Managing water, sustaining life

The institutionalization of water resource management policy

Albin Malmros

Abstract

This bachelor thesis investigates how the implementation of water resource management promote an institutional design that can create lasting change. It is a case study of the Mara River Basin Initiative in Kenya and Tanzania, where great efforts have been taken to combat water related problems. The national governments have delegated the operational responsibilities to local water users' groups, which are in charge of administering the policies locally. Rules are also in place, punishing pollution or over-usage of water by tariffs. By using the Institutional Analysis and Development framework developed by Elinor Ostrom, the structure of the water institutions are analysed. I am able to describe the institutional structure of the project, and through the framework also determine its institutional stability. It is concluded that many of the actions taken are in line with Ostroms' thoughts, and that it very well can be applicable to other water management projects.

Key words: Integrated Water Resources Management, Institutional Analysis and Development framework, The Mara River Basin Management, Governing the Commons

Number of words: 8294

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1   Introduction

1.1   Aim of the Study and Research Question

The aim of this study is to analyze how the institutional design affects the sustainability of water resources management, or rather what institutional structures needs to be in place in order for water management policies to sustain in the long run. My research question is as follows:

How does the implementation of Integrated Water Resource Management policies promote a sustainable institutional design?

In order to answer this question, I will analyse a river basin management program in Kenya and Tanzania, using Elinor Ostroms' Institutional Analysis and Development framework. By "sustainable institutional design" I mean an institutional structure that according Ostrom would be self-sustaining. After performing the analysis on the case of interest, I hope to be able to draw conclusions that might make it useful for the continuing study of water resources management.

1.2   Integrated Water Resources Management

Water is essential for the survival of every living being on this planet. Where I live it is not common to reflect over the abundance it means to have clean, always-accessible running water, and the absolute luxury it is with the long hot showers in the morning. In many parts of the world there is severe water scarcity, which leaves people thirsty since they can't drink, hungry since they cant cook, and dirty since they can't wash. Places were the rain doesn't fall for months on end, where crops won't grow, and where the only water that exists is of such bad quality, that it is outright dangerous to consume it.

Countless international efforts have been taken to combat water shortages. Integrated Water Resources Management is another one – one that gathers them all under one roof, to find a common strategy on how to deal with water issues. It is a "process which promotes the coordinated development of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP 2010)". It is a cross-sectoral approach, in which public and stakeholder participation in the formulation, implementation and maintenance of policies is often an important part. In this thesis I will mostly refer to it as IWRM, or simply WRM.

2 Theory

The Institutional Analysis and Development framework

2.1 Common-pool resources and the IAD framework

A common-pool resource (CPR), such as the water in a river, is a resource not owned by anyone and therefore jointly accessible to all individuals in its proximity. When a CPR is subtractive, meaning one users consumption decreases the amount which is available to others, scarcity occurs, which in effect leads to the degradation of the environment. This phenomenon is what is generally known as the Tragedy of the Commons. Political scientist Elinor Ostrom argued that the key to making sure that usage of a resource is allocated sustainably, is an institutional arrangement that specifies how much of the resource each individual is allowed to use and how often (Ostrom 1990, p. 2). It is important that this system is fair, efficient and enforceable in order to make sure it is maintained and that there are no free riders (Ostrom 2007, p. 40-42).

As a theoretical framework for this thesis, I use the Institutional Analysis and Development (IAD) framework, which hopefully provides the analytical tools for adequately answering my research question. The IAD framework, which was developed by Elinor Ostrom, focuses on how institutions affect the collective behaviour of individuals (Ostrom 2007, p. 21), and is commonly used when assessing how common pool resources are being managed. Water being a common resource, making an institutional analysis of an IWRM initiative is therefore suitable.

2.2 Institutions as rules-in-use

In the IAD framework, institutions are defined as "the shared concepts used by humans in repetitive situations organized by rules, norms, and strategies". Since this definition of institutions does not necessarily refer to written rules or laws, but merely shared concepts, one of the greatest challenges when studying institutions is to identify and measure them. In order to make this distinction easier, the

analytical focus is on rules-in-use, meaning the set system of behavioural rules practised in a community (Ostrom 2007, p. 23).

Rules are shared understandings amongst people about what actions are required, prohibited, or permitted. Much of these rules occur as individuals meet to solve a problem through collective action. Rules guiding our everyday life have different sources, and come in different shapes. In addition to formal legislation and regulations of the central government, agencies on all levels of society can make laws, and corporations and voluntary organizations can influence the rules that people follow in their day-to-day actions and interactions. One step to take, in order to make a deeper analysis of the institutions behind our actions, is to understand the working rules – the set of rules individuals would refer to if asked to justify their actions – that are used when making decisions. The stability of rules and laws are dependent on the shared meaning assigned to the words used to describe them. If there is no shared meaning of the words, confusion will arise about what actions are required, permitted, and forbidden (Ostrom 2007, p. 36-37). When individuals in a community have a shared set of values, they are also more likely to develop rules to combat a common resource-problem, as well as more likely to follow them (Ostrom 2007, p. 43).

Analysis of decision-making situations are made on three levels, in a somewhat hierarchical system, in the IAD framework. The constitutional, the collective-choice, and the operational level are all nested within one another. Rules that specify what individuals can and cannot do are on the operational level. What can be decided on the operational level is, on the other hand, stipulated by the collective-choice rules, and the collective-choice rules are themselves constrained by the constitutional rules. Rules on all three levels are needed in order for a collective endeavour at the local level to operate. Due to the intertwined levels of rule-making, crafting rules that decide the dealings of individuals is not necessarily the privilege of the government; an individual can make both collective and constitutional choices (Lam 2011, p. 509).

2.3   The Action Arena

When analyzing, explaining or predicting behaviour within a certain institutional arrangement – will I will do in this thesis – the first step is to identify the action arena. This arena is the social space where individuals interact – for example to solve problems, or exchange goods and services – and consists of an action situation and the actors who are a part of this situation (Ostrom 2007, p 28). The actor in a situation can both be a single individual and a number acting as one, like a corporate actor. In order to describe the structure of an action situation, seven variables are commonly used. I will illustrate the action situation using the action arena of a river basin management initiative:

- The set of participants – who and how many use the river?

- The positions – what different positions are there to be filled by participants? On what levels are decisions made and by who?

- The set of allowable actions – what rules does the water initiative consist of and how do they affect the outcome?

- The potential outcomes – what region and what events are affected by the actions of participants?

- The level of control over choice – do participants take the intended actions or can they choose not to?

- The information available – how much information do participants have about the structure of the action situation?

- The cost and benefits – how costly or beneficial are various actions to the outcome?

By finding the structure of the action situation in a problem-solving process, the hope is to find regularities in human actions (Ostrom 2007, pp. 29-30). The term action refers to human behaviour, and the hope is to be able to predict the behaviour of actors in certain situations. By looking at the institutional structure surrounding an IWRM initiative, it is possible to predict how actors will behave in that particular setting, and by aggregating their behaviour it is possible to make predictions of the outcome of the collective actions (Ostrom 2007, pp. 30-33).

Actors are presumed to have incomplete knowledge of alternative actions and their likely outcomes. It is often the case that institutions can help improve knowledge, and create incentives for making decisions that are collectively beneficial. Because of the lack of perfect knowledge, often actors do not know how their usage of a resource is affecting others negatively, or that they are interdependent of one another. Creating institutions make actors aware of these things, and them people look beyond their self-interest and find an arena for collective action (Lam 2011, pp. 510-511). The goal of a common-pool resource management program is to make the collective actions needed to solve the problem become institutionalized, which creates a self-sustaining institutional structure.

2.4 Analysing outcomes

In the IAD framework, governance of the commons is an ongoing process. In order for it to work effectively, it takes an institutional design that ascertains the continual contributions by participants. Elinor Ostrom has identified eight principles of institutional design for successful common-pool resource governance:

- The boundaries of the resource should be clearly defined, as well as what groups and individuals get access to the resource.

- Rules should correspond with physical conditions and local needs.

- Arrangements should be in place to ensure that those affected by rules can participate in modifying them.

- Monitoring of the behaviour of users should be carried out by community members.

- The use of graduated sanctions should apply for rule violators.

- There should be accessible mechanisms at hand for solving conflicts.

- The right of the users to their own institutions should be guaranteed.

- Responsibilities should be shared in a nested system of multi-level governance of the common in question.

Institutions that have these characteristics are better equipped to provide incentives for users of a common resource to, continuously set rules-in-use for effectively governing the CPR (Lam 2011, p. 510).

When evaluating the outcome of an institutional arrangement, it is also good to look at other criteria. Economic efficiency, fiscal equivalence and redistributional equity all have to do with changing the allocation of resources. Are the benefits of a project at an economically optimal level, will actors get back what themselves contributed, and will the resources be redistributed in a fairer way in order to raise the standard of living for poorer individuals? These three are not completely compatible with one-another, and trade of between them have to be made (Ostrom 2007, p. 33). Implementing user-costs for using a resource, sanctions for not following the rules, or incentives for following them is a good way to make sure that the users follow through with their engagements, and at the same time would help increase economic efficiency. For the poorest members of society user costs are not an option – the collective action incentive has to be strong, but still equitable. As mentioned before, external monitoring and enforcement activities is also favourable in order to make sure the institutional arrangement is strong enough (Ostrom 1990, p. 16-17).

When evaluating an institutional arrangement, it is also necessary to look at the *accountability* of officials to citizens involved. This, as well as efficiency and equity, is hopefully increased if the institutional arrangement make sure the officials are informed of the preferences of citizens. Whether the institutions dealing with a CPR comply with *general morality* is another subject to evaluation. Is there a system in place for detecting actors who wish to cheat for their personal gain, and is there a system for rewarding people who follow through with their obligations? Lastly, *adaptability* to changes in the environment, such as natural disasters, is crucial in order for a institutional arrangement to be sustainable over time (Ostrom 2007, pp. 34-35).

3 Methods

3.1 Choice of subject, theory and unit of analysis

In this study I investigate the foundations for successful implementation of water resources management. Water being a common-pool resource, I find Elinor Ostroms institutional analysis and development framework to be a useful theoretical tool for evaluating IWRM policies. As for finding a unit of analysis, it is very important for it to be carefully selected. Since the purpose of my study partly is to answer if IWRM implementation creates a sustainable institutional design, it is important that the case could be seen as representative for IWRM projects (Teorell, Svensson 2007, p. 83). I see the Mara River Basin Management Initiative as suitable, since the project is very well documented. It is also a very large project, which makes it possible for a wide-ranging implementation of IWRM on all levels.

According to my knowledge, an institutional analysis of an entire IWRM project like this one has not been done. Elinor Ostrom has done multiple studies on irrigation systems in small villages, but it has not been done with a policy that incorporates all aspects of IWRM. So therefore, why not see the study as an introduction to the institutional analysis of integrated water resources management as a whole. Hopefully, it results in a meaningful analysis that explains how water institutions affect the sustainability of IWRM policies.

3.2 The Case Study

I have chosen to conduct a single case study for this thesis. The case study is the methodological approach of gathering enough information about a particular event, policy or manifestation of a phenomenon in order to effectively understand how it functions (Berg 2001, p. 225). A qualitative study aims to understand every phenomenon in society from its own individual context. By choosing only few units of research it is possible to take many different factors of explanation into account when trying to analyze a certain phenomenon (Teorell, Svensson 2007, p. 11).

The study of few cases is used when the researcher want to thoroughly analyse a subject, going under the surface to try and find answers. Sometimes, criticism is

directed at the case study method because of its presumed lack of generalizability (Yin, 2007, p. 17). It is argued that looking at only a few units of analysis would make it unscientific. In my opinion, this does not apply to this study. Although renowned researchers such as Elinor Ostrom have both time and resources to conduct studies which are both extensive in scope and intensive in precision, it is very rare to have those resources. In this study, it is my firm conviction that by applying the theoretical framework in use on only one case, more can be said about the possibilities for lasting and effective water resource management. As long as the case in question is thoroughly chosen, and the amount of collected data is enough for a in-depth analysis, mixing in more cases to this study would in my opinion not necessarily help answering the question. The case study stands for itself, but I believe that finding patterns could lead it on. I hope to make a compelling case that is also applicable on other similar cases. The goal in a case study is to achieve analytic generalization which means being able to generalize theories – not to achieve statistical generalization (Yin 2003, p. 10).

Had I made a quantitative study trying to answer this same question I could probably only have used two or three variables of explanation. Since gathering much information about large quantities of study objects is very time consuming, quantitative studies are often used to test a theory on a causal mechanism between a dependent and independent variable (Teorell, Svensson 2007, p. 182). At the same time, it is important to realize that I most likely would not have gotten the same results from a study conducted with a quantitative method. There is no need for a case study to also be a qualitative study. Many case studies have elements of both, and some are purely quantitative. The question of whether you prefer a qualitative or quantitative study, rather has to do with philosophical beliefs (Yin 2003, p. 15). I for one believe that a qualitative study will in many cases (at least this case) give the best results. It is a complex world we live in, with so many factors influencing every single event or action – that trying to gain knowledge of why or how things happen by isolating the very few variables of explanation needed to complete a quantitative study is painting a picture of a world without greyscales. Such a world does no exist.

This case study has an explanatory ambition. In most studies in political science, casual connections are complex, and hard to isolate and measure (Yin, 2007, s. 150). Many factors a part from institutions play a role in the sustainability of common-pool resources policies, and one can never be certain beyond doubt of an answer in social sciences. By defining key concepts, and by conducting a study that is focused, theory-connected, and approached in a systematic manner, the idea is that fallacies can be ruled out to a high degree (Yin 2003, p. 21). It is my opinion that this study follows these core principles. Additionally, two questions are important to ask when conducting a case study: First, has the researcher made too many subjective decisions in order to get to his conclusions for them to be truly objective? Second, does the study offer information that can be as useful beyond the individual case (Berg 2001, p. 231)? When it comes to the question of objectivity, every researcher makes subjective choices the research process. The real question here is rather about replicability, would another researcher conducting the same study get the similar results? In my opinion, I am open about

every step on the way in this study, discussing the different choices I've made in order for anyone to follow the line of thought. The second question is a matter of generalizability (Berg 2001, p. 232). For some this is not a question of interest, but as I said before, I do believe that it is possible to produce meaningful knowledge on a more general level. It is my belief that IWRM management issues are similar in many different settings, and that doing thorough research on one big project can also contribute to the understanding of others.

3.3   Data collection

In order to get a more substantive picture of reality, it is useful for researchers to use multiple sources of evidence, and more than one data-gathering technique through so called triangulation (Yin 2003, p. 97). When initially starting this project, a triangulation approach was my intention. I have not however been able to get in touch with people with first-hand information on my case of study. Proceeding with the study anyway might not be optimal, but it is my opinion that the empirical background for my analysis is adequate, and that my conclusions are scientifically relevant. It could be seen as an obvious flaw of this study, that the data-gathering only consists in reports and writings from NGOs and such, and no first-hand sources such as expert- or participant interviews. There lies a threat to validity that I have to keep in mind when performing the actual analysis, making the need for careful considerations of every conclusion drawn even more stressing than usual (Berg 2001, p. 6). Concluding this section, I want the reader to bear in mind that it is answering of questions through the application of systematic procedures - not simply the gathering of data - that is the purpose of conducting research. As long as my analysis is structured, valid and reliable, and I hold myself accountable for any errors, my question can be considered sufficiently answered (Berg 2001, p. 5). It is possible to do a valid high-quality case study without leaving the library (Yin 2003, p. 11).

As I mentioned previously, one of the reasons I chose to analyse the Mara River Basin management initiative, is because of the amounts of accessible information. Compared to many other of the IWRM projects I've encountered, it is possible to retrieve written sources from many different organizations regarding the same water initiative, which should increase the validity of the project. Much of the data is however extracted from the Norad and WWF evaluation report on the Mara River Basin management initiative. Letting one source take up a too big part of a study is problematic out of many reasons. If the author is biased and selectively collects data, or produces the report for a specific purpose and a specific audience, it might not be ideal for the basis of a scientific analysis (Yin 2003, p. 86). I will however defend my selection – the report is written by three scholars in different fields of study, with extensive experience in water management policies. Also, they are not themselves employees of the WWF. The fact that I have all these written sources of data gives me a broad overview, which covers many events and settings, and is stable and easy for any reader to access.

4   Background

The Mara River Basin Management Initiative

4.1   The Mara River problem structure

The Mara River is a river in East Africa that originates in the Kenyan highlands and drains out into Lake Victoria in Tanzania. The river basin covers an area of approximately 13,750 km2, of which 65% is on the Kenyan side of the border. The river basin supports over one million people, and many rely on the river for drinking water even though the quality is poor (WWF 2010). During dry seasons scarcity occurs, and conflicts over water tend to arise. A part from poor water quality and quantity, there is a general environmental degradation which threatens biodiversity and the livelihoods of people living in the area. The nature and wildlife is of global conservation significance, and attracts many tourists, which also makes it of great economic importance. The causes of the problems are many; over-abstraction of water resources due to an ever-increasing demand, unsustainable agriculture, deforestation, pollution, poor infrastructure, and weak legal and institutional arrangement are all things can be said have contributed (Onyando et al. 2013, pp. 9-11).

4.2   The institutional structure

In light of these difficult challenges, both countries initiated political and institutional reforms of the water management sector in the 2000's. By decentralizing decision making and devolving powers over water resources to WRM institutions, a fundamental change in the institutional framework has occurred. The Mara River Basin Management initiative, which will be analyzed in this thesis, operates within these institutional framings.

In Kenya, the Water Act from 2002 is the general law that governs the management, conservation, and use of water resources. It promotes a decentralized system, where the Ministry of Water and Irrigation formulates the policies only, leaving the actual managing of all water resources to the Water Resources Management Authority (WRMA). The WRMA, in turn, delegates the administering and conflict resolution to the water resources users' associations, which bring water users together in their respective regions of the country. In line

with this, the issues regarding the Mara River, such as the regulating and enforcing of WRM, are handled at the sub-regional level. For example, included in the set of laws regulating water resources is a system for controlling the water quality through issuing pollution permits at a fee for businesses polluting the river (Onyando et al. 2013, pp. 6-8). The National Water Policy of 2012 builds on lesson learned from the previous water policy and among other things emphasizes: greater autonomy for user groups, and the devolvement of functions to the lowest possible level, increased enforcement of pollution control through the polluter pays principle, and improved monitoring and evaluation systems.

In Tanzania, the Ministry of Water is responsible for the WRM, and it is administered at the local level by District Councils and sub-basin water offices. The National Water Sector Development Strategy, in an attempt to streamline the institutional framework for WRM, clearly defines the roles and responsibilities of stakeholders to ensure their participation at different levels (Onyando et al. 2013, pp. 6-8). Among other things, the National Water Policy of 2002 promotes: autonomy of water user groups, training staff at the lowest level, effective monitoring mechanisms, tariffs for over-use of water, and increased water supply for low income groups. Efforts are also made to make the water institutional structure less sensitive to natural disasters (Ministry of Water and Livestock Development 2002, pp. 32-47). The institutional structure in the two countries is further depicted in the appendix in section 8 of this thesis.

4.3   The implementation of the Mara Initiative

The Mara River Basin Management Initiative was carried out between 2003-2012 and its' overall goals was "improved quality and reliable quantity of water in the Mara River Basin for sustainable ecosystem functions and basic human needs". The anticipated outputs were: (1) Strengthened capacity of community level representatives and their institutions to implement IWRM and income-generating activities. (2) Enhanced knowledge and participation in IWRM through spreading lessons learned to partners and stakeholders. (3) To engage partners on the local, regional and national level to influence legislations for improved delivery of IWRM through lobbying. (4) Improved IWRM implementation at local, national and trans-boundary levels through strengthening sustainability, coordination and partnerships among IWRM institutions (Onyando et al. 2013, p. 12).

During the ten years of the initiative, 17 water resources users' associations were formed in both Kenya and Tanzania, enhancing multi-stakeholder participation and decentralized systems of water governance, which is in line with both IWRM, and the national policies and institutions on the subject (WWF 2010). Users' associations were trained on registration procedures and formulating by-laws, and also participated in monitoring of the water quality and collecting water fees. This should make sure local users have the ability to sustain the initiative. Close collaboration between government agencies and regional

partners and their successful lobbying should also make the system more stable in the future. The users' associations were trained on developing sub-catchment management plans for their local communities, and to present it to their local government and the Basin Water Board, which was a success (Onyando et al. 2013, pp. 30-31). The newly formed users' associations were a success, with more than 850 new members who wanted to act as representatives for their local communities. The effect is however not exclusively positive, since only 125 of these new members were regarded as active (Onyando et al. 2013, p 22). The formalization of the monitoring methods of the water quality was implemented with some success.

The Water Users Associations got their formal legal recognition with the new national policies in the beginning of the 2000's. This was also the start for many different projects in the River Basin, with the support from many international organisations and government, but under the leadership of the domestic governments in the two countries. In 2006, a trans-boundary WUA was established, to help grassroots cooperate and voice their concerns in the planning, implementation, and monitoring of trans-boundary agreements. The government water agencies in both countries made sure they were properly integrated in the management process (Global Water for Sustainability Program 2006).

4.4   The outcome of the project

A comprehensive document was produced containing key lessons learnt, among them the need for sustainable institutions and activities, the importance of systematic monitoring and simple methods for data collection, and the need for strong regional cooperation and the involvement of influential actors. Among the greatest achievements of the project was the improved legal and policy environment in line with the regulatory frameworks, as well as the establishment and formalization of WRM institutions to promote water governance, and increased local capacities to promote awareness of the threats to the basin (Onyando et al. 2013, pp. 22-25).

There is evidence that some of the activities of the Mara Initiative has spread even after the project was finished. For example – in Tanzania, there is a community group which have continued with maintaining protected springs and establishing new nurseries for promoting bio-diversity. In the last phase of the project, great emphasis was put on the capacities of the users associations to become sustainable. All the action plans for the community groups have got clearly stated conservation priorities and activities for soil and water conservation. The projects success in creating local community groups has created much awareness amongst local people about the value of the river. This should enhance its' conservation value, and contribute to the sustainability of the program (Onyando et al. 2013, pp. 34-35). Also, the Mara River Basin Management initiative, has implemented an environmental education program in a number of schools in Kenya and Tanzania (p. 399).

In the efforts to make the project go on and disseminate into the future, efforts were made including helping community institutions to implement IWRM, and activating and sustaining stakeholder platforms for IWRM. In Kenya, but not in Tanzania, other government agencies on local, national, and trans-boundary level were engaged in order to incorporate experiences from the project to improve common-pool resources policies. Capacity needs assessments were also carried out, in order to ensure institutional stability (Onyando et al. 2013, pp. 30-31). People have volunteered to participate in IWRM activities such as collecting water samples. However, the lack of mechanisms to ensure that lead agencies meet their obligations, and the lack of incentives for volunteers to continue collecting data, can only be seen as a severe limitation, that might make actual institutionalization of these policies take longer (Onyando et al. 2013, p. 32).

The Mara River Basin Initiative has strengthened capacities throughout the region. Respondents in group discussions have also been confident that the community awareness of the threats of the River Basin, such as deforestation, soil erosion and pollution. Through lobbying and advocacy, more people are now aware of the legal frameworks in place to promote IWRM in both countries. A more favourable environment for WRM institutions has been created, and stakeholders such as water users, government officers and private businesses have engaged in dialogue to support the implementation and ongoing engagement of actors. The development and signing of contractual agreements has endorsed and clarified the role of the IWRM institutions on different levels. Through formal users associations and clear rules, the process of IWRM can be said to have become institutionalized. By producing comprehensive documents key achievements and failures and why this is, lessons are learned for the future (Onyando et al. 2013, pp. 36-40).

5   Analysis

In this analysis I go through the features of the Institutional Analysis and Development framework and connect it to the findings of the background of this thesis. I start by identifying the institutions, or rules-in-use, affecting the River Basin Management project. Continuing, I determine the action arena, and the actors and actions that makes it up. The analysis then continues to analysing outcomes of the project, and predict its' sustainability.

5.1   Rules-in-use

There are rules-in-use affecting the River Basin Management that exist on a constitutional level, set by the government through the national water policy and water agencies. These are hard laws regulating the institutional structure through different agencies, as well as setting standards for pollution, and over-use of water. These rules also exist on the collective-choice level, where people share the same concepts on what needs to be done collectively in order to live up to the standards set by the government. On this level of analysis, rules are set by catchment- and sub-catchment groups, and by water users' associations. They in turn, stipulate the opportunities and constraints for what can be decided on the operational level, were individuals make day-to-day decisions. Since I don't have any first-hand sources it is hard for me to analyse the individual level of the institutional structure. The rest, however, I know enough about to proceed with the analysis and make conclusions.

5.2   The Action Arena Analysis

In order to find the structure affecting regularities in human behaviour when it comes to water resources management, the action situation has to be defined. This is easily made by using the seven criteria stated in the theory section of this thesis.

- The participants of the Mara River Basin management project can be seen as everyone who to some extent use the river, either they need it to clench their thirst, water their crops, cook their meals or sustaining their livelihood through tourism activities. However, since over 1 million people live in the river basin, of obvious reasons not

all are active participants, who have changed their behaviour, or even aware of the problem or the project to fix it.

- The positions filled by participants vary. Looking at the pictures in the appendix can help the reader get an idea of what roles exist – from policy maker, to government official, local representative, users' association members down to individual users of the water.

- The set of allowable actions refer to the rules-in-use, or what measures must be taken according to them. For example, implementation of a self-sustaining system of IWRM could mean corporate actors to cut their emissions, or people to stop washing their cars in the river. Giving up these actions would affect the project in a positive way.

- The potential outcome of the Mara project has been thoroughly stated. The goal is increased water quality as well as quantity, increased bio-diversity and a higher degree of participation from stakeholders. If the actions are not taken, it would be devastating for all of the river basin, and for the people living there.

- The level of control over choice from institutions is overall good. Many of the participants have changed the behaviour, and do take the intended actions, and there are sanctions in place to prevent people from not following the rules, such as tariffs for polluting or over-using. It is however hard for me to say how the sanctions, especially social sanctions, are enforced on the individual level.

- The information available to participants about the structure of the action situation has increased tremendously due to the project. Awareness of the problems facing the river has spread through the involvement of the water user associations, as well as from government campaigns.

- The benefits of acting in accordance with the IWRM practice that is stipulated through the water institutions are tremendous. Sustaining quantities and increasing quality of the water is closely associated with sustaining life and quality of life for so many people. The costs of implementation, monitoring and enforcing might be high – but the stakes are higher.

This combined information makes it possible to initiate the analysis. There is a lot at stake if the water problems in the Mara Basin isn't solved. There are over one million users dependent on the river, for many of whom it is the only thing standing between them and starvation or thirst. There is an institutional settings in place, with rules stipulated all the way from the government, through the local water associations, that affect how people act on a daily basis. The awareness of the problem and of the fact that it is necessary to look beyond short term personal interest and act collectively in order to solve it is crucial. Many more people are aware now, but all might not have incentives to comply, since the enforcement of

sanctions are not easy for me to be sure of. Also, incentives such as rewards for following through with obligations are, as far as I know not existent. This is why the spreading of knowledge is so important, it is what will create institutionalization of the rules and norms, sustaining them in the long run.

The most important thing for an institutional design that wants to combat a common-resource problem – and the focus of this bachelor thesis – is that it is structured in a way that makes it self-sustainable, ensuring the ongoing dedication of participants. The Mara River Basin Management initiative has in many way succeeded in building strong and lasting institutions. The national policy acts are many, and emphasis is put on that conflict-solving as well as day-to-day implementation should be done in the lowest possible level, close to the users.

5.3   The analysis of outcomes

Now that the initial setting of the action arena is defined – it is time to move on to the eight criteria that makes institutions work effectively, and ultimately tells us whether there could be success in sustaining the IWRM policies:

- The boundaries of the resource, and of what individuals and actors get access to it is, as far as I can tell, good. The stage is clearly set with a system that stipulates on what level decisions are made, and what actors can decide. National policy is in place that should give users' associations and other lower level groups a clear view of what they can do.

- It is my impression that the rules in place correspond with the physical conditions and local needs. By decentralizing decision-making and conflict-resolution, these things should be handled at the lowest level possible. Through interactions at the action arena, hopefully the communities themselves know the collective action solutions.

- For effective governance of commons, arrangements should be in place to ensure that those affected by rules can participate in modifying them. Once again, the decentralization and stakeholder participation in decision making should make sure that this is what happens. The users' associations have gotten training in registration procedures, as well as formulating by-laws. Participation is a central part of the IWRM strategy.

- The monitoring of users' behaviours are carried out by the users themselves, just as Elinor Ostrom recommends. To some extent we know this to be true. Users' associations participate in collecting water fees, and the collection of water samples by volunteers is also way of monitoring the behaviour of others. All though there is a lack of incentives to carry this out, as has been discussed earlier, the

monitoring system is in place and hopefully will become more efficient as lessons are learned. When it comes to individual actions I can not really say what monitoring activities are going on.

- There is a system of graduated sanctions in place for polluters and people who extract too much water from the river basin, where they pay fines for violating rules, in accordance with how much they pollute or use.

- There should be accessible mechanisms at hand for solving conflicts, and I would say that there are. In Kenya, the Water Resources Management Authority has delegated the conflict resolution onto the users' associations in the respective regions of the country.

- According to the Institutional Analysis framework, users should be guaranteed the right to control their own institutions. One of the key parts of the water policies in both Kenya and Tanzania is that the central government have very little involvement in the operational level of water management. They set the policy but leave the administering, regulating, and enforcing WRM to local governments. This makes users closer to the power, which should give them some influence

- The last criteria for effective IWRM is the notion that responsibilities should be shared in a nested system of multi-level governance of the common in question. As seen in the analysis of the seven previous bullet points – this is the case. The constitutional, collective-choice, and operational level are intertwined, and all share the responsibilities for implementing the IWRM strategy.

As I have shown, the Mara River Basin Management Initiative has at least some of the characteristics of all of these criteria. This gives incentives for users to go together and, through collective action, effectively manage the resource.

A part of Ostroms' analysis of effective institutional settings that must not be left out, is looking at alternative variables that have to do with the allocation of resources associated with the WRM institutions. Economic efficiency is increased when there are economic incentives to comply with rules. Water user costs, and pollution tariffs are such policies that are in place in the Mara basin. This makes the institutional structure good for efficiency, but is it also fair? With regard to redistributional equity, I would say yes – as long as the fee is reasonable. If you take something away from the environment, you should give something in return. If equity is the goal it depends on the structure of rules. Fees are paid by someone who over-uses water or pollutes the river basin. The poor usually don't have much, and don't consume much either - so as long as they get their water for the day, the system can be said to be equitable as well.

Proceeding the analysis, is there accountability in the institutional system? Again, I would say yes. As long as users' groups work as they should they have a certain degree of self-determination, and they can contact authorities and let them know of their preferences. When it comes to the demand that institutions should

comply with general morality, so that you can't cheat the system for your own personal gain? I am sure you can, but the enforcement mechanisms mentioned are in place to prevent that from happening. I have not however found any evidence of a system that rewards you for following through with your obligations. I guess being part of a collective action for the common good must be reward enough. The last thing in this analysis is whether or not the institutional system is adaptable to changes in the environment. As I said in the background for this analysis, Tanzania are preparing there institutions for just that (Ostrom 2007, pp. 34-35).

6   Conclusions

I now conclude this institutional analysis of the Mara River Basin Management Initiative, by going through some of the reoccurring features in the analysis, connect the dots, and hold a short discussion on its' applicability on other water management projects.

The Mara River basin is in general degradation. The river supports over 1 million people who live in the area, but has poor water quality, and during dry season when water is scarce, conflicts tend to arise. The reasons for this are many, including over-abstraction of water, pollution, as well as the historically weak institutional and legal arrangements. In order to combat this, in the beginning of the new millennium, the Mara River Basin Management Initiative was initiated. Its' goals were set: more water, better water, increased bio-diversity, and increased participation. About the same time, the governments of Kenya and Tanzania implemented National Water Policies in order to strengthen water institutions. The policies stipulated that the administering of the water sector should be conducted on the lowest level possible. The responsibility for much of this was put on the newly formed regional water users' associations, which members were trained in governing water, and were given the authority to help solve conflicts that could arise. The governments also decided on penalty fees for using too much water or polluting the river, which vary with how much harm was done. The users' associations were in charge of enforcing these rules, as well as monitoring and collecting data on how the water quality progressed. The users' associations also helped spread the word to other users of the river, explaining to them the magnitude of the problem, what needed to be done and that the only way to get it done was through collectively changing their behaviour.

This whole last paragraph is a depiction of what Elinor Ostrom calls an action arena, where actors meet to solve problems, and the structure of the action situation that is in the arena. Every single one of the actions taken in the action situation above are in line with Ostroms' idea of how a common-user resource is best governed. We have the multiple action levels working together, jointly responsible for managing the water resource, tangled together in a net of interdependencies. Where the government decides the constitutional rules, which says what the users' associations can and can not do on the collective-choice level. They in turn, don't have the power of making laws, but through interactions and information, they can change the working rules that people live by that decide how they act down on the operational level. When this information has become common knowledge, and people everywhere act after these working rules, the action has become institutionalized – and we've created a self-sustaining institutional structure.

I am off course stretching the analogy way to far here. It is not possible for me to say exactly how the implementation of IWRM promote a sustainable institutional design. But I can conclude that many of the features in the Integrated Water Resources Management process that the Mara River case represents vital aspects of the Institutional Analysis and Development framework. Answering my question: it does promote a sustainable institutional design – in the way that it allows users to make decisions themselves, and in the way that it promotes learning and spreading of knowledge, and in the way that it has enforcement mechanism in order for people to follow the rules.

I am the first one to admit that the data collected not is enough for an understanding of how individuals act and why. Participant interviews would probably have been the only way to really get to know the working rules of people. The enforcement mechanisms for cheaters and incentives to be good could have been stronger, and there are off course a hundred other factors that are left out of the analysis, because I am not aware of them. But I have concluded that the institutions are strong, since they fitted well into the framework. And I do think I have managed to say something meaningful on the collective-action level, and that performing the IAD-analysis has proved to be very favourable for Integrated Water Resources Management projects. And yes, I do believe the result it is applicable to other cases to some extent. The IWRM process is more and more standardized, with participation and multi-level governance as an important part. I guess I will just have to do an analysis of another project some time in the future, with participants interviews on the bank of the river.

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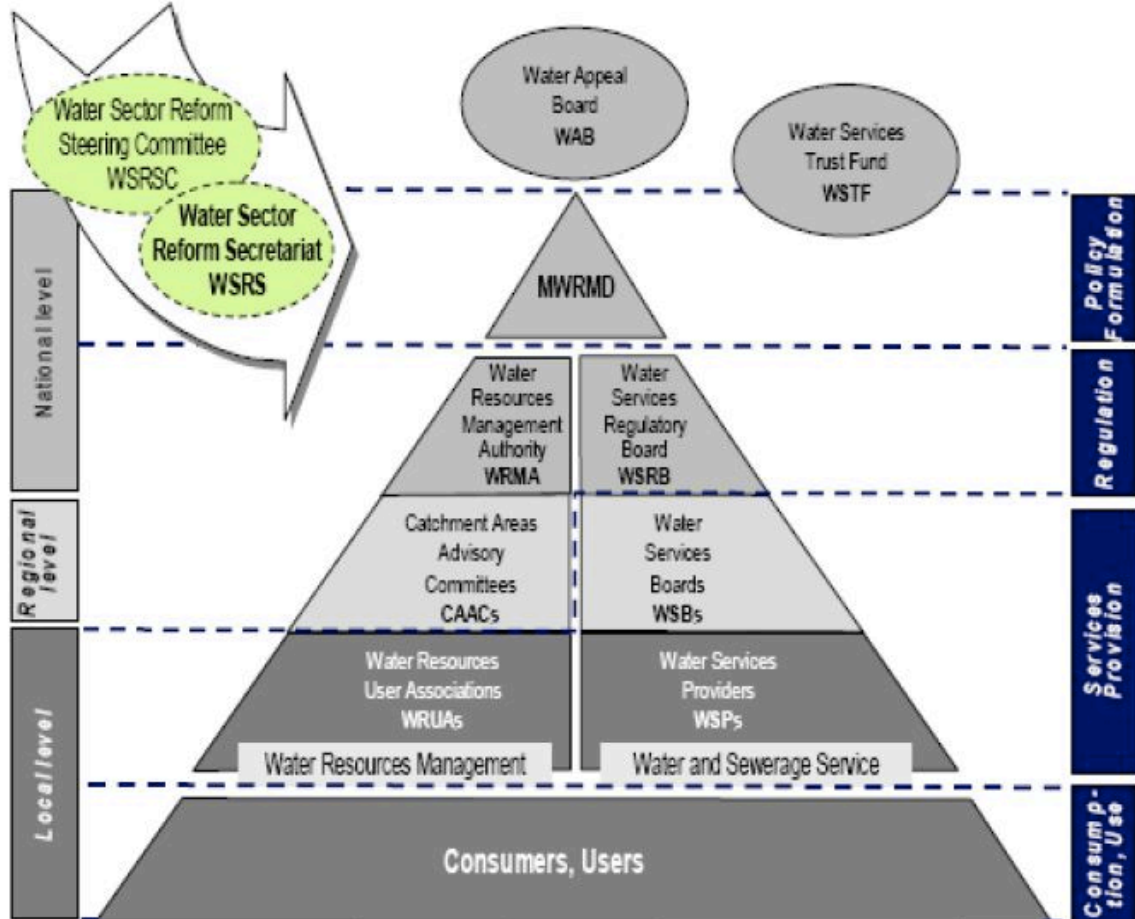Yin, Robert K., 2007. *Fallstudier: design och genomförande*. Malmö: Liber.

8 Appendix

8.1 Institutional arrangements for WRM in Tanzania
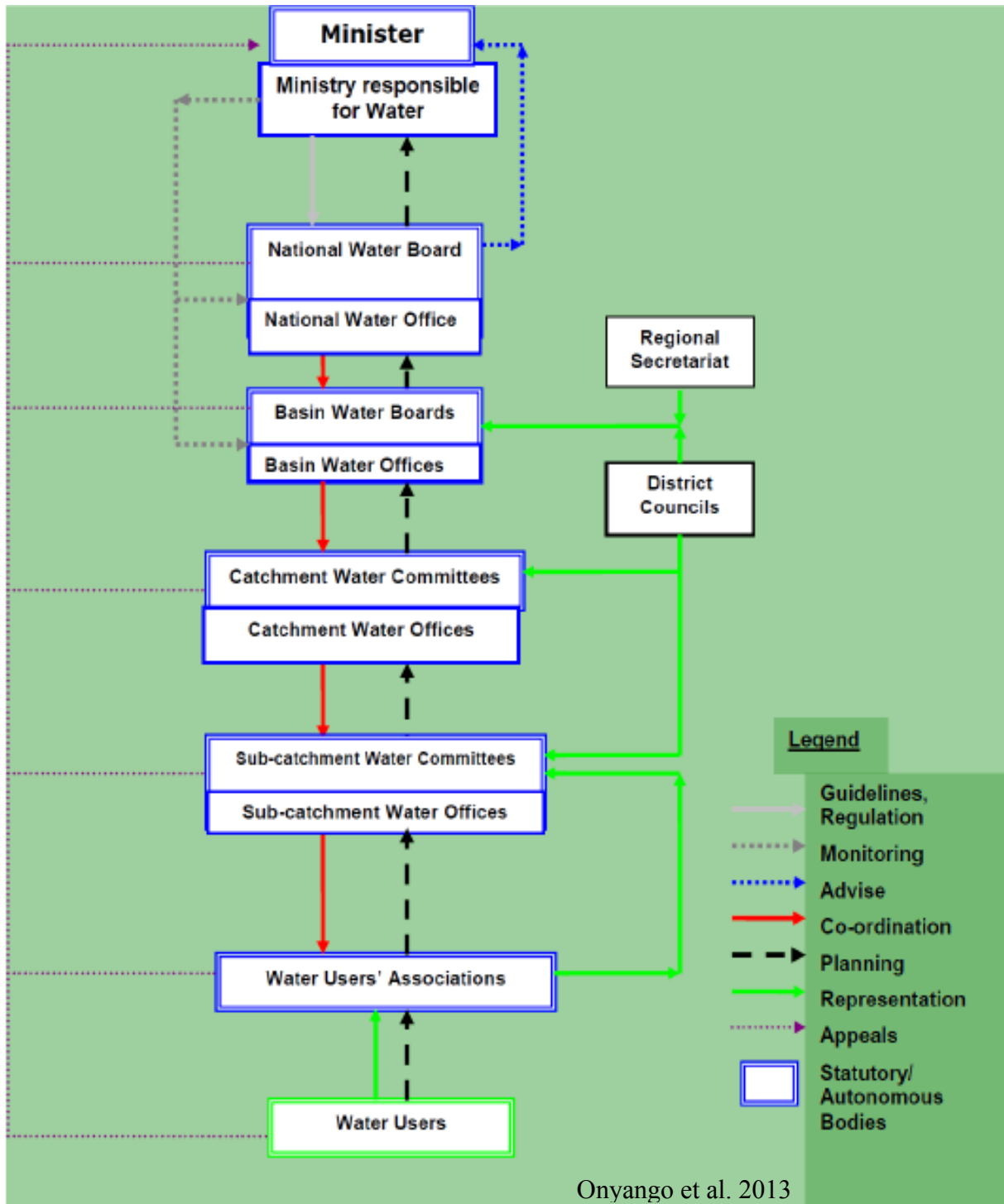
Onyango et al. 2013

8.2 Institutional arrangements for WRM in Kenya

INSTITUTIONAL SET-UP UNDER WATER ACT 2002

Onyango et al. 2013