could not reach an agreement on how the waters of the Nile are going to be allocated in a mutually accepted manner. This problematic situation is reflected through the NBI and its transitional character without legal binding status. In addition, it was found that this interim institution could not have the full potential to sufficiently promote transboundary water cooperation between the riparian states of the Nile.

Through the web-based survey targeted at transboundary water professionals, but also by means of a review of the existing literature it could be revealed that there was a need and desire for a NRBO to be created in the near future to adequately address the major problems identified, as well as to receive the most desired services for promoting transboundary water cooperation in this region. In this context, the insights, which have been acquired by the results of the survey, showed that ‘lack of political will’, ‘insufficient cross-border exchange of information and data’, ‘no commonly accepted and agreed legal frameworks’, ‘insufficient benefit-sharing arrangements’, ‘lack of confidence between disputing parties’ and ‘prior agreements’ were considered as the most severe problems hindering cooperation. It was interesting to realize through the findings of this thesis that

most of these transboundary water cooperation problems did not emerged recently, but have been persistent for a longer period of time. It was also interesting to see that the questioned transboundary water professionals generally requested those NRBO services which would be required to address the identified problems. In this relation, ‘sharing and exchange of information and data’, ‘performing joint research planning and management’, ‘basin-wide access to knowledge and tools’, ‘ability to enforce agreements’, ‘encouraging political engagement’ and ‘design of dispute settlement procedures’ were determined by the respondents to be the most desired NRBO services. The aspects mentioned above can therefore be used as an indication that the assessment of transboundary water cooperation in the Nile Basin and the consequent determination of the desired NRBO services thus enabled to address the study objective of this thesis to propose design determinants for a NRBO.

In relation to the assessment of the regional capacity, which sought to analyse if an organization within the Nile Basin already provides the services that a NRBO aimed to offer, it has to be admitted, however, that additional research on this matter would be inevitably necessary to receive detailed results about the amount of capacity needed, as well as to know in which particular part of the basin the identified services would be actually required. During the treatment of this subject matter, it also became apparent that due to the complex nature of RBOs and the consequent extensive scope of this thesis, a complete analysis could not be conducted. It is therefore recommended to elaborate this topic in further studies.

Following the words of Kofi Annan (2002): “(...) *the water problem facing our world need not to be only a cause of tension; they can also be a catalyst for cooperation. (...) If we work together, a secure and sustainable water future can be ours*”, this paper finally provides a number of major conclusions that are related to transboundary water cooperation within the Nile Basin and can be associated with the five design dimensions presented in this paper - legal framework, institutional structure, functions and capacity, exchange of information and joint activities, stakeholder involvement and public participation, financing, benefit- and cost sharing.

- The international community with its implementing agencies should encourage Egypt, but also Sudan to open talks again on the CFA. The equitable re-distribution of the Nile waters is crucial to enable the peaceful, cooperative and sustainable management of transboundary water resources in this region. In this context, the governments of the Nile Basin are requested to bring their national agreements and legislations into coherence with international law to facilitate the development of an effective transboundary water agreement for joint cooperation that is applicable to all levels and

would allow the equitable utilization of the Nile Waters. However, this rearrangement has to enable downstream countries to influence decision made by upstream countries in order to minimize the risk to be negatively impacted.

- When it is applied to the specific conditions of the Nile Basin, the 1997 UN Water Course Convention has the potential to provide the riparian states of the Nile with guiding principles (e.g. no harm rule, equitable and reasonable utilization), which can serve as a guideline for their negotiations in order to reach an agreement that sufficiently considers the upcoming water demands of all Nile Basin riparian states. It thereby could resolve conflicts over the use, allocation and management of the Nile waters and would help the riparian states of the Nile in the effort to find legal framework that is accepted and obeyed by all parties concerned.
- The presence of a strong NRBO that is resilient overtime should be seen as one of the most important factors for transboundary water cooperation in this region. A crucial element is that this institution has adequate decision-making and enforcement powers to sufficiently perform the tasks which can be related to the coordination and advisory function, the executive function and the control of implementation and dispute settlement function of RBOs. In this relation, a NRBO should engage in defining its roles and responsibilities. It should also incorporate those functions which the riparian states of the Nile expect to be provided by such an institution.
- Even though no trust among the Nile Basin riparian states exists, cooperation may flourish with the exchange of information and data across borders or with joint activities. This would help to balance and strengthen the capacities of each riparian state and therefore could increase the likelihood that conditions for improved cooperation are formed.
- Conduct stakeholder analysis and develop joint activities for participation, especially at the local levels of the Nile Basin to sufficiently engage local stakeholders and interest groups outside the government departments. Their needs and worries further have to be adequately reflected on the international level and in the implementation of actions. In doing so, a NRBO could enhance transparency, avoid conflicts and risks, create ownership and facilitate the acceptance and enforcement of decisions, agreements and policies.
- In order to enhance political will, mutual understanding, economic interdependencies and confidence building, a NRBO should assist and advice the riparian states of the Nile in identifying and assessing the potential benefits of cooperation. The effective

implementation of the concept of benefit sharing, however, makes it necessary that the riparian states of the Nile will concentrate on their comparative advantages (e.g. technical expertise vs. hydropower generation or agricultural production etc.). Here, the concept of virtual water and the identification and assessment of ground water resources should also be taken into account because they could increase the scope of cooperation.

- To reduce the dependence on donor support and ensure the financial sustainability of a NRBO, adequate financing mechanisms (e.g. regional revolving funds, payments for ecosystem services, cost recovery for water services etc.) and financial commitments of the Nile Basin riparian states are strongly required (e.g. financial support through a separate line in the national budget etc.).
- Various international organizations and development partners are involved in the International Consortium for Cooperation on the Nile (ICCON) and/or finance various development projects within the Nile region. They have consequently the possibility to determine cooperation as a prerequisite for accessing international financial resources, which in turn could serve as an incentive for the riparian states of the Nile to collaborate.

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Attachment 1: Questionnaire (WEB-Version)

Mail preview

Sender: Matthias Morbach <matthias.morbach@small.fn-koeln.de>

Subject: Design Determinants for a Nile River Basin Organization (NRBO)

{if #u_gender# = "2"}Dear Ms.{else}Dear Mr.{/if} #u_firstname# #u_name#,

This questionnaire is part of a Master Thesis at the Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne, Germany (ITT) and has been developed for the purpose to identify through expert experiences design determinants for a Nile River Basin Organization (NRBO), which are considered to improve transboundary water cooperation in this region. Your knowledge, experiences and recommendations herein could make a substantial contribution to:

1. Identify those issues, which are considered to be the major problems for improving transboundary water cooperation in this region.
2. Assess the existing regional capacity to take measures against these problems.
3. Determine the desired NRBO services, which are considered to enhance transboundary water cooperation in this region.
4. Assess the demand and desire for creating such a NRBO.

To begin the survey, which has 9 questions, click the web site link below:

Content: #code_complete#

Notice:

- a) If you are interested in receiving the results of this questionnaire, please mark with a cross at the end of this survey.
- b) Your provided specific information herein will be kept in confidentiality and will not be accessible to unauthorized third parties nor be used towards any other purposes than towards the original purpose.

Thank you in advance and if you have any questions, or wish to provide additional insights on this matter, please do not hesitate to contact:

Matthias, Johannes Morbach
 Masters Student in Technology and Resources Management in the Tropics and Subtropics
 University of Applied Sciences, Cologne, Germany
 Telephone: 0049-175-6030500 Fax: 0049-8336-533
 Email: matthias.morbach@small.fn-koeln.de alternatively: matthias-morbach@web.de


 Fachhochschule Köln
 Cologne University of Applied Sciences


 Institute for Technology and Resources Management
 in the Tropics and Subtropics

10%

Welcome to the survey: *Design Determinants for a Nile River Basin Organization (NRBO)*.

Please take a few minutes to participate in this online survey.

Thank you very much!

CONTINUE


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 in the Tropics and Subtropics

20%

1. Please mark with a cross, which classification best represents your organization:

Federal Government

National (State/Province) Government

Non-Governmental Organization

University (Academic Research Institution)

Water Expert

River Basin Organization

Sub-Basin Organization

National Water Authority

Inter-Governmental Agency

Community Interest Group

Private Sector Business

Other (please include here) →

CONTINUE

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ITT

30%

2. Please indicate what is your opinion about the following statements:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) Improving cooperation between the Nile Basin's riparian states is one of the most important transboundary water resources management challenges in this region:	<input type="radio"/>				
b) In relation to managing transboundary water resources, your work is very much involved in improving cooperation between the riparian states of the Nile:	<input type="radio"/>				
c) Your organization's ability to make/influence decisions, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources is high:	<input type="radio"/>				
d) Your personal ability to make/influence decisions within your organization is high:	<input type="radio"/>				

CONTINUE

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ITT

40%

3. How long have you been working in the water-related field?

Please type in the number of years:

CONTINUE

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50%

4. How long have you been working in promoting cooperation between the riparian states of the Nile in order to anticipate, prevent or resolve water-related disputes through direct assistance/training and/or academic research?

Please type in the number of years:

CONTINUE

5. In your experience, what are the most important problems associated with improving transboundary water cooperation in the Nile Basin?

Please rate the five most important problems and place a "x" in the appropriate boxes (only select five boxes).

- Insufficient cross-border exchange of information and data
- Lack of stakeholder participation across borders
- Inadequate financing mechanisms
- Lack of political will
- Lack of joint development ventures
- Insufficient capacity building across all Nile Basin states
- Lack of dispute resolution mechanisms
- No commonly accepted and agreed legal frameworks
- Joint planning and management
- Insufficient education and advanced training
- Basin-wide monitoring of water quality and quantity
- Insufficient benefit-sharing arrangements
- Prior agreements
- Insufficient common data-base for accessing basin-wide knowledge and tools
- Inadequate institutions to devolve decision-making to lower levels
- Insufficient cost-sharing arrangements
- Lack of confidence between disputing parties
- High turnover of key staff
- Insufficient ability to enforce agreements
- Other (please include here) →

 Fachhochschule Köln College University of Applied Sciences				 Institute for Technology and Resources Management in the Tropics and Subtropics		 ITT	
 70%							
<p>6. For each method to improve transboundary water cooperation listed below, please indicate if an organization within the Nile basin is sufficiently providing the related services (or is assisting the stakeholders).</p> <p>a) Your Organization and/or a Regional Organization that you know provides the services within the Nile Basin (please mark with a cross at YES). b) The service that you know is not performed or is unavailable within the Nile Basin (please mark with a cross at NO). c) You are unsure or Do Not Know, if the service is provided in the Nile Basin.</p>							
	YES	NO	Do NOT KNOW				
Direct Assistance							
Design of dispute settlement procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Performing joint research, planning and management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Basin-wide access to knowledge and tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Identifying and implementing cost-sharing arrangements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Enforcing agreements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Impartial third party advice and mediation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Sharing and exchange of information and data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Assistance in accessing financial resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Convening parties	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Participation and stakeholder identification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Creating joint development ventures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Best practice analysis and cooperation identification	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Designing, implementing and adapting legal frameworks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Assess dispute situations and needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Implementing agreements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Identifying benefit-sharing schemes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Training and Public Outreach/Awareness Building							
Capacity building	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Education and advanced training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Community advisory committees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Stakeholder advisory committees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
Political engagement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>				
<div style="border: 1px solid black; padding: 5px; display: inline-block;">CONTINUE</div>							

80%

7. According to the assumption that a Nile River Basin Organization would be created, what do you think would be the most desired services in order to improve transboundary water cooperation in this region?

Please rate the five most important services and place a "x" in the appropriate boxes (only select five boxes). Note: The list below is not comprehensive. If you feel that other services/assistance is required to improve transboundary water cooperation in the Nile Basin, please indicate in the "Other" box below and add comments if necessary.

Direct Assistance

Design of dispute settlement procedures

Performing joint research, planning and management

Basin-wide access to knowledge and tools

Identifying and implementing cost-sharing arrangements

Ability to enforce agreements

Impartial third party advice and mediation

Sharing and exchange of information and data

Assistance in accessing financial resources

Assisting in convening parties

Participation and stakeholder identification

Creating joint development ventures

Best practice analysis and cooperation identification

Designing, implementing and adapting legal frameworks

Assess dispute situations and needs

Implementing agreements

Identifying benefit-sharing schemes

Training and Public Outreach/Awareness Building

Capacity building

Education and advanced training

Organize and assist community advisory committees

Organize and assist stakeholder advisory committees

Encouraging political engagement

Other

Other (please include here) →

8. Please indicate what is your opinion about the following statements that relate to the urgency of creating a Nile River Basin Organization in order to provide those services you indicated in Question 7.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a) There is a need for a Nile River Basin Organization to be created in order to receive those services you indicated in Question 7.	<input type="radio"/>				
b) There is a need for a Nile River Basin Organization to be created due to the fact that other service providers operating in this region cannot adequately provide those services you indicated in Question 7.	<input type="radio"/>				

Additional Comments:


 Fachhochschule Köln
 Cologne University of Applied Sciences


 Institute for Technology and Resources Management
 in the Tropics and Subtropics


 ITT

90%

9. In your opinion, the stakeholders of the Nile Basin would likely consider using the Nile River Basin Organization:

Immediately

In the near future (5-10 years)

Unlikely that they would use it

Never

Other (please include here) →

Additional Comments:

If you are interested in receiving the results of this questionnaire, please mark with a cross at YES.

YES NO

CONTINUE


 Fachhochschule Köln
 Cologne University of Applied Sciences


 Institute for Technology and Resources Management
 in the Tropics and Subtropics


 ITT

100%

Thank you for your help!

If you have any questions, comments or concerns, please do not hesitate to contact:

Matthias, Johannes Morbach

Masters Student in Technology and Resources Management in the Tropics and Subtropics

University of Applied Sciences, Cologne, Germany

Telephone: 0049-175-6030500 Fax: 0049-8336-533

Email: matthias.morbach@smail.fh-koeln.de

alternatively: matthias-morbach@web.de

Close window

Mail preview

Sender: Matthias Morbach <matthias.morbach@smail.fh-koeln.de>

Subject: Reminder Email: Design Determinants for a Nile River Basin Organization (NRBO)

{if #u_gender# = "2"}Dear Ms.{else}Dear Mr.{/if} #u_firstname# #u_name#,

This is a friendly reminder to please take a moment to fill out this very important questionnaire regarding transboundary water cooperation in the Nile Basin.

The goal of this survey is to propose design determinants for a Nile River Basin Organization (NRBO), which are considered to improve transboundary water cooperation in this region. Your participation is essential to:

1. Identify those issues, which are considered to be the major problems for improving transboundary water cooperation in this region.
2. Assess the existing regional capacity to take measures against these problems.
3. Determine the desired NRBO services, which are considered to enhance transboundary water cooperation in this region.

Content: 4. Assess the demand and desire for creating such a NRBO.

To begin the survey, please click the website link below:

#code_complete#

Thank you for your time and participation in this survey.

Sincerely yours,

Matthias, Johannes Morbach
 Masters Student in Technology and Resources Management in the Tropics and Subtropics
 University of Applied Sciences, Cologne, Germany
 Telephone: 0049-175-6030500 Fax: 0049-8336-533
 Email: matthias.morbach@smail.fh-koeln.de alternatively: matthias-morbach@web.de

Mail preview

Sender: Matthias Morbach <matthias.morbach@smail.fh-koeln.de>

Subject: End of the Survey: Design Determinants for a Nile River Basin Organization (NRBO)

{if #u_gender# = "2"}Dear Ms.{else}Dear Mr.{/if} #u_firstname# #u_name#,

This is a friendly reminder to please take a moment to fill out this very important questionnaire regarding transboundary water cooperation in the Nile Basin. The survey is part of a Master Thesis at the Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne, Germany (ITT).

Due to the situation that the assessment process will end on the 24th of Mai 2012, this is the last possibility to participate in this questionnaire. The goal of this survey is to propose design determinants for a Nile River Basin Organization (NRBO), which are considered to improve transboundary water cooperation in this region.

Your participation is essential to:

1. Identify those issues, which are considered to be the major problems for improving transboundary water cooperation in this region.
2. Assess the existing regional capacity to take measures against these problems.
3. Determine the desired NRBO services, which are considered to enhance transboundary water cooperation in this region.
4. Assess the demand and desire for creating such a NRBO.

Content:

To begin the survey, please click the website link below:

#code_complete#

Thank you for your time and participation in this survey.

Sincerely yours,

Matthias, Johannes Morbach
 Masters Student in Technology and Resources Management in the Tropics and Subtropics
 University of Applied Sciences, Cologne, Germany
 Telephone: 0049-175-6030500 Fax: 0049-8336-533
 Email: matthias.morbach@smail.fh-koeln.de alternatively: matthias-morbach@web.de

Attachment 2: Questionnaire (PDF-Version)

“Design Determinants for a Nile River Basin Organization”

This questionnaire is part of a Master Thesis at the Institute for Technology and Resources Management in the Tropics and Subtropics, Cologne, Germany (ITT) and has been developed for the purpose to identify through expert experiences design determinants for a Nile River Basin Organization (NRBO), which are considered to efficiently and effectively improve transboundary water cooperation between the riparian states of the Nile. Your knowledge, experiences and recommendations herein could make a substantial contribution to:

1. Identify those issues, which are considered to be the major problems for improving transboundary water cooperation in this region.
2. Assess the existing regional capacity to take measures against these problems.
3. Determine the desired NRBO services, which are considered to enhance transboundary water cooperation in this region.
4. Assess the demand and desire for creating such a NRBO.

Note:

- *If you are interested in receiving the results of this questionnaire, please mark with a cross at the end of this survey.*
- *Your provided specific information herein will be kept in confidentiality and will not be accessible to unauthorized third parties nor be used towards any other purposes than towards the original purpose.*

If you have any questions, or wish to provide additional insights on this matter, please do not hesitate to contact:

Matthias, Johannes Morbach
Masters Student in Technology and Resources Management in the Tropics and Subtropics
University of Applied Sciences, Cologne, Germany
Telephone: 0049-175-6030500 Fax: 0049-8336-533
Email: matthias.morbach@smail.fh-koeln.de alternatively: matthias-morbach@web.de

Section 1: General Information

1. Please mark with a cross, which classification best represents your organization:

- | | | |
|--|---|--|
| <input type="checkbox"/> Federal Government | <input type="checkbox"/> National (State/Province) Government | <input type="checkbox"/> Inter-Governmental Agency |
| <input type="checkbox"/> Non-Governmental Organization | <input type="checkbox"/> University (Academic Research Institution) | <input type="checkbox"/> Water Expert |
| <input type="checkbox"/> River Basin Organization | <input type="checkbox"/> Sub-Basin Organization | <input type="checkbox"/> National Water Authority |
| <input type="checkbox"/> Community Interest Group | <input type="checkbox"/> Private Sector Business | |
- Other (please include here) → _____

2. Please indicate what is your opinion about the following statements:

	Strongly Agree 1	2	3	4	Strongly Disagree 5
a) Improving cooperation between the Nile Basin's riparian states is one of the most important transboundary water resources management challenges in this region:	<input type="checkbox"/>				
b) In relation to managing transboundary water resources, your work is very much involved in improving cooperation between the riparian states of the Nile:	<input type="checkbox"/>				
c) Your organization's ability to make/influence decisions, which could improve the way in how the Nile Basin's countries cooperate in managing transboundary water resources is high:	<input type="checkbox"/>				
d) Your personal ability to make/influence decisions within your organization is high:	<input type="checkbox"/>				

3. How long have you been working in the water-related field?

Please type in the number of years: _____

4. How long have you been working in promoting cooperation between the riparian states of the Nile in order to anticipate, prevent or resolve water-related disputes through direct assistance/training and/or academic research?

Please type in the number of years: _____

Section 2: Assessing Transboundary Water Cooperation in the Nile Basin

5. In your experience, what are the most important problems associated with improving transboundary water cooperation in the Nile Basin? Please rate the five most important problems and place a “x” in the appropriate boxes (only select five boxes).

• Insufficient cross-border exchange of information and data	<input type="checkbox"/>
• Lack of stakeholder participation across borders	<input type="checkbox"/>
• Inadequate financing mechanisms	<input type="checkbox"/>
• Lack of political will	<input type="checkbox"/>
• Lack of joint development ventures	<input type="checkbox"/>
• Insufficient capacity building across all Nile Basin states	<input type="checkbox"/>
• Lack of dispute resolution mechanisms	<input type="checkbox"/>
• No commonly accepted and agreed legal frameworks	<input type="checkbox"/>
• Joint planning and management	<input type="checkbox"/>
• Insufficient education and advanced training	<input type="checkbox"/>
• Basin-wide monitoring of water quality and quantity	<input type="checkbox"/>
• Insufficient benefit-sharing arrangements	<input type="checkbox"/>
• Prior agreements	<input type="checkbox"/>
• Insufficient common data-base for accessing basin-wide knowledge and tools	<input type="checkbox"/>
• Inadequate institutions to devolve decision-making to lower levels	<input type="checkbox"/>
• Insufficient cost-sharing arrangements	<input type="checkbox"/>
• Lack of confidence between disputing parties	<input type="checkbox"/>
• High turnover of key staff	<input type="checkbox"/>
• Insufficient ability to enforce agreements	<input type="checkbox"/>
• Other (please include here) → _____	<input type="checkbox"/>

6. For each method to improve transboundary water cooperation listed below, please indicate if an organization within the Nile basin is sufficiently providing the related services (or is assisting the stakeholders). Please place a cross for each method (only select one box for each method).

a) Your Organization and/or a Regional Organization (*Your/Regional Org.*) that you know provides the services within the Nile Basin (*please mark with a cross at YES*).

b) The service that you know is *Not Performed* or is unavailable within the Nile Basin (*please mark with a cross at NO*).

c) You are unsure or *Do Not Know*, if the service is provided in the Nile Basin.

Your/Regional Org.

Not Performed

Do Not Know

Direct Assistance			
	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Design of dispute settlement procedures	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Performing joint research, planning and management	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Basin-wide access to knowledge and tools	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Identifying and implementing cost-sharing arrangements	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Enforcing agreements	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Impartial third party advice and mediation	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Sharing and exchange of information and data	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Assistance in accessing financial resources	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Convening parties	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Participation and stakeholder identification	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Creating joint development ventures	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Best practice analysis and cooperation identification	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Designing, implementing and adapting legal frameworks	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Assess dispute situations and needs	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Implementing agreements	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Identifying benefit-sharing schemes	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
Training and Public Outreach/Awareness Building			
	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Capacity building	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Education and advanced training	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Community advisory committees	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Stakeholder advisory committees	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>
• Political engagement	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/>

Section 3: Determination of Desired NRBO Services

7. According to the assumption that a Nile River Basin Organization would be created, what do you think would be the most desired services in order to improve transboundary water cooperation in this region? Please rate the five most important services and place a “x” in the appropriate boxes (only select five boxes).

Note: The list below is not comprehensive. If you feel that other services/assistance is required to improve transboundary water cooperation between the riparian states of the Nile Basin, please indicate in the “Other” box below and add comments if necessary.

Direct Assistance	
• Design of dispute settlement procedures	<input type="checkbox"/>
• Performing joint research, planning and management	<input type="checkbox"/>
• Basin-wide access to knowledge and tools	<input type="checkbox"/>
• Identifying and implementing cost-sharing arrangements	<input type="checkbox"/>
• Ability to enforce agreements	<input type="checkbox"/>
• Impartial third party advice and mediation	<input type="checkbox"/>
• Sharing and exchange of information and data	<input type="checkbox"/>
• Assistance in accessing financial resources	<input type="checkbox"/>
• Assisting in convening parties	<input type="checkbox"/>
• Participation and stakeholder identification	<input type="checkbox"/>
• Creating joint development ventures	<input type="checkbox"/>
• Best practice analysis and cooperation identification	<input type="checkbox"/>
• Designing, implementing and adapting legal frameworks	<input type="checkbox"/>
• Assess dispute situations and needs	<input type="checkbox"/>
• Implementing agreements	<input type="checkbox"/>
• Identifying benefit-sharing schemes	<input type="checkbox"/>
Training and Public Outreach/Awareness Building	
• Capacity building	<input type="checkbox"/>
• Education and advanced training	<input type="checkbox"/>
• Organize and assist community advisory committees	<input type="checkbox"/>
• Organize and assist stakeholder advisory committees	<input type="checkbox"/>
• Encouraging political engagement	<input type="checkbox"/>
Other	
• Other (please include here) → _____	<input type="checkbox"/>

Additional Comments: _____

8. Please indicate what is your opinion about the following statements that relate to the urgency of creating a Nile River Basin Organization in order to provide those services you indicated in Question 7.

	Strongly Agree 1	2	3	4	Strongly Disagree 5
a) There is a need for a Nile River Basin Organization to be created in order to receive those services you indicated in Question 7.	<input type="checkbox"/>				
b) There is a need for a Nile River Basin Organization to be created due to the fact that other service providers operating in this region cannot adequately provide those services you indicated in Question 7.	<input type="checkbox"/>				

Additional Comments: _____

9. In your opinion, the stakeholders of the Nile Basin would likely consider using the Nile River Basin Organization (only select one box):

• Immediately	<input type="checkbox"/>
• In the near future (5-10 years)	<input type="checkbox"/>
• Unlikely that they would use it	<input type="checkbox"/>
• Never	<input type="checkbox"/>
• Other (please include here) →	<input type="checkbox"/>

Additional Comments: _____

- *If you are interested in receiving the results of this questionnaire, please mark with a cross: →*

Thank you for your help!

Thank you very much for completing this questionnaire and if you have any questions, comments or concerns, please include these below.

If you have any questions, please do not hesitate to contact:

Matthias, Johannes Morbach
Masters Student in Technology and Resources Management in the Tropics and Subtropics
University of Applied Sciences, Cologne
Telephone: 0049-175-6030500 Fax: 0049-8336-533
Email: matthias.morbach@smail.fh-koeln.de alternatively: matthias-morbach@web.de

Attachment 3: Indicators

Table 1: Indicators to Identify the Major Problems to Transboundary Water Cooperation in the Nile Basin

• Insufficient cross-border exchange of information and data
• Lack of stakeholder participation across borders
• Inadequate financing mechanisms
• Lack of political will
• Lack of joint development ventures
• Insufficient capacity building across all Nile Basin states
• Lack of dispute resolution mechanisms
• No commonly accepted and agreed legal frameworks
• Joint planning and management
• Insufficient education and advanced training
• Basin-wide monitoring of water quality and quantity
• Insufficient benefit-sharing arrangements
• Prior agreements
• Insufficient common data-base for accessing basin-wide knowledge and tools
• Inadequate institutions to devolve decision-making to lower levels
• Insufficient cost-sharing arrangements
• Lack of confidence between disputing parties
• High turnover of key staff
• Insufficient ability to enforce agreements

Table 2: Indicators to Assess the Regional Capacity within the Nile Basin

<i>Direct Assistance</i>
• Design of dispute settlement procedures
• Performing joint research, planning and management
• Basin-wide access to knowledge and tools
• Identifying and implementing cost-sharing arrangements
• Enforcing agreements
• Impartial third party advice and mediation
• Sharing and exchange of information and data
• Assistance in accessing financial resources
• Convening parties
• Participation and stakeholder identification
• Creating joint development ventures
• Best practice analysis and cooperation identification
• Designing, implementing and adapting legal frameworks
• Assess dispute situations and needs
• Implementing agreements
• Identifying benefit-sharing schemes
<i>Training and Public Outreach/Awareness Building</i>
• Capacity building
• Education and advanced training
• Community advisory committees
• Stakeholder advisory committees
• Political engagement

Table 3: Indicators to Identify the most desired NRBO Services

<i>Direct Assistance</i>
• Design of dispute settlement procedures
• Performing joint research, planning and management
• Basin-wide access to knowledge and tools
• Identifying and implementing cost-sharing arrangements
• Ability to enforce agreements
• Impartial third party advice and mediation
• Sharing and exchange of information and data
• Assistance in accessing financial resources
• Assisting in convening parties
• Participation and stakeholder identification
• Creating joint development ventures
• Best practice analysis and cooperation identification
• Designing, implementing and adapting legal frameworks
• Assess dispute situations and needs
• Implementing agreements
• Identifying benefit-sharing schemes
<i>Training and Public Outreach/Awareness Building</i>
• Capacity building
• Education and advanced training
• Organize and assist community advisory committees
• Organize and assist stakeholder advisory committees
• Encouraging political engagement

Attachment 4: Declaration of Authorship (*English and German Version*)

Declaration of Authorship:

Name: Matthias Morbach
Matr.-Nr: 11072348

I hereby declare that myself have composed the master thesis presented here. I also declare that all information in this document has been acquired and presented in accordance to the academic rules. In this connection, I confirm that all places, which were inferred literally or in a general manner from published and unpublished sources, are marked as such and have been fully cited and referenced.

I certify that this work has not been submitted, either in part or whole, for a degree at this or any other university.

Cologne, the 27th of July 2012

Signature:

I agree to a publication (partially or fully) of this master thesis and confirm that it will become part of the permanent collection of the Institute of Technology and Resources Management in the Tropics and Subtropics, Cologne, Germany. My signature below further authorizes the release of my thesis to a reader upon request.

Signature:

Erklärung Eigenständiger Arbeit:

Name: Matthias Morbach
Matr.-Nr: 11072348

Ich versichere wahrheitsgemäß, dass ich die vorliegende Masterarbeit selbständig verfasst und keine anderen als die von mir angegebenen Quellen und Hilfsmittel benutzt habe. Alle Stellen, die wörtlich oder sinngemäß aus veröffentlichten und nicht veröffentlichten Schriften entnommen sind, sind als solche kenntlich gemacht.

Die Arbeit ist in gleicher oder ähnlicher Form noch nicht als Prüfungsarbeit eingereicht worden.

Köln, den 27 Juli 2012

Unterschrift:

Ich erkläre mich mit einer späteren Veröffentlichung meiner Masterarbeit sowohl auszugsweise, als auch als Gesamtwerk in der Institutsreihe oder zu Darstellungszwecken im Rahmen der Öffentlichkeitsarbeit des Institutes einverstanden.

Unterschrift:

