

Challenges in water management in the Lake Naivasha Basin

Analysis on the effects and performance of IWRAP for different irrigation water user groups in the Lake Naivasha Basin, Kenya



M.Sc. Thesis by Joël Verstoep

March 2015

Water Resources Management Group



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Frontpage images:(<http://www.makewealthhistory.org>; <http://www.seeddaily.com>;
WWF, 2012)



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Master Thesis Water Resources Management submitted in partial fulfillment of the degree of Master of Science in International Land and Water Management at Wageningen University, the Netherlands

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March 2015

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Acknowledgements

I would like to make use of this opportunity to thank the people that assisted me in my journey that ended with this M.Sc thesis. The road towards this report was an adventurous one, with surprises, challenges and revelations. Several people helped and supported me or stood beside the road and showed me the right direction.

Firstly, I would like to thank my supervisor, Pieter van Oel, for supporting me in my fieldwork, in the process of analysing and writing and for stimulating me to think critically. Secondly, I would like to thank the sub-regional office of WR MA-Naivasha for hosting me for 4 months during the period of research. Special thanks goes out to John Munyao, for arranging the facilities for my stay and to Dominic Wambua and Joseph Wendott for involving me in their day-to-day duties for WRMA. Besides that I want to thank all WRMA-staff for the warm welcome, nice atmosphere and your enormous help. Thirdly, I want to thank Carls Gakuu for enabling me to stay in his small guesthouse, just outside Naivasha town. It was a great pleasure to be part of your family for 4 months.

Also special thanks to my parents. They supported me throughout the whole thesis process and they even visited me in Naivasha. Last but not least I want to express my gratitude to my family and friends who supported me, encouraged me and who were always willing to listen to my stories about Lake Naivasha, the flower farmers and the hippo's walking around my house.



Abstract

Lake Naivasha Basin (LNB) is a basin under pressure. Both environmental integrity and the booming horticulture and floriculture must live together. Lake Naivasha is a freshwater lake in the Rift Valley, Kenya. Due to the presence of horticulture and floriculture around the lake the interests in water availability are high. The agricultural-based economy depends highly on the available water resources in the LNB. Also power relations play a big role in the water management. The project Integrated Water Resources Action Plan (IWRAP) is implemented since 2013 in the LNB. This ongoing project aims for a long-term sustainable development in the LNB.

The main question in this thesis research is: “What are the effects of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin, with a particular focus on the interests for different irrigation water user groups?” To answer this question the concept of the Echelons of Right Analysis is used. This concept is suitable because it classifies resources, rules, authority and discourses in areas of water conflict or scarcity. The discourse analysis is supported by several other concepts including those by Foucault (1977) and Pahl-Wostl (2005). The data is acquired through 3 months of fieldwork in the Lake Naivasha Basin, making use of observations, structured and semi-structured interviews. The results show that the IWRAP project encounters difficulties in implementing their integrated project. Due to corruption, volatile environmental conditions, a gap between politics and policies and the skewed power relations it is hard to become successful. The beneficiaries are mainly the IWRAP partners themselves. The lack of accurate data and knowledge is one of the biggest problems in the LNB. This knowledge gap is caused by volatile environmental conditions and the weak position of the Water Resource Management Authority (WRMA-Naivasha). WRMA-Naivasha is not able to generate accurate data on water quality and quantity to ensure a proper water management. Due to this knowledge gap, especially on the hydrological subsystem, proper policies are hard to be implemented and legal authorities face problems with enforcement. Therefore one of the conclusions is that IWRAP can be a target-wise success, but an impact-wise failure. Also the debate about water availability is an interesting result. There are different opinions about water scarcity and this hinders an integrated approach as well. NGOs and several local organisations try to convince that there is an increasing water scarcity, while the farmers in the LNB and WRMA-Naivasha claim that there is enough water for the existing practices.



This thesis explores how the success of an integrated project is hampered by lack of accurate data and knowledge, transparency, communication and involvement of all stakeholders. Besides that the aspects of corruption, volatile environmental conditions, bureaucratic issues and cultural habits needs consideration to achieve a successful implementation.

Keywords: Lake Naivasha Basin (LNB), Echelons of Rights Analysis (ERA), water scarcity, water management, water rights, IWRAP, discourses, volatile conditions



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List of abbreviations

CAAC	Catchment Area Advisory Committees
ERA	Echelons of Rights Analysis
FBP	Flower Business Park
ITC	University of Twente, Faculty of Geoinformation Science and Earth Observation (ITC)
IWRAP	Integrated Water Resource Action Plan
IWRM	Integrated Water Resource Management
KFC	Kenya Flower Council
Ksh	Kenyan Shillings
LaNaWRUA	Lake Naivasha WRUA
LNB	Lake Naivasha Basin
LNBIMP	Lake Naivasha Basin Integrated Management Plan.
LNGG	Lake Naivasha Growers Group
MWI	Ministry of Water and Irrigation
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
PMU	Programme Management Unit
SDAP	Sustainable Development Action Plan
WAP	Water Allocation Plan
WRMA	Water Resource Management Authority
WRUA	Water Resource Users Association
WSP	Water Supply Project
WWF	World Wide Fund for Nature

The abbreviations CF (Commercial Farmer), MK (Mkungi Kitiri farmer), IP (IWRAP Partner) and MT (Meeting or interview with stakeholder) are used in order to secure anonymity for the involved farmers and stakeholders, due to the somehow sensitive topic.



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INTRODUCTION

1. Introduction

This thesis research is situated in the Lake Naivasha Basin (LNB), central Kenya (fig. 1). Lake Naivasha is the second-largest freshwater lake in Kenya (WWF, 2012), the lake and the wetlands are a renowned Ramsar site (Ramsar, 2014). Lake Naivasha is, unlike most other Ramsar sites, a huge source of water for a large horticultural and floricultural industry around the lake (WWF, 2011). Lake Naivasha is fed by different rivers in the LNB, the Malewa, Gilgil and Karati (fig. 1). The lake levels are highly variable, due to volatile weather conditions and runoff from the upper-catchment (Kuhn et al., 2014; Van Oel et al., 2013). The natural resources in Lake Naivasha and the LNB are contested and debated intensively. Debates and disputes about the lake's environmental quality, the water quality, the volatile conditions, the commercial activities of large commercial farms and the (over)abstraction of water from the water resources in the LNB are actual and present (WWF, 2011; WRMA, 2010; IWRAP, 2012; De Jong, 2011). Different projects and initiatives are established to preserve the environmental value of the LNB. The Water Allocation Plan (WAP) in 2010 (WRMA, 2010) was an important first step towards the transparency of water abstraction and allocation in the LNB, although the targeted transparency is still far away. This thesis



research evaluates several parts of the Integrated Water Resource Action Plan Programme (IWRAP). The implementation of IWRAP that started in 2013 aims to create a sustainable land and water management for people, businesses and nature in the LNB, Kenya. This programme is led by WWF Kenya, while supporting partners are: Imarisha Lake Naivasha Board, Water Resource Management Authority (WRMA), University of Twente (ITC) and two Dutch Regional Water Authorities. Other closely related partners are Lake Naivasha Growers Group (LNGG), Kenya Flower Council (KFC) and the Water Resource Users Associations (WRUA) of Lake Naivasha and Mkungu Kitiri (IWRAP, 2012; MT3). Therefore the IWRAP programme consists out of public (WRMA), private (Imarisha Lake Naivasha Board) and NGO (WWF) organizations. The programme focuses on a partnership engagement in water resource management, governance and natural resource management (IWRAP, 2012).

The implementation of the IWRAP addresses several issues, discussed in the section of the problem statement (1.1), but the project is triggered by a severe drought in 2009. The water level in the lake dropped enormously and the response to this situation by local government, the private sector and civil society was unique: “they combined their efforts to set out on a path to ensure long-term sustainable development in the Lake Naivasha Basin” (IWRAP, 2012, p. 8) In this action plan, the WWF and their supporting partners, formulated 7 results (IWRAP, 2012, p. 5), two of these results are used in this thesis research, to assess the effects of IWRAP in the LNB:

1. *Increased capacity and improved governance in WRM institutions (Water Resource Management Authority (WRMA) and Water Resource Users Association (WRUAs)) for water resource management in LNB*
2. *Increased knowledge and technical capacity for quantitative water resource management and monitoring in LNB*

The main focus of this thesis research is on the effects and the interests associated with implementing the IWRAP programme. More in particular on the irrigation sector and water management, for different irrigation water user groups. These groups are divided in 1) commercial farmers using surface water, 2) commercial farmers using groundwater and 3) smallholder farmers in the Lake Naivasha Basin. The research covers the existing practices of water allocation, water use and governance by different irrigation water user groups and water management in the Lake Naivasha Basin and the analytical framework is based on the Echelons of Rights Analysis (ERA) in which resources, rules, authority and discourses are considered. The focus in this thesis research is on the first and second result of the IWRAP. Theories and concepts that are used as a framework to give an answer to these questions are the Echelons of Rights Analysis (ERA) (Boelens, 2008), supported by concepts from Foucault



(1977) and Pahl-Wostl (2005) for the discourse analysis, the socio-technical approach (Mollinga, 1997) and literature on river basin governance and responses to water scarcity (Molle 2003; Molle et al, 2007). The type of research that is performed included fieldwork in a sub-catchment, comparing cases of large commercial farmers, using either surface water or groundwater and smallholder farmers.

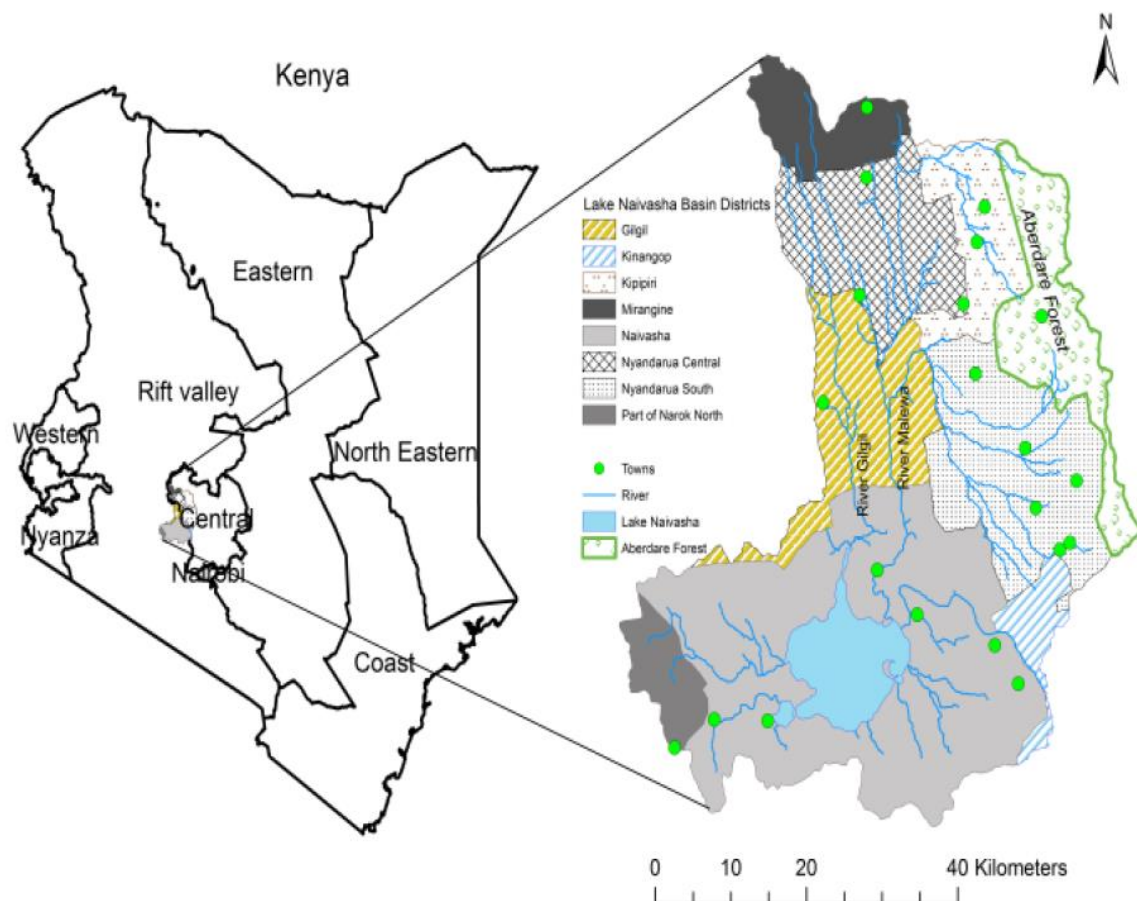


Figure 1: Lake Naivasha Basin, central Kenya (Imarisha Naivasha Trust, 2012)



1.1. Problem statement

There are a lot of water users in the LNB with different interests (including large commercial farmers using either groundwater or surface water, smallholder farmers upstream the lake and domestic users), competing for the water resources in the LNB. This pressure on the water resources leads to water scarcity in dry periods, unsustainable water resource management, poor water quality, poor natural resources management and the emergence of conflicts between users and institutions in the LNB. The volatile conditions in the LNB and the variability of the lake levels create more problems (Van Oel et al., 2013; Kuhn et al., 2014), due to the unpredictability of the situation. There is a knowledge gap in the way water is allocated, regulated and distributed (Van Oel et al., 2014; Kuhn et al., 2014). Data about water quality and quantity should be collected by WRMA and the Water Allocation Plan (WAP), although this happens barely and there is little data available about the water abstraction in the basin. Another problem is the lack of proper management and enforcement in the LNB. Several institutions, in particular WRMA-Naivasha, lack the data to achieve sufficient enforcement of rules and regulations. On the basis of a case study the ambitions of the IWRAP programme, combining people, business and nature together, can be analysed and evaluated to assess whether they are realistic and feasible. The last example contains a knowledge gap as well. The IWRAP programme is a reaction to the prevailing poor water management practices in the LNB by different stakeholders. Through the IWRAP programme, the WWF, together with other partners, tries to create enabling conditions for effective water regulation, water allocation, governance and a sustainable land and natural resource use. It is not clear whether and how the smallholder farmers (upstream) and the commercial farmers around Lake Naivasha (LaNaWRUA) are participating in the articulation and execution of IWRAP.

1.2. Research Objectives

Through the IWRAP programme, the partners aim at creating enabling conditions for effective water regulation, water allocation, governance and a sustainable land and natural resource use. Different outputs have been formulated in the proposal of the IWRAP programme and this research focuses on two of these outputs (nr. 1 & 2). In this thesis research the aim is to gain a better understanding of present water uses, according to the ERA framework, and to assess the impacts of an ongoing programme (IWRAP) on the existing irrigation water user groups and partners.

The main research objective is to assess the impacts of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin, with a particular focus on the interests of different irrigation water user groups in the LNB. In order to do so, the ERA framework is used, complemented with other concepts by Foucault (1977) and Pahl-Wostl (2005), to



indicate the different echelons in the contested water allocation. The different irrigation water user groups are defined in three groups: in 1) commercial farmers using surface water, 2) commercial farmers using groundwater and 3) smallholder farmers in the Lake Naivasha Basin. This study builds on existing knowledge on rules, rights and data, collected by WRMA-Naivasha and others. In this way this study contributes to assess the effects of the IWRAP programme on the irrigation sector in the Lake Naivasha Basin, with respect to different irrigation water user groups, water allocation and specific regulations on restrictions of water use. These research objectives resulted in the following main and sub-questions.

1.3. Main Research question and sub-questions

What are the effects of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin, with a particular focus on the interests for different irrigation water user groups?

1. Which water resources are used by the different irrigation water user groups?
2. What are the existing rules concerning water management and how are these rules materialized?
3. How is the authority and governance organized and enforced in the LNB?
4. What are the discourses of the different irrigation water user groups and the IWRAP partners in the LNB?
5. How does IWRAP affect the four echelons of rights?
6. What are the benefits, burdens and expectations for the different irrigation water user groups concerning the IWRAP?

The research questions critically reflect on the results of the IWRAP programme. As explained in the introduction, two of the seven results are central in this research. In Figure 2 a schematic overview of the linkages from the results of IWRAP to the sub-questions and the main research question is presented, as well as how the ERA framework interacts.



1.4. Scope

This thesis research aims to assess the effects of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin and to investigate how IWRAP interacts in the different echelons of rights. The timeframe covers the period since IWRAP started, in January 2013 until the moment of research, September 2014-December 2014. The interviewed farmers are part of the Lake Naivasha WRUA sub-catchment (LaNaWRUA) or the Mkungi Kitiri WRUA sub-catchment. These WRUAs are chosen because these two are mostly involved in the IWRAP. The first four research questions are covering the four echelons of rights, resources, rules, authority and discourses. These echelons are based on the ERA framework by Boelens (2008). The structure of this thesis is based on these echelons as well. The reason why the ERA is used, is because it can be used in cases where water, as a natural resource, is contested. The use of discourse analysis methods (Foucault, 1977; Pahl-Wostl, 2005), on top of the ERA approach are also important tools in analysing the situation in the LNB, they are used to create awareness and a better understanding about the disputes and discourses according to resources, rules and authority. Further literature and concepts that are used are the socio-technical approach by Mollinga (1997), responses to water scarcity (Molle, 2003) and the river basin governance model by Molle et al. (2007). By using the ERA framework it is possible to investigate in which echelon IWRAP influences the conflict of water allocation and distribution. Figure 3 shows a schematic overview about the study groups and the aspects of water management that is investigated between them. On top of that, the figure shows how the studied groups are related to the IWRAP programme, in order to answer the main research question, concerning the effects of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin, with a particular focus on the interests for different irrigation water user groups, defined as commercial farmers using either groundwater or surface water and smallholder farmers.



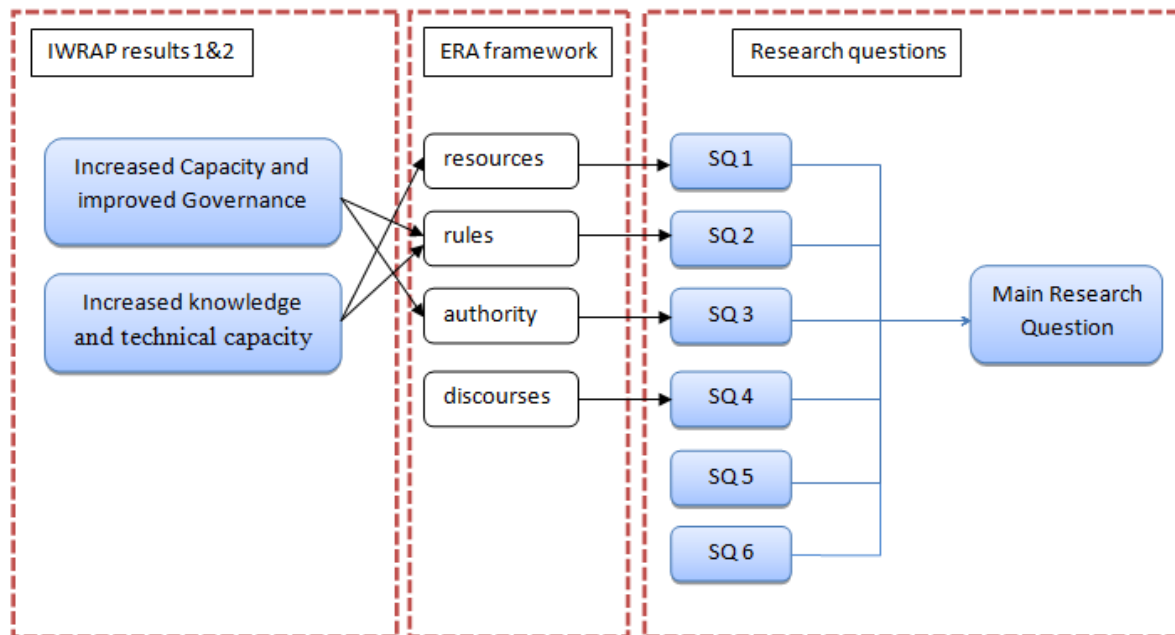


Figure 2: Schematic overview of research questions. The linkages are shown between the results 1 & 2 from IWRAP and the ERA framework and the first four sub-questions are directly converted from the echelons of rights analysis.

1.5. Scientific perspective

This research contains a socio-technical type of research (Mollinga, 1997). Crucial issues include how water is allocated, used and governed and how this is evaluated by different stakeholders in the LNB. To come up with data and answers on these elements quantitative and qualitative research methods are required, as well as data analysis and literature review. Besides that the gained knowledge is socially constructed and negotiated, consequently universal validity is not proven, because the data is very context-specific. Therefore the aim is to understand causality in which cause-effect relations are subject of the thesis research.

Interdisciplinarity is needed to tackle real problems in the world, because real-world problems are wicked problems in which solutions and problems are complex and not always easily defined. To approach these wicked problems, interdisciplinarity can be an option. Especially this thesis topic, embedded in the IWRAP programme, needs an interdisciplinary research. Reasons for this need is the involvement of different stakeholders in the IWRAP programme and their expectations, requirements and concerns towards the programme and its participating organizations.

Due to the complexity of the problem and the strong interdisciplinary character, a socio-technical approach might be a solution to reach a simultaneous analysis of the technical/ecological and the social aspects of the object.



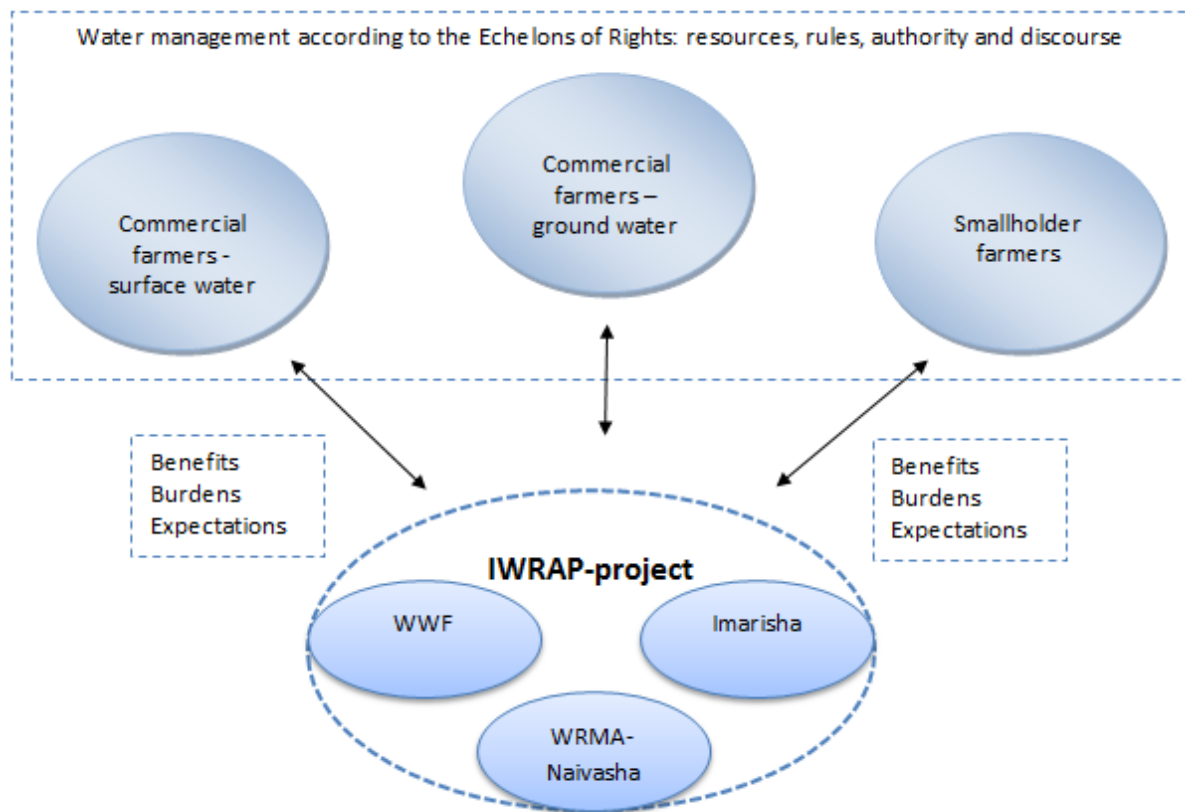


Figure 3: Schematic overview of study groups and research scope. The irrigation water user groups and the existing water management are described and analysed by the ERA framework as a leading tool. The effects of IWRAP on the irrigation water user groups are identified by the arrows, and they cover the benefits, burdens and expectations. The focus in this research is on the local partners of IWRAP: WWF, WRMA-Naivasha and Imarisha.





CONCEPTS AND THEORIES

2. Concepts and theories

Different concepts and theories have been used in this thesis research. These concepts and theories together create a framework that provides the conceptual base for the analysis and understanding of existing practices of water allocation, water use and governance in the Lake Naivasha Basin and what the expectations, requirements and concerns are of different irrigation water user groups concerning the IWRAP programme and its partners. Several models, approaches and concepts are outlined and used to perform this thesis research. The first concept is a kind of awareness and notion that water management is a socio-technical phenomenon, therefore a socio-technical approach (Mollinga, 1997) is used. Also the Echelons of Rights Analysis (ERA) (Boelens, 2008) is used, to de-construct the complex situation and to get a better understanding about the disputes and discourses according to resources, rules, authority and discourses. Concepts by Foucault (1977) and Pahl-Wostl (2005) are used to support the discourse analysis. The last section (2.3) in this chapter will deal with the concept of river basin governance (Molle et al., 2007), responses to water scarcity (Molle, 2003) and the concept of IWRM. They present different types of multiplicity, interconnections and reactions to water scarcity and water management.



2.1. Socio-technical approach

The socio-technical approach focuses on the interrelations between water, water users, water technologies, water infrastructure and the resulting water networks and agro-ecologies. Mollinga argued that water issues should be promoted and approached in an interdisciplinary manner. He states that an “interdisciplinary investigation of irrigation requires insight into its technical, organizational, socio-economic and political aspects” (Mollinga, 1997). Interdisciplinarity is needed to tackle real problems in the world, because real world problems are wicked problems in which solution and problem are complex and not always defined. To approach these wicked problems, interdisciplinarity can be an option. So in the case of the LNB, the approach should not only be on the technical aspects of allocation and abstraction, because then one might miss a lot of crucial information about social aspects of water management and abstraction. Water management is both socially and technically constructed, with technical aspects such as infrastructure, closely related to social aspects of understanding, communication and enforcement, so therefore water management is a socio-technical phenomenon. Water management in the LNB is influenced by politics, big horticulture and floriculture companies, smallholder farmers, environmentalists, history, domestic uses and agricultural uses. Concluding it is clear that a solely social or technical approach would fall short if one studies the impact of an integrated programme. The complexity or heterogeneity of a system concerned with water resource management can be defined as a socio-technical system. It is complex because both human and physical aspects interact continuously and profoundly, so an understanding of (irrigation) systems as a socio-technical process seems appropriate (Uphoff, 1986, p. 4).

2.2. ERA (Echelons of Rights Analysis)

The ERA framework is very useful in this thesis research. The Echelons of Rights Analysis (ERA) helps to clarify how the access to water is defined, how it is managed and how this access is contested (Boelens, 2008). The Echelons of Rights Analysis looks at four different domains or echelons. The four domains are: resources, rules, authority and discourses.

The first domain is about the struggles over *resources*. Who have access to the water to withdraw it and do these users have the material means to abstract water from the source, to concretize their water rights. Concrete aspects are infrastructure, technological artefacts, financial and social capital, etc. The second domain concerns the *rules*: who is in charge of management and operation, who owns the water rights and which mechanisms are used to create water rights? “The bundles of rights and obligations; categories, roles and responsibilities of users; criteria for allocation based on the heterogeneous values and meanings assigned to water; diverse ideas and constructs of fairness, are key elements of this



field of analysis.” (Boelens, 2008, p. 7) The third domain within the ERA framework is the *authority* or *regulatory control*. Who is in charge of the water rights, who defines water rights and who enforces them? It is about who is making decisions and giving sanctions in case of non-compliance and the third domain refers to institutionalized faculties to govern water affairs and the responsibility over differentiation of access to water, probably according to hierarchy. The fourth and last domain is the most abstract domain of the ERA framework. It refers to the regime of representation: *the discourses*. The discourses are regimes of representation which are defending, imposing or establishing water right policies, regimes and decisions made by actors (Boelens, 2008). “Regimes of Representation legitimize use and distribution of resources; contents of rules; and regulatory control or authority to set the rules of the game. As powerful discursive practices, they make the moral, institutional and political linkages among the social and technical, human and natural, theoretical and practical water worlds, as if these bonds were entirely natural.” (Boelens, 2008, p.8). Some discourses stress certain criteria, while neglecting others, therefore discourses are commonly used by political or social groups, strengthening the reasons of certain groups or people and weakening someone else’s (Roth et al., 2005).

Additional concepts are used to get a better understanding and analysis of the discourses. There are many definitions or explanations considering discourses. Hall (1992) defines a discourse in the following manner: “a set of statements or beliefs which produce knowledge that serves the interest of a particular group or class” (Hall, 1992, p. 202), while Thomson (2011) sees discourses as a socially constructed representation of (a part of) reality. It is important to understand that discourses are not innocent in their development and use. Discourses are representations of a part of reality often to serve the own interests, while neglecting the interest of others (Foucault, 1977). Therefore discourses are powerful tools. Power can create truth, but the other way around truth can also create power. Since discourses often claim to be the truth, power depends on knowledge and on discourses/truth, therefore discourses both create and are created by power and knowledge (de Bont, 2013) This interdependency is illustrated by Foucault in the Foucault triangle (Fig. 4) “Power, thus, produces reality, knowledge and truth claims, it even produces the ways in which ‘truth is made true’”(Boelens, 2008, p. 17). In this research the main analytical concepts used to analyse the discourses in the LNB are the Foucault triangle (1977) (Fig. 4) and the stakeholder matrix by Pahl-Wostl (2005) (Fig. 5).



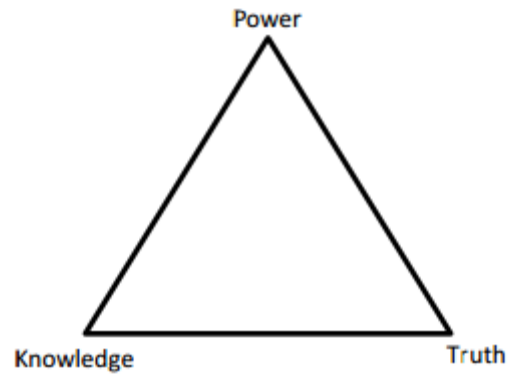


Figure 4: The Foucault triangle explains the interdependency of power, knowledge and truth considering discourses. Power depends on knowledge and discourses, which are accepted as truth in society, but power also create knowledge and truth at the same time.(Foucault, 1977)

An analytical framework by Pahl-Wostl (2005) is used to support the analysis and classification of the discourses. This framework helped to classify stakeholders on stake and power and it helped to outline in which direction they move and might move in the future. In this framework or matrix the stakeholders are characterized by their goals and perceptions of the problem domain (Pahl-Wostl, 2005). These perceptions of problem domains are closely related to discourses. The matrix is built on the stakes and powers of stakeholders. This matrix and the positioning of the stakeholders in the matrix is used in the analysis. Therefore, the discourses are approached and analysed per stakeholder group, using several definitions and interpretations of various discourse analysis methods.

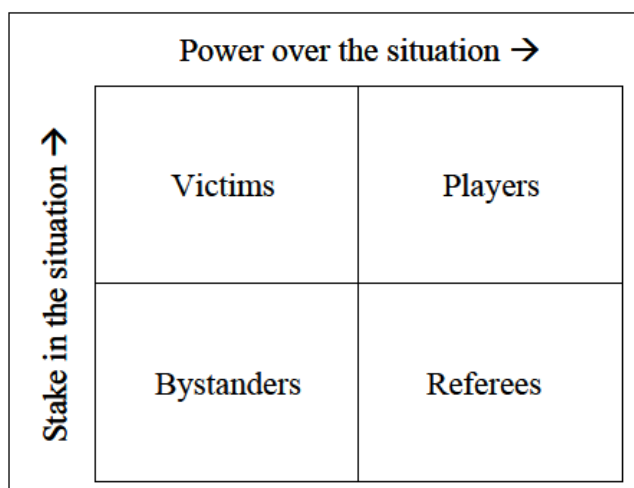


Figure 5: Matrix in which stakeholders can be classified on their position according to stake and power in a situation (Pahl-Wostl, 2005).



All different echelons interact and are linked to each other. The four domains are combined in the legitimating and enforcement of water rights, in which they shape social-technical discourses and bring together discursive and material aspects with water truth and knowledge claims.

In Figure 6 the four echelons are presented in the situation of the Lake Naivasha Basin. In every echelon the different irrigation water user groups are investigated according to the current echelon. The echelons of rules and authority are combined because of a lot of interaction and overlap between these echelons. The interests and differences are classified and clarified. According to this investigation of interests and differences, an indication of the influence of IWRAP on the different echelons of rights in the water allocation can be made and the perceptions on IWRAP of the different irrigation water user groups can be researched.

The first four sub-questions can be linked to the four echelons of the ERA framework (Fig. 2). The results are also structured according to the ERA framework. The last two sub-questions are formulated in order to get the interrelations and interaction of IWRAP in the four echelons of rights and to get an understanding of the interests of different irrigation water user groups and institutions and how the IWRAP influences these interests in different echelons.

The ERA framework is used in the Lake Naivasha Basin and the established IWRAP programme. There are different debates and disputes about the (contested) resources in the LNB, besides that the rules and authority in the LNB are not clear for all users and it lacks enforcement to control the intended rules and legislations. There is also a regime of representation in the LNB. There are several discourses present in the LNB and they all try to create their own truth. Therefore the ERA framework is suitable for analysing, describing and evaluating the actual water allocation, water use and governance in the LNB and the mapping and investigation of the expectations, requirements and concerns of different irrigation water user groups concerning the IWRAP programme and its participating organizations.



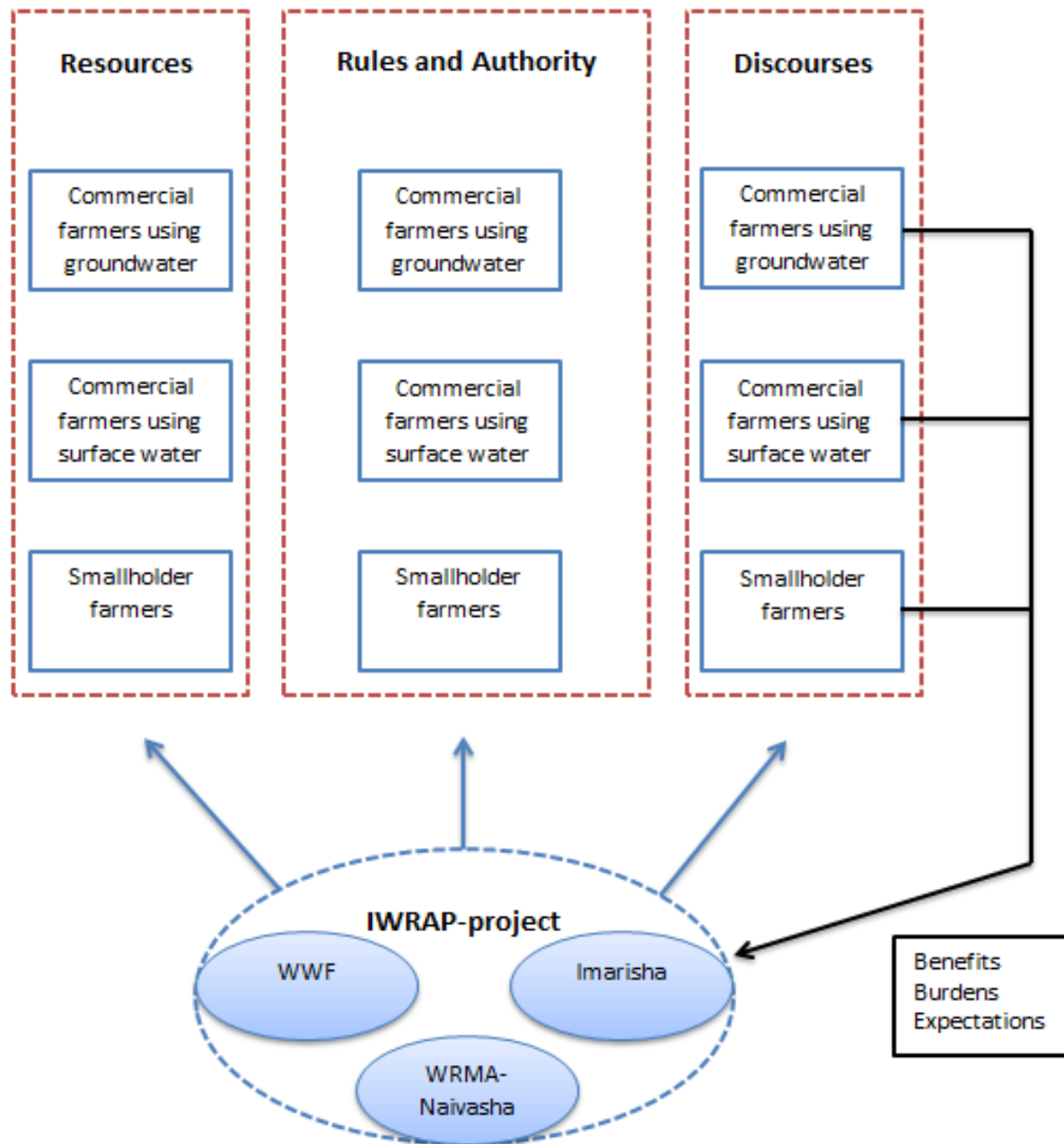


Figure 6: ERA framework applied to the situation in the LNB. The three different irrigation water user groups (commercial farmers using groundwater, commercial farmers using surface water and smallholder farmers) are investigated along the echelons of rights (ERA). After that the influence of IWRAP in each echelon can be identified. The last step is to investigate who benefits most from the situation in the LNB, including IWRAP and what the perceptions are about IWRAP.



2.3. Water Management Concepts

2.3.1. River Basin Governance

Several types of governance configurations are possible in analysing and addressing the multiplicity of interactions and the governance of a (closed or closing) river basin. There are different types of governance (fig. 7), which are extracted from two variables: stakeholder-driven vs. state-driven and centralized vs. decentralized.

The River Basin Governance model (Molle et al., 2007; Fig. 7), can be used to classify the interactions and the multiplicity in the Lake Naivasha Basin on the institutional level. The institutional framework in the LNB is quite complex and this theory is used to give more insight into the manner in which the water allocation, distribution and governance is done. The Water Act 2002 might aim at transforming the situation from the uni-centric state agencies, concentrating on extensive power and roles, into the more stakeholder driven agencies with coordination roles, allowing input from stakeholders (Hakijamii Trust, 2008). The type of governance performed by Imarisha and IWRAP is definitely more stakeholder driven, but how do they act? Is it more centralized and why is it organised that way? These questions are answered by using the model of River Basin Governance.

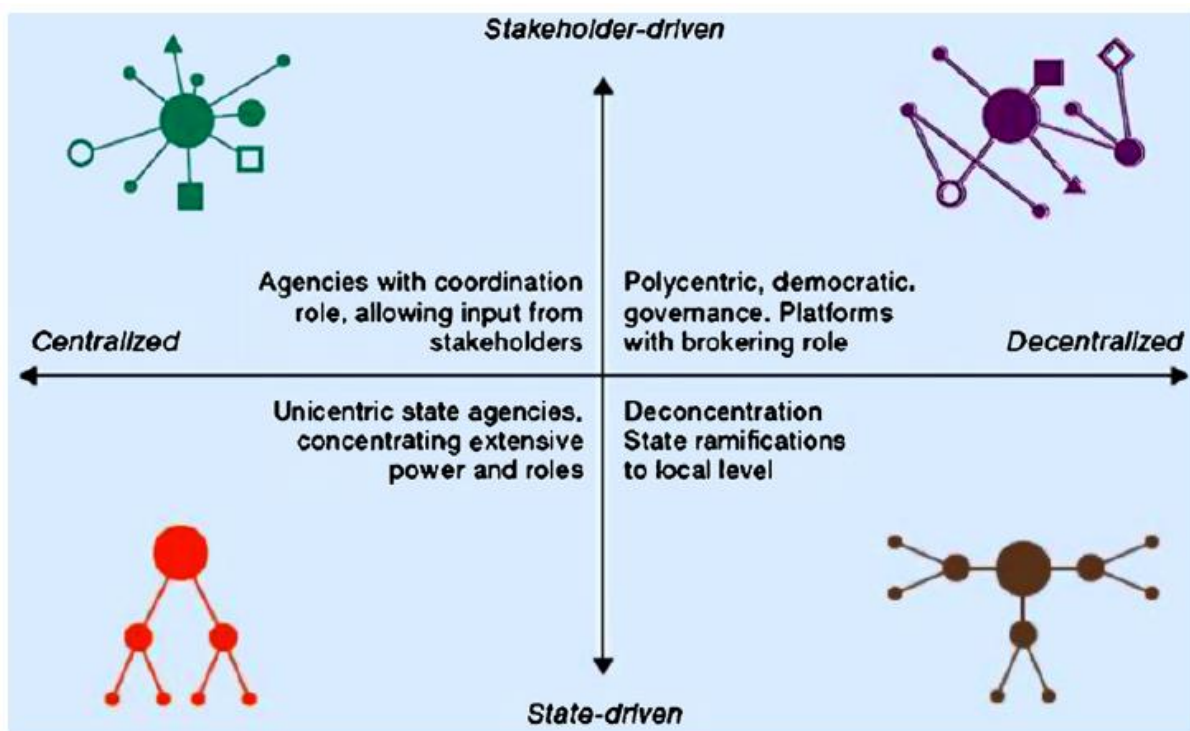


Figure 7: River Basin Governance, (Molle et al., 2007) Different typologies of governance can be classified by the elements of centralization and state-intervention.



2.3.2. Responses to water scarcity

Molle also provided a model of responses to water scarcity (Molle 2003). This model is helpful to investigate in which manner the authorities and the stakeholders are concerned and responsive towards the increasing demand of water in the LNB and results in terms of water scarcity. There are three main responses towards water scarcity, as can be seen in Figure 8 (Molle, 2003). The first is development, the reaction to augment the existing resources as well as tapping from new sources. The second response is about conserving the water. Improving the efficiency of already operational water resources without increasing the quantity. The third and last strategy is reallocation of water within or across sectors and basins. “Bribery, water theft and tampering with hydraulic infrastructure are also ways to reallocate water” (Molle et al., 2007 p. 595). Often reallocation is the last response towards water scarcity, because it goes along with conflicts. Reallocation can be on local level on the farm to gain a higher return per m³, it can be on regional level or irrigation system level and it can be on trans-basin level (Molle, 2003). This is because if one changes the pattern of water allocation, this results often in huge opposition and conflicts (Molle et al., 2007). The responses of conservation and allocation are often combined together in their approach, because those responses embrace the concept “doing better with what we have” (Molle, 2003, p. 13) This model of responses to water scarcity is helpful in classifying the awareness of increasing water shortage in the LNB.



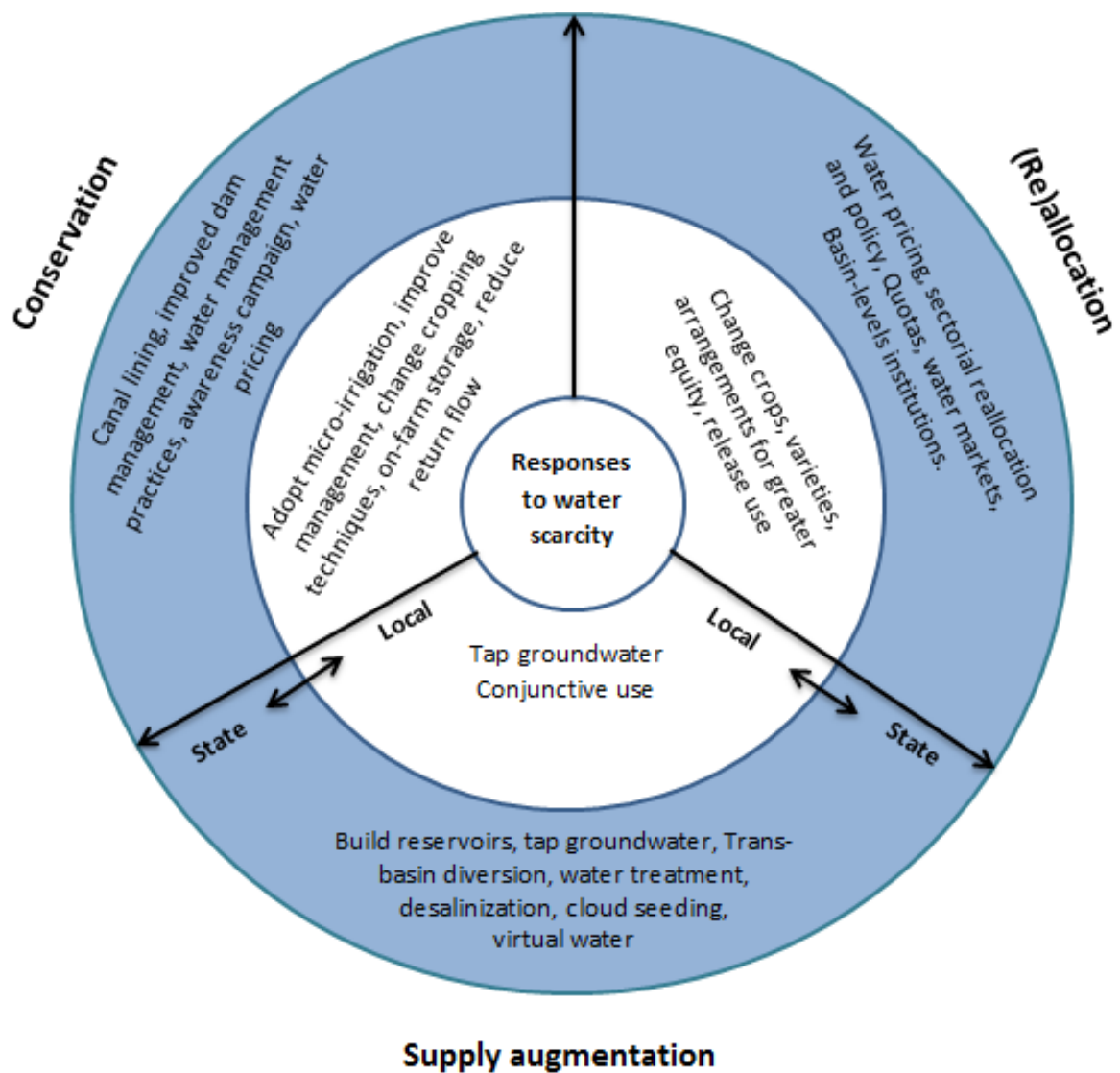


Figure 8: Responses to Water Scarcity. Molle distinguishes 3 responses to water scarcity: supply augmentation, conservation and (re)allocation. (Molle, 2003)



2.3.3. Integrated Water Resource Management

The concept of IWRM is used in this thesis research to analyse the IWRAP programme and to reflect on the feasibility of the project. Over the past two decades the concept of Integrated Water Resource Management (IWRM) became more popular due to the simplicity of IWRM and the possibility to receive funds for these projects (Biswas, 2008). The concept of IWRM is debated thoroughly and there are a lot of different definitions concerning IWRM. In this research the definition of IWRM by the World Bank is used. IWRM is the “*Perspective that ensures that social, economic, environmental, and technical dimensions are taken into account in the management and development of water resources*” (World Bank, 2003). Therefore the focus of IWRM is on a multidimensional approach for a multidimensional world. However through intensive analysis some negative reflections were published on integrated water management projects (Medema et al., 2008; Biswas, 2008). Firstly, the concept of IWRM is very vague, so everybody got their own understanding and definition about it, this fact “reduces the implementation potential to a minimum.” (Biswas, 2008, p. 14; Davis, 2007) Secondly, the attractive additional funds going along with the concept of IWRM, ensured that many people and institutions kept doing what they always did, only labelled by the new IWRM concept. Thirdly, despite of all efforts and donors, the results of IWRM projects are very meagre (Biswas, 2008) On the other hand IWRM projects can have massive impact, although a lot of literature is clear in their judgement that something needs to be done to improve and speed up the implementation. Additionally they stress that integration, coordination and education are of high importance for any success (Anderson et al., 2008; Davis, 2007).





METHODS

3. Methods

In the starting phase of the thesis research the focus was on extensive literature review about the LNB. Before the start of the fieldwork phase, reports, articles and BSc and MSc theses, were reviewed to get a better understanding and knowledge about the existing practices, the IWRAP and other connected initiatives and programmes. The theories and conceptual framework in this thesis research have been derived and extracted out of literature review. To answer the main question stated earlier, I conducted a case study research in the Lake Naivasha Basin. Data is collected in the period from September 2014 – December 2014. Unit of analysis was the water management and the perceptions on this management by commercial farmers, smallholder farmers and involved organisations.

3.1. Data collection and sample selection

During my thesis research I was hosted by WRMA sub-regional office in Naivasha. During the fieldwork, data is collected mainly through qualitative research through interviews and questionnaires. Additional methods were observation and literature research. The selection



of farmers was done in Naivasha. Selection was made through farmers that were willing to participate in the research. Therefore the sampling method wasn't based on statistical principles, but led by practical issues, constraints and willingness of the respondents. The size of the sample group was distinguished by the saturation point of information, meaning that not much new, relevant information was collected from new interviews. Several types of interviews are used to get a understanding of the water management, water use and governance in the different irrigation water user groups (commercial farmers using either groundwater or surface water and smallholder farmers) and involved organisations. The interviews that are held are informal, semi-structured and structured to get a representative picture and understanding of the issues and aspects of water management in the LNB. Data obtained from commercial farmers and smallholder farmers were mainly structured or semi-structured. The questionnaires used during the interviews were mainly structured by the ERA framework, ensuring the coverage of all echelons. The commercial farmers were approached by myself, while the smallholder farmers were invited by the Mkungi Kitiri WRUA. The interviews with commercial farmers were mainly structured (Annex I), although data is also obtained through informal chats with several commercial farmers. In the period of fieldwork I conducted 12 structured interviews with commercial farmers and 8 unstructured interviews with commercial farmers. With smallholder farmers a group discussion was organized and five semi-structured interviews were conducted. Besides the interviews with the farmers, structured interviews were conducted with IWRAP partners and other stakeholders. Structured or semi-structured interviews were conducted with the Project Coordinator of IWRAP, Imarisha, WWF, LNGG, LaNaWRUA, Mkungi Kitiri WRUA, Waterboard Noorderzijlvest and WRMA-Naivasha. Besides these structured interviews, a lot of data is obtained through informal interviews with WRMA-staff and farmers or other organisations visiting the sub-regional office of WRMA-Naivasha.

Besides the structured data collection a lot of data was collected through simple observations. Observation is an important technique to get a better understanding of the gained and perceived data that is extracted through interviews (structured, semi-structured and unstructured), data analysis and attendance of meetings. By attending several fieldwork activities and meetings of WRMA-Naivasha and joining WRMA-staff in day to day business I was able to place the collected data in its context (Fig. 9). Therefore observation played a big part in the analysis of the data.

Data collection at field level also consisted out of the analysis of data sets collected by different models concerned with water abstraction, water management and water use, however the availability of these data sets was minimal due to the lack of data monitored by WRMA-Naivasha. Due to time constraints and lack of equipment it was not possible to gain



own data of water abstraction, allocation and distribution. Additional qualitative data is collected by attending staff-meetings, the Annual General Meeting of LaNaWRUA, the presentation of the preliminary results and other meetings with stakeholders or experts. After collecting all the field data I gave a presentation about the preliminary results in front of all IWRAP partners and interested stakeholders. After the presentation there was room for discussion and this improved the preliminary data and provided additional information and reflection.

3.2. Data analysis

Firstly, the data is analysed on its validity, completeness and relevance. This is done by comparing the interviews, verifying the data through additional interviews and informal chats and continuing the interviewing and data collection until I reached the saturation point for new information. Secondly, the data collected in this research is analysed according to the theories, framework and concepts explained in the previous sections. These are the ERA framework (Boelens, 2008), supported by concepts from Foucault (1977) and Pahl-Wostl (2005), responses to water scarcity (Molle, 2003) and a model for river basin governance (Molle et al., 2007). All these concepts are embedded in the socio-technical approach (Mollinga, 1997) to analyse and classify a phenomenon that is not only technical or social, but socio-technical in its existence and occurrence. Besides the selected concepts, the data is linked to various academic articles to deepen the discussion, to reflect on the results in a broader context and to indicate the position of this research.

3.3. Research limitations

The most important research limitations in this thesis research are the sampling method and the sensitive topic and information concerning the research. In the discussion (9.3) I will elaborate on the research limitations, however it is good to consider the fact that the interviewees were selected by practical issues, distance and willingness. Some farmers refused to be involved in any research, therefore questions can be raised by their performance and consequently by the relevance and completeness of the results. Besides that the content of the research sometimes was perceived as sensitive, so considerations need to be made concerning the honesty of respondents and truth of data.





Figure 9: Experiencing the administration of Mkungi Kitiri WRUA. By observing and joining WRMA-staff in day-to-day activities I was able to understand the collected data in its context.





SETTING THE SCENE

4. Setting the scene

4.1. Study area

Lake Naivasha ($0^{\circ}45'S$, $36^{\circ}26'E$) is an endorheic shallow freshwater lake subject to natural fluctuations and human impact (Becht and Harper, 2002). The lake has no surface outlet and the runoff which is generated by the Lake Naivasha Basin (LNB) feeds Lake Naivasha and a connected aquifer, the lake Naivasha lakeside aquifer (De Jong, 2011). Due to the size of the catchment area and the volatile conditions (Kuhn et al., 2014) the lake levels are highly variable and this hinders proper predictions and effective policies (Van Oel et al., 2014). Lake Naivasha is an important area for industry and environment while it is known as a major site for horticulturalists and flower industry, producing up to 70% (US\$ 400 million) of the Kenyan horticultural output (Otiang'a-Owiti and Oswe, 2007; IWRAP, 2012).

Lake Naivasha is as well an important site for wildlife and birds, appointed a Ramsar-status and IBA-status (Important Bird and Biodiversity Area) (Ramsar, 2014; Birdlife International, 2014). The LNB covers approximately 3400 km², in the upper catchment a lot of small scale



agricultural activities are located, while the total irrigated commercial farm area is about 4500 ha, which is situated around the lake. Out of this irrigated area, cut flowers account for 43%, vegetables for 41% and fodder for 15% (Musota, 2008). In this research the focus is on the commercial farms surrounding the Lake Naivasha. These commercial farms are mainly situated in three parts: Flower Business Park (FBP), South lake and North lake (Fig.11). The farms in North lake and South lake largely depend on surface water, while the farms in the FBP depend on groundwater (CF3, CF1).

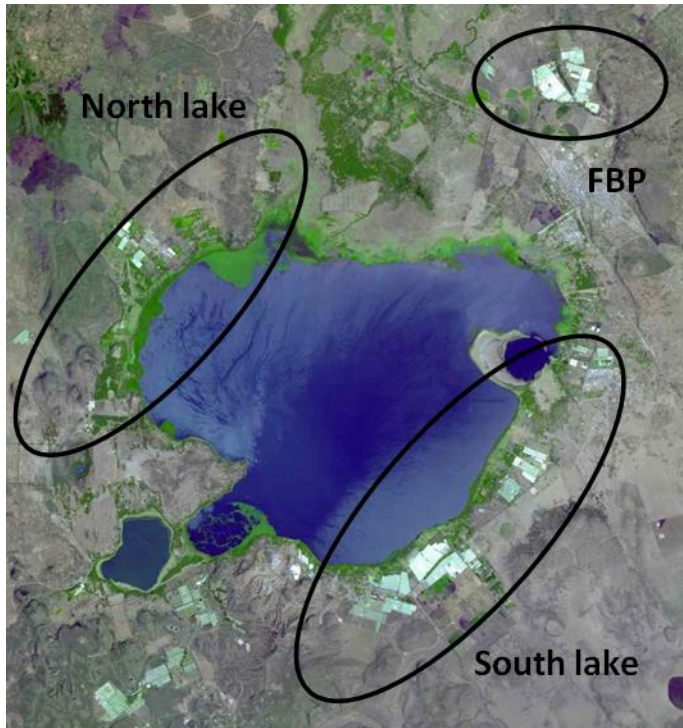


Figure 10: Location of horticulture and floriculture areas. Flower Business Park (FBP) situated north of Lake Naivasha, using only groundwater and the surface water users are situated around the lake on Southlake and Northlake (adapted from Google Maps).

Due to the presence of the flower industry the population of the Lake Naivasha Basin have grown rapidly over the past decades, from 230.000 people in 1979 to over 650.000 people in 2009 (WWF, 2011). Due to the flower industry a lot of direct and indirect job-opportunities were created around the lake, this population growth goes along with problems of untreated sewage and pollution along the lake shores (CF1; CF2; WWF. 2012).



4.2. Hydrology

Lake Naivasha is fed by different rivers entering the lake from the north. The Malewa river with a drainage area of 1,730 Km², which provides 80% of the surface inflow, the Gilgil river with a drainage area of 420 km² (Imarisha Naivasha Trust, 2012), that provides 18% of the surface inflow and a third river, the Karati river, which is a seasonal river that flows for about two months into the lake, and provides the remaining surface inflow (Fig. 11). River inflow, by the three rivers, and precipitation into the lake provides 85% of the water in the lake, while the remaining 15% enters the Lake via subsurface recharge (De Jong, 2011) The hydrology is characterized by its volatile conditions, this consequently results in unpredictable and variable lake levels (Kuhn et al., 2014; Van Oel et al., 2013).

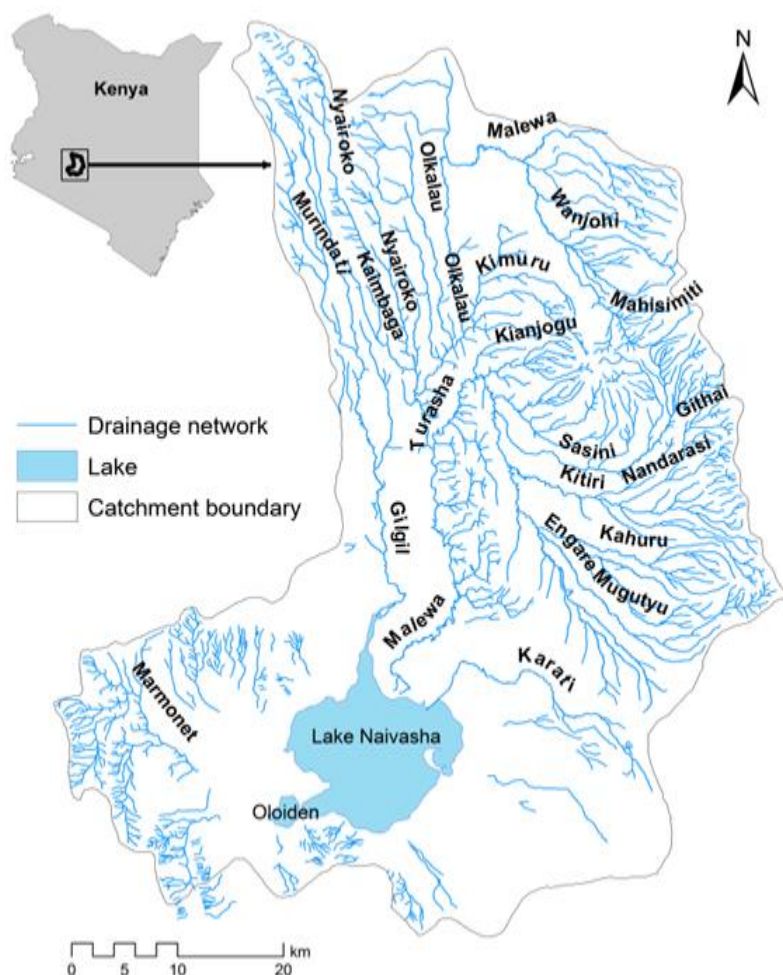


Figure 11: Location of the Lake Naivasha Basin in Kenya and its major inflows. The major rivers entering the lake are the Malewa, Gilgil and Karati rivers. (Imarisha Naivasha Trust, 2012)



4.3. Institutional framework

The implementation of the Water Act in 2002, created an institutional framework for regulation and legislation of the water sector in Kenya (E. van de Loo, 2011). “The purpose of the Act is to provide for the management, conservation, use and control of water resources and for the rights to use water” (Hakijamii Trust, 2002, p. 7) The Water Act presented some radical changes in the management of water in Kenya. Water services were separated from water resource management and the Water Resources Management Authority (WRMA) regulates and protects the conservation, catchment, water quality, wetlands and other water resources. In this thesis research the focus is on the Water Resources Management, so therefore only this part of the Water Act is explained. According to the Act, WRMA is supported and advised by Catchment Area Advisory Committees (CAAC), while conflict resolution and service provision is done by Water Resource Users Associations (WRUAs). All the WRUAs should have representatives in the sub-regional WRMA and all water users should be represented in the WRUA. In the Lake Naivasha Basin are 12 WRUAs (WWF, 2011; fig. 13). Two of these WRUAs, Mkungi Kitiri and LaNaWRUA are WRUAs in which IWRAP is implementing pilot-projects. The WRUAs exist to provide most of the services at field level. They have been established and formalized by the Water Act 2002. The Ministry of Water and Irrigation (MWI) is on the top of the pyramid and has the overall sector oversight (Fig. 12). All the water resources should be managed according to the Water Act and the State got ownership over all water resources in Kenya (van de Loo, 2011). “The Water Act obliges a permit to be obtained for the exploitation of water resources” (Hakijamii Trust, 2002) So the Water Act is the legal framework in which water allocation, water distribution and the establishments of water rights are carried out.

The sub-regional WRMA office of Lake Naivasha Basin is situated in Naivasha Town. This sub-regional office falls under the regional office in Nakuru, who are in charge of the Rift Valley catchment area. All these sub-regional and regional offices need to be accountable to the WRMA headquarters in Nairobi.



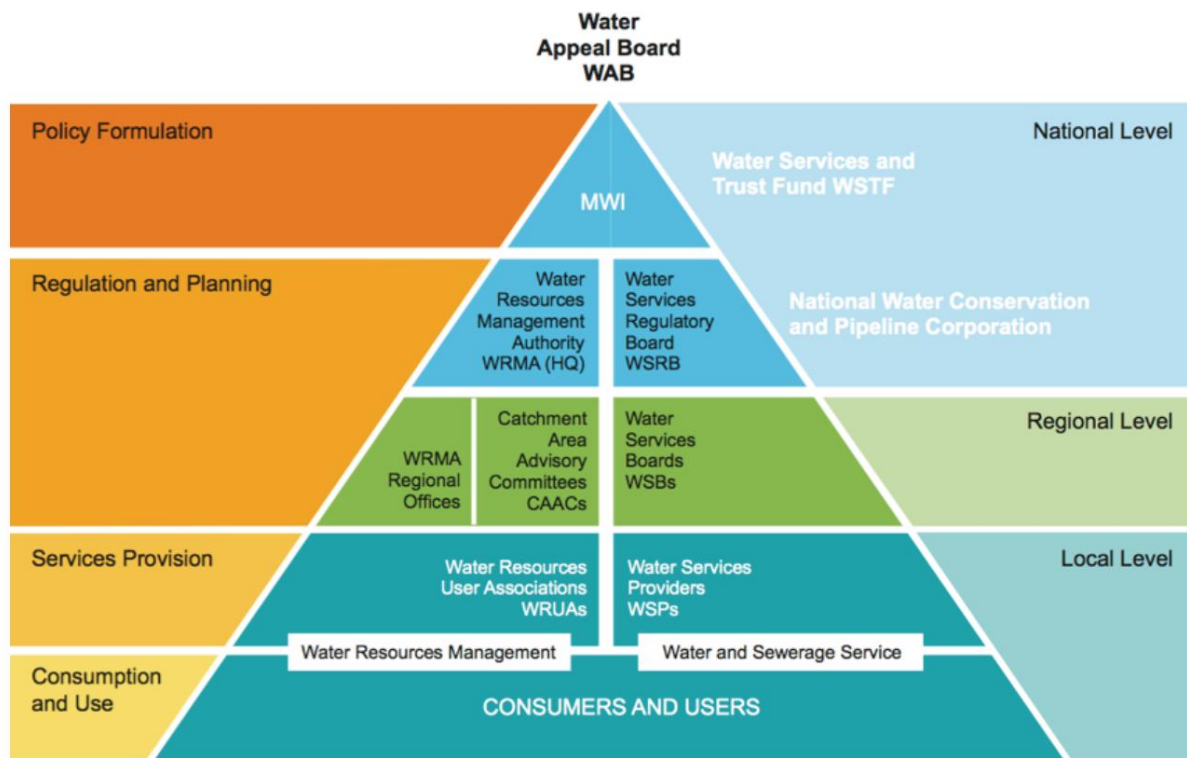


Figure 12: Institutional framework from national to local level. In the LNB there are 12 WRUAs, WRMA-Naivasha is a sub-regional office, they are accountable to the WRMA regional office in Nakuru. WRMA-Naivasha is situated between the local and regional level in this framework. (GoK, Water Act, 2002)







RESOURCES

5. Resources

This chapter describes the water resources in the LNB, covering the first echelon of the ERA framework. Distinctions are made between the different irrigation water user groups and how they access their water resources.

5.1. Upper-catchment and LaNaWRUA

In the Lake Naivasha Basin several water resources are used in the irrigation sector. The geographical location highly influences the access to a particular water resource. The smallholder farmers in the upstream catchment are all using rainwater as their main water source, only in the driest months (January-March) they sometimes use the domestic tap-water for irrigation (MK 1 – MK 5). This domestic tap-water is provided by 18 different Water Supply Projects (WSP) in the Mkungi Kitiri sub-catchment. Officially this water is not meant for irrigation purposes, although many farmers use it during the driest months (IP2). Only few farmers in the Mkungi Kitiri sub-catchment are using river-water for irrigation. Reason for this limited use of river-water is the fact that one can depend on rain-fed agriculture for nine months a year, while only the driest months (January-March) needs additional



irrigation, the investments of infrastructure to abstract water from the river are therefore too high for smallholder subsistence farmers (MK3). The farmers don't know exactly how much water they use. There is no limitation and monitoring of their use. They pay the WSP per day and not per volume of water (MK1, IP2). There is enough water for everybody, so that might be an explanation why the WSP is not bothered by the fact that farmers use the domestic water for irrigation as well. The WSP is not even using half of the allocated amount of water (IP2). The major problem according the water resources in the upstream catchment is the erosion and damage of riparian lands. After rainfall the water goes so fast downstream, taking a lot of sediment with it, that the people cannot benefit from it anymore, besides that it is dangerous (MK1). This problem is however also a problem for communities downstream and for the water quality in the lake (CF1, CF2, IP3, IP5).

More downstream, towards the Lake Naivasha, there is not enough rain and the evaporation is too high to sustain rain-fed agriculture (Becht and Harper, 2002). So in the Lake Naivasha sub-catchment (LaNaWRUA), the farmers are using either groundwater or surface water for irrigation. There is a clear distinction in the uses of these water resources. Farms in the Flower Business Park (FBP) (Fig. 11) are using solely groundwater because of their geographical location too far from the lake and the fact that the groundwater is easy accessible and of good quality (CF1, CF3, CF10, CF11). The farmers along the shores of Lake Naivasha (See farms in Southlake and Northlake in Figure 11) are using mainly surface water, although there has been a shift to groundwater in the past 5 years (CF5, CF9). Main reason for this shift is the severe drought in 2009-2010, which affected the farms in Southlake considerably. They were forced to dig large gullies in to the lake in order to get the water to the farms (CF2, CF5, CF6, CF7, CF8, CF9). In reaction to this drought event some farms, using surface-water, decided to switch partially to groundwater (CF5, CF9). Another reason for the change to groundwater is the poor quality of the surface water (CF5, CF9), although there are also complaints about the quality of the groundwater (CF1, CF3, CF4). The surface water is polluted by several sources. Population growth and the open sewage are major polluters for the lake (CF2, CF1, CF6; Otiang'a-Owiti & Oswe, 2007; WWF, 2011), several settlements (Karagita, Kihoto, Kongoni) have been established alongside the lake and they have grown rapidly in the past years. Another source of pollution for the lake water is the influence of agriculture and the use of pesticides and fertilizers, especially the area of the Malewa mouth in the lake is a concerning area, because of the agricultural nutrients and pesticides coming from the upper catchment (WWF, 2011). This is a hot topic among the farmers in the LNB. The smallholder farmers upstream are blaming the commercial farmers for polluting the lake (MK1-5, IP2), while the commercial farmers downstream are blaming the farmers in the upstream catchment for polluting the rivers and streams and therefore as



well Lake Naivasha (CF1, CF2, CF8, CF3), to cite one of the farmers (CF10):

“We are doing our best in order to make a business and to preserve the lake, while the farmers upstream are polluting the lake and pointing to us as the source of pollution and you know why? Because we have the money.” (CF3)

This is a striking example of the conflicting views about who is polluting the lake.

Another important change that can be recognized is the introduction of hydroponics for irrigation. This is a manner of irrigation that increases the application efficiency for the farmers and several farms are already 100% hydroponic (CF5, CF1, CF11, CF8), while others are aiming to get a 100% coverage of hydroponics (CF3, CF4). Due to the commotion and awareness creation about water shortage, the commercial farms are searching for new or more efficient ways to irrigate in order to retain their business. The shift to hydroponics is one of those methods, other methods are rainwater harvesting (CF2, CF4, CF3) and reuse of wastewater (CF1, CF3, CF5, CF8, CF9, CF11). This responses to water scarcity will be explained more elaborately in section 6.4.

5.2. Water use and allocation

The water use in the LNB for commercial farms is roughly between the 4-8 litres per square meter. This amount of water decreased over the past decades, due to the mentioned methods to get a higher application efficiency in irrigation. Because of the decreased actual amount of water per unit of land, the allocated abstraction amounts are often far too large for the commercial farms, but they want to keep these permits for the huge amounts of allocated abstraction amount, because this is the amount that will be decreased concerning to the Water Allocation Plan (WAP) in water scarce periods (WRMA, 2010; MT3). However, these allocated abstraction amounts are based on data from years ago, they are still in place to be used if water get scarce again (IP1, IP3, CF8, IP8). Practically speaking, this gap between allocated and actual abstraction can be outlined by some examples. In FBP and Southlake there are similar cases of farms that own allocated abstraction permits of 2000 m³ a day, however they only use 1000 m³ a day. The commercial farms try to maintain this gap, due to the consequences of the WAP (MT3, CF1, CF10, CF3, CF8). The commercial farms prefer to receive fines for non-compliance than to lower their abstraction amounts (CF2, CF3, CF8, IP6, MT2, MT3). Besides the fact that this gap exists, the commercial farmers have the power to maintain it, this is a result of their powerful discourse, which is discussed later (7.1). The WAP made a threshold system, according to the lake level. At a lake level between 1885.3 meters (a.s.l.) and 1884.6 meters (a.s.l.) the irrigators need to draw 75% of their water use, while they need to draw 50% of their water use at a lake level between 1884.5 meters (a.s.l.) and 1882.5 meters (a.s.l.) (WRMA, 2010). So commercial farmers are very motivated to keep



their allocated abstraction amount as it is and they even prefer fines, while these amounts have been calculated years ago, when the irrigation methods were not that efficient as they are nowadays (MT3). In Table 2 the actual abstracted amounts as reported by the farmers themselves and their water source and size are listed.

Water use charges for Irrigation

up to 300 m ³ /day	0,50 Ksh/m ³
over 300 m ³ /day	0,75 Ksh/m ³

Table 1: Water use charges for irrigation (WRMA, 2007)

Company name	Product	Water use	Size	Water source
Flower Business park commercial farmers				
Terranigra (Colourvision)	Breeding roses	40 m ³ /day	0,6 ha	groundwater
Interplant Roses	Breeding roses	220 m ³ /day	2,5 ha	groundwater
Maridadi	Roses	1680 m ³ /day	42 ha	groundwater
Panda Flowers	Roses	1000-1400 m ³ /day	40 ha	groundwater
Southlake commercial farmers				
Twiga Roses	Roses	6700 m ³ /day	135 ha	surface water
Jay Consultancy	Testing pesticides	50-150 m ³ /day	8 ha	surface water
Longonot farm ltd.	Breeding roses	30 m ³ /day	1,5 ha	surface water
Florensis	cuttings garden flowers	450 m ³ /day	13,5 ha	surface water
V.d. Berg Roses	Roses	2500-3500 m ³ /day	72 ha	groundwater (30%) + surface water (70%)
Nini farm	Roses	1000 m ³ /day	42 ha	groundwater (85%) + surface water (15%)

Table 2: Companies with their features

The amount of water that is allocated to a farm is categorized by a class-permit system. This system is designed by WRMA headquarters and is made official in the Water rules of 2007 (WRMA, 2007). In Table 3 and Table 4 the class permits can be found, in the next chapter the class-permit system and the accompanying rules are explained (3.2). All abstractors in the LNB need to pay for their water consumption. The rates for the water use for irrigation are defined in the Water rules and are set on 0.50 Ksh/m³ or 0.75 Ksh/m³ by over-abstraction, the exact figures can be seen in Table 1 (WRMA, 2007). In the upper-catchment the WSP will pay WRMA-Naivasha for the abstraction of water on behalf of their members (MK1-5, IP2) In the LaNaWRUA sub-catchment the commercial farms mainly have their own



boreholes, consequently they pay for the abstraction themselves. However, FBP distributes the water among their members, so those members will not pay directly to WRMA-Naivasha (CF1, CF3, CF4, CF10, CF11).

In this research there were contradictory claims whether there is water scarcity and over-abstraction or not. In the class permit of groundwater abstraction can be seen that the status of the Lake Naivasha aquifer is Alarm (WRMA, 2007), while several academic articles and researches also claim that there is or will be water shortage and over-abstraction in the LNB (Otiang'a-Owiti & Oswe, 2007; Kuhn et al., 2014; GoK 2002, KWS & WWF, 2012). These contradictory claims concerning water scarcity can be understood in the light of the volatile and fluctuating conditions of the rainfall and the lake levels (Kuhn et al., 2014). Due to this high changeability and the lack of data it is hard to predict the water quantity problems. In interviews, conversations and observations within WRMA it is seen that they are currently not bothered at all by water scarcity; to cite employees of WRMA-Naivasha (IP7):

“The media and the NGOs like to create these problems of water shortage and over-abstraction, so funds will come to Naivasha, so this over-abstraction problem and the water shortage problem only exists on paper. If there is a drought it is a natural event. What can people do about that?”

This remarkable difference in concerns about the water availability might hinder the development of any integrated program towards an improved water availability in the LNB, due to the poor understanding of the actual problems such as the changeability and the lack of data (Van Oel et al., 2014; Kuhn et al., 2014). The farmers that are interviewed argued as well that water quantity was not a problem, on the contrary water quality is a bigger problem nowadays (CF1, CF2, CF3, CF7). It needs to be considered that these arguments are collected in a context of a water abundant situation in the period September-December 2014. Although, the claim of poor water quality is relevant because the informal settlements around the lake (Kasarani, Kihoto, Kongoni) results in pollution such as: chemical waste in the lake, open sewage ending up into the lake, cattle drinking and defecating in the lake and other chemicals and plastics ending up in the lake (CF2, CF7, CF3, CF8, CF10). Several farmers opted for action towards these polluting habits (CF2, CF3, CF10).



Thresholds in m ³ /day for Surface water				
Class A	Class B	Class C	Class D	Sub-catchments
up to 20	> 20 – 500	> 500 - 1000	> 1000	Rivers Malewa, Wanjohi, Oleolondo, Nyairoko
up to 20	> 20 – 500	> 500 - 1000	> 1000	Turasha – (Mukungi, Kitiri, Sasini, Nandarasi, Kinja)
up to 20	> 20 – 500	> 500 - 1000	> 1000	Gilgil, Little Gilgil and Kiriundu rivers
up to 20	> 20 – 500	> 500 - 2500	> 2500	Lake Naivasha

Table 3: Surface water thresholds (WRMA, 2007)

Thresholds in m ³ /day					Status
Name aquifer	Class A	Class B	Class C	Class D	
Lake Naivasha Lakeside	up to 20	> 20 - 99	> 100 - 999	> 1000	Alarm: Over-abstraction, declining water quality (pollution risk); geothermal recharge
Kinangop	< 10	> 10 - 20	> 20 – 40	> 40	Satisfactory: Under-exploited, some Water Quality concerns
Njoroi	10	> 10 - 25	> 25 – 50	> 50	Alarm: Issue: Inadequate quantity, poor quality: over abstraction taking place

Table 4: Groundwater thresholds (WRMA, 2007)

The farmers in LaNaWRUA are accessing and materializing their water resources very individually. They bought and installed the borehole or surface water pump by themselves and the operation and maintenance costs are also their responsibility (CF6, CF2, CF7, CF8, CF9, CF11). They pay their actual abstraction fee to WRMA-Naivasha, but furthermore they are fully responsible for the access and materialization of the water resources. The farmers at FBP are helped by the management of the FBP, they own 8 boreholes and they distribute water among the farms on FBP, although several farms on FBP are independent and have their own borehole (CF1, CF11). The commercial farmers are nowadays concerned with the investments they make in order to increase their application efficiency and develop new methods of water collection and abstraction. Introduction of hydroponics, rainwater harvesting and wastewater treatment is costly, but all farms are responsible for their own water provision, so they should pay for all those investments. This is a huge difference with the smallholder farmers upstream. They are all members of a WSP, the WSP is responsible for the operation and maintenance of the piped system, while the farmers only pay a membership fee and a monthly fee for the water.



Due to the individual character of the water abstraction, conflicts are scarce in the LNB. All farmers state that in the last 10 years there were no conflicts between the farmers in the LaNaWRUA sub-catchment, but also not between the upstream and downstream farmers. They act independently from each other, so they don't bother what the others are doing (CF2, CF8). The only conflicts that are mentioned by the farmers are between WRMA-Naivasha and the farmers, because WRMA-Naivasha got some problems with enforcement and permit delivery (CF1, CF2, CF3, CF5, CF8, CF9). This issue on permit delivery is explained in a later chapter (6.2).

5.3. Future perspective

The future perspective of the water resources is very uncertain. A lot of different organizations and institutions are worried about the sustainability of the LNB and are working on approaches to make it sustainable for the future. Initiatives and projects like IWRAP, WAP, Lake Naivasha Basin Integrated Management Plan (LNBIMP) and Sustainable Development Action Plan (SDAP) are all focused on "Sustainable land and water management for people, businesses and nature in the Lake Naivasha Basin, Kenya" (WWF, 2012, p.8). Further on in this thesis a elaboration on the success and impact of those projects and initiatives can be found, especially on the impact of IWRAP (8.1). Some farmers are also concerned about the future perspectives of the LNB. Nowadays there is enough water to satisfy all the farms in the LNB, but the farmers still refer to 2009-2010, when there was a severe drought and some farmers, especially the commercial farmers using surface water, were hit by water shortage (CF2, CF5, CF9). By referring to the last drought, farmers also fear a new drought, but they are uncertain what will happen in those days (CF1, CF2, CF3, CF8, CF9, CF6).

"Nowadays there are no problems with the quantity of water, because the last four years there was enough rain, so the lake and the aquifers are very full. This was very different in 2009, when the water was really scarce. But what will happen if there will be scarcity again... that is the question. I think that in those days there are huge problems with the rules. Because, everybody wants to survive and maybe it will be the survival of the strongest in those days?" (CF1)

Also academic articles mention the increasing pressure on water resources in the LNB. Kuhn et al. (2014) argued that, whatever is done according to the WAP and other enforcement strategies, the lake level will decline in the coming 20 years. Also other researches and farmers claim that through the big natural variability and unpredictable rainfall the short-term changes are present, but also the long-term lake levels are prone to decrease (Van Oel et al., 2013; Van Oel et al., 2014; Becht and Harper, 2002; Otianga'a-Owiti and Oswe, 2007;



CF1). Farmers using surface-water as their main source of irrigation tend to be more worried about the future than the farmers in FBP. The FBP is depending on groundwater and the farms on FBP think that this will last longer than the lake. This is hard to say due to a knowledge gap that exists about the hydrological subsystem (Van Oel et al., 2014). The effect of abstraction on the lake levels is estimated (Van Oel et al., 2013), but the difference in abstraction of groundwater and surface water is not clear (Van Oel et al., 2014). Farmers around the lake are more dependent on the lake water and these levels are fluctuating and subject to volatile conditions (Kuhn et al., 2014).

The question who is responsible for the decrease of lake levels is hard to answer, but it might be very interesting to investigate. In the chapter of discourses the different discourses are analysed and presented. These discourses shape the way in which one interprets and perceives the water management in LNB. Therefore this question about who is responsible for the decreasing lake levels and the questions about which facts are presented as truth are discussed later (7.6).





RULES & AUTHORITY

6. Rules & Authority

Water management in Lake Naivasha Basin is characterized by a lot of rules, policies, organizations and institutions. Reasons for all this attention and legislation in the basin are the multiple resources and possibilities available in the LNB. WRMA-Naivasha, as the manager and legal authority of water resources, is concerned with water allocation, catchment protection and conservation, delineation of catchment areas, water resource assessments and conservation, collection of water use and effluent discharge charges, protection of wetlands, monitor and enforce conditions connected to permits for water use, to regulate and protect water quality and to gather and maintain information on water resources and from time to time publish forecasts, projections and information on water resources (WWF, 2011; GoK, 2002). WRMA is the officially established authority by the Water Act, 2002 (GoK, 2002). As explained earlier (Fig. 13), 12 WRUAs are established in the LNB (Fig. 10), WRMA-Naivasha is the coordinating body. These WRUAs are implemented to be the link between water users and WRMA and to help WRMA to perform the duties.



6.1. Organisations in LNB concerning water management

Several organizations are crucial, concerning water management, allocation and distribution. These are WRMA-Naivasha, the WRUAs, Lake Naivasha Growers Group (LNGG) and FBP. WRMA-Naivasha and the WRUAs and their function is explained above. LNGG is present in the LNB since 1997 and they strive for balance between commercial and environmental sustainability. *“To this end, LNGG has an explicit mission to promote the conservation of the natural resources in and around Lake Naivasha, thereby ensuring the commercial sustainability of the areas horticultural growers, through the fostering of best farming practices amongst its members for the benefit of all stakeholders”* (LNGG, 2014 website). The members of LNGG are mostly situated in south lake and north lake. The FBP is there for their own farmers. The FBP provides service for the farmers on FBP and they are intermediates between those farmers and WRMA-Naivasha, because most of the boreholes in FBP are owned by the FBP. If there are complaints, the farmers connected to LNGG or FBP often go via these organizations to WRMA-Naivasha. However, some farmers complain about the weak lobbying power of these organizations (CF8, CF3). Also the WRUAs got the function of intermediates between farmers and WRMA-Naivasha. Although only a small number of farmers are member of LaNaWRUA (only 67 members), the area covered by members of LaNaWRUA is big. The WRUA of Mkungi Kitiri consist of a small number of active members, while officially everybody is indirectly a member if they receive water from a WSP (MK2, IP2). Therefore the function of the WRUAs is limited. In the last two years, through support of IWRAP, the WRMA-WRUA agency is stimulated again. This plan targets more responsibilities for the WRUAs, to unburden WRMA-Naivasha from a lot of activities (Subsidiary Legislation, 2013). LaNaWRUA and Mkungi Kitiri are the pilot-WRUAs in this project. Monitoring and collection of data, reporting of non-compliance and revenue collection are elements that should be transferred to the WRUAs (Subsidiary Legislation, 2013), although some critics are heard. Firstly, the WRUAs don't have the capacity for executing all activities. Secondly, how will the WRUAs be paid for these activities? Thirdly, the WRUAs don't get the trust, confidence and authority to collect the revenue. It is clear that the legal authority lays with WRMA, although they don't have the capacity to develop the enforcement in the LNB. The other organizations are not organized or powerful enough to support WRMA-Naivasha.

The commercial farmers in the LaNaWRUA sub-catchment are acting quite individually. They are not asking for any help from other organizations. They prefer to act alone and access the water resources themselves. One of the farmers mentioned that the farms around lake Naivasha are big enough to operate individually, they don't need each other (CF8, CF4). So they are not that much interested in organizations like LNGG, WRUAs or WRMA-Naivasha.



Only the farms in the FBP are linked together due to the access to the boreholes. The majority of the farms receive their water from FBP, so there is a certain level of cooperation there (CF1, CF3, CF4, CF10, CF11). The farms directly around the lake are acting totally individual (CF5, CF6, CF7, CF8, CF9). LNGG is the lobbying group for these farms, but they are not very active and farmers are not very positive about them (CF8, CF2, CF9). The farmers of the Mkungi Kitiri sub-catchment are organized by the WSP, although this WSP functions as a umbrella organization, the farmers of the Mkungi Kitiri sub-catchment are also acting quite individually. In this individual-acting environment it is hard for organizations to create awareness and to create a well-functioning enforcement strategy.

6.2. Legal rules and application for permits

The rules that are followed legally are the rules established in the Water Act 2002. These rules are very clear concerning authority and management of water resources. WRMA is established according to the Water Act and WRMA is highly structured by it. Most of the interviewed farmers, commercial and smallholder, acknowledge the Water Act 2002 as the leading legal rules in water management. Although, all of them know about the existence of the Water Act 2002, nobody knows what is in it and what the exact rules are. Smallholder farmers in the Mkungi Kitiri sub-catchment openly admitted, in the presence of the WRUA chairman, that they don't know the rules and that they violate the rules of the WRUA and WSP, by irrigating their fields with allocated domestic water (MK1-5). Almost all commercial farmers stress the fact that the farmers and the community don't know the rules as well (CF1, CF2, CF4, CF5, CF6, CF7, CF10, CF11). You can see the trend that the farms just do what they do and change this working-method if WRMA-Naivasha complains. Several commercial farmers as well as the farmers in the Mkungi Kitiri sub-catchment opted for a workshop or training by WRMA-Naivasha or the WRUA to create awareness of the existing rules concerning water management (CF2, CF6, CF7, CF9). To materialize the water rights in the LNB one need to apply for a permit for water use (IP2, MT2, MT3, CF1-12). These permits have to be issued by WRMA-Naivasha. For all permit applications the farmers first need to visit the sub-regional office of WRMA-Naivasha, after that the permits for class A and B can be issued by WRMA-Naivasha, while the permits for class C and D need to be approved by regional office in Nakuru or WRMA headquarters in Nairobi (MT3; WRMA, 2007; Table 3-4). The official permit application process can be seen in Figure 14. WRMA-Naivasha, as a sub-regional office, is responsible for almost the whole process, except the issuing of the permit itself. Commercial farmers around the lake complain a lot about the issuing of permits, especially the class C and D permits. Several commercial farmers are waiting 3-5 years to get a valid permit (CF1, CF3, CF7, CF8). They are able to continue abstracting water, but officially they don't have a valid permit. The commercial farmers blame WRMA-Naivasha



for this issue, while WRMA-Naivasha claims that it is not their fault, because the applications are pending at WRMA headquarters in Nairobi (MT3, MT4, AGM, ST1). The reality is that often not all of the required documents are available for the application process, but this is not reported to the applicants. Therefore the applicants of permits are waiting very long for their permits. In Figure 14 you can see the permit application process. The issuing of the permit is the biggest problem, because in this step WRMA-Naivasha is dependent on Nakuru regional office or Nairobi headquarters. However in the steps before the issuing of the permit, WRMA-Naivasha also miss critical points in the process. So it is not fair to blame the regional office and headquarters only. The main point WRMA-Naivasha forget is the feedback to the farms if they miss crucial documents for the application (CF1, CF3, CF7, CF8, CF6, IP1, MT3). Due to this long pending period, the confidence and trust in WRMA-Naivasha is lost and WRMA-Naivasha is no longer seen as a strong authority.

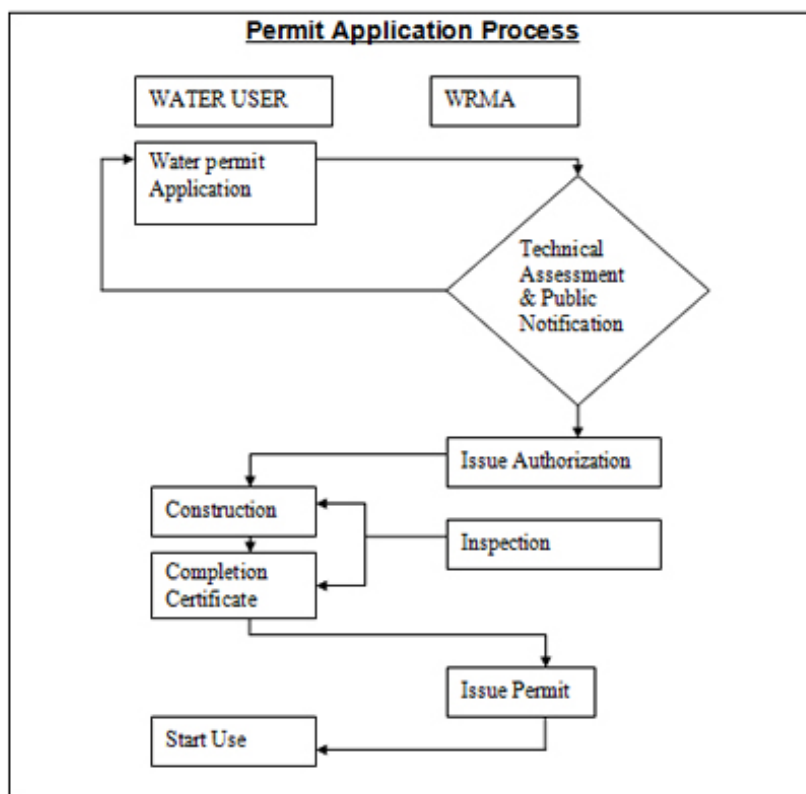


Figure 10: Permit Application Process (WRMA, 2014) WRMA sub-regional office of Naivasha is responsible for almost the whole process. Only the issuing of the permit is performed by the regional office in Nakuru or the headquarters in Nairobi. The issuing of the permit causes a lot of troubles and take a lot of time.



The commercial farmers around the lake, argue that the rules in Kenya concerning water management are perfect, but that the reality is totally different. This claim was stated in several ways, including the following citations:

“I don’t know the rules by heart, but the rules are very, very good in Kenya. No any problem with them, I only have a problem with the authority” (CF8)

“The big problem with authority of water allocation and management is the gap between policies and politicians. There can be awesome good policies, but the politicians will do their own things. It will happen as the politicians or the rich want, instead of good policies being implemented. Policy makers are very smart, intelligent people, but they are overruled by the stupid, dumb politicians. These politicians profit of the institutional framework and the culture of Kenya. The bad people have the real power to decide what happens. You just need to bring enough money and then you can decide what will happen. If this gap between policies and politicians will not be closed, it will be impossible to implement successful policies and projects.” (CF7)

The argument of the commercial farmers is that there is nothing wrong with the rules, but the institutional framework and the position and power of politicians and rich people creates a situation in which the compliance of the rules and policies is lacking. The example of the gap between policies and politicians is a striking one. According to this gap between policies and politics, it is hard to implement any rules or to enforce them. Farmers told examples about permits which were not given by WRMA-Naivasha or problems they had with WRMA-Naivasha, these problems were solved by addressing higher politicians or friends in the Ministry of Water and Irrigation (CF7, CF8, CF9). In these cases WRMA-Naivasha is overruled by the powerful politicians or by the money and connections of commercial farmers and the paper-rules will never be followed (IP1). This overruling of WRMA-Naivasha affects its authority in the LNB. Farmers know how to get around WRMA-Naivasha to get things done. The personal interests seems to be more important than the policies and the established frameworks in the Water Act 2002. In this way of working it is hard to implement any good policies, until the gap is closed between policies and politics. This gap exists because of the strong culture in Kenya. Several farmers had opinions and explanations about the reason why policies and rules don’t tend to work in Kenya, a quote to illustrate:

“Kenyan culture is not a culture of strict regulations. They don’t have that strong community feeling to make something out of it with a community or with a big group of people. If resources become scarce they only think about themselves and their family or tribe. The others can suffer. If you don’t have a community feeling,



you will never build an authority or a community that can be strict and regulative in a proper way.” (CF1)

The compliance to the rules seems to be variable in the LNB. A big group of farmers chooses to follow the rules as good as possible because water is an important factor for their business (CF1, CF3, CF4, CF8, CF9). They cannot afford to lose the allocated water, so they are really willing to comply to the rules. Although there are also farms that still have greenhouses on the riparian lands, which is forbidden. These farmers don't bother about WRMA-Naivasha and its authority. They take the risk of fines and disconnection, because they say that through connections and corruption they will manage to keep the flow of water coming (CF9). An interesting topic is the question: 'What will happen when water get scarce?' Nowadays there is enough water, this results in a quite good harmony between farmers and WRMA-Naivasha and in ignorance of the rules, as stated by one of the farmers:

“There is no need to look very carefully to the rules nowadays. When there is scarcity however, the people will be more precise again” (CF1)

But what will happen with the authority and the enforcement when water gets scarce? And how will commercial farmers comply to the rules in those days? These questions were asked to the farmers in the LNB and the responses varied a lot. Several farmers claimed to comply to the rules, even when they have to reduce their water abstraction and consequently their production for the sake of the water availability for domestic uses and a sustainable environment. Although the bigger part of the commercial farms argued that they will never stop abstracting the water they need and that nothing can stop them of doing this (CF1, CF3, CF8, CF2, CF9, CF5). They claim that their business is too important for the LNB, Kenya and their employees to stop it. The Water Allocation Plan (WAP) is a plan that comes into action when water is getting scarce. It is initiated after the droughts in 2009 by LNGG and implemented by WRMA-Naivasha in 2010. There are big billboards to create awareness of the lake level in Naivasha and the WAP made a threshold system, according to the lake level. At a lake level between 1885.3 (m.a.s.l.) and 1884.6 (m.a.s.l.) the irrigators need to abstract 75% of their water use, while they need to reduce 50% of their water use at a lake level between 1884.5 (m.a.s.l.) and 1882.5 (m.a.s.l.) (WRMA, 2010). Despite the existence of this legal document, supported by WRMA-Naivasha, the commercial farmers don't believe in a functioning WAP:

“Haha, this WAP. What do they think, it is bullshit. When water is getting scarce, the people/growers at the lake they have a problem. But we do not have a problem. We will just use the water that is in the boreholes. Thousands of people are working here, who will tell us to stop using water. They cannot force thousands of people to



be jobless. Some institutions or NGOs think they can stop a business with almost 100.000 direct or indirect employees, well I would like to see that happen... that will never happen, what will these thousands of people do?” (CF3)

“WRMA defines the rules on paper, in reality they don’t have any authority, however they pretend they have a lot of authority. But for example the rules and the enforcement as well as the Water Allocation Plan is worth nothing. It is nicely written and thought off, but it will not work in reality. Because do you think a flower business can run without or with a deducted amount of water? This will never happen, the business needs to continue. Also this branch of business is too important for Kenya to lose. They need the dollars we export, otherwise there are big problems. So we will always be supported by the president and the government.” (CF8)

This critique on the WAP is somehow remarkable, because it was an initiative of the LNKG, implemented by WRMA-Naivasha (WRMA 2010, IP1). The LNKG consists out of farmers that are located mainly around South lake using surface water, although the results show that also the Southlake farmers are criticizing the WAP. So nowadays they criticize their own initiative.

Another critique on rules and authority in the LNB that is often heard is the amount of institutions and organisations. Several commercial farmers stated that they didn’t know what all these abbreviations meant and what they are doing in the LNB (CF1, CF3). They don’t want to be involved in those organisations because it is a lot of talking and nothing happens. There is also a lot of confusion about the roles of WRMA and National Environmental Management Authority (NEMA). Both governmental organisations are collecting revenue and farmers are confused by that. Commercial farmers complained about the fact that NEMA and WRMA-Naivasha are both collecting revenue for the effluent discharge (CF11, CF9, CF1), therefore the image of greedy, money-grabbing institutions is enhanced (CF9).

6.3. Functioning of sub-regional office WRMA-Naivasha

Besides the confusion, caused by the number and duties of all institutions and organisations, WRMA-Naivasha also performs poor according to most of the farmers. Only one farmer was really satisfied with the activities and performance of WRMA-Naivasha (CF11). The reason might be that this was a relatively young farm, without a long history of experiences with WRMA-Naivasha. The other farmers are blaming WRMA-Naivasha for the long pending period for water use permits and for the fact that they are only interested in revenue-collection and not in providing service (CF1, CF3, CF5, CF6, CF7). They lost confidence in WRMA-Naivasha, because of the long pending period for permits and the fact that WRMA-



Naivasha is overruled by politicians. The opinion of a lot of farmers is summarised in the following quote:

“WRMA is the authority on paper concerning the water rights and water allocation. But what can they do in reality. WRMA doesn’t do anything about follow ups. They only come and check, and then nothing. This is the problem with all institutions in Naivasha and generally all the governmental institutions. What will WRMA do if water gets scarce? They cannot do anything against the commercial farmers. These farms will not listen to WRMA, because WRMA cannot enforce and otherwise corruption will do it for the farmers.” (CF6)

This corruption is an additional problem in the Kenya, it also exists in the LNB. Corruption and bribing is a method to get things done in Kenya. Several commercial farmers admit that bribing is used to work around the rules of WRMA-Naivasha and other governmental organisations (CF1, CF2, CF3, CF9, CF10). This is something that is hard to avoid in Kenya and therefore it might be hard as well to create good functioning authorities and policies which are able to enforce their rules. One of the farmers explained the problem of the lacking authority with a nice metaphor.

“Yes, I am interested in a strong authority, that would be very good. But it is impossible. Because corruption roots deep down in all Kenyans. It is like training a grown-up dog again.... this is very hard, nearly impossible.” (CF6)

Another complaint that is often heard by farmers towards WRMA-Naivasha is the lack of information about water resources. They would like to receive data on water quality and quantity on regularly bases, in order to be more involved in the water management, to be more in touch with WRMA-Naivasha and to have more transparency (CF5, CF8, CF9, CF3, CF1, CF6, CF2). Data provision should be one of the tasks of WRMA-Naivasha, because of several reasons WRMA-Naivasha is not able to provide data to the farmers. Firstly WRMA-Naivasha doesn’t have the capacity to monitor and collect all data in the LNB. Secondly, WRMA-Naivasha lacks a lab for proper analysis and research on water quality, so they are dependent on the regional office or headquarters (IP1, MT3). Thirdly, WRMA-Naivasha doesn’t have the infrastructure and network to provide the data to the water users and communication is very poor. Fourthly, due to volatile environmental conditions in the LNB it is hard to collect and generate proper data and forecasts (Kuhn et al., 2014). Despite these shortcomings of WRMA-Naivasha the data is very important for a well-functioning water management. It is a prerequisite to have accurate data at different time and space scales, as well as various degrees of prior synthesis and analysis, to reach effective water management and governance (McDonnell, 2008; Van Oel et al., 2014). This data should not only be



available to WRMA-Naivasha, but also to numerous users who have variable skills and knowledge. Besides that, the farmers and community should also be able to access the information if they want to (McDonnell, 2008). The poor data collection and analysis was already addressed in 2005 (Becht et al., 2005), although it seemed that not much progress has been made since then. A lot of decisions and projects are based on the Water Abstraction Survey 2010 (De Jong, 2011), although he questions the quality of this WAS himself, after comparing with related researches, by stating: *“According to this related research the abstraction quantities derived from the WAS are questionable. And should be re-examined before it can give a reliable background for taking management decisions.”* However, several decisions are based on this WAS 2010. In 2014 a new Water Abstraction Survey was held, solely the areas of LaNaWRUA and Mkungi Kitiri, although the amount of abstractions differ largely with the WAS 2010. In the WAS 2010 there were 454 abstraction points (184190 m³/day) in the LaNaWRUA sub-catchment, while in the WAS 2014 there are 154 abstraction points (54204 m³/day). The information derived from the WAS 2014 is therefore also highly questionable. This example illustrates the use of uncertain and randomly collected data in the LNB.

6.4. Responses to water scarcity

The situation of governance and authority in the LNB can be analysed by the River Basin Governance model of Molle et al., (2007). There is often a multiplicity of interactions in a closing or closed river basin or a basin with water scarcity (Molle, 2003). Due to the high population growth, urbanization and the diversity of competing values, livelihoods and economic interest a river basin might be vulnerable to basin closure and water scarcity (Molle et al., 2010). Especially population growth and competing values and economic interest are very relevant for the LNB. Additionally the interventions such as tapping more groundwater or using other irrigation types often have side-effects and unexpected results and consequences elsewhere in the basin (Molle et al., 2010). This pattern is also seen in the LNB, because due to the increasing demand of water, more and more boreholes are installed to meet the water demand. Commercial farmers and WRMA-Naivasha don't see the side-effects of creating more boreholes (CF3, CF4, CF11, CF9), however it is not clear if there are site-effects and what the state of the water store is (ST3). This is one of the knowledge gaps explained by Van Oel et al. (2014) as the knowledge gap on the hydrological subsystem.

The model of responses towards water scarcity (Molle, 2003) identifies three main responses. These responses can be recognized in the LNB, although the stakeholders in the LNB differ in their responses to the threat water shortage (Fig. 15). Several commercial farmers and WRMA-Naivasha are mostly operating according to the first response towards basin closure: development and augmentation. More boreholes have been created over the few past years by



farmers and with approval of WRMA-Naivasha (ST3, IP6), especially the farmers using surface water are creating new boreholes. Several commercial farmers state that if they want to increase production, they just create a new borehole and apply for the permit (CF5, CF9, CF2). These commercial farmers are mainly the surface water users, shifting partially to groundwater. While other farmers are investing in rainwater harvesting methods (CF2, CF3, CF10, CF6) and reuse of wastewater (CF5, CF8, CF9) to develop the quantity of water. The second response to water scarcity, conservation, is also very present in the LNB. With this method, farmers don't increase the supply, but they use the accessible water more efficient (application efficiency). Almost all farmers are looking for methods to improve the efficiency of their irrigation methods. Hydroponics are introduced completely or partly by more than half of the interviewed commercial farmers (CF4, CF1, CF11, CF3, CF5, CF8, CF9, CF10). Although all the responses concerning conservation are initiatives of the commercial farms themselves, one of the farmers argued that the commercial farms need to be ready for water shortage times, because WRMA-Naivasha or any other authority is not doing that for them (CF3), that means that the commercial farmers are conserving the water amounts in the LNB to sustain their production. Some farmers, especially the farms using surface water, therefore create on-farm storage systems to be prepared for shortages of water. The authorities are not really conserving the water in the LNB, cause a good monitoring infrastructure and stricter regulations are necessary to get a better collective management and those requirements are quite absent in the LNB (Molle et al., 2007; ST1, MT3, MT4, CF3). Only Imarisha and IWRAP are conserving the LNB, although they do this through projects, creating awareness and improved management and enforcement. These organisations are concerned about the sustainability of the LNB. The third strategy or response is hardly officially seen in the LNB. This strategy concerns (re)allocation. WRMA-Naivasha is trying to lower the allocated abstraction amounts from commercial farms (IP6), but the commercial farms prefer the fines to keep the higher allocated amount, also with their power, money and connections they are able to stick to the high allocated abstraction permits (IP7). The allocated abstraction amounts are too important for the commercial farms, so they use their powers to keep it that way. Molle et al. (2007) states that: "Bribery, water theft and tampering with hydraulic infrastructure are also ways to reallocate water" (Molle et al., 2007 p. 595), although this bribery occurs in the LNB only as a matter to secure that there is no reallocation. However the WAP 2010 is a characteristic of reallocation. In water scarce periods the WAP, if enforced properly, will secure water for the domestic users at the expense of the commercial farmers, although a lot of opposition and complaints are expected and a lot of farmers question if the WAP will function and will be enforced (CF3, CF8, CF1). Additionally there is one sign of a supply augmentation response on state level in the LNB. In the upper-catchment water is transferred from the LNB to the Nakuru basin. This is an example of supply augmentation for



the Nakuru basin but it creates some frustration and opposition among farmers in the LNB (CF1, CF3, CF4, CF8). They claim that (governmental) institutions are not allowed to do anything according to (re)allocation within the LNB, if this trans-basin transfer still occurs (CF1, IP3, CF3, CF8). So in periods of enough water the responses are obviously very low, however development and conservation keeps going on. The allocation strategy probably only occurs in water scarce periods, although it is questionable if this will really be feasible in the situation of the LNB. The smallholder farmers are not bothered at all by the water scarcity. They depend on rainwater and are not in need of big amounts of water. Therefore they are not involved in any response towards water scarcity. This model by Molle doesn't take situations into account where volatile conditions are shaping the water scarcity. Molle assumes in this approach that the process of water scarcity is linear, however in the LNB this process is very irregular. In water scarce periods the farmers are more concerned with the responses, while in water abundant periods farmers are not worried at all. The underlying problem of all this changing responses and management issues is the high variability of the lake levels and the volatile rainfall conditions (Kuhn et al., 2014). The variability in the LNB causes several problems with water management, while variability itself is a problem for water management. One of the problems variability causes is poor data availability, due to the low monitoring capacity WRMA-Naivasha is not able to gather and monitor the variable water quantity and quality on regularly bases (ST1, IP6, IP7). Data availability is one of the main requirements for a proper water management (McDonnell, 2008; Biswas, 2008)) In an article about common pool resources by van Oel et al. (2009) five requirements for good manageability are formulated, these are: small spatial extent, well-defined boundaries, possibilities of storage, predictability of resource flows and low levels of mobility of the resource (van Oel et al., 2009). The LNB scores very low on two out of these five requirements. The spatial extent of the LNB is 3400 km² (WWF, 2012), this is quite big for an monitoring organisation with a capacity with not more than 24 officers and 2 cars. Also the predictability of the resources flow is very poor, due to the volatile rainfall conditions it is hard to predict any water flow in the LNB (Kuhn et al., 2014). Therefore it is hard to develop a proper management in the LNB. Kuhn et al. (2014) also argue that even with perfect management and full enforcement of existing laws and the WAP, it will not be able to stabilize lake levels well above thresholds considered as severe scarcity (Kuhn et al., 2014). This indicates that the issue of water management in the LNB is a very complex assignment for any organisation, probably not even manageable perfectly, because as mentioned before, the rules are considered to be very good (CF8, CF7).



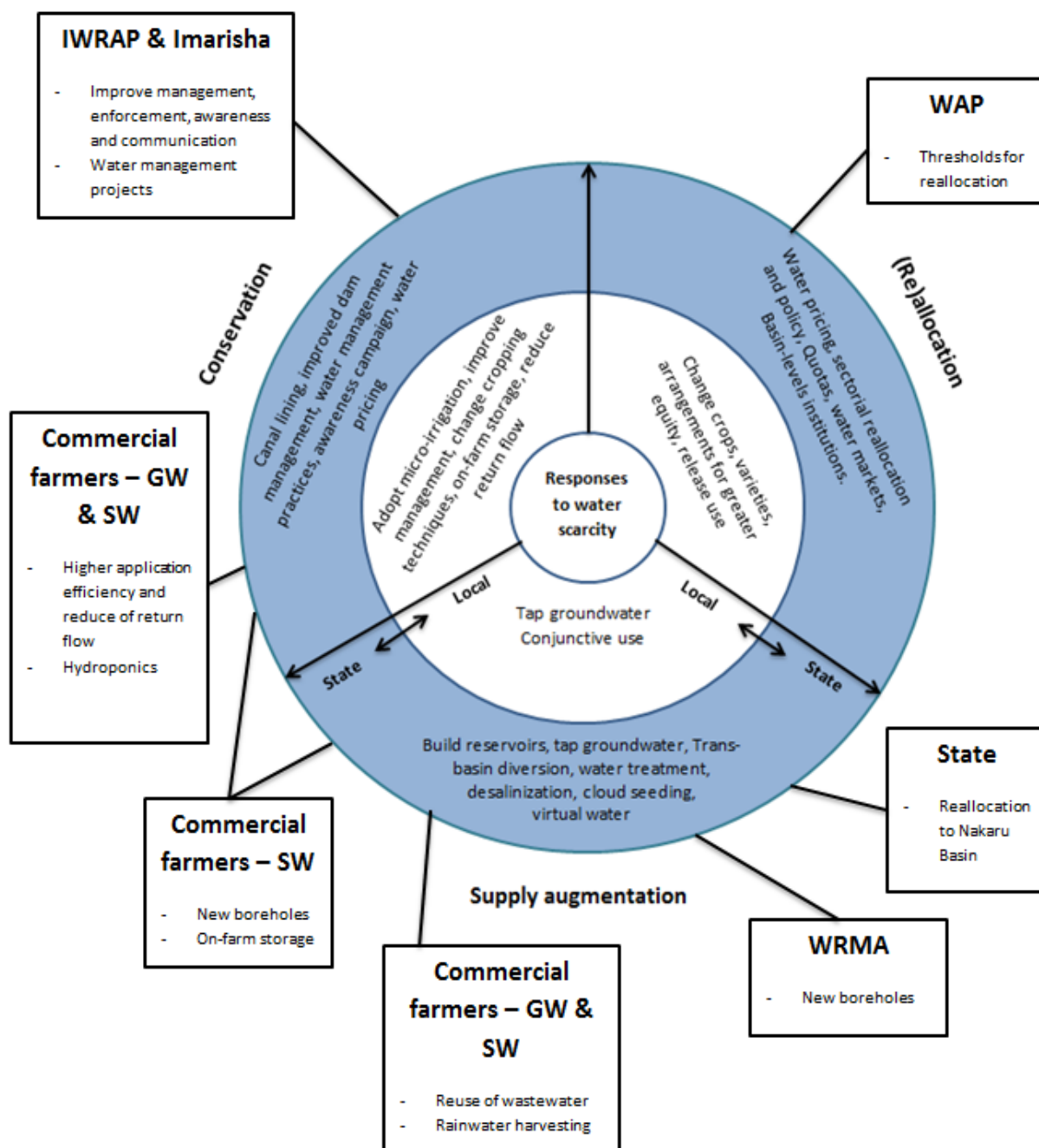


Figure 11: Responses to water scarcity in the LNB by several stakeholders or initiatives (adapted from Molle, 2003). The given measures are not hard facts, although through this classification the responses to water scarcity in the LNB are outlined and it can be seen that the focus is more concentrated on supply augmentation and conservation. The information is retrieved from interviews and observations



6.5. River Basin Governance

To classify the interactions and authority in the LNB several typologies of river basin governance are set by Molle et al., (2007). Three different governance agencies are distinguished: WRMA-Naivasha, Imarisha and IWRAP as a project. WRMA-Naivasha and Imarisha are IWRAP partners as well, but they are approached separately because of their distinctive nature and importance in the LNB. The management and governance in the LNB is legally highly centralized and state-driven. The water management is highly centralized, WRMA-Naivasha is responsible for most of the water related development and management functions. The structure of WRMA in Kenya is state-driven and centralized, WRMA sub-region Naivasha heavily depends on decisions from regional office Nakuru and headquarters in Nairobi. The water act 2002 and the WRMA-WRUA agency are trying to make the organisation less centralized, however this is hard to achieve due to traditions and poor relations. This centralized character of WRMA hinders IWRAP in the implementation of their project, but this is discussed in the chapter considering the role of IWRAP in the LNB (8.2). This centralized and top-down approach is also seen as one of the options in the institutional framework presented in Figure 16. However, there is a lot of activity besides the governmental organisations. Imarisha and IWRAP are projects with important influence in the river basin management, but they are mainly stakeholder-driven and not state-driven. Although both organisations/projects are involved with governmental organisations, in the so-called public-private-partnerships (World bank, 2014). Imarisha got board members from public and private sector, allowing input from stakeholders, however originally it is a state-driven organisation. They coordinate a lot of initiatives by different stakeholders, in order to ensure that all information becomes available to all stakeholders and that possible conflicts are recognized in advance and that they are duly debated (Molle et al., 2010; IP5). IWRAP as a project is acting as a polycentric, democratic governance system. IWRAP clearly defines the activities, obviously because they need to meet the targets. Although there is a lot of input of stakeholders, especially by Imarisha, WWF and WRMA-Naivasha and these stakeholders also have own responsibilities and activities (IP1, MT4). The biggest difference with the model is that Imarisha Naivasha and IWRAP don't have any legal power, all the legal decision-making power is with WRMA-Naivasha. IWRAP and Imarisha are contributing to the governance, but because they are highly dependable on WRMA-Naivasha, it is hard for Imarisha and IWRAP to be really stakeholder-driven, because WRMA-Naivasha is involved in everything and they follow unicentric regulations and patterns.



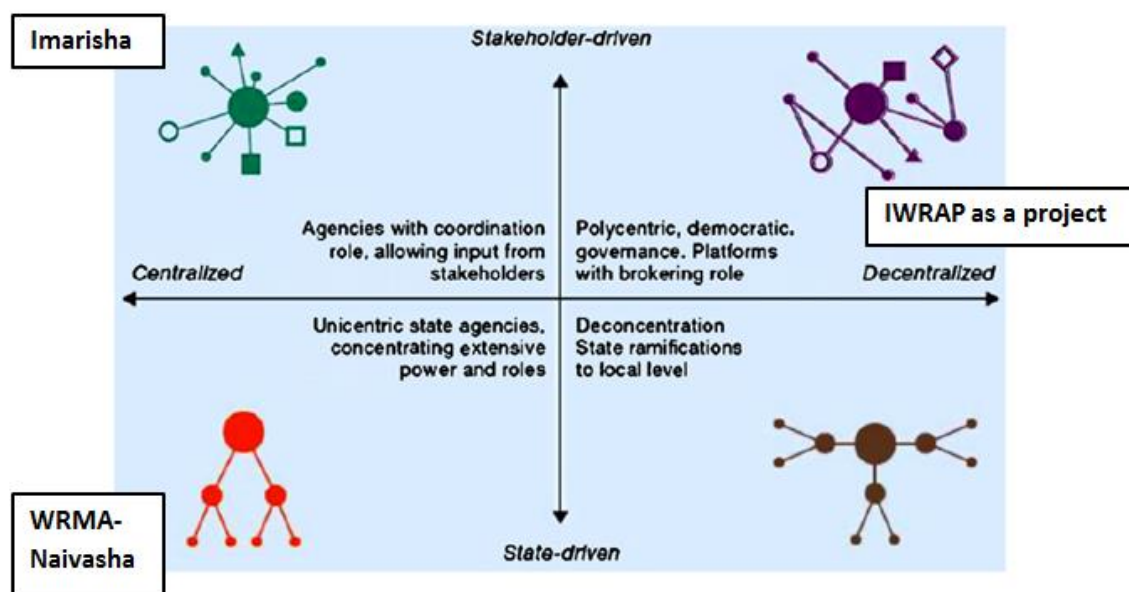


Figure 12: Typologies of river basin governance and the position of agencies in LNB (adapted from Molle, 2007) WRMA-Naivasha is a real state-driven organisation, while Imarisha and the IWRAP as a project are public-private partnerships, mainly focussed on stakeholder-driven activities. Imarisha and WRMA-Naivasha are also IWRAP partners, but due to their distinctive nature they are approached separately in this concept.





RULES & AUTHORITY

7. Discourses

The fourth echelon of the ERA framework concerns the discourses present in the arena of water management in the LNB. The discourses outline the problems and solutions of different stakeholders. The discourses are regimes of representation which are defending, imposing or establishing water right policies, regimes and decisions made by actors (Boelens, 2008). It is important to understand that discourses are not innocent in their development and use. Discourses are representations of a part of reality often to serve the own interests, while neglecting the interest of others (Foucault, 1977). Discourses are explained and defined very differently over time and context, through some thorough reading and comparing, the following definitions approach the case of LNB most accurately. Discourses are “products and reflections of social, economic and political factors, and power relations” (Widdicombe, 1995, p. 107) and discourses are “socially defined frameworks of meaning that define categories and specify domains of what can be said and done” (Burman, 1994, p. 2)

The framework by Pahl-Wostl (2005) is explained in the chapter of concepts (2.2) and is adapted to the LNB in Figure 17. This matrix and the positioning of the stakeholders in the matrix is used in the discourse analysis. The discourses are approached and analysed per



stakeholder group, using several definitions and interpretations of various discourse analysis methods. The movement of stakeholders over time can be identified by this matrix and is discussed. The different irrigation water user groups are distinguished as discourses, however groundwater and surface water commercial farmers are approached together in the discourse analysis, although the differences between them will be highlighted. Also IWRAP partners are approached together, apart from WRMA-Naivasha, because WRMA-Naivasha got a distinctive nature.

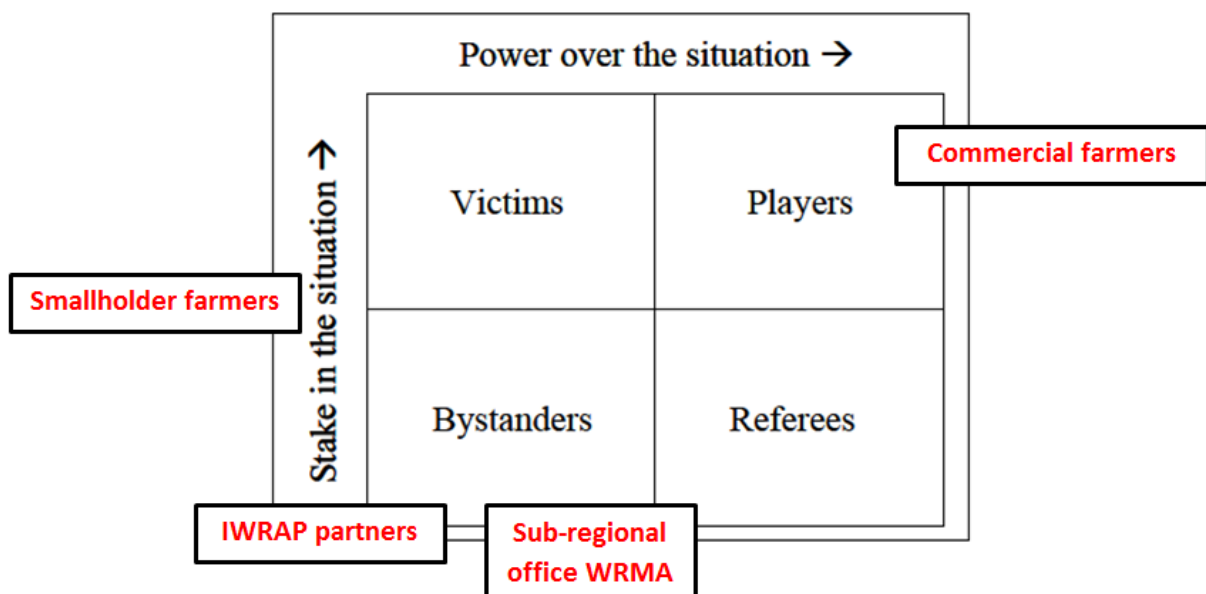


Figure 13: Mental model on stake and power in the LNB (adapted from Pahl-Wostl, 2005) All stakeholders are situated somewhere in the matrix and their position will be explained in this chapter. Sub-regional office WRMA-Naivasha is approached separately from the IWRAP partners because of its distinctive nature and importance in the LNB.

Considering the definitions and explanations of discourses as explained in the concepts, several discourses in the LNB are distinguished. The discourses are made up with several arguments and claims by different stakeholders. These arguments and claims are mentioned for every stakeholder group and it is explained how these arguments make up the discourse. Arguments are analysed according to the social, economic and political factors framing the discourse (Widdicombe, 1995). The discourses, often claimed to be the truth are created by power and knowledge. Although, as discussed in the chapter of concepts (2.2) discourses both create and are created by power and knowledge (de Bont, 2013). Therefore I adapted the Foucault triangle and tried to position the stakeholders with their discourses. Also literature is included that stress the importance of accurate data, considering that this data is not available in the LNB (Kuhn et al., 2014; Van Oel et al., 2014). There is an interdependency in



the Foucault triangle. If you own one of the characteristics of a discourse, you are able to create a strong discourse/truth. This can be seen by the commercial farmers. Because they have power, due to their economic position and network, they can create a strong discourse by using the knowledge gap in their advantage (Fig. 18). WRMA-Naivasha, smallholder farmers and IWRAP partners are not able to create a discourse with the strength to present their own truth successfully. Because nobody in the LNB have access to accurate data, the most powerful stakeholder is likely to create the strongest discourse and this is what happened in the LNB. Within every discourse, there is a reflection according to the chosen analytical frameworks by Pahl-Wostl (2005) and Foucault (1977).

7.1. Commercial farmers

The discourse of the commercial farmers is shaped by a lot of arguments and claims that validates their existence, performance and water abstraction in the LNB. The main argument for the commercial farmers is their economic position in Naivasha and in Kenya. The cut flower industry in the LNB accounts for 70% of the floriculture industry of Kenya, while they are generating 9% of the Kenyan total foreign exchange revenue and they contribute 2-3% to the Kenyan GDP (WWF, 2011). Due to their strong economic position they gain a lot of power. This power is used to avoid legislation and organisations hindering their business. For example the WAP is considered not to be a big issue by several commercial farmers, they claim that they will get water anyway because their business is more important (CF4, CF3, CF1, CF8, CF9, CF6, CF2). An additional linked argument is the fact that the commercial farmers employ a lot of people. To cite the WWF report:

“The flower industry in Naivasha employs approximately 20000 people directly and a further 350000 jobs are created in the associated service and informal businesses sector” (WWF, 2011)

Due to this high amount of employees the position of the commercial farmers is very strong, because they have the opinion of the community behind them. Also WRMA don't want to be blamed for making so many people unemployed, so they find ways to help the commercial farmers to continue their business, even when it is not according to the rules (CF1, IP7, ST1, MT3). Another argument creating the discourse of the commercial farmers is the fact that almost all farms are highly involved in social activities to help the community in Naivasha. They provide accommodation, clean drinking water, social services, insurances and schooling to their employees (CF4, CF8, CF9, CF3, CF2), besides the services for their employees they also have charity goals in the LNB. One of the farmers explained that they spent 3000 euro's each month to help the needed in LNB (CF3). In this manner they (try to) create goodwill



among the community in Naivasha. Several commercial farmers claim that due to their presence in the LNB it developed into a active, prosperous region and therefore they claim that they do a lot of good in the region (CF4, CF3, CF1, CF8).

However the commercial farmers often get the blame of over-abstracting and polluting the water. These blames comes from the local people in Naivasha, the local institutions and the international opinion from consumers and media. The response to these blames also forms part of the discourse of the commercial farmers. They argue that it is the opposite way. A lot of commercial farmers blame the smallholder farmers upstream for the pollution and they claim that the abstracted water for irrigation purposes can be neglected, because there is enough water. To counter the blame of pollution they point towards their highly sophisticated techniques to clean the water. Also the existence of wetlands and wastewater treatment for reuse are arguments that are often heard (CF1, CF3, CF6, CF8, CF11). Due to their knowledge, equipment and power, they can easily shape these claims into ‘truth claims’, without proper research and arguments whether they are really true or not. The commercial farmers use the knowledge gap in their advantage, because they have the power to do that.

Besides all their arguments and claims the discourse is also built by their power, money and connections. The majority of the farmers use their power and money to get things done. Corruption, bribing and using their connections to overrule WRMA-Naivasha are no exception (CF8, CF3, CF1). A striking example was the fact that power increases with more owned land. The bigger farmers are less concerned about WRMA-Naivasha and other policies and legislations that might interfere with their business, they are also not that much bothered about following the rules perfectly (CF2, CF9, CF3,), however the small commercial farmers are more willingly to obey the rules and listen to WRMA-Naivasha (CF1, CF11, CF6). This outlines how power shapes the discourse of the (large) commercial farmers. The commercial farmers which are fully depending on groundwater also act differently in comparison to the farmers depending on surface water. Farmers using groundwater tend to be less concerned about the water availability, they argue that the surface water users will have the first problems and that they can always get access to the groundwater (CF3, CF4, CF1, CF10, CF11). This results in a more stable and powerful position in the LNB, they use their power to keep doing what they do. However part of the discourse for all commercial farmers is that they claim that there is no water shortage and that in future the water shortage will not be a very big problem, however about the future the farmers using groundwater were more confident about their position (CF3, CF4, CF1, CF10, CF11).



The discourse of the commercial farmers is supported by the National Government of Kenya. The stake of the government in the LNB is the production of flowers, because it contributes to the foreign exchange revenue collection and these dollars are very welcome for the Kenyan government (IP1; MT3; WWF, 2011). The aim of the Kenyan government is to keep the horticultural business running in the LNB. The Kenyan government is not very present in the LNB, but they are quite involved in it. Several rules and legislations need to give way for this aim of ongoing production. WRMA-Naivasha is overruled by politicians and the Ministry of Water and Irrigation in favour for the business of commercial farmers. The Kenyan Government is very powerful and they use their powers to support the discourse of the commercial farmers as the 'truth' in order to keep the foreign exchange revenue at a high level (IP7). It almost seems that at all costs the commercial farmers in Naivasha basin needs to be conserved. The Kenyan government is actively promoting the commercial farmers and are very positive towards their business. They justify their position towards the decreasing environmental state of the LNB and the increasing demand on water resources, with the argument that the dollars of the foreign exchange revenue are needed to help the country (MT3, IP1). The farmers are also aware of this position, so it also enhances the commercial farmers' discourse.

Wrapping up the elements of the commercial farmers discourse it is clear that it is a very powerful discourse. The commercial farmers are important players in the LNB, also according to the matrix of Pahl-Wostl (2005). Due to their high stake and power in the LNB, supported by the National Government of Kenya, the commercial farmers play an important role in the water management. The commercial farmers use their powers and knowledge to counter blame from other stakeholders and they create goodwill by social services for their employees and charity funds for the community in LNB. However the main pillar to keep their discourse standing is the economic importance for employment in Naivasha and Kenya and the large addition to the foreign exchange revenue and the Kenyan GDP. After all the discourse of the commercial farmers is strong because they are highly involved in the water management and often threatened in their use and production. Because power and the knowledge gap is on their side, the discourse is quite strong because they are able to shape the truth in the way they like it (Fig 18). The commercial farmers are the only stakeholder that really own one of the three elements (power, knowledge, truth) that built a discourse. Because of the interdependency, outlined by the Foucault triangle, the commercial farmers can use this position in their advantage.



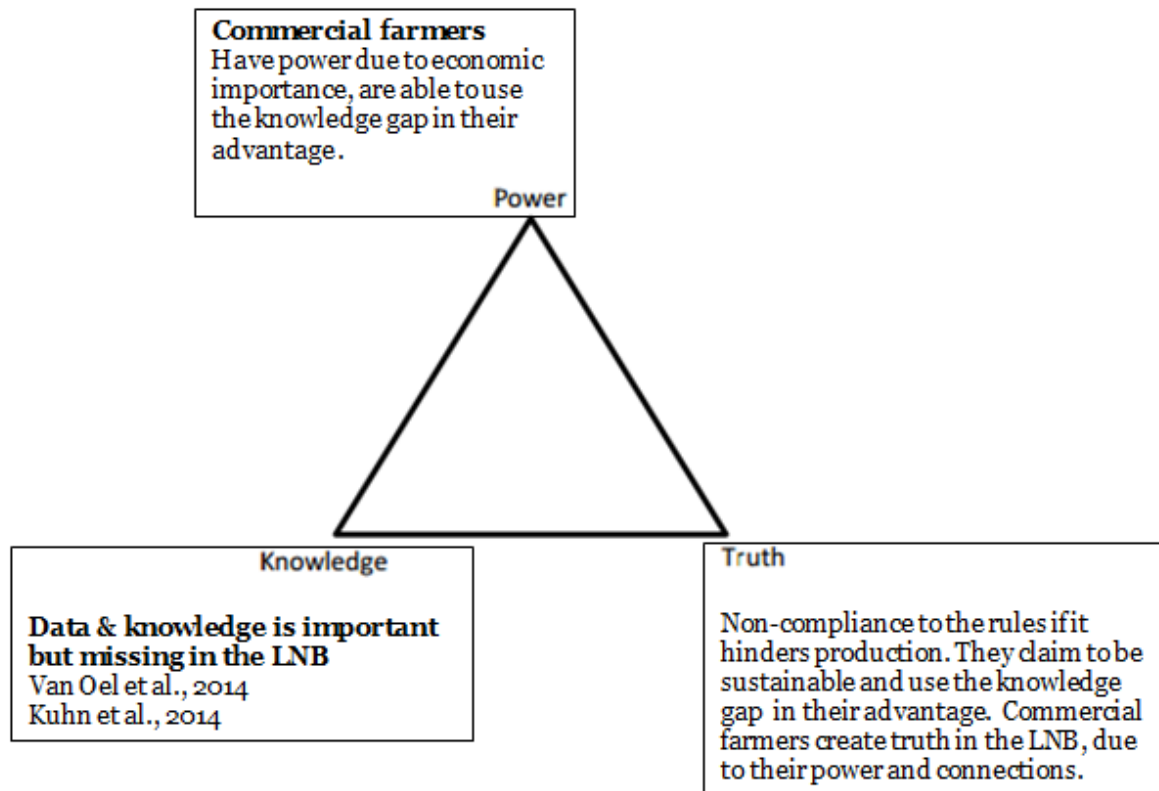


Figure 14: Adapted Foucault triangle for commercial farmers (1977). Outlining the discourse of commercial farmers in the LNB and how they relate to the Foucault triangle. Also literature, concerning the importance of accurate data in discourse creation is included to stress the importance and the absence of it in the LNB.



7.2. Smallholder farmers

The discourse of smallholder farmers is quite different compared to the commercial farmers. Their stake in water availability is high, because they need water for agriculture, but their stake in water management is low and their powers are very limited. This situation characterizes them as potential victims or bystanders according to the matrix by Pahl-Wostl (2005). Although they don't act like victims, they are not able to change their situation. Additionally they are not that much involved in the debate about water management and therefore one might argue that their stakes concerning water management are low. Therefore they are positioned just outside the matrix of Pahl-Wostl, but related to the victims and the bystanders area (Fig. 17). The main argument from the smallholder farmers in order to make their discourse strong is the claim that this was their land for ages. The local farmers lived in the LNB for centuries and have been using the water for subsistence farming purposes for a long time. Since the entrance of commercial farmers the pressure on natural resources, in particular the water increased tremendously. Although some of the smallholder farmers in the Mkungi Kitiri sub-catchment claimed that they had the rights for the water because they are Kenyan citizens and they are upstream farmers. The water first passed their fields, so they can use the water.

Another part of the discourse for smallholder farmers is the fact that they are not bothered about water issues at all. They get their domestic water through the WSP and they use this water as well if there is not enough rain for their agricultural purposes. They are not bothered about organisations striving for a sustainable river basin and they just do what they do. Their only motivation for organisations like IWRAP to get involved with their practices, is because they think there is some money in it for them.

The smallholder farmers don't have any power, they don't have money and they don't have connections with any organisational structures concerning water management. Only the board of the WRUA has connections with WRMA-Naivasha. The reasons for no power, money and connections is because the majority of the smallholder farmers in the upstream areas are subsistence farmers. They are too small to be interesting for any organisation and they don't use a lot of water. The smallholder farmers don't have a well-based opinion about the commercial farmers, this is due to their limited water use and connection with sustainable water management. The commercial farmers are a totally unknown world for them, they only know that they got money, that is why they tend to blame the commercial farmers for polluting the basin. After all the smallholder farmers discourse is a weak discourse concerning water management and the Foucault triangle. They don't have a real problem with the water management and they are not threatened by anybody on this issue, so their discourse is not strong and they are not really involved in the arena of competing



discourses shaping truth in the LNB. According to the Foucault triangle the discourse is quite weak because they don't have a lot of power and knowledge and consequently they are not able to create or present 'truth' (Fig. 19). However their stakes are high, because they need water as well, their power position is low, due to economic position and the knowledge gap. They are simply overruled by the commercial farmers.

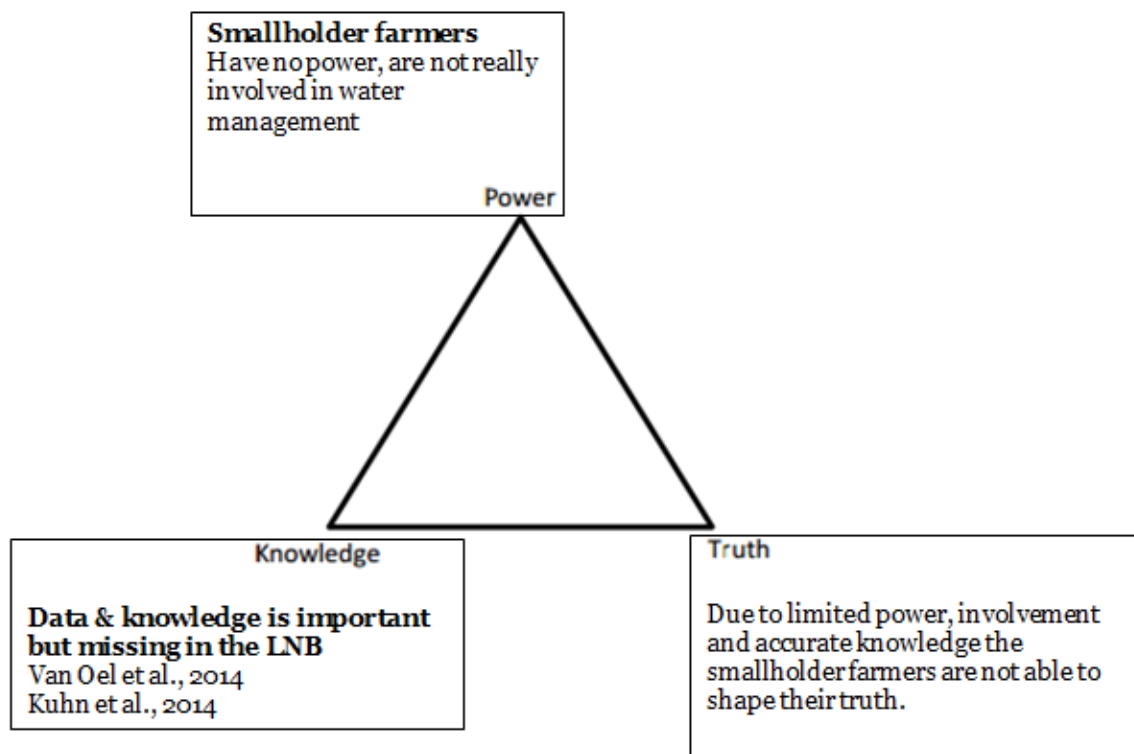


Figure 15: Adapted Foucault triangle for smallholder farmers (1977). Outlining the discourse of the smallholder farmers in the LNB and how they relate to the Foucault triangle. Also literature, concerning the importance of accurate data in discourse creation is included to stress the importance and the absence of it in the LNB.



7.3. Sub-regional office WRMA-Naivasha

The sub-regional office of WRMA in Naivasha is one of the IWRAP partners. However they are discussed as a separate discourse because of their distinctive nature and importance in the LNB. WRMA-Naivasha is the official authority concerning water management in the LNB. Therefore their claim on authority as an enforcing and regulating organisation is valid, however their power is limited. This limited power is caused by corruption, lack of enforcement, lack of capacity, lack of knowledge and the fact that water management in LNB is a political game (CF7, CF6, CF3, CF10, MT3). The WRMA-Naivasha discourse is mainly built on the fact that they are the official mandated authority. WRMA-Naivasha admits that they lack some aspects, earlier mentioned, that creates a lack of authority and power. This affects the strength of the discourse tremendously. According to the interviews with the commercial and smallholder farmers, they don't rely on WRMA-Naivasha as a strong authority or organisation. The farmers lost confidence and trust in WRMA-Naivasha. Therefore the position of WRMA-Naivasha in the matrix by Pahl-Wostl (2005), shifted from referee to the bystanders-role. For the enforcement and legal authority in the LNB this is a bad trend. However, due to the mentioned difficulties in which WRMA-Naivasha is in nowadays, it is hard to return to the position of referee.

Part of WRMA's discourse is the fact that they are not worried about over-abstraction or water shortage. They claim that there is no reason to worry, because there is enough water and that the community and farmers can't do anything about it because it is a natural phenomenon (MT4, IP7). Therefore they don't see the need to reallocate water or to conserve water practices. Another result of this ignorance of over-abstraction is that they give the commercial farmers a lot of space, because there is enough water.

The last aspect of the discourse of WRMA is the involvement in projects such as IWRAP. This gives them some authority and involvement in the institutional framework of water management in the LNB. Advantages are more budget for monitoring and capacity. For example WRMA-Naivasha was able to buy two cars from the IWRAP budget.

After all the discourse of WRMA-Naivasha is not very strong. They are the official authority and expected to have the power that comes along with this authority. However, according to the Foucault triangle (Fig. 20) WRMA-Naivasha lacks power and knowledge due to low capacity, poor enforcement and the consequently loss of trust. This limited power and knowledge results in a discourse that is not able to present the truth.



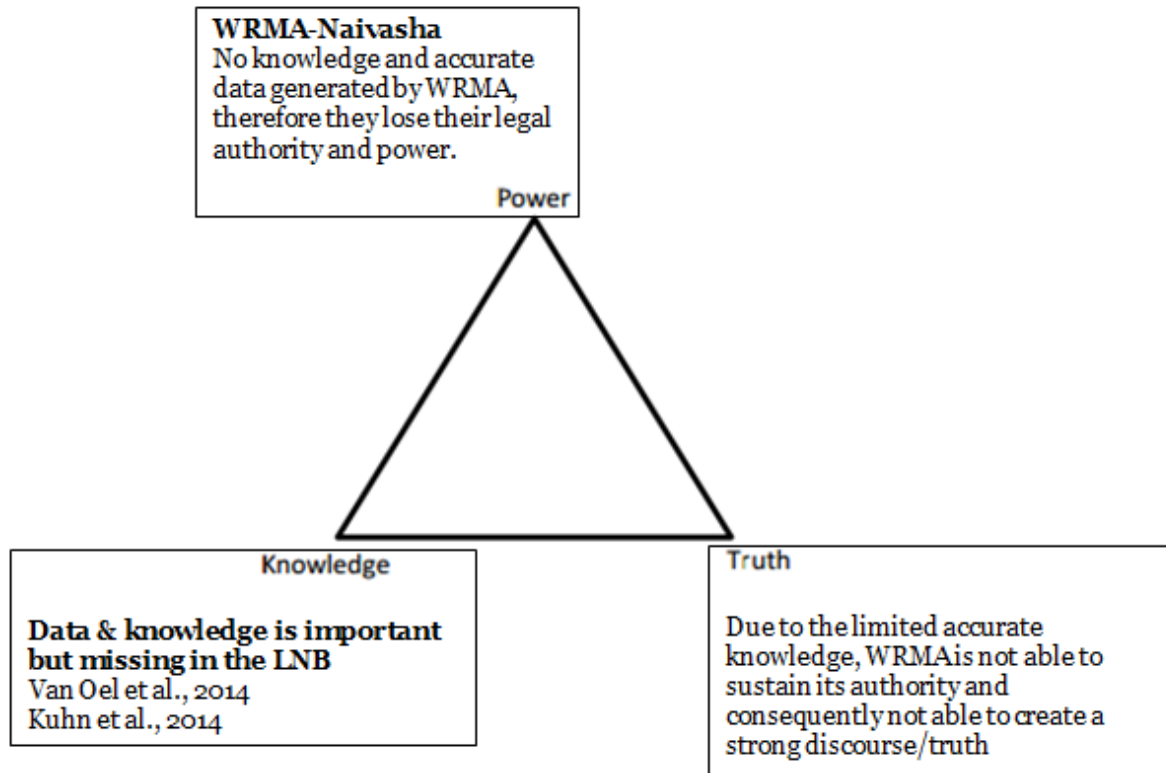


Figure 16: Adapted Foucault triangle for WRMA-Naivasha (1977). Outlining the discourse of WRMA-Naivasha in the LNB and how they relate to the Foucault triangle. Also literature, concerning the importance of accurate data in discourse creation is included to stress the importance and the absence of it in the LNB.

7.4. IWRAP partners

The discourse of the IWRAP partners is built on several small arguments. The IWRAP partners are present to help the water management in the LNB. The IWRAP partners exist out of WWF, Imarisha, sub-regional office WRMA-Naivasha, KFC and LNGG. Their main objective is to combine nature, business and people together in order to get a sustainable management of water resources in the LNB (WWF, 2012). Part of the discourse is the awareness that something is needed to be done in order to preserve the different characteristics of LNB. They claim that there is an increasing demand on water resources and some of them claim that there is over-abstraction and water shortage or that this will happen in the near future. Therefore they justify their actions and proposals in order to sustain these water resources. A lot of money is spent on these activities and proposals. They also claim that the water management is very poor in the LNB, therefore IWRAP came in to focus on this part of sustaining the LNB. Funds are available through several research



institutes (University of Twente (ITC), Leicester University) or governments (Embassy of the Kingdom of the Netherlands) so the NGOs claim that the work they do is valid and helpful for the basin (IP7, MT3).

The IWRAP partners are not very powerful, but they achieve quite something because they want to help the local community and the environment in LNB. They have quite some knowledge about their field of work and their general mission is to provide help and coordination in the development of the LNB (LNGG, WWF). Another aspect is that the IWRAP partners are not personally connected to water management issues, but they try to help. That makes their efforts to create a strong discourse less active than for example the commercial farmers and sub-regional office WRMA-Naivasha. These groups are really responsible or depending on water resources or the side-effects of them. This positioning of the IWRAP partners classifies them as bystanders, due to their low stake and power (Fig. 17). According to the Foucault triangle the IWRAP partners have difficulties to gain knowledge and power, so it is hard for them to have huge impact in the LNB. Their impact is low as well because they depend on WRMA-Naivasha and the knowledge and accurate data that should be gathered and generated by WRMA-Naivasha.

7.5. Justifying and comparing discourses in the LNB

After listing the existing discourses of stakeholders in the LNB a comparison of those discourses can be made on how they are interlinked.

There is a hegemonic order in the different discourses. The hegemonic discourse determines what is true or what is represented as 'true' for a certain period or point in time (Boelens, 2008). So therefore as stated before, the discourses create and are created by power and knowledge (Foucault, 1977). In the LNB, the discourse of the commercial farmers is the strongest discourse. Their discourse is supported by the Kenyan government. The discourse of commercial farmers and the Kenyan Government are in favour of the production of flowers, so they favour economics above environment. Due to the interdependency of power, knowledge and truth, as presented by Foucault (1977), the commercial farmers are able to create their discourse as the leading, hegemonic discourse. The opposing discourse is clearly the discourse of the IWRAP partners, they want to preserve the basin with sustainable water management. However, this discourse is not very strong, so they face troubles to create their 'truth' of required action towards a sustainable development. The discourses of WRMA-Naivasha and the smallholder farmers are situated between the discourses of the IWRAP partners and the commercial farmers. The smallholder farmers' discourse is not strong and not involved in the water management and the WRMA-Naivasha discourse supports both the discourses of the IWRAP partners and commercial farmers. However the discourse of



WRMA-Naivasha also lacks power, due to the lack of data and knowledge (Van Oel et al., 2014). This lack of data and knowledge is created by a lack of capacity and by the volatile environmental conditions (Kuhn et al., 2014). The decision-making is influenced heavily by these different discourses and power relations. This also affects the functioning of the (governmental) institutions. As North (1995) states in his article: “institutions are not necessarily, or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interests of those with the bargaining power to create new rules.” (North, 1995, p. 3) In the matrix by Pahl-Wostl (2005), the discourse or stakeholders are characterized by their role in the LNB. Some stakeholders or discourses take the role they are supposed to, however some are more dominant. WRMA-Naivasha for example is shifted too much to the bystander role, instead of taking the role of referee. This vacuum is taken by the commercial farmers to control the water management themselves by means of networking or corruption, with support from the Kenyan government. The position of the smallholder farmers and IWRAP partners as (potential) victims and bystanders are not subject to change a lot. Without a changing role of WRMA-Naivasha, the positions will not change significantly in the future, because of the status quo that will be maintained by the current players (commercial farmers and government) to keep their favoured position.

Discourses are variable over time (Ramazanoglu, 1993) and as Macleod (2002) argued they are “progressively and dynamically achieved over time and within particular contexts of power relations (Macleod, 2002, p. 6), but nowadays it is clear that the discourse of commercial farmers, supported by the Kenyan government discourse is dominant and these discourses represent particular water rights, water uses, policies and regimes as if they are true. Probably this will change over time, because this position is gained in the last 10-15 years, since the commercial horticulture and floriculture is present in the LNB. However if any hegemonic party, in the LNB the commercial farmers, are able to maintain the status quo in an area, or other organisations are not able to breach this status quo, the current hegemonic and powerful party will maintain their position and nothing will change (Zeitoun & Warner, 2006). In the case of the LNB it is hard to breach this status quo, because there is a lack of accurate data, which creates a knowledge gap (Van Oel et al., 2014), so it is hard to change anything the LNB. This accurate data is of crucial importance as explained earlier (McDonnell, 2008) Also the lack of power and authority owned by (governmental) organisations like WRMA-Naivasha, Imarisha, WWF and LNGG is so weak that in the near future the chance for a breach of the situation occurring nowadays is minimal.





ROLE OF IWRAP IN THE LNB

8. Role of IWRAP in the LNB

In this chapter the role of IWRAP is analysed and reviewed according different steps. Firstly, the achievements of IWRAP in the past 2 years are presented, as well as the steps taken to improve water management in the 2nd phase of IWRAP. Secondly, the focus is on events, threats and trends that hindered the implementation and performance of IWRAP. Thirdly, improvements, recommendations and missed aspects brought forward by farmers (smallholder and commercial) are listed and discussed. All of these achievements, improvements, requirements, hindering events and trends and missed aspects are concerning water management issues, formulated mainly in result 1 and 2 of IWRAP (IWRAP, 2012).

8.1. Achievements IWRAP

Since 2013 IWRAP is active in the LNB and since then there have been some achievements and changes in the institutional framework and communication in the LNB. Most of the partnering organizations are satisfied with the achievements of IWRAP. Imarisha, WWF, WRMA-Naivasha, the two interviewed WRUA chairmen and the Project Coordinator all



mention the trainings, exchange and awareness programs initiated by IWRAP (IP5, IP1, IP2, IP3, IP6, IP7). Also the capacity building activities are mentioned by Imarisha, WRMA-Naivasha and WRUAs. Through this capacity building these organizations are able to perform their duties in a better way. Especially the LaNaWRUA depends a lot on IWRAP at the moment, because IWRAP pays the salaries of the two office officials (IP3). Also WRMA-Naivasha benefits a lot from IWRAP through the purchase of two new cars and a lot of equipment for fieldwork (IP7). A major goal of IWRAP is an improved communication and collaboration between the partners and from the partners to their members (IWRAP, 2012; IP1). This has improved over the past years, although there is still a long way to go (IP1, MT3, IP7). Through trainings, meetings and workshops the communication is improved, however there is still a lot of miscommunication. An additional achievement by IWRAP for WRMA-Naivasha is the start of an own lab. IWRAP aims to purchase the basic equipment for a functioning lab in Naivasha, while WRMA headquarters need to maintain this lab in future (IP1). The WRUA of Mkungi Kitiri mainly mentioned the advantage of exchange programs and the purchase of trees to plant in the riparian lands (IP2). Another major achievement of IWRAP is the permit database, however it is not yet functional, the process towards a functioning permit database is almost finished (IP1, MT2). This permit database will make the permit application and paying process more transparent and effective. More transparency is also one of the requests from the commercial farmers (CF1, CF3, CF6, CF7, CF8). The factor that hampers the implementation of this database is the laxity of the WRMA headquarters, they request for approval is still pending (MT2, IP1), however the permit database might not be a tool that will solve all problems according to the permit application process. WRMA-Naivasha should also be willing and motivated to use it properly, otherwise it will make no sense. The WRMA-WRUA agency is an initiative from IWRAP as well, however they reintroduced this idea because it was not implemented properly in an earlier attempt. The WRMA-WRUA agency is not yet implemented, but there are pilot projects started for a part of this WRMA-WRUA agency, some of these projects are mentioned earlier in the section of rules and authority (6.1). After listing several practical achievements or planned achievements it can be stated that IWRAP is doing some good work with the partnering organizations. Especially WRMA-Naivasha, WRUAs and Imarisha are satisfied with the actions of IWRAP, however they also see the shortcomings of IWRAP. Wrapping up the achievements of IWRAP one can say that the project is doing a good job by enhancing the partnering organizations. Also communication and awareness between the partners has improved, however there is still room for more improvement.



8.2. Events, threats and trends hindering IWRAP

Despite all the mentioned achievements several events, threats and trends hinders a better implementation and performance of IWRAP. Some of these events and threats are the responsibility of IWRAP, however a lot are also beyond their control. Perhaps a more thorough research before implementation would have prevented a lot of these hindering events. The main threat towards a good implementation of IWRAP is the fact that the project depends on cooperation with the government and governmental organizations (IP1, IP7, MT2, CF6, CF7). The following quote of one of the partners of IWRAP outlines the influence of the government towards IWRAP

“The WRMA headquarters in Nairobi, the government, the ministries and all this bureaucracy is a big, big monster in Nairobi. It kills the IWRAP project and any good integrated initiative or growth” (IP1)

The governmental organizations in Nairobi normally need to approve the laws and new initiatives, as for example the permit database. The IWRAP partners did everything in their powers to implement this database, although the proposal is pending for approval in Nairobi (IP1, IP7). A problem linked to the governmental organizations is the trend that the staff of WRMA-Naivasha is transferred quite often and irregularly (IP1, IP6, IP7, MT2, MT1). The result of this trend is that a lot of staff that is trained by IWRAP is transferred to other WRMA stations in the country, additionally the position of sub-regional technical manager, responsible for WRMA-Naivasha, also changed several times in the past years (MT2, IP1, IP7). Considering these changes it is very hard for a project like IWRAP to find fertile ground for a successful implementation. Another problem for IWRAP, however obviously considered before implementation, is the amount of joining partners and consequently the communication between these partners (IP1, IP7, MT2, CF8). The problem is that despite the cohesive approach of IWRAP, most partners are just performing their own duties, without communication between each other. Mainly in the starting phase of the project this was a problem, nowadays attempts are made to increase the communication, although the problem of solely acting ‘islands’ remains (IP1, MT2).

An argument mentioned by commercial farmers that caused problems with the implementation of IWRAP is the lack of community feeling among Kenyans, the ‘dependency syndrome’ and the ‘general pettiness syndrome’ (CF1, CF3, CF7). These are not official syndromes, but used by several farmers to outline the dependency of Kenyans towards donors and foreign projects.



“Kenyan culture is not a culture of strict regulations and so on. They don’t have that strong community feeling to make something out of it with a community or with a big group of people. If resources become scarce they only think about themselves and their family or tribe” (CF1).

“The Kenyans, NGOs, government or any other, they all suffer from the general pettiness syndrome. With this identity they will never be able to develop and implement policies by themselves” (CF3).

The commercial farmers argue that it is very difficult to successfully implement integrated programs in the Kenyan culture (CF1, CF3, CF7). Some farmers even claimed that all these projects are doomed to fail (CF7, CF8, CF3). The doomed failure according to commercial farmers is caused by the amount of corruption and bribing in the LNB. It is hard for any project or policy to make an impact in the LNB, because like one of the commercial farmers mentioned: *“the gap between policies and politics is just too big in Kenya”* (CF7). Another reason why projects like IWRAP might fail in the LNB is the lack of proper data on water quantity and quality. As mentioned earlier, it is hard, perhaps nearly impossible, to implement a successful project without proper data (McDonnell, 2008). For example the WAP is hard to implement or enforce, due to the questionable data on which it is based (IP2, MT3, CF8). However, it should be considered that collecting and monitoring data in the LNB is a challenging job, due to volatile environmental conditions.

One might also reflect on the feasibility of integrated projects, such as IWRAP. These integrated projects and the concept of IWRM seem to be easy to understand and implement. The integrated projects are attractive because of their simplicity on paper and the popularity created by numerous funds from donors. However these integrated projects and IWRM cannot be easily applied to the real world increasing complexity and interdependent issues (Biswas, 2008; Biswas & Tortajada, 2004) Additionally Biswas (2008) argued that integrated projects are often hindered by inter- and intra—ministerial turf wars and bureaucratic infighting. This phenomena is clearly seen in LNB case, IWRAP encountered huge difficulties with the governmental institutions for approval and progress (IP1, IP3, MT2, MT3, IP7). Cook & Spray (2008) claimed that there is an implementation gap for IWRM projects. Due to the lack of accurate data and knowledge (McDonnell, 2008), corruption and the gap between politics and policies it is very hard to implement an integrated, institutional project in the LNB.

In order to achieve an integrated project, it would be wishful that all important stakeholders would be involved. However this might be a problem in the LNB. The commercial farmers are not interested in projects like IWRAP and they are not willing to participate in those projects



(CF1, CF3, CF4, CF7, CF9, CF11, CF10). Therefore it is hard to get a functional integrated project, because as explained in the previous section (7.1), the commercial farmers are quite powerful and their dominant discourse thus hinders the implementation of integrated projects significantly. On top of that it is explained that integration, coordination and education are crucial for a proper implementation (Anderson et al., 2008; Davis, 2007). However, this might encounter some problems in the LNB, due to the individualistic character of the farms and the unwillingness to participate.

8.3. Suggestions/recommendations/improvements

The majority of the commercial and smallholder farmers didn't know anything about IWRAP and its existence (CF1-CF11, MK1-5). However in the interviews I explained about IWRAP and asked the farmers for their opinion on integrated projects in LNB. Therefore they made some suggestions about areas where, according to them, help was needed. However the first critique, especially from the commercial farmers, was the fact that they were not involved in IWRAP. Some of the commercial farmers questioned how it is possible to be make any impact concerning water management issues if they are not involved (CF3, CF6, CF8, CF9, CF10). They claim that things happen according to their preference. Their suggestion is to involve commercial farmers in the Programme Management Unit (PMU). Also the WRUAs should be involved in the PMU, this suggestion is made by several farmers and by the WRUAs themselves. The claim is that it is important to have information from field level in order to make good decisions on management level (IP3, CF6).

One of the main suggestions from the farmers is the request for training of local people and farmers and infrastructural development in the LNB. There are organizations in the LNB that are responsible for training and infrastructural development, but the majority of the farmers lost their confidence in those organizations. They claim that a project with a large budget should just implement simple training sessions and infrastructure concerning water use. Some of the suggestions for infrastructure development are stilling basins for sediment from the upper catchment, drinking water facilities (boreholes) for Maasai cattle and proper sewage facilities in Kasarani, Kihoto and Kongoni (CF2, CF6, CF7, CF8, CF3, CF10). All these suggestions are linked to the water quality problem in the LNB. This is also the main problem that the farmers face (CF2, CF3, CF4, CF6). The farmers are not too much bothered about the quantity of the water, but the quality of water makes them worry (CF9, CF10, CF2). The suggestions towards more training concerns training of local people about living in a natural environment and the responsibilities towards that. Several farmers opted for training to create more awareness about the polluting habits of people in the informal settlements around the lake. The informal settlements around the lake (Kasarani, Kihoto, Kongoni) causes pollution such as: soaps in the lake, open sewage ending up into the lake, cattle



drinking and consequently defecating in the lake and other chemicals and plastic ending up into the lake (CF2, CF7, CF3, CF8, CF10). Additional topics for training could be possibilities to address the water misuse and increase the water use efficiency. Also training on conserving strategies through waste water reuse, rainwater harvesting and use of hydroponics can be very useful (CF7, CF11).

The suggestions are mostly obtained through interviews with farmers, because they were not able to give improvements for IWRAP, due to the lack of knowledge about the existence. The improvements and recommendations are obtained by interviews with IWRAP partners, WRMA-staff and attending meetings of LaNaWRUA. The main recommendation for IWRAP in the coming years is an improved communication between the participating partners. In several interviews it was mentioned that due to poor communication between partners, everybody is doing their own thing and duties. Therefore the special effect of an integrated project is largely lost (IP1, IP3, CF1, MT1, MT2). The miscommunication occurred strikingly during the presentation of the preliminary results of this thesis in Naivasha. While addressing the problems concerning the permit application process it appeared that there were no major issues at the levels of LNGG and WRMA-Naivasha, but information was not communicated between WRMA-Naivasha and LNGG and between WRMA-Naivasha and the applicants. This miscommunication caused a lot of anger and distrust in WRMA-Naivasha among the farmers (IP8). Another problem is the lack of clear understanding about roles and responsibilities in IWRAP, due to some difficulties in the beginning of the project there have been some problems with clear target definition and responsibilities (IP1, MT2, MT1). A major concern for the WRUAs and the partners of IWRAP is the question what happens after the 5-year period of IWRAP (IP1, IP2, IP3, IP5). In the official proposal of IWRAP there is an 'exit-strategy', however it became clear in the interviews that there is not a lot of confidence in this 'exit-strategy'. People and organizations are depending too much on the funds of IWRAP and they fear what will happen when IWRAP is gone. A proper and realistic 'exit-strategy' therefore is crucial for the project to get any sustainable results from their efforts in the LNB.





DISCUSSION

9. Discussion

This discussion is divided in three parts. Firstly, a discussion about the results is performed. Remarkable and contrasting elements in the water management in LNB are discussed and there are some reflection on occurring events and trends. Secondly, the concepts used are discussed. Central in this discussion is the use of ERA framework in analysis of water management. Thirdly, the methodology used in conducting the research is discussed. At the end of the discussion the position of this research compared to others in the context of Naivasha and the context of academic works is discussed.

9.1. Discussion of results

The discussion of the results is structured according to the ERA framework and the concepts used to analyse the discourses.

9.1.1. Resources, water scarcity and volatility of environment

Water scarcity is a point of discussion and disagreement in the LNB. In the period of research there was water abundance, so there was no water scarcity. In 2009 there was a big drought and especially the Southlake farmers, using mainly surface water, experienced difficulties. However, WRMA-Naivasha and the majority of the farmers are not bothered by the volatile



conditions in the LNB and the occurring water scarcity (IP6, IP7, CF1, CF2, CF3, CF8). While the IWRAP partners and other NGOs claim that steps should be taken in order to avoid huge problems in time of water scarcity (IWRAP, 2012; WWF, 2012; IP7). These different views on the availability of water arise due to the volatile environmental conditions (Kuhn et al., 2014), the unpredictability of water abstraction and the lack of data. There is so much unpredictability that it isn't possible to create one ruling opinion concerning the availability of water resources. This is the knowledge gap of the hydrological subsystem described by Van Oel et al. (2014). Because of this knowledge gap there is limited accurate data on the quality and quantity of water and therefore proper water management is impossible in the LNB (McDonnell, 2008, Biswas, 2008, IP1, MT2) The lack of accurate data also affects the creation of discourses and truth with regard to the Foucault triangle (Foucault, 1977; Fig. 18,19,20). Not any stakeholder group or discourse can rely on knowledge as a pillar for their discourse. Therefore the volatile environmental conditions and the limited access to data affects all echelons. The different irrigation water user groups however are responding to water scarcity as explained earlier in the model of Molle (2003). The smallholder farmers are not active in any response to water scarcity, but the commercial farmers are. The commercial farmers, using surface water are more engaged in the responses than farmers using groundwater. Reasons for this difference are that farmers using groundwater tend to be more confident about their water availability in future. They argue that the surface water users will have the first problems and that the groundwater users can always get access to the groundwater. The farms using surface water already experienced some hardship in 2009, so they are more active in responses such as on-farm storage and conservation techniques, on top of that they try to get access to groundwater sources as well. The farms using surface water are also more subject to the volatile environmental conditions in the LNB. So the farmers are aware of the (arising) problems, but the majority still don't (want to) see the problems or they argue that there is no problem. One might argue that the commercial farmers using surface water would be more open for interfering projects like IWRAP, because their position is more uncertain compared to the position of groundwater users. However, this is hard to claim because the relation between surface water and groundwater is not clear (Van Oel et al., 2014), so the groundwater users might feel more confident, but it is not proven that this is based on the truth. The role of IWRAP in the echelon of resources can be recognized in their efforts to build capacity in order to collect more and accurate data according water quantity and quality.

9.1.2. Rules, Authority and the implementation gap

The gap between policies and politics is one of the biggest problems in the LNB. It is not only a problem in the LNB, but also in the national context it hinders the implementation of



policies. Besides that it is a problem in a lot of developing countries (Veldwisch et al., 2013) and Cook & Spray (2008) claims that there is an implementation gap, especially for IWRM projects. Nobody in the LNB argued that the rules were wrong, but mainly all said that the enforcement and compliance is terrible (CF1, CF2, CF3, CF8, IP1, IP2, MT2, MT3, MK1-5). Some said that IWRAP was quite ambitious in their policy making, not taking into account the local situation, but solely focused on the policy itself, they cannot say that it is wrong (IP1, MT2, MT3). Commercial farmers, smallholder farmers and organisations all agreed about this gap between policies and politics. Another example of the implementation gap is the WAP. This WAP is setup nicely, however the farmers will not comply to the WAP in dry periods, because of their power position and their criticism about the data used to calculate the thresholds (CF1, CF3, CF7, CF8, CF9, CF6). So the farmers will use their powers and network to avoid the policy measures of the WAP. The majority of the farmers and organisations interviewed, agreed about the fact that politics are ruining the policies, but due to this consensus a lot of people accept this situation and they don't have any solution or power to close the gap. It is very difficult to close this gap between policies and politics, because it is embedded in cultural habits and wrong examples. However some farmers really plead for training and education, also because they lost faith and confidence in interfering projects and organisations, such as WRMA-Naivasha, Imarisha and LNGG (CF1, CF8, CF3, CF6, CF7). The gap between politics and policy is a gap that exists because of the knowledge gap and the skewed power relations. These are two major aspects of the Foucault triangle, which create discourses, but which are not present or which are skewed in the LNB (Fig. 18). Due to the skewed power relations and knowledge gap, WRMA-Naivasha is not able to take their position as the authority concerning water management. They cannot build their authority on knowledge, because it is absent. This interdependency between the power of WRMA-Naivasha and the ability to generate accurate water data is very strong. If one of this factors is hampered the interdependency will come into a negative spiral and this is hard to breach. This is seen nowadays in the LNB where WRMA-Naivasha is not able to gather accurate water data and consequently they are not able to sustain and enforce their authority. In periods of water abundance WRMA-Naivasha can be the operating authority, but when water is getting scarce WRMA-Naivasha will most probably not be able to enforce the rules and therefore they will lose their authority. The enforcement in the LNB is poor. The echelons of rules and authority are the echelons where IWRAP is most active. By giving trainings and workshops IWRAP tries to strengthen their own partners and other institutions. The aim and purpose is that these IWRAP partners and other organisations who benefit from these trainings will translate the benefits to their members. However this is something that is not (yet) happening, because communication is very poor.



9.1.3. Discourses and skewed power relations

The discourses that are present in the LNB and the power distribution is another point of discussion and reflection. Due to the huge differences in power distribution the current situation is maintained by the powerful commercial farmers. Due to the interdependency between power, knowledge and truth (Foucault, 1977), the commercial farmers can shape their discourse as if it is 'true', because they have the power gained by their important economic position. WRMA-Naivasha and other organisations and projects are not able to break or interfere in this dominant discourse of the commercial farmers. However as explained in the previous section (9.1.2), in periods of water abundance WRMA-Naivasha is tolerated to be the authority, but if water is getting scarce the farmers are quite clear that they will not comply to the WAP or the rules from WRMA-Naivasha (CF1, CF3, CF5, CF6, CF7, CF8). This is also explained in the matrix by Pahl-Wostl (2005) where it shows that WRMA-Naivasha shifted from the original position of referee towards the position of bystander. This trend affects the arena of discourses and the possibilities of good water management. Both farms using groundwater and surface water reacted the same according to their power position. Although one might argue that the position of the groundwater users is even more strong, because they are confident about their water availability. The big commercial farmers have more power than the small commercial farms. This is mainly because of the amount of labourers that work on their farm and their economic position, because the farmers claim that it is impossible to stop production, because this will result in huge unemployment (CF2, CF9, CF3, CF4) There is a status quo in the LNB, created by the skewed power relations and the disability to breach these power relations, due to the lack of knowledge. As long as these power relations will not be equalized, the status quo is maintained and it will favour the strong players (Zeitoun & Warner, 2006). According to the matrix by Pahl-Wostl (2005) the commercial farmers using groundwater are the most important players, followed by the commercial farmers using surface water. The size of the farms also matters; the biggest players are the biggest farms. Breeders with small farms are also commercial, but don't have the same power compared to big growers with 150 ha (CF1, CF2, CF11). The smallholder farmers are not directly victims of this situation, but their power is very limited. In water scarce periods the smallholder farmers might have a problem and can become victims, although their advantage is that they are situated upstream compared to the commercial farms. All stakeholders have explanations why they are not able to change this status quo or why they want to maintain this status quo. The power distribution in the LNB is also embedded and influenced by the cultural context. The powerful commercial farmers are often western people or rich, old Kenyans. Due to their position as a 'mzungu' (white man) or a 'mzee' (old respectable man) they benefit from the hierarchical culture in Kenya. This results in the fact that WRMA-staff and local people and organisations don't dare to criticize



commercial farmers (in public). Consequently the commercial farmers make use of this position to gain stakes by bribing and corruption (CF8, IP1, MT3, MT4). Therefore conflicts are limited as well, because the smallholder farmers will feel that their chances are limited in advance due to the unequal power distribution. The echelons of discourses is an area where the effects of IWRAP are very limited. The reason for this limited effect is the position of the discourse of IWRAP and its partners. The discourse of IWRAP and its partners is not strong, due to lack of enforcement, lack of compliance, lack of accurate data and corruption.

9.1.4. IWRAP, evaluation of performance

The performance of IWRAP and how the project contributes to the different irrigation water user groups is investigated as well in this research. One of the main discussion points is the statement that IWRAP is a target-wise success, but an impact-wise failure (IP1). IWRAP might achieve the majority of their targets, but if the targets are not well defined or the outcomes are not used it will not make any impact. Impact is missed as well if there is no proper 'exit-strategy'. One cannot say a lot about this 'exit-strategy', because it is not implemented yet, but the WRUAs and other IWRAP partners are worried about the period after IWRAP (IP2, IP3, IP5, IP6, MT2, MT3). It is hard to discuss an 'exit-strategy' which is not yet implemented, therefore the discussion will be on the goals and targets that are implemented. This implemented goals do not simply turn out into a success. For example the implementation of a lab for WRMA Naivasha. There is nice and expensive equipment, but the glasswork is not maintained and WRMA-staff lack the knowledge to use this technical equipment. Due to this low impact and poor performance of especially local organisations the farmers lost their confidence in these (integrated) projects. The implementation gap (Cook & Spray, 2008), mentioned earlier, really affected the view of farmers on the IWRAP partners. Also the communication from IWRAP partners towards farmers is very poor (CF1, CF3, CF6, CF7, CF8, MT2, IP3). This also affects the perception on those organisations. More involvement by commercial farmers would help IWRAP in their integrated approach, but due to the reasons mentioned before, the farmers are not willing to join. The position and success of integrated projects is also highly debatable in the academic literature (Biswas, 2008; Anderson et al., 2008; Davis, 2007). The major claim is that on paper those projects are perfect, but implementation is very complicated (Cook & Spray, 2008). This situation is also present in the LNB. The management and the IWRAP partners also admitted that the implementation is far more difficult than expected (IP1, MT2). This implementation difficulty is hard to tackle, because nobody knows exactly what the situation is before implementation and due to the integrated character you cannot focus on one aspect. The irrigation water user groups hardly benefit from IWRAP, the commercial farmers benefit from the situation that occurs nowadays, but they don't benefit directly from IWRAP. One might argue that the main



beneficiaries are the IWRAP partners, they receive the training, the funds and the equipment. The IWRAP project hopes that these efforts will be translated by their partners towards the farmers and water user groups, however as mentioned before, the communication is very poor (IP1, IP6, MT2, MT3, CF8, CF7), so they don't succeed in this mission. Therefore the statement that IWRAP will be an impact-wise failure may hold some truth. The difficulties that IWRAP encounters are also linked to aspects like corruption, bureaucratic issues and cultural habits. The bureaucratic issues and corruption are discussed already. However, the cultural habits are also an important aspect in implementing an integrated project. Due to the low community feeling and the dependency on donors and funds (CF1, CF3, CF8, MT3, MT2), it might be hard to implement a successful integrated project. With integrated projects the involvement of local stakeholders is important, so you cannot neglect these issues.

It can be seen that IWRAP is interacting in the different echelons in the LNB. The biggest influence is in the echelons of rules and authority. Because of their focus, which is mainly institutional, IWRAP is training their partners and other organisations in enforcement and communication. These are nice achievements, however the effect is not (yet) clear. Because the IWRAP partners and other organisations face difficulties in translating these trainings to their members. So impact-wise the farmers will not recognize the IWRAP involvement in the echelons of rules and authority. IWRAP also tries to create more capacity in order to get a better data collection in the LNB. This is a slow and difficult process and therefore no effects are seen (yet). A lab and new equipment are created, but as discussed, there are difficulties in maintaining and using these achievements. The role of IWRAP in the echelon of discourses is very limited. This is because the own discourse of IWRAP and their partners is weak, so they are not able to breach through the status quo that exists in the LNB according to the power relations and therefore the discourse creation.



9.2. Discussion of concepts

Concepts and frameworks are used to guide the research and to help in analysing, structuring and explaining the data. While performing this research it went as stated here, however some comments can be made on the specific frameworks and concepts used.

The ERA framework is used as a guiding tool to structure this research. It is the leading concept and the chapters are structured according to the ERA. By structuring the chapters and research according to the echelons, it is clear how the water management is arranged in the LNB. The ERA framework is helpful and practical in structuring a water conflict or water management situation. Due to the structuring of water resources, rules and authority one is able to deconstruct the current situation in only a few elements. In its nature the ERA framework is a descriptive tool, useful to observe and structure gathered data. Data collected can be structured according to the four echelons. The boundaries of the echelons can be defined by the researcher him/herself, because the descriptions of these echelons are very broad and the researcher gets a lot of freedom to decide him/herself. In my research I decided to keep a very broad understanding of the echelons while gathering data. After the data collection the major trends are distilled from each echelon. After the deconstruction you are able to reconstruct these echelons again and link them to each other. This is in my opinion very helpful to get a better understanding of the situation. However this understanding is fragmented because reconstruction tools are not provided in the ERA framework. The echelons are hardly connected or interlinked, only within the last echelon of discourses one is able to reflect on the previous three echelons. Additionally the ERA framework is providing limited help and guidance for analysis and explaining the data. As mentioned before, a concept should also guide, explain and structure the data, however in my opinion the ERA framework is mainly suitable for structuring and describing a complex situation. My suggestion is to use additional concepts or methodologies to explain the structured data gathered through the ERA framework. Especially with regard to the fourth echelon of discourses. Additional methodology or conceptual thinking is required to analyse the discourses, because the ERA framework doesn't provide analysis of these discourses. Therefore also in this research, literature is used to define and understand the concept of discourses and to analyse the situation in the LNB. Also other concepts are used to gain a better analysis of the different echelons and to link them together to get a better understanding of situation in the LNB. The lack of analysis within the ERA framework can be seen as a strength and as a weakness. The strength of the missing analysis is the opportunity to apply any additional concepts that fits best in the specific area of interest, however with this freedom it is hard to get comparable cases of the ERA framework. Although the ERA framework is descriptive and strong structuring tool I had some troubles with structuring



and dividing information gathered that fitted in the second and third echelon of rules and authority. These echelons are overlaying each other due to their character that are quite close to each other. There are quite some interlinks between those two echelons, therefore I chose to combine these echelons in one chapter. Concluding about the ERA framework I think it is very useful to structure a complex problem in a rough manner, although additional concepts and methods are needed for further analysis and guidance, especially concerning the discourses. The concepts I used in addition to the ERA framework are the Foucauldian approach, with the Foucault triangle (Foucault, 1977) and the matrix of stakeholders classified by stake and power (Pahl-Wostl, 2005). These concepts helped me to define the boundaries of the discourses set in this research. The matrix by Pahl-Wostl (2005) helped to outline the positions of discourse in the LNB and helped to identify the changes that occurred in this positions over time. The Foucault triangle helped me to understand and conceptualize the interdependency of knowledge, power and truth in discourses. Besides the extra concepts the definitions by Hall (1992), Widdicombe (1995) and Burman (1994) helped me to get a better understanding of discourses and outlined the way in which I perceived discourses in the LNB.

Besides the ERA framework, that mainly structures the results, two models from Molle (Molle, 2003; Molle et al., 2007) are used to achieve some more analysis and explanation in the structured information about resources, rules and authority. The concept of responses to water scarcity (Molle, 2003) is used to analyse and structure the different responses to water scarcity by different irrigation water user groups in the LNB. This appeared to be helpful and useful as well in the analyses of discourses. The concept of responses to water scarcity helped to link the echelons of resources and rules/authority, because it analyses the response or ability to react (echelon of rules/authority) on events that happen within the echelon of resources. Problems encountered according to this concept were the indistinctness of the problem of water scarcity. Not all stakeholders admitted that there was scarcity, so the indication of responses is gained through interviews and own understanding through observation. The weakness of the concept of responses to water scarcity is the fact that Molle assumes that the responses will occur according to a linear process of water scarcity, however the process of water scarcity in the LNB is very irregular. Therefore it was a challenge to classify the different responses, because some of the responses are existing and some of the responses are expected to happen. The second concept by Molle is the concept of River Basin Governance (Molle et al., 2007). This model consists of several characteristics of organisations, it helps to estimate the position of an organisation in a river basin. The model is based on four extreme ends/characteristics of river basin governance. Therefore the model is simplified and generalizing in my opinion and you can never claim to know the exact



position of an organisation, however I used the model to analyse and distinguish the shift that organisations make in the LNB and how WRMA-Naivasha, Imarisha and IWRAP relate to each other. Therefore the concept was useful in addition to the ERA framework and to deepen out the echelon of authority and the understanding of the discourses.

In addition to the analytical framework the concept of IWRM is used to reflect on IWRAP and to situate IWRAP in a broader (scientific) context. To reach this goal, literature on IWRM by Biswas (2008), Davis (2007), Anderson et al. (2008) and Cook & Spray (2008) is used to analyse IWRAP and its performance. By using the concept of IWRM I was able to relate the challenges of the IWRAP project to other projects or to the concept of IWRM in general. One might argue that the people or organisations in the LNB are not to be blamed, because they try to implement something that is hard to achieve. Everywhere in the world people and organisations encounter huge difficulties with integrated projects, so therefore the critique on the involved people and organisations in the LNB is gentler.

9.3. Discussion of methodology

In this section the methodology in this research is discussed. Why are certain decisions made and are these decisions the right ones? Also difficulties and events encountered in the methodology that might have influenced the gathered data are discussed.

The first point of discussion is the selection of interviewees in this research. Not any official sampling method is used, due to constraints according to time, availability and willingness of participants. Farmers are selected for interviews because they responded to the approaches via email or telephone or because they were selected, like in the case of Mkungi Kitiri farmers, by the WRUA. Therefore I had limited influence in the sampling method. This influenced the gathered data, however it cannot be said to which extent. What can be said is that several commercial farmers refused to be part of the research. This behaviour can be explained as if the farmers are trying to hide something. Due to these constraints in sampling, only the farmers that were willing to participate in the interviews are part of the research and therefore the information received from them might be positively biased concerning compliance and involvement in the water management in the LNB.

The second point of discussion is the choice for the different irrigation water user groups. The main focus in this research was from the beginning on the irrigation sector, so therefore groups using water for domestic or industrial uses are ignored. In the irrigation sector three user groups are distinguished. In the starting phase of this research the focus was only on the commercial farmers and the smallholder farmers, however the commercial farmers are split into two groups because there are differences between the groundwater and surface water users. Also the focus shifted more to the commercial farmers, because the smallholder



farmers are not involved in and are not concerned with the situation of water management in the LNB.

Another point of discussion concerning the methodology is the fact that almost all farmers didn't know of the existence of IWRAP. The reasons for this lack of knowledge is firstly that IWRAP is an institutional interference, not specifically for the farmers and secondly that IWRAP is only half-way and due to the slow process not yet fully operational and implemented. However, in the interviews with the farmers I generalized the part considering IWRAP, into a part about development projects concerning water management. The limitation however was that the practical example of IWRAP disappeared and that the farmers were confused about the vagueness and hypothetic turn in the interview. The positive side of this lack of knowledge about IWRAP was the fact that if I asked about the requirements concerning water management issues, the farmers were not biased by activities of IWRAP, but they were triggered to think by themselves. This trend of biased understanding of water management activities was seen by the organisations and partners of IWRAP. They were satisfied with everything that IWRAP did and could not think easily out of the box about other interventions, requirements or activities.

9.4. Added value to theory and practice

The position or added value of this research can be perceived on two different levels. The first level is the positioning of the research in the context of the LNB and the second level is the positioning of this research in the broader scientific context.

The positioning of this research in the first level, the LNB, is quite easy to distinct. Over the past two decades a lot of research is performed in the LNB, however the focus of this research is mainly technical. Due to the social-technical character of this research it was somehow innovative for the existing literature in LNB and institutions. Often farmers or participating stakeholders were surprised by the social character of the research, they were not used to it. Besides that the focus was on how farmers perceived the water management in the LNB, this was also totally new for them. So the starting point or focus of this research was new for the LNB. Although the data gathered is informally known by farmers and stakeholders, it is never mentioned literally and wrote down in a report. The reason for this is the presence of sensitive information and the fact that the most research in the LNB is technically focused. Besides that, there were some striking new insights and revelations for the IWRAP partners as well. For example the indistinctness about the WAP, initiated by the Southlake farmers, but now criticized by those farmers as well, due to the unrealistic measures and non-compliance (MT6). LNGG, LaNaWRUA, WRMA-Naivasha and members from the PMU of IWRAP were surprised by that shift. This research can also be a starting point for the mid-



term evaluation of IWRAP, as mentioned in the first chapter as well. This is obviously also innovatory information but probably not relevant for the whole catchment.

The position of this research with regard to the broader scientific context is more complex to distinct. The research performed and frameworks used are not revolutionary. Although an interesting aspect is the fact that the ERA framework is not commonly used in Africa. The only research that used the ERA framework in Africa so far is performed by Chris de Bont (de Bont, 2013) in Tanzania. Due to the different cultures this might give some new insights about the applicability of the ERA framework, however as mentioned before, it is hard to compare case-studies that used the ERA framework due to the researchers' freedom to set boundaries and use different methodologies and concepts. Beside the hardship to compare case-studies according to the ERA framework, it is also hard to position a case-study in its broader context. As explained in the section on scientific perspective (1.5) the gained knowledge is socially-constructed and negotiated. Consequently universal validity is not proven, because the character is very context-specific. Therefore the aim was to understand causality in the context-specific situation of the LNB.





CONCLUSION

10. Conclusion

To give an answer to the main research question, the main conclusions are presented. These main conclusions contribute to the answer on the main research question, formulated as: “What are the effects of implementing the IWRAP programme for the irrigation sector in the Lake Naivasha Basin, with a particular focus on the interests for different irrigation water user groups?” The situation in the LNB is very complex. Due to the volatile environmental conditions, the high stakes considering floriculture and the environment value of the LNB, the water management can be seen as a huge challenge. There is limited accurate data on water quality and quantity available, this hinders a proper water management and implementation of projects. Reason for this limited data is a weak position of WRMA-Naivasha, no equipment to monitor and collect data and the volatile environmental conditions in the LNB. A strong position of WRMA-Naivasha and enough available knowledge and data for water management are interdependent. If one of this factors is hampered the interdependency will come into a negative spiral. Due to the huge uncertainties concerning accurate water data, there is also indistinctness about the water availability. This volatile conditions and uncertainties concerning accurate water data affects all echelons, especially the discourses. The rules concerning water management in the LNB are very good,



but the implementation is very poor. Due to the implementation gap, the gap between policies and politics and corruption the implementation of IWRM projects, such as IWRAP is complex. The IWRAP project encounters difficulties in implementing their plan because of slow bureaucracy, no enforcement and corruption. Currently, the strongest discourse in the LNB is the discourse of the commercial farmers. Due to the interdependency of power, knowledge and truth the commercial farmers are able to shape the truth in the way they want to create it, because they have power and an important economic position. Therefore the commercial farmers became the main players in the arena of water management in the LNB. Accurate knowledge is absent in the LNB and that absence explains the position of WRMA-Naivasha. Their original position should be as a referee, however they are bystanders nowadays, without a lot of power and influence. This shift affects the arena of discourses and the possibility of good water management. Discourses change over time, however if the lack of knowledge will not change, the status quo in the LNB with the current discourses will be maintained.

IWRAP is a target wise success, but might turn out in an impact-wise failure. In the first two years IWRAP achieved practical targets, according to result 1 & 2 of their project. Including the implementation of a lab, the permit data base, new equipment and capacity building. The farmers in the LNB are unaware of the existence of IWRAP, because the focus of IWRAP is mainly on the partners, however these partners encounter difficulties to communicate the benefits of IWRAP to their members. Therefore the IWRAP partners are the main beneficiaries of IWRAP. They benefit from training, capacity building and funds by IWRAP. The smallholder and commercial farmers don't recognize any effects from IWRAP. The commercial farmers perceive projects such as IWRAP as negative, because they don't see the effects and because the commercial farmers act very individualistic. The smallholder farmers are less involved in the debate about water management. They tend to be always open for new projects, such as IWRAP, because it will result in funds for activities, however the effects that are seen by smallholder farmers are minimal as well. For the farmers IWRAP is an impact-wise a failure, despite the achieved targets. This is because the beneficiaries are at the institutional level and these institutions and IWRAP partners are not able to make the translation of these benefits to their members. Therefore IWRAP interacts mostly in the echelons of rules and authority. IWRAP is not able to achieve big changes in the echelons of resources and discourses, because also IWRAP lacks the capacity, enforcement and power, and on top of that IWRAP is depending on the local institutions. The minimal influence in the discourses is because their own discourse is quite weak.

The methods and concepts used in this research made it possible to outline the water management situation of the irrigation sector in the LNB. The ERA framework helped to



deconstruct and classify the water management situation and additional concepts by Foucault (1977) and Pahl-Wostl (2005) on discourse analysis helped to analyse and distinguish discourses in the LNB, because on discourse analysis the ERA framework is a bit meagre. With the analytical framework it was also able to investigate the interference of IWRAP in the different echelons. IWRAP interferes mainly in the echelons of rules and authority, slightly in the echelon of resources and minimally in the echelon of discourse. Besides the discourse analysis the two frameworks by Molle (2003, 2007) helped to classify the governance and responses to water scarcity, in order assess the effects of IWRAP. Although both concepts are adapted to fit this research. The IWRM-concept that is used, reflected on the success of integrated projects and this reflection resulted in the conclusion that the integrated approach used for IWRAP was quite ambitious. Therefore implementation and impact achievement of IWRAP is a challenge.

This thesis argues that an integrated project, such as IWRAP, can only be successful when there is accurate data and knowledge, transparency, communication and involvement of all stakeholders. Besides that, the aspects of corruption, volatile environmental conditions, bureaucratic issues and cultural habits needs consideration to achieve a successful implementation.



11. Recommendations

At the end of this research some recommendations can be given. These recommendations can be meant for practice or for theory. The practical recommendations are for the water management in the LNB and the recommendations concerning theory are focussed on further research.

The practical recommendations can be split up in recommendations for the IWRAP project and recommendations for other organisations and institutions in the LNB. For IWRAP the recommendations are:

1. Create a proper exit-strategy for the period after IWRAP. The WRUAs and other organisations are worried about that.
2. Try to involve farmers, public and WRUAs into these projects. Now mainly IWRAP partners benefit from the project and they are not able to translate this to their members.
3. Improve communication between IWRAP partners and between the IWRAP partners and their members.
4. Improve data collection and monitoring. Without accurate data it is hard for IWRAP to be feasible and sustainable.

The recommendations for the other organisations and institutions in the LNB can be listed as well. There is some overlap with the recommendations for IWRAP, because IWRAP and the organisations and institutions interact with each other. The recommendations are:

1. Better communication with each other and with the members of the organisation. For example, a better communication between LNKG and their members.
2. Transparency and feedback in the permit application process and other bureaucratic issues. Nowadays there are a lot of problems due to miscommunication and missing documents.
3. Improve data collection and monitoring. Without accurate data it is hard to develop any sustainable projects.
4. Training for the farmers and local communities concerning water quality and quantity issues. Training about existing rules and obligations.



The theoretical recommendations for further research are also important. Especially because there is a lot of technical-oriented research in the LNB, but the social component is underexposed. Therefore the following recommendations can be given:

1. Further research on how commercial farmers can be involved in policy-making and projects.
2. Focussed feasibility study on integrated projects in the LNB. A lot of organisations are very positive about that in the LNB, however the results until now are meagre.
3. Further research on the role of data availability in decision-making in the LNB.
4. Further research on how to use the ERA framework in situations where a thorough discourse analysis is required.
5. Further research on how to use the concept of responses to water scarcity by Molle (2003) in volatile and irregular conditions.



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Annex

Annex I: Blueprint Interview Commercial & smallholder farmers

- Farmers name (optional, interview can also be anonymous)
- Age of farm (optional, interview can also be anonymous)
- Size of farm (optional, interview can also be anonymous)

Resources

- Which water sources are available in the LNB for you?
- How much water do you abstract?
- How much water is required per day for your farm?
- What is the quality of the water you abstract?
- Are there difficulties you encounter with regard to the access of water resources?
- How can you access this water resources legally?
- How do you abstract water? Was this always the same?
- Do you use all the water you abstract?
- Are there problems (Quantity/Quality) with water abstraction or allocation?
- What do you do with the drainage water?
- Can you describe how farmers together (up & downstream) access the water resources?
- Do you need to pay for the water?
- What is the infrastructure that is needed to access this water resources?
- Who is responsible for the management and operation of the infrastructure?
- Did you pay for the infrastructure and abstraction of water?
- How long can you use this water resources?
- Are you the only one having access to your water resources?
- Is the access to the water resources contested?
- If you have complaints, what do you do? Are these complaints heard by someone?
- What can be improved in the access and materializing of water resources?
- Does IWRAP plays a role in the creation or access of water resources?
- Did something changed in the access to water resources when IWRAP came in?



Rules

- What are the formal rules according to water allocation?
- Who is in charge of the water allocation in the LNB?
- Who declares/makes the rules according to water allocation and distribution in LNB?
- Do you obey the rules?
- Do you have a (valid) permit for water abstraction?
- Are you a member of the WRUA? Why (not)?
- What are your responsibilities according the water allocation and water rights?
- How can you create water rights?
- Are you interested in more strict or new rules?
- Are there difficulties you encounter according to the rules?
- How does IWRAP contribute to the existing rules in the LNB?
- If you have complaints, what do you do? Are these complaints heard by someone?
- Are you satisfied with the existing rules?
- Are there different rules and obligations for different users?
- Was there any cooperation in establishing the rules and regulations?
- What can be improved in the LNB according to rules?
- What is the role of IWRAP in the establishment of rules?
- Are there conflicts with regard to settlement of rules?
- Did something changed in the setting of rules when IWRAP came in?

Authority

- Who is in charge of the water rights?
- Who defines the water rights? (Legally and practically)
- Who enforces these water rights?
- Are there strategic alliances in the LNB?
- What happens when you don't fulfil the obligations and rules?
- What are the penalties?
- Are you interested in a authority that is strict and regulates everything according to water allocation?
- Are there difficulties you encounter according to the authority?
- Who got the decision making power?
- Are you involved in the decision making?
- Are you satisfied with the actual authority and decision making power?
- What is your relation with the WRUA?



- What is your relation with the WRMA?
- What is the role of IWRAP in the decision making?
- Are there conflicts with regard to the authorization of water allocation?
- What can be improved on authority and governance in the LNB?
- How does IWRAP interacts in the decision-making?
- What power does IWRAP have?
- Did something changed in the authority and decision-making when IWRAP came in?

Future, IWRAP

- What do you see as important aspects of water allocation?
- What will be the best way to allocate the water to nature, business and people?
- Can you describe what you know about IWRAP?
- How are you involved in the IWRAP?
- What do you recognize from IWRAP?
- Do you think IWRAP is important for the Lake Naivasha Basin.
- Would you like to be involved in programmes such as IWRAP?
- Did something changed in the LNB when IWRAP came in?
- What are the benefits of the IWRAP programme?
- What are the burdens of the IWRAP programme?
- How can IWRAP be improved?
- What are your requirements according to water allocation?
- Do you think IWRAP can meet your requirements?
- What do you expect of IWRAP?
- Do these expectations differ from 2 years ago?

