Water Governance and policy networks in Indonesia

The challenges of a decade of water sector reformation

MSc Thesis

February 2011

Program: Systems Engineering, Policy Analysis and Management
Graduation Section: Policy Analysis
Faculty of TPM, TU Delft

Graduation Committee:

TU DELFT
Mr. L.M. Hermans, PhD (first supervisor) – Section of Policy Analysis
Mr. W. Ravesteijn, PhD (second supervisor) – Section of Technology Dynamics and Sustainable Development
Prof. dr. ir. S. Schaap – Section of Policy Analysis

UNESCO-IHE
Mr. J. Luijendijk, MSc

Student:

Name: Martijn Wieriks
Student Number: 1132784
Email: mwieriks@gmail.com

Acknowledgements

The completion of this thesis would not have been able without the help of the following individuals, for which I am exceptionally grateful. In no specific order I would like to thank the following people for their contributions.

My graduation commission, for their time and constructive criticism at all meetings. Wil Thissen and Siebe Schaap for their shared roles as professors and heads of the committee. Wim Ravensteijn for his interest in the project and inspiring knowledge on Indonesia's water history. Jan Luijendijk and Klaas Schwartz from UNESCO-IHE for their time and energy in helping me formulate this research.

Leon Hermans for his long lasting supervision and demonstrating incredible patience and confidence in this project and myself, even at times when I did not.

Simon Warmerdam, Jeroen van der Sommen and the Partners voor Water program for providing the financing for this this project. Jan Yap and the crew at CKNET-INA, for offering me the facilities to do my work in Jakarta and many interesting lunch talks. Tineke Huizinga, Annemieke Nijhof and Theo Toonen for their letters of recommendation and gaining me access to the World Bank.

Pak Anshori, Pak Darismanto, Pak Samekto, for their time and valuable insights of the inner workings of the Indonesian water sector. All interview candidates both formal and informal for their cooperation and assistance. Hongjoo Hahm and Micha Fisher of the World Bank Indonesia for their insights into the work of the bank and the potential challenges of my research.

Ratna Savitri, for helping out with swift accommodation, translation services and ensuring my general wellbeing while being abroad.

Shanon, Hans, Jan Wouter, Joas, Liesbeth, Menno and all other study friends who have always been at the ready to listen, motivate and give advice.

My late grandfather, who always demonstrated great interest in my studies and graduation work, but was sadly unable to witness its completion.

Finally I would like to explicitly thank my family: Dad, Mom, Sander and Eline for their continuous support and love throughout my studies. I dedicate this work to them.

Den Haag–16.02.2011

M. Wieriks

Executive summary

After the reign of Suharto ended in 1997, Indonesia has undergone a series of government reforms. Decades of strong, centralized and military-dominated government resulted in inefficient to non-existent management of public works and water resources. With help of the World Bank, the IMF, the Asian Development Bank, and various national governments (amongst which Japan and The Netherlands), significant investments were made over the past decade to decentralize and reorganize the ways in which water was managed and governed.

Now, 10 years later, water problems occur just as frequently, if not more. Climate change, rapid population growth and urbanization put additional stress on water resources in urban areas. This translates into an increased risk of floods, extreme land subsidence, serious health and sanitation issues. Little has been achieved by responsible Indonesian water agencies to deal with these issues.

Indonesian and international donor agencies alike wonder how effective their investments have been, and why results fail to show.

- Why do water problems still occur with such frequency?
- Why do responsible agencies fail to formulate or execute effective policy to deal with these problems and with new water challenges?
- Why do Indonesian actors fail to formulate and execute innovative water policy without external aid?
- How is water policy formulated and implemented?
- To what extend do these processes contribute to the lack of results in Indonesian water resource management?

In order to give an answer to these questions this MSc thesis research was completed in joint collaboration with UNESCO-IHE. In this research an attempt was made to map the Indonesian water policy network through Social Network Analysis (SNA). Furthermore, the role of the distribution of information and knowledge in this (policy) network with respect to its' capacity to perform well has been investigated.

This research has shown that there are there are some fundamental issues at hand in Indonesian water management that cause systematic underperformance of the sector as whole. Although sector reformation has introduced several principles of integrated water resources management into the Indonesian water sector, positive results in terms of water policy and solutions remain unseen because they are limited by ineffective policy processes and water policy network in transition.

The main research findings were as follows:

- ✓ Lack of clear relations between RBOs and national organization makes it unclear what information should be transferred at what time and with what purpose

- ✓ Coordination and cooperation between responsible agencies is present but scarce, hesitantly initiated and informal in character.
- ✓ Although the water sector has formally reformed, the chain of events in policy formulation to implementation has not. At present no rules exist with respect to how, when and where information should be shared and made available. This conflicts with an increased need for new and possibly more information and knowledge to formulate new innovative policy.
- ✓ Lack of accountability mechanisms, evaluation and feedback results in a lack of ownership of projects and responsibility of authorities to the public cause and publicly desired outcomes
- ✓ Adaption of new institutions is slow and has a steep learning curve. Lack of shared learning experiences, slows this process down unnecessary and works counterproductive
- ✓ Water councils at present do not aid sufficiently to quality and quantity of information at the moments where water management decisions are made by individual actors as they are not sufficiently part of the policy formulation process. Their disputed role does not enable them to act as a connector of actors, even though they remain highly regarded and appear influential.
- ✓ Communication and information exchange takes place intensively at the ministry/national level, but not always with clear purpose or intent
- ✓ Communication and information exchange with lower tier actors takes place through three influential actors: the Balai Besar, the ministry of PU and the Balai PSDA. (it is important to realize that there is only one Ministry of PU, but that there are many Balais across Indonesia, and that not all river basins have a Balai Besar)
- ✓ The two Balais maintain separate (but the same) contacts to lower tier actors, this may suggest inefficient (double) sharing of information across these actors, which increases the risk of miscommunication and information loss
- ✓ The role and position of the Balai PSDA in this process seems to be less certain than that of the other two (no mutual accordance)
- ✓ The lower down the government tiers, the less information is exchanged across that tier (losing interconnectivity)
- ✓ Little can be said about the quality of information exchanged or the impact that information quality has on decision-making processes [on basis of the social network analysis]
- ✓ More information exchange takes place during the implementation of water policy than for the formulation of water policy
- ✓ Relations between actors in policy formulation do not all correspond to relations for policy implementation, suggesting a potential loss in information, particularly in terms of feedback and evaluation of projects

With more attention to how policy processes should occur, what information and knowledge is required at what times and what should be shared and what not, much can be gained in terms of performance of the Indonesian water sector. Increased attention and investment in mechanisms that allow for this distribution will significantly increase performance of the Indonesian Water sector and the transition of water governance which was kick-started in the last decade.

On the other hand, the current water policy structure is a result of rapid change and lack of acceptance of this change in Indonesia itself. The Indonesian water sector is still in transition, and many discrepancies and “sub-optimal” entities can be explained by the fact that they are the only way for water policy formulation and implementation to continue while the sector changes slowly.

With sufficient time this adaption will take place eventually and more efficient network structures as well as policy processes will be developed. However what must be realized is that the present structure is far from effective and does *not* contribute to the development of sustainable water policy and solutions. It is the responsibility of Indonesians and the international community alike to see to it that the transition into a solid and sound water sector is realized over the next decade and that many of the issues found in this research are addressed. That said, it must be highlighted that change of the sector must come from within the sector. Although external parties can provide the

resources, knowledge and aid in the design, the willingness to change must be initiated by the Indonesian water sector itself.

List of acronyms

4PMoU	4 Party Memorandum of Understanding
ADB	Asian Development Bank
BBWS	Balai Besar Wilayah Sungai – Greater regional river basin
BWS	Balai Wilayah Sungai – River basin
Balai PSDA	Balai Pengelolaan Sumber Daya Air – "Office for water resources management"
Bappeda	I: Badan Perencaan Pembangunan Daerah E: Regional Development Planning Board
Bappenas	I: Badan Perencaan Pembangunan Nasional E: National Development Planning Agency
BWRM	Basin Water Resources Management
BWRMP	Basin Water Resources Management Project
CK-NET INA	Knowledge center and network institute in Indonesia
DAU	I: Dana Alokasi Umum E: General Allocation Fund, General Purpose Fund
DGWR	Directorate general of water resources
DPR	Indonesian Parliament
IWRM	Integrated Water Resources Management
KemenPeRa	I: Kementerian Perumahan Rakyat E: Ministry of housing and settlement
MDG	Millennium Development Goal
MinPU	See MPW
MPW	Ministry of Public Works Indonesia
Permen	Ministerial decree
Perpres	Peraturan Presiden – Presidential decree
PJT	*Perum Jasa Tirta* – "Public enterprise for water service"
PJT1	PJT that manages Brantas and Bengawan Solo River Basins
PJT2	PJT that manages Citarum River Basin
Pola	(River) Basin Policy or Strategy
PP	Government regulation
PPTPA	River territory level water management committee
PTPA	Provincial level water management committee
SDA	Sumber Daya Air – Water Resources Management
SWS	Satuan Wilayah Sungai – River Basin Area/Unit
UNDP	United Nations Development Programme
UU	Undang-Undang – Law
WASAP	Water and Sanitation Program
WRDM	Water resources development and management
WRM	Water Resources Management
WUA	Water User Association

Table of Contents

Chapter 1: Introduction

The archipelago of Indonesia is South-East Asia's wealthiest nation in terms of natural resources. The variety and amount of natural resources that characterize the country are only exceeded by its' history and culture. Indonesia as a nation however is relatively young. Founded in 1945, it has undergone tremendous growth and tumultuous times alike.

Water resources have played an important role in the development of Indonesia over the past decades. Although water resources are in abundance, the unique tropical climate, the topography, general environment and increasing user demands impose challenges on their management. The need for extensive irrigation to feed that nation's population for instance, is immense. The strong growing population demands water for sanitation, health and industry. Together with these challenges, the protection from floods has been at the heart of public works administration over the past centuries (Ravesteijn and Kop, 2008).

Kop (2008) describes how traditionally the water sector has been managed by the most influential parties (henceforth called "actors") in the nation; varying from sultans and kings, rice farmers and agricultural conglomerates, Dutch rulers and engineers, to strict nationalized governments and ministries. 25 years plans to support and stimulate the rice production in the 1980's under the regime of Suharto have been a tremendous success and all occurred in the "golden" days of Indonesia's extreme economic growth. Without strong hierarchical, centralized governance and international donor agencies' funding this may not have been attainable.

In the 1990's Indonesia was severely affected by the Asian economic crisis and internal political problems which ultimately let do the fall of the Suharto regime in 1998. In the wake of political and economic disaster, public administration and government went through serious reformation with help of the IMF and World Bank. As a result, these agencies became increasingly influential in their development aid during the following decades (Ravesteijn and Kop, 2008).

The Indonesian water sector in turn required major revision in light of this reformation, as well as an increasing amount of water problems resulting from a lack of investment, operation and maintenance of civil water works in the country. Some of these works still operating as originally designed in the 1940s through 1980s without significant revisions or maintenance (Ravesteijn, 2008).

In addition, new challenges in the water sector have arisen as a result of increased population growth, rapid urbanization and climate change. The combined result of these issues has led to an increased demand and strain on water resources for health and sanitation, degradation of the environment and complications such as frequent flooding in urban areas as well as land subsidence (WB, 2009; WB, 2008), Ministry of Public Works the Netherlands, 2002).

Through combined efforts of the Indonesian government, the World Bank, the ADB and several national governments over the past decade (most notably the Netherlands and Japan), the reorganization of water governance in Indonesia gained significant foothold through the acceptance of the 2004 Water Law by the Indonesian parliament. This law was considered "an important step […] towards modernization of Indonesian water legislation" (Teeuwen, 2010).

In the meantime several smaller, more focused, projects were initiated by the aforementioned parties to address more specific issues in the water sector. Irrigation development and management

(World Bank), Coastal Defense (Dutch government/Deltares), Floods (WJEMP project – World Bank 2005-2007), Dredging of water ways (Dutch government, Partners voor Water), as well as of course massive support in terms of tsunami rehabilitation projects from all over the world, are some examples of how continuous project based work has taken place with the help of international donor agencies. The Dutch and Indonesian government have over the years developed a strong bi-lateral relation on the subject of water and development aid. So much in fact that Indonesia has been included as key-associate "Deltaland" in the Dutch National water plan: the primary source of long term water policy strategy in the Netherlands.

Despite the continuous efforts and investments in the water sector and reformation of its governance, their effects are still going largely unnoticed. "Traditional" problems that have been part of Indonesian water governance over the last decades are still very prominent. The constant imminent risk of natural disasters (i.e. floods, droughts, landslides), problems related to water resources allocation and the quality of these resources are still ever-present in Indonesia. This becomes increasingly evident in large urbanized areas (e.g. consistent frequency of floods in Jakarta, Surabaya; failure of infrastructure: Reservoir dam breach in Jakarta, 2009; clogging of waterways with trash and waste in densely populated areas).

1. 1 Research objectives and focus

So why do signs of improvement remain unseen despite these vast reformations? This question has been asked by authorities, stakeholders, experts and researchers alike, but a definite answer remains out in the open (Herman, 2005; UNESCO-IHE, 2008). The answer to this question is however of great importance to many, both within and outside of the Indonesian water sector. Large scale investments of international donor agencies such as the Asian Development Bank, The World Bank as well as national governments (such as The Netherlands and Japan) into the Indonesian water sector have created great interest into a closer look at the inner workings of Indonesian water governance.

The issues, user needs and limited availability of water resources in Indonesia has become evident from the above. It is clear that water resources are important in Indonesia, and so is their management. Large investments have been made in the water sector to secure and develop these resources. This has been done individual projects, but also in institutional strengthening and reorganization and encompassing legislation as was shown earlier in this chapter.

Nonetheless, 'classic' problems such as flooding in urban areas, deteriorating infrastructure and the lack of development of sustainable solutions to these problems keep occurring. Why is there no improvement despite these reformation processes and investments? In order to get an answer to this question it is necessary to know more about how water governance works in Indonesia.

Governance, policy formulation and implementation

Governance is defined by the World Bank as "the exercise of political authority and the use of institutional resources to manage society's problems and affairs". More specifically, they state that government effectiveness depends on "the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policy" (The World Bank, 2006).

Governance therefore is closely related to problem solving and policy formulation and implementation. A closer look on decision-making and policy processes is also supported by Saleth and Dinar (2004) who state that "water sector policies, their underlying reasoning and principles and the framework within which they are formulated and implemented, are the main limitation for efficient water resource management". With this they highlight the significance of water policy, but also the foundation of these policies. In other words, the way in which policy is formulated and implemented (or, the way in which decisions are made in order to come to these policies), determine the success or failure of water resource management.

There are different models to observe the process of governance, decision-making and policy formulation and implementation. How policy is formulated and implemented can be understood in several ways, depending on the subject, focus or scope of the system.

For instance, the Global Water Partnership (GWP) describes Integrated Water Resources Management (IWRM) in terms of the problem solving cycle; where policy formulation and implementation is depicted as a series of activities which are looped through feedback (see chapter 3 for a more elaborate description). The problem solving cycle lies within the policy cycle which is often referred to as the "classical view" in public policy analysis. Here, policy formulation and implementation is considered as a rational process, resulting in a rational "best" choice to a specific (predefined) problem considered usually by a single actor (Hermans, 2005)

Policy networks

However, observing policy formulation and implementation purely as a linear process where one phase follows the next would be too simplistic of a view to justify the complexity of such processes. In reality, these phases may occur simultaneously; phases may be less detailed or receive less attention, or may even be skipped altogether. Next to this, other aspects play important roles in policy formulation and implementation as well that cannot be captured by the policy cycle alone, for instance the inclusion of multiple stakeholders as opposed to a single problem owner.

Problems are by definition a matter of perception, and therefore solving problems in a multi-actor context (which water problems are without a doubt) needs to involve these actors and their perceptions. In other words, in order to understand what happens within the policy cycle and why, it is also necessary to know which parties play a role in the different phases and stages, and how they interact. The environment in which this interaction between actors takes place will henceforth be called the policy network.

Luzi, Hamoude et al. (2008) relate the effectiveness of policy to the network of actors that come to these decisions and more specifically state that "Network approaches to policy analysis assume that the way policy actors are linked with each other has an effect on the design and the outcome of policies. Governments are considered not as unitary decision makers but as internally divided and as interacting with a range of actors through relatively stable, nonhierarchical linkages" (Luzi, Hamouda et al. 2008)

The need to incorporate the multi-actor dimension into water management was realized by both academics and practitioners in the 1990's. The development of this network view into water management occurred with the introduction of some of the principles of Integrated Water Resources

Management (IWRM), for instance in the well-known 1992 Dublin Principles. Stakeholder participation and decentralization of authority to the lowest appropriate level are examples of such principles that incorporate the ideas of network thinking and multi-actor problem solving.

The network approach is a means of viewing the policy formulation and implementation process as an arena of individuals and groups (henceforth called "actors") that are related to each other in a network. This policy network encompasses all actors that are to a more or lesser extend involved in the formulation and implementation of policy.

The behavior of parties in this network is significantly influenced by the image that these parties have of the situation at hand. Their perception on what is possible, impossible, or what they consider problems determines the way they act and position themselves in the policy network. Furthermore, this shows that no single actor in a policy network ever has complete oversight: everyone only sees a part of the "puzzle". Finally, it must be noted that this network notion particularly applies to a water sector, as water is considered *cross-sectoral* in nature and relates to many subjects, users, and actors in a society.

With the above in mind, network thinking –and more importantly- the notion of a water policy network, will have a central role in investigating the Indonesian water sector in this research.

Information and knowledge

While networks and the policy cycle say something about the process in which policy is formulated and implemented, it does not say anything about the quality of the decisions made in these processes. Information and knowledge are crucial for "good" decision-making. A perfect decision is one where all information and knowledge is known to the decision-maker beforehand, and through which he/she can make a calculated decision based on the facts and his/her goals. In reality no decision-maker will ever be able to consider all the facts, information or knowledge before making a decision, nor will he/she always be sure to have the right information and knowledge. Nonetheless it can easily be seen that the quality of a decision is likely to increase with the quality and completeness of information and knowledge available to the decision-maker beforehand.

The availability of knowledge and information at different locations of different parties in the network, and at a specific phase in the policy cycle, is therefore likely an important factor that determines how these parties behave and act. This in return influences the outcome of these policy processes.

What actors do with their knowledge in information depends on the means that these actors to themselves. These means are dependent on the power and positions of actors, which highlights another important variable: the position of an actor in the policy network. The position determines whether or not specific information can be obtained, if they are capable to make specific decisions, and whether or not they have sufficient influence on other actors.

Within this assemble of actors and networks, policy is created, translated into implementation and ultimately results in appropriate policy in the water sector – or not -. Research into these networks and the role of knowledge and information herein, will therefore help in understanding if and how, recent reformation will lead to actual improvement of Indonesian water management.

Preceding research

Some research has already been done on specific components of Indonesian water networks. Three specific examples relate in some way to the research presented in this thesis.

First off all, UNESCO-IHE concluded their report 'Towards a Masterplan for Capacity Building in the Indonesian Water Resources Sector' in 2008. The research accomplished by UNESCO-IHE (2008) focused, primarily on the implementing agencies in the water sector. The research accomplished by UNESCO-IHE (2008) focused, primarily on the implementing agencies in the water sector. More specifically the focus was to map capacity requirements at the individual and agency level. This research has resulted in a long list of capacity deficiencies at different organizations in the sector. Furthermore they state the need for additional research into capacity requirements in the 'enabling environment', which constitutes the environment in which the development of policies, regulations, organizations and procedures takes place.

In the second case, individual actors were examined in a performance assessment exercise of Indonesian river basin organizations. In this studies the Balai PSDA Citarum, BBWS Citarum and Perum Jasa Tirta 2 (see Kurniawan, 2009; Sabri, 2009; Arwik, 2009) were assessed, and it was generally concluded that in all three cases the RBOs demonstrated general ineffectiveness in operations and lack of clarity concerning tasks and responsibilities.

In the third case, specific sub-networks were also studied; for instance the in-depth analysis about the functioning of bureaucratic designs with respect to Irrigation management reform in Indonesia (Suhardiman, 2008). Suhardiman (2008) demonstrated the political tensions in the water sector and policy networks with respect to irrigation law and policy. She concludes that the bureaucratic identity of Indonesian irritation agency conflicts with the goal to decentralize and privatize the irrigation industry. Furthermore, she notes how the reformation efforts were mostly driven by foreign (international) policy makers, and in fact considered a threat to the irrigation agency's authority and decision-making power in the sector. She questions the degree of change after the irrigation management transfer process due to these conflicts.

Although these individual analyses shed some light on the ineffectiveness and struggle of formulation and implementation of specific Indonesian water policy, a broader scale investigation of the overarching water policy network is lacking. Such an analysis is however crucial in identifying the fundamental issues that cause the lack of performance in the sector.

1.2 Research Questions and chapter summary

This is what this research intends to do and therefore, with all the points above in mind, the following research questions have been formulated:

1. *Why do signs of improvement in Indonesian water management remain unseen, despite vast sector reform in recent years?*
    i) *To what degree does the present structure of the water policy network influence the formulation and implementation of water policy?*
    ii) *How does the extent to which information and knowledge are distributed in this policy network affect the formulation and implementation of water policy?*

Summary

The focus of this research lies on (policy) networks, and the role of knowledge of information and knowledge herein. Doing so is important because the network perspective and the knowledge and information angle are crucial elements in policy and decision-making processes. Additionally, none of these aspects have been included in previous research for this case study. It must of course still be realized that this focus still remains part of a bigger picture. Several other explanations as to why change in the Indonesian water sector remains to go unnoticed may still exist, but are much less tangible and more difficult to research. Additionally, without said focus, an already complex field of work would become even less manageable and likely result in very general conclusions and much more difficult to "fix" with recommendations. Specifically within the limitations of this graduation research, focus is required to manage an already complex field of work where corruption, collusion and nepotism alone play an important role.

The chosen focus also suits well with the focus of existing research and inspired by the work of UNESCO-IHE. There is a clear link between information and knowledge and capacity as well as capacity building. On the one hand capacity building activities often focus on knowledge development, where knowledge is considered to be capacity (UNESCO-IHE, 2008). Therefore research into the role and position of information and knowledge in the water policy network may add to the findings and research done by capacity builders. On the other hand, information and knowledge may enable capacity as they may increase the efficiency of available capacity. For example, through coordination of information an actor may discover new opportunities on how to solve problems or collaborate in policy formulation, making use of shared capacity and on overall become more efficient.

Finally, it must be noted that what may seem at first as a limiting choice in theory on describing policy processes, is in fact a necessary focus to manage the boundaries of this research. The Indonesian water sector and its policy processes are, above all, complex in nature. And as Ostrom has mentioned in her research, many theories exist that address public policy making processes, but no single theory that can be selected in advance which is the "best" or most suitable way to describe and explain them (Ostrom et al., 1994, p. 49, as read in Hermans, 2005).

In this chapter the main research issues and focus have been briefly explained. In summary the following can be said:

- Little is known about policy formulation and implementation processes and decision-making with respect to water policy in the Indonesian water sector
- It is expected that these processes contribute significantly to the lack of results in Indonesian water resource management
- Mapping the policy network at this level can provide insights into the workings of these processes, and identify potential contributing problems
- The extent to which information and knowledge are distributed in this policy network is crucial in its capacity to perform well

This study presents qualitative network characteristics for a single case study and considers the linkages between network characteristics and water policy processes as well as their outcomes in a qualitative manner.

With respect to these questions and the focus this thesis and research aims to:

- Provide insights into how policy formulation and decision-making processes take place in Indonesia
- Map the Indonesian water policy network
- See if problems at this level of Indonesian water governance can account for a lack of results after recent changes in government, institutions and law
- Relate these findings to what is already known in a larger framework of water governance in Indonesia
- Come to recommendations on how to improve performance in the Indonesian water sector

1.3 Structure of this thesis

This thesis is structured as follows. In chapter 2 an outline of the Indonesian water sector will be given. This serves a closer look at the case study and offers more background information as to why and how the water sector is structured as it currently is. In chapter 3, the theoretical framework, or foundation, for this research is presented in more detail. More specifically it will elaborate upon the role of policy networks in public governance, as well the role of information and knowledge in decision making processes. Chapter 4 presents the methodology applied in this research. A justification for the applied research methods and form of analyses to address the hypotheses in the previous chapter will be offered. Chapter 5 and 6 present the results of these analyses, for the conducted open interviews and applied social network analysis respectively. Chapter 7 offers a discussion and reflection on these results. Finally, Chapter 8 constitutes the conclusions of this research and recommendations for the Indonesian government and further opportunities for research.

Chapter 2 – The Indonesian Water Sector

Figure 1: Indonesia: Administrative Divisions (Political) U.S. Central Intelligence Agency 2002

2.1 Introduction

Before continuing with the methodological aspects of this research report it is necessary to highlight the case study a little more. The Indonesian water sector is complex and in order to understand some of the notions in this thesis some aspects require a more detailed introduction. These aspects, as well as other factors, determine how institutions have emerged and how the Indonesian water policy network has developed into its current structure.

This chapter provides a brief overview of the current state of the Indonesian water sector and how it historically developed. First, a short history on water management, engineering and development of Public Works is presented. This is followed by a section on the state of the art, explaining the most significant actors, formal relations between these actors and present laws and institutions.

2.2 Historical development of the Indonesian Water Sector

Development of the Indonesian water sector has (for the purposes of this thesis) been split up into six distinct periods:

- 1800-1900 – Emergence of public works under colonial rule
- 1900-1945 – Decentralization and specification of government
- 1945-1968 – Sukarno's old order
- 1968-1992 – Suharto's new order
- 1992-2000 – Economic crisis and "reformasi"

- 2000-2009 – A new framework for Indonesian water legislation

In the following sections each of these periods is briefly elaborated upon. The factual information within these sections is a summary of the work of Ravesteijn and Kop (2008) and the contributing authors in this work.

1800-1900 – The emergence of public works under colonial rule

During the first years of colonization of Indonesia by the Dutch (after the 1600s), Indonesia was governed by several smaller kingdoms across the archipelago. Despite the power and prominence of the VOC (Dutch East India trading company), their influence and control was limited to key locations on Java, Maduro and in New Guinea. The need for a more centralized form of government arose over the years and Dutch government institutions started to emerge slowly. It was not until 1818 that the first Chief inspector of Public Works was appointed, and that the development of Public Works and civil administration started to take on a more structural approach. In 1866 the Department of Civil Public Works (BOW) was founded. With respect to the water sector, the construction of Public Works in the fields of sanitation, irrigation and drainage canals got kick-started. Overall, the development of these fields commenced more or less parallel to the developments in the Netherlands (for instance the development of the Amsterdam Dune Drinking Water Company in 1851). Knowledge between the two countries was frequently exchanged resulting in state of the art developments in the Archipelago.

1900-1945- Decentralization and specification of government

Within this period the development of the East Indies started to take a flight and the need for firmer and more local control of the nation emerged. In 1903 the first ever Decentralization Act was passed, allowing for local government and more local involvement of stakeholders. The so called “local council ordnance” (local councils where stakeholders were able to voice themselves) were founded which was considered a vital decentralization instrument.

During this period the first realizations of the value of coordination between governing and planning bodies was noticed. In 1920 Karsten (1920, as read in Ravesteijn and Kop, 2008) highlighted the importance of coordination in town planning and the relation to public works. Efforts towards a first “planning” workshop to promote an integrated approach towards planning -initiated by Karsten- were interrupted by the War and the invasion of the Japanese into the Dutch Indies in the 1940’s. The war also halted all primary development efforts of public works and the water sector. In 1945 Sukarno took office as the first Indonesian President and the Indonesian Independence was declared (although not officially recognized by the Dutch until 1949).

1945-1968– Sukarno’s old order

All Dutch colonial efforts seized and the Dutch were sent home until in 1958 the last Dutch had left the country. As of that moment all Dutch interaction with Indonesia seized, and all water management and construction and development of public works became an Indonesian affair. In the period until 1968 the focus of the nation was foremost on very individual topics (establishment of new government, and education) under national policy now known as “Orde Lama” (Old order legislation). This policy was mostly marked as populist and highly political. In the field of public works this translated in focus on primarily very large engineering projects (i.e. the Jatiluhur dam, which was

completed in 1967). However existing infrastructure and public works were largely neglected in terms of operation and maintenance which lead to a worrisome state of the country's infrastructure for transport, irrigation and water management.

Not insignificant was the development in the rest of the world during this period. After the second World War the foundation of the United Nations and a large body of development aid institutions (IMF, World Bank, Asian Development Bank, UNDP, WHO, FAO) was achieved with a primary goal of aiding "underdeveloped" countries. At the same time, the declaration of Indonesia's independence resulted in an immense influx of engineers with a lot of knowledge about irrigation and development of (tropical) land into the Netherlands: exactly the expertise required in the growing world of aid and development institutions.

1968-1992 – Suharto's new order

When Suharto ceased power in Indonesia in 1968 a radical change took place in National policy. With the use of 5-year plans the focus shifted into strong economic development and population control. Self-sufficiency in rice production (achieved in 1987) was sought after, and the Nation's population and governance was restructured. This came to be known as "Orde Baru" (New order legislation). This rapid economic expansion of the country could only be achieved with help of foreign donors which resulted in the help of the UN and most notably the IMF and the World Bank. This is also where the Dutch government and Dutch engineering firms (i.e. NEDECO) started to become involved again, specifically in the water sector. "New" water problems started to arise in the country as a result of overpopulation (encroachment of river banks, illegal housing), poor operation and maintenance of existing infrastructure as well as a lack of new public works and required specific technological know-how to be solved. With help of foreign funding and expertise specific projects in irrigation, flood protection and development of water for sanitation and health were formulated. Close cooperation between the Netherlands, several UN organizations and Indonesian government took form in Bilateral, Multilateral and Non-lateral relationships. With respect to the water sector the Dutch government often functioned as a catalyst in these processes. In 1992 the involvement of the Dutch was once again cut off abruptly due to growing diplomatic tensions about supposed human rights violations in Indonesia.

1992-2000– Economic crisis and "reformasi"

With departure of the Dutch some of the development tasks in the water sector were taken over by the Asian Development Bank and the Japanese in specific. In these brief eight years the political tension in Indonesia started to rise ultimately resulting in the fall of Suharto in 1998. After this tumultuous period "Reformasi" - considerable reformation of government was initiated under rule of President Habibie and the decentralization law (1999) was accepted by parliament.

2000-2009 – a new framework for Indonesian water legislation

The presidential term of Habibie lasted only a year and was followed by President Wahid. Under Wahid's rule the ministry of public works was significantly restructured to reduce its power. A new department, the department of Kimpraswil was founded and tasked with planning and significantly less executive powers in public works and the water sector, much in line with the decentralization law of 1999. In 2001, Wahid's term ended and Megawati Soekarnoputri (The daughter of President

Sukarno) took office. In this term the decision of splitting up the ministry of public works into Kimpraswil was reversed again, showing the political tensions in the water sector and policy networks (see also Suhardiman, 2008).

Development in the water sector and more importantly, the development of water governance has therefore been a dynamic and turbulent experience. Not until 2004 when after much discussion and controversy and with strong involvement of the World Bank the Water Law (2004) was accepted. Although not fully completed, the water law –for the first time- provided a framework for water legislation and governance, and included advanced concepts of Integrated Water Resources Management and the Decentralization law (1999). From 2004 until 2008 parts of this framework have slowly been started to fill out and materialize.

2.3 State of the art of the Indonesian Water Sector

The current structure of the Indonesian Water Resources sector is a combination of the water law from 2004, decentralization laws and regulations between 1999 and 2004 and existing law prior to 1999, most notably the "basic law 1945" and REPLITA 1 to 6 (the first 6 "5 year plans"). Underneath a description of the current structure is presented.

Levels of administration

National

There are three levels of government: national, provincial and local. The water law (#7/2004) defined, for the first time, the authority and responsibility of these three levels (Ramu, 2007). At the top of this structure stands the President followed by the ministries. At the national government level there are 6 Ministries that have water resources in their portfolios, these are: Public Works, Forestry, Environment, Bappenas (regional development and planning agency), Agriculture, and Home Affairs.

The ministry of public works (MinPU) is split into several directorate generals of which one is the DG Water Resources. The Director General (Dirjen) is at the top of this DG. The DG splits into several directorates (Irrigation, lowlands/coastal areas, rivers/lakes and dams, planning and programming, and the WR Guidance directorate). Each of these directorates is subsequently split into several sub-directorates, which in turn are split into sections.

Provincial

The provincial government is headed by its governor. Underneath the governor five assistant governors (with different portfolios) and one secretary governor are in place who (in combination with the Governor himself) form the top level of this administrative unit. Underneath the top level several directorates are situated, these are called "Dinas" (freely translated: "services"). These constitute several portfolios, and can have different water resource management activities under their portfolio. Two examples of Dinas who both hold water resources are Dinas SDA (Sumber Daya Air – Water Resources Management) and Dinas PU. Each Dinas is subsequently split into sub-Dinas (for example: Dinas SDA is split into divisions for planning, operation and maintenance etc.). The distinction between Dinas SDA and Dinas PU as well as their responsibilities is not always uniform and clearly defined. Overlap and integration of efforts takes place frequently and definitions of either are mostly dependent on local situations and administrations. Finally, with respect to water management there is the function of the PTPA which constitutes the Provincial level water

management *committee*. The committee is set between the Governor and the Provincial Water Resources Management Agency (PSDA). Once again the exact composition of this committee and the degree of their influence may differ per region.

Local

The final administrative level of government is the local level. This level can actually be split up into two categories: districts and municipalities. Towns and large urban areas are considered municipalities and are headed by a Walikota (major). Districts are combined territories that encompass rural areas and smaller towns. Districts are headed by the Bupati (head of district). Districts tend to deal more with irrigation policy and forestry issues while municipalities tend to be more concerned with urban water problems and sanitation. Similar to the provincial administration; the heads of administration (Bupati/Walikota) are aided by assistant heads of district (divided per policy field) and a region secretary (Sekda). This top level management is followed by the Dinas, which are sub-divided into sub-Dinas (generally speaking four to five). Each sub-Dinas is then again divided into sections (with about 5-6 employees per section).

Other actors with water resource portfolios

There are several other water management related actors in Indonesia in the form of river basin organizations (RBOs), councils and water user (associations). These are in part complexly defined and therefore briefly described below. The exact definitions of these organizations may differ per region and administrative boundary. The description and distinction between RBO's is based on Ramu, 2007; Kurniawan, 2009; Arwik, 2009; and Sabri, 2009.

Types of RBO's: Balai PSDA – Balai Pengelolaan Sumber Daya Air

These units function as the provincial authority for water resources management. At present there are 42 PSDAs in Indonesia.

Types of RBO's: PJT – Perum Jasa Tirta

These are special administrative units that can manage river basins on Java. Currently, only two such organizations exist conveniently called: PJT1 and PJT2. PJT1 operates the Brantas and Bengawan Solo river basins while PJT2 operates the Citarum river basin. PJT's are special as they are governed in joint governance between state and enterprise/corporations and can be considered Public Private Partnerships (PPPs). The State Ministry of State Owned Enterprises takes responsibility over these organizations.

Types of RBO's: BBWS and BWS – Balai Besar Wilayah Sungai and Balai Wilayah Sungai

Under the authority of the Ministry of Public Works and as a direct result of the water law 7/2004 these organizations function under central/national government and are in charge of river basins considered as "category A" as denoted in the water law. These organizations can cover a single or multiple river basins. These organizations replace executive/project departments of the DGWR

BBWS are in charge of “major” category A basins, while BWS are in charge of “minor” river basins. Furthermore there are two types of BBWS: Type A and Type B. Currently in Indonesia there are 11 BBWSs (8 of type A, 3 of type B) and 19 BWSs.

Apart of the fact that such a variety of RBOs exist in WRM in Indonesia, another dimension of complexity is added by the fact that that these types of RBOs in some cases coexist in the same river basin. In case of the Citarum River Basin three of these RBOs function at the same time in the same region.

Summarized administrative network structure for water resources

With the above in mind a preliminary network structure, based on existing law and regulations, can be constructed. The result of this is shown in Figure 2 below. In this figure the various authorities are shown per level of administration and their theoretical[1]relations.

[1] “Theoretical” in the sense of “ how the relation was intended to be”, as opposed to a “practical” relation, where the relation may or not function as intended.

Institutional Arrangements in the Indonesian Water Sector

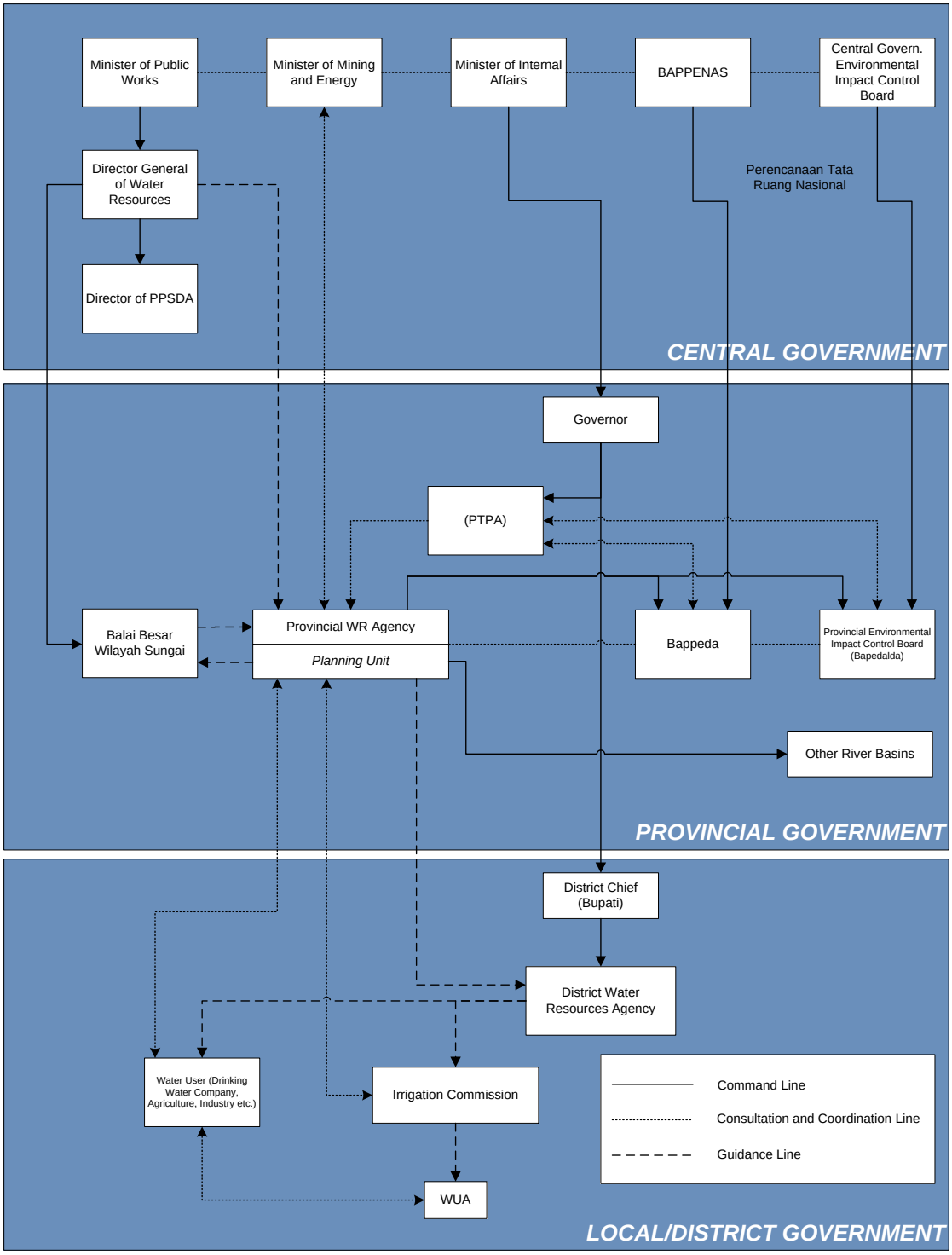

Figure 2: Institutional arrangements in the Indonesian Water Sector - Adapted from UNESCO, 2008)

The water law 7/2004

The establishment of a central water law that legalizes important principles for integrated water resources management has been a major achievement in the decentralization and sector reform efforts of the Indonesian government. The law provides a clear framework for IWRM in Indonesia,

enabling government to now further stipulate national water policy that forms the basis for IWRM at lower administrative levels of government. More specifically the law;

- Specifies policy fields (Transportation, Industry and Mining, Agriculture and Irrigation, etc.)
- Provides a framework for developing water policy on all of these fields for ministries
- Provides a framework for developing water resources management **planning** at river (basin) areas
- Frames 10 government regulations (abbreviated to "PP") to be established under the water law:
  - PP about water resources management
  - PP about irrigation
  - PP about groundwater management
  - PP about water quality
  - PP about drinking water and sanitation
  - PP about river and lake
  - PP about swamp
  - PP about water user rights
  - PP about state owned enterprises
  - PP about corporation

It must be understood that the law only partially specifies the government regulations and is therefore more a framework than an actual specification for water policy. Still much of the actual content is open and yet to be filled out. A table with all the components with a need for further specification is mentioned in Appendix A. Furthermore, for all of these components Sabri (2009) and Teeuwen (2009) has identified which regulations have already been completed and which are still missing.

The creation of the water law in 2004 marked a historical event in Indonesian water management after years of efforts in restructuring the water sector. Nonetheless, it is criticized on its current form and process of development (Suhardiman, 2008). The law provides a framework and leaves out many specific definitions of objectives and standards. Outlines are therefore very broad in nature. For example, the proposed changes of Irrigation management structures (as formulated in the WATSAL project of the World Bank) have been subject to fierce resistance by the department of Kimpraswil (which was at the time responsible for planning and management of the water sector). The resulting law provision therefore seems has been deemed a compromise and "vague" (Suhardiman, 2008).

Furthermore it is not always clear which government parties are responsible for filling out provisions[2] in the law.There are two possible explanations for this:

1. Indonesian politics and structure of government is currently highly dynamic in nature. It is not clear how government structures (i.e. constitutions of ministries and according responsibilities will change in the (near) future).
2. Deliberate diffusion enables more freedom to very powerful actors to fill in regulations and policy (strategic behavior)

[2]merely the "government" defined as president + ministers/ministries

The water law enables for the first time a solid framework for water policy formulation and implementation in Indonesia. Nonetheless, in its current state and without the support of complementing government regulation, much uncertainty exists about whether or not good Integrated Water Resources Management can be guaranteed for the coming decades.

Chapter 3: Theoretical framework

This chapter serves as a more elaborate presentation of the theoretical framework in which this research is embedded. Already briefly mentioned in the introduction of this thesis, this chapter will answer more precisely how selected literature supports the scope and focus of the proposed research. In addition the most important concepts from theory will be defined and explained. In the final section of this chapter the main research question for this thesis is presented and an attempt is made to formulate a three hypotheses, deduced from the literature, to indicate a possible direction to the answer on the research questions.

3.1 Research scope – Definition of concepts

Policy analysis is a relatively young research subject that has been developed in the late 1960s and early 1970s, since its original establishment it has undergone various shifts in scope, most notably changing focus from a traditional "means-end rationality" approach towards a more "political, procedural" (process-based) approach. (Hermans and Thissen, 2009). This research conforms more to the latter than the former approach. The focus of this research is information and knowledge as enabling capacities in policy networks, these only represent a part of all the capacity required to successfully translate policy into action. Choosing such a focus has however both its' merits and flaws. On the positive side there is the fact that it allows to answer a more clearly defined research question and to investigate the role of information and knowledge in Indonesian water management. On the downside it only tackles part of a larger problem and the impact of the research may not be as apparent as hoped. This research therefore by no means intends to provide a final solution for the problems described in this thesis, instead, it is aimed to provide information and insight into a complex situation to kick-start a process of change towards more favorable conditions for all the parties involved.

3.2 Decision-making models and information requirements

Knowledge and information are two concepts very closely related in nature. Some definitions from the oxford English dictionary[3]:

- Knowledge: "Acquaintance with a fact; perception, or certain information of, a fact or matter; state of being aware or informed; consciousness (of anything) ... Acquaintance with facts, range of information…"
- Information: "Knowledge communicated concerning some particular fact, subject, or even; that of which one is apprised or told; intelligence, news…"

Information is therefore a subset of knowledge. For purposes of this research it suffices to take note that knowledge is a collection of information of some sort of impartial nature and information is its partial unit. Discussions of the absoluteness of knowledge are disregarded in this context. Practically speaking: information can be transferred, knowledge cannot. Information is knowledge that is transferrable. Knowledge is an immobile source that springs information to other knowledge

[3] http://dictionary.oed.com, with respective search terms "knowledge" and "information"

sources. This is the definition that will be used in this research and when required the different interpretations will be reminded upon in-text[4].

Information and knowledge are crucial for "good" decision-making. As mentioned in chapter 1, a perfect decision is one where all information and knowledge is known to the decision-maker beforehand and where he/she can make a calculated decision based on the facts and his/her goals. In reality no decision-maker will ever be able to consider all the facts, information or knowledge before making a decision, nor will he/she always be sure to have the right information and knowledge. Nonetheless it can easily be seen that the quality of a decision is likely to increase with the quality and completeness of information and knowledge available to the decision-maker beforehand.

The need for knowledge and information in Indonesian (water) policy formulation and implementation was already mentioned in 1920 by the Dutch engineer H. Th. Karsten who stated that "*What is essential is a perpetual interest in and knowledge of local issues […]. Town planning can only be good if planners are well-informed about local conditions and constantly in touch with people's needs and the needs of industry."* (H. Th. Karsten 'Indiese stedebouw', Mededeling locale belangen, 40 (1920), as read in Ravesteijn en Kop, 2008)

How policy is formulated and implemented can be understood in several ways, depending on the subject, focus or scope of the system. Underneath three different models are proposed that explain how this process can be perceived. It needs to be understood that all of these models describe in essence the same decision-making system, with the same actors involved who all have the same distinct characteristics and desires. None of the models is therefore better than the other, as they are all based on the same reality, but merely describe them in different paradigms. In each of these models (or paradigms) one important common variable exists: the requirement of information as input to make decisions at one point in the policy formulation and implementation process.

Model 1: Problem solving and policy analysis cycle

Within this model the basis of action is a perceived problem or lack of a desired solution. With this at the foundation, subsequent (alternative) solutions are formulated upon which a selection process takes place based on specific selection criteria. Hereupon the solution is implemented and evaluated leading to a new reality which is monitored. If problems are perceived again at this point the cycle repeats. A visualization of this model is presented in the figure below.

[4] Note by the Author: In most literature this distinction between information and knowledge is not made. It is therefore possible that in some of the sources used, the term "knowledge" is applied whereas by the definition made in this research "information" would be more applicable. If necessary the author will make this distinction explicit at these points, however if not then "information" should be read wherever "knowledge" is mentioned.

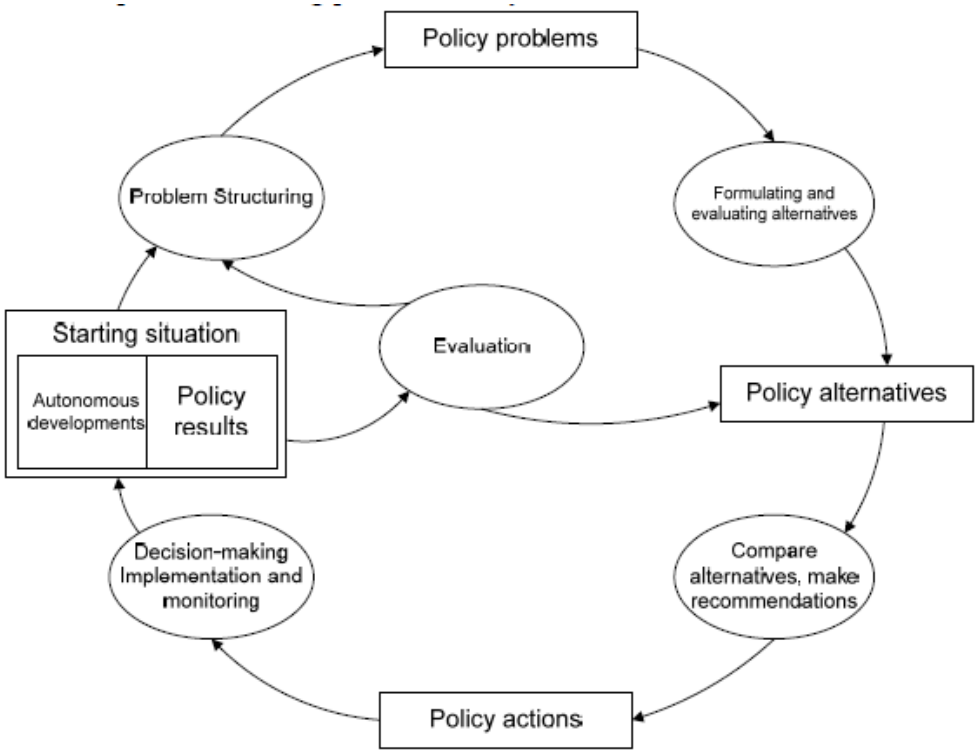

Figure 3: the problem solving cycle (Geurts and Vennix, 1989)

Placing this cycle in a more elaborate context (see figure 1, below) the significance of stakeholder involvement also becomes clear: they provide sources and sinks for input and output for the model at the different process stages.

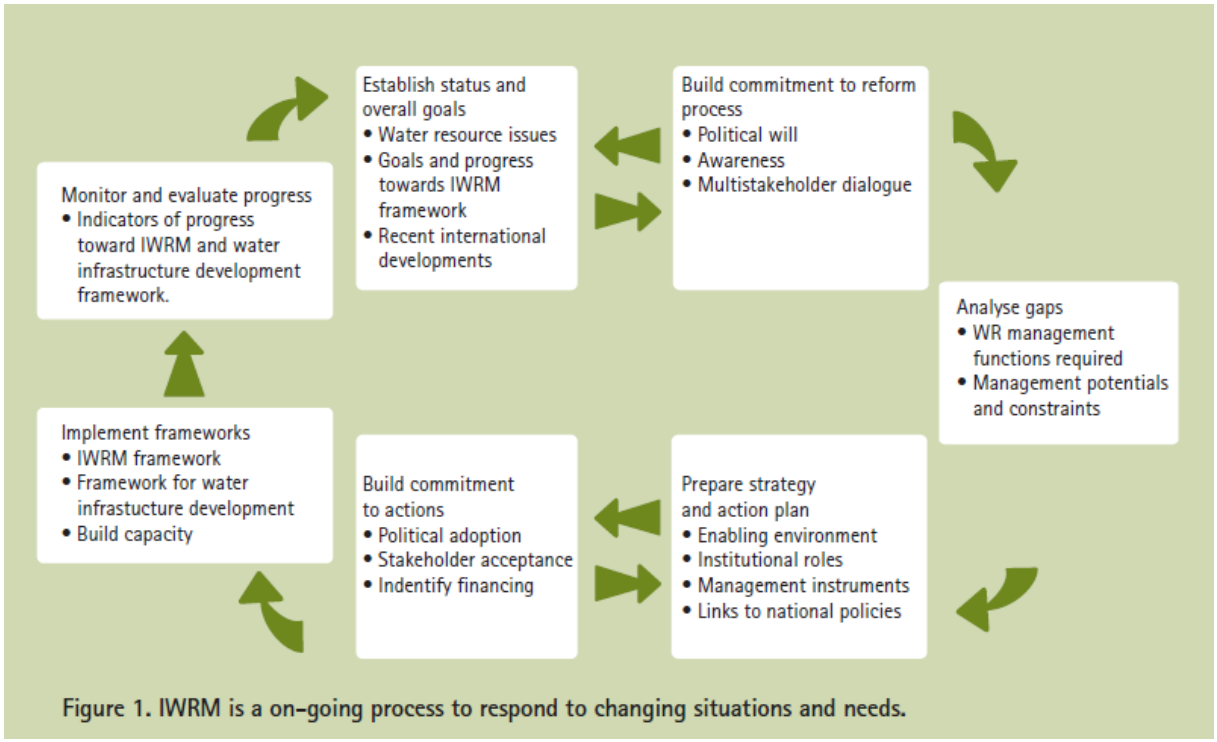

Figure 4: The problem solving cycle in an IWRM context - GWP Handbook IWERM 2004

For each of these stages it is also possible to formulate the information and knowledge required, as shown in the table below

Process stage	Requirements	Information required
Analyse gaps	• WR management functions • Management potentials and constraints	• Issues and problems • Desired situation / preferences • Capacity needed to solve the problem ("what is available")
Prepare strategy and action plan	• Enabling environment • Institutional roles • Management instruments • Links to nationalpolicies	• Law and regulations • Strategic vision • Goals and needs of stakeholders • Other policy (existing and in preparation) • Leadership perceptions
Build commitment into actions	• Political adoption • Stakeholder acceptance • Identify financing	• What means are available • Identification of allies and enemies • Perceptions of stakeholders
Implement frameworks	• IWRM framework • Framework for water infrastructure development • Build capacity	• Implementation knowledge
Monitor and evaluate progress	• Indicators of progress toward IWRM and water infrastructure development framework	• Measurement data
Establish status and overall goals	• Water resources issues • Goals and progress towards IWRM framework • Recent international developments	• Outcomes of evaluation and monitoring
Build commitment to reform process	• Political will • Awareness • Multi-stakeholder dialogue	• Stakeholder perceptions and needs • Awareness data • Progress data

Table 1: knowledge and information requirements in the problem solving cycle

Model 2: The logic model

A similar representation of the processes in the chain of events has been described by the World Bank (Figure 5), in which they distinguish between a causal chain (inputs, activities, outputs, outcomes, impacts) and organizational performance. This model, also known as the logic model (McLaughlin and Jordan, 1999; Gysene.a., 2006) emphasizes the effect of policy and organizational output on the systems that they are placed in.

The first three events represent the translation of inputs into outputs through organizational activities; the extent to which this is done successfully is a measure of the organizational *efficiency*. Secondly, the degree of success to which outputs are translated into outcomes is determined by organizational *effectiveness*. Last but not least, the degree of success to which outcomes are translated into significant impacts on the water sector are a measure of organizational sustainability, that is: the ability of an organization to ensure long-term and significant impact of its implementation efforts.

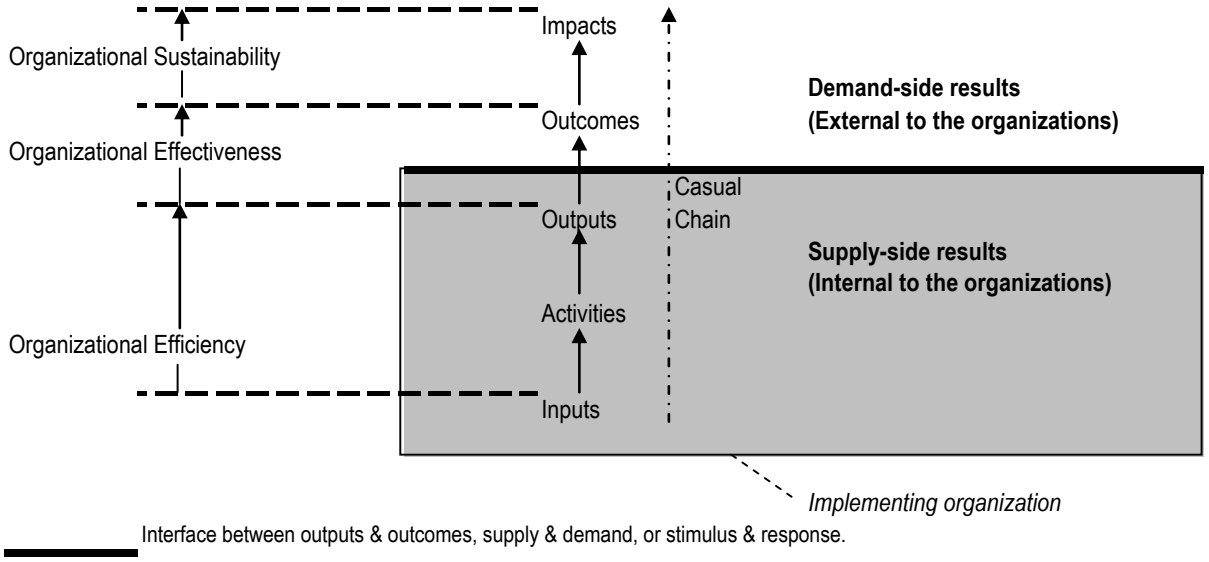

Figure 5: Focus on expected outcomes to achieve effectiveness (Source: WB JEDI Document, 2009)

Another important distinction that this model makes (opposed to model 1) is that between supply-side results and demand-side results. The first three factors in the causal chain (inputs, activities, outputs) are primarily supply-side driven and internally developed. The final two factors (outcomes and impacts) on the other hand are primarily demand-side driven and externally developed. In practice the primary desire for organizations may be to focus on the internally driven process and to deliver on supply-side results. This behavior is incentivized by performance measurement –and accountability- systems of the organizations that do not look beyond the borders of the organization. In Indonesia this is predominantly the case because self-preservation of organizations is particularly important in the organizational culture driven by power and strong hierarchical ties, and where bad news is generally not welcomed. Incentives are required to drive follow-up beyond the limits of the efforts of organizations.

Process stage	Knowledge requirements	Information requirements
Inputs	• How to collect input	• Actual input from sources (internal and

		external)
Activities	• How to do activities	• Progress and montoring information
Outputs	• How to generate and process outputs	• Measuring output, reporting, feedback
Outcomes	• How to observe outcomes • How to link outcomes to outputs	• Feedback
Impact	• How to measure impact	• Feedback

Table 2: knowledge and information requirements in the logic model

Model 3: The network approach

Both the models described above are closely related to the causal chain of events that has been defined earlier in this paper. Each process is a logical follow-up of the preceding step. This causal chain of events visualizes the path that a policy-generating organization follows to formulate plans and policy.

There are however two distinct factors that must also be kept in mind. First of all decision-making processes do not always follow a strictly linear path. Decisions are made all the time, information becomes available what may be perceived as a random process, and opportunities for implementation or formulation of policy (or "windows or opportunity") come and go. This leads to another form of traditional decision-making models such as the Garbage Can Model of Organizational Choice (Cohen, March and Olsen, 1972). In these type of models decisions are modeled are modeled much more as a *process* as opposed to a linear causal chain of events.

Secondly it must be taken into account that decisions take place within an environment in which various stakeholders and interest groups interact. It is unusual that decisions can be taken taking into account the sole interests of the legislator or interest group in question. This is what leads to the third and final model described in this chapter: the Network model.

The sum of all the stakeholders and interest groups (or henceforth called "actors") is equal to the network of actors that take part (and interest) in the policy formulation process as they influence the process but are also influenced by the process (or the outcomes).

Knowledge is distributed across these actors which all represent various interests. Information, in this case seen as the transfer of knowledge, flows around within this network and interacts with this causal chain of events as input, output and throughput. The significance of networks in the distribution and flow of information in knowledge has been shown in various publications. Jackson (2006) describes some of the most influential scholars in this field of research. One of the most important conclusions in this field is that the degree of complexity of the network increases exponentially with every node (actor) involved. This is directly related to the flow of information between these nodes, significantly increasing the amount of information. Additionally, the dynamics of networks add to its complexity and make it difficult to observe structures (if any).

With added complexity, the network becomes less and less transparent and so does the information that flows within. Because the right information at the rights points at the various process stages (no matter which model is observed) is invaluable to the quality of the output of such processes, it is imperative that policy networks are made more transparent to improve policy formulation and implementation processes.

Information in networks

With the administrative structure as presented in the previous chapter in mind, there are several networks that can be identified. Due to the wide range of actors and their responsibilities on different aspects of the water sector (with often unclear definitions of tasks and responsibilities and large amounts of overlap) the entire network of water resources management in Indonesia is incredibly large and complex. To add some structure and clarity to this network it is possible to identify sub-networks depending on policy topics (i.e. water quantity, water quality, irrigation, spatial planning).

Within these networks information is distributed. It is natural to assume that the distribution of information coincides with the allocation of responsibilities and policy fields, but this is not necessarily the case. Given the unclear definitions of institutions, responsibilities, authority and relations between actors –as well as the recent changes in administration due to decentralization processes- it is more likely that knowledge is distributed unequally over a large amount of sub-(policy) networks than the formal hierarchical chart suggests.

Cowan and Jonard (2004) also highlight that "Recent studies of knowledge and its transfer among agents emphasize the importance of tacit knowledge and the crucial role of face-to-face interactions. If this knowledge is diffused therefore, models of its diffusions must take explicit account of the structure of connections between agents" . Their conclusion supports the notion in this thesis that mapping network structures is imperative in the investigation on the distribution of information and knowledge in policy formulation processes.

Concluding remarks on decision-making models and information requirements

Keeping in mind the high complexity of the Indonesian water sector in terms of structure, institutions and regulation it is difficult to capture policy formulation and implementation processes, as well as their information requirements into the linear-causal decision-making models presented in this section. The network model on the other hand incorporates the dynamics and multi-actor characteristics of the Indonesian water sector. Capturing policy formulation and implementation processes in this model may aid in gaining more insight. This is why in the next section the role of policy networks in public administration will be made clear

3.3 The role of policy networks in public administration

Saleth and Dinar (2004) state that water sector policies, their underlying reasoning and principles and the framework within which they are formulated and implemented, are the main limitation for efficient water resource management. With this they highlight the significance of water policy, but also the foundation of these policies. In other words, the way in which policy is formulated and implemented, or; the way in which decisions are made in order to come to these policies, determine the success or failure of water resource management.

Luzi, Hamoude et al. (2008) relate the effectiveness of policy to the network of actors that come to these decisions and more specifically state that "Network approaches to policy analysis assume that the way policy actors are linked with each other has an effect on the design and the outcome of policies. Governments are considered not as unitary decision makers but as internally divided and as interacting with a range of actors through relatively stable, nonhierarchical linkages" (Luzi, Hamouda et al. 2008)

Other authors (most notably Daugbjerg, 1998 and Börzel, 1997) support this view of networks being primary coordination mechanisms on the one hand, and that their structure is directly related to their policy outcomes. Börzel (1997) mentions that policy networks have a coordinative function and focus distinctly on decision-making and policy formulation processes. Kenis and Raab (2003) say that "[…] policy networks are seen as a way to integrate differentiated actor systems and to adjust to problems that cannot be tackled by existing formal institutional configurations.". This latter definition may be a stretch (within this research policy networks are considered complementary to – or even a result of- formal institutional configurations, not as a replacement) but does highlight the problem-solving capacity that policy networks possess. Klijn (2006) extends this view and effectually says that networks provide resources to support interaction, decision-making, cooperation and learning.

The importance of stakeholder input in Integrated Water Resources Management and policy formulation

The involvement of stakeholders in decision-making processes for water management is a critical component of IWRM and directly related to democratic principles as public-sovereignty (as explicitly stated in the Dublin principles, 1992 (principle 2)). Government and public administration are (in a democracy) an extension of the people; they represent and act out the will of the majority. Representation is guaranteed through elections, and the risk of not being re-elected is usually the mechanism to ensure that the "right" policy is formulated and implemented. Nonetheless, especially in a country as large and diverse as Indonesia, it is practically impossible to reflect the demands of all the people in centrally formulated water policy. Even at the most decentralized level of government one cannot assume that those in charge are fully aware, let alone capable, to accurately represent the water needs of the voters. So a second way of hearing the voice of the people is required, and this can only through direct stakeholder input on particular issues.

Apart from these principles it is increasingly important to include the public in decisions and policy formulation for a variety of other reasons. First of all the involvement of all stakeholders in a policy formulation process will make such policy more comprehendible to the public and thus in its application. A flood risk awareness campaign for example is only as effective as the people that come to use the techniques taught. Including them in the process of formulating and implementing such a campaign significantly increases the chance that the campaign will be a success. Another advantage lies in the fact that by involving stakeholders it is easier to formulate and implement sustainable innovative policy. At present no such a mechanism is present in Indonesia, and the majority of innovative water policy is initiated and driven by external actors such as (mostly foreign) consultancies, governments and NGOs.

3.4 Introduction of research questions

This is what this research intends to do and therefore, with all the points above in mind, the following research questions have been formulated:

1) *Why do signs of improvement in Indonesian water management remain unseen, despite vast sector reform in recent years?*
    i) *To what degree does the present structure of the water policy network influence the formulation and implementation of water policy?*
    ii) *How does the extent to which information and knowledge are distributed in this policy network affect the formulation and implementation of water policy?*

With the above in mind the following hypotheses and sub-hypotheses have been formulated. It must be noted that these hypotheses are not to replace the research questions above. The research questions are still the core of this research, and intended to be answered at the end of this thesis. The hypotheses merely function as a way to indicate possible answers with respect to the focus of this research and that what the literature and theory say about these topics. These hypotheses are not meant to be (statistically) falsified; instead they should be seen as summaries of this chapter, and indicate possible results based on the theory and literature found in the sections above.

Main Hypothesis: The Indonesian water sector underperforms because water sector policy, its underlying reasoning and principles, and the framework within which it is formulated and implemented are being carried out ineffectively.

Sub-Hypothesis 1: "Effective translation of law into policy, subsequent management activities, and actual implementation is dependent on how the policy network is structured. The current policy network does not correspond to the network as described by law and therefore performs sub-optimal."

Sub-hypothesis 2: "Effective translation of law into policy, subsequent management activities and actual implementation is dependent on the quality and quantity of information at the moments where decisions in this chain of events are made. Currently, information is ineffectively distributed both in the qualitative and quantitative sense."

Even though in the above the elements of actor networks and knowledge availability are separated into two research questions and hypotheses, they are highly interrelated. The availability of knowledge and information during decision moments depends on how actor networks are structured ("who brings what, when, to the table?") and vice versa. Actor networks are invariably structured around knowledge pools. The research questions and hypotheses above should therefore not be seen as opposing but complementing.

With this in mind, this research primary focuses on testing and evaluating sub-research question 2 and only partially addresses the issue mentioned in sub-research question 1. This is due to several reasons:

1. Actor networks invariably situate around knowledge and information to increase capacity and are thus dependent on knowledge and information. Mapping knowledge pools is therefore a specific way of mapping actor networks.

2. This focus lies closest to existing studies on capacity building activities, and may therefore be more complementing to existing research (or at least formulate it in similar terms)
3. Mapping, and consequently adapting, networks is a time-consuming process that takes many years of continuous effort to be successful. Networks are dynamic and depicting them will always be a freeze-frame of the current situation. Finding answers to the problems posed in the second sub-research question may be more effective within the limited scope and time of this research.
4. Whether or not the existing policy network structure "fits" the formal network structure is a relatively simple question to answer based on the analysis required for sub-research question 1 and the main research question. Therefore even without specific research on the effect of network structure on policy formulation and implementation outcomes something may be able to be said about this relationship.

To address sub-research question 2 and the main research question (and specifically to map the water policy network) a social network analysis has been performed. However, as Luzi e.a. (2008) mention, "Social network analysis is […] a useful tool to highlight cooperation patterns in the water sector, but its utility for explaining policy processes without supplementary qualitative information is limited". Because of this a second research phase has been included which constitutes of a series of open interviews with experts of the Indonesian water sector to provide this qualitative information on water policy processes. How this has been achieved is presented in the following chapter: Methodology.

Chapter 4: Methodology

4.1 Chapter Introduction

In this chapter the research methodology is presented and justified. It enables the reader to gain insight into how the research was structured, how data was collected and where it was collected from. In section 4.2 the research approach will be introduced and the main distinction in two research phases justified. Next, the methodology of both phases will be explained individually.

4.2 Research approach

The research can roughly be divided into three sections: a formulation and orientation phase, a data collection phase, and a data processing and reporting phases. The first of these phases, formulation and orientation, consisted of literature review, expert consultation and general preparation of the field work in Jakarta. The data collection phase was completed over a period of 2.5 months in Jakarta, Indonesia and consists of two distinct data collection phases elaborated upon below. The final and third research phase consisted of the processing of this data and the writing of this thesis. The focus of this chapter lies on the second and third phase, most notably the data collection and data processing.

The research in Indonesia has been divided outlined in two phases: a diagnostic –more qualitative and passive- data collection phase and an involved – more quantitative and active- data collection phase.

The first and primary reason to incorporate a first diagnostic and qualitative research phase is as a means of complementing data resulting from the more quantitative Social Network Analysis (SNA). As mentioned earlier, SNA is limited in its utility to explain qualitatively *why* policy processes occur as they do. Supplementary qualitative information is required to do so. The second reason to gain this additional information is to first gain more understanding into the workings of the Indonesian water sector and to experience at firsthand the unique work culture and characteristics of Indonesian government.

This first phase comprised of the first six weeks of research in Indonesia. In this phase the researcher got acquainted with the situation and the people involved. Literature research, site visits and preliminary interviews with experts were held and an overall research framework for phase 2 was developed. Within this phase the layout of the questionnaire was also developed, this will be elaborated upon below.

Phase two comprised the final six weeks of research in Indonesia and focused on applying this questionnaire and the social network analysis framework. The results of this phase are mixed and do not in all ways conform to the “traditional” way of SNA. Nonetheless some insightful observations have been made in this phase from which significant conclusions can be deduced. The results of phase 1 and 2 are described in chapter 5 ‘Findings’.

4.3 Phase 1 – Qualitative data collection and analysis

Phase one was based on a series of open interviews with several experts in the Indonesian expert. Selection of these experts took place based on a mixed approach with experts being partially

selected based on existing literature, and partially on the "snow-ball method" where experts would refer to other experts in the field that may know more about specific subjects that were raised in the interviews. General selection criteria for the experts to be interviewed were twofold, namely: (1) their "level of expertise" in their respective knowledge fields and; (2) maximizing diversity in expertise and ensuring that experts from different interest groups were chosen (in terms of allegiance).

Interview structure and method

The interviews were conducted in an open and deliberately unstructured way, with the primary goal being to enable experts to speak their mind freely and from their own perspectives. Key question and starting point of every interview was for the experts to:

- Identify key issues in the Indonesian water sector with respect to the policy processes, decision-making, networks and water management in Indonesia.
- Explain the inner workings of these processes (as much as their function and expertise allowed)

To achieve this, sessions were limited to a maximum of 60 minutes and scheduled in (as much as possible) informal settings. The interviewer deliberately chose for as little guidance in the interviews as possible in the form of questions or directing topics. This enabled the interviewee to speak freely and highlight what they deemed important, without being directed towards possible conclusions of the interviewer.

Data collection and processing

Interviews were collected in form of brief minutes with the key statements and points made by the interviewees. Out of these minutes key statements made by the interviewees were deduced and collected into a central spreadsheet document. With this document all interview statements could be structured, compared and scored in terms of frequency and similarity.

For this data 90 different statements were constructed from the interviews. Some of these statements are mentioned by several of the respondents, whilst others are more particular. By scoring the respondents on each of these statements (to the degree that they referred to, or agreed with, a statement), subtotals per statement could be created giving an indication of the relative significance of the statements with respect to each other. An elaborate explanation on the way this scoring process took place has been presented in the corresponding chapter, Chapter 5.

4.4 Phase 2 – Quantitative data collection and analysis

Phase two is primarily centered on quantitative data collection analysis in the form of interviews and social network analysis. To conduct and structure the interview a standardized questionnaire was designed. The questionnaire was not designed to be filled out by the interviewee alone. It assumes the presence and guidance of an interviewer who is trained to conduct the interview. The full questionnaire can be obtained from the author upon request.

Relation to social network analysis

Social network analysis is based on quantitative data gathered through questionnaires with actors within the network to be examined. In the case of this research the data has been gathered by interviewing key actors within the network that produces water policy in Indonesia.

With help of the interviews, the relations between the various actors can be identified and mapped. This data can then be structured using techniques of social network analysis. The interviews themselves are structured with the use of a standardized questionnaire. The questions, topics, form and methods used in this questionnaire have been inspired by Luzi e.a. (2008). Permission by the original author has been granted for the use of these questionnaires. Luzi e.a. have applied their questionnaires and social network analysis framework in two MSc theses in Egypt and Ethiopia where they investigate the actor policy networks of the water sectors in each of these countries. For both cases a network map was realized that showed a ranking of the most significant actors in the policy network and how they are related to the other networks.

The questionnaire: General format and question types

The main guidelines in designing the questionnaire were increasing simplicity and speed of completion. In doing so the interviews could be cut down to a minimum amount of time spend for completion (efficient for both the interviewer and the interviewee), and would be easier to understand for all the respondents (situated at different levels of government or companies with different levels of understanding of concepts and knowledge of the water sector).

To ensure that these requirements were met, the interview questions were chosen as closed instances. Showing the relation to other actors was accomplished by often simply checking the name/function of the instance in question on a long list with all the actors in the network. In case that an actor was not present on the list, but still deemed significant by the interviewee, the option was given to add this actor to the list. This would then be taken into account in the remainder of the interview and future interviews.

Depending on the question, the interviewee could either be asked to rank actors, indicating a value on a scale for a particular actor, or entering simple true/false answers were necessary. For all questions the method of answering is well-described and repeated by the interviewer.

Interview questions and main topics

As mentioned the questionnaire was inspired by the work of Luzi e.a. The questionnaire has been divided into five sections constituting five main topics. These are:

1. Influence and reputation
2. Meetings
3. Information exchange
4. Joint activities
5. Effective cooperation

In each of these sections several questions are asked to reveal the relation of the interviewee to the other actors in the network, with respect to the respective main topic. Each of these topics is described in more detail below.

Influence and reputation

In this section of the questionnaire two main questions are asked. First of all the interviewee is asked to point out the 10 most influential actors regarding water management strategies and planning in Indonesia. Secondly, the respondent was asked to point out the actors that have the greatest influence in the implementation of that those water policy strategies. In both cases a list was generated that ranked the top 10 most influential actors from the point of view of the respondent. Finally, to confirm and validate the choice of the respondent, the interviewer asked the respondent to elaborate on some of the choices by giving more specific examples and information related to the choice and ranking of said actor.

To substantiate the difference between *planning* phase and *implementation* phase, the following definitions and characteristics were given to the respondent prior to answering the two questions as described above.

Definition	
Planning phase	**Implementation phase**
- General national policy formulation - Annual national plans - Ant other important strategies or planning activities	- Implementation of projects - Technical plans for realization of projects - And other implementation activities

Table 3: Definitions of planning and implementation phase

Meetings

The second main topic in the questionnaire constitutes meetings. In this part the interviewee is asked to fill out the frequency at which he or she engages in meetings with particular actors concerning issues of water resources management (concerning both planning and/or implementation).

The respondents were asked to use the following frequencies:

Table 4: Frequency categories of meetings

1. Very seldom	Once in a six months and less
2. Sometimes	Once in a month up to twice in six months
3. Often	Twice a month and more

To validate the answers by the respondent the interviewer asked the respondent (at random) to elaborate on some of the choices made by summarizing the reason for the last meeting had with a particular actor, and the outcome of that meeting.

Information exchange

The third main topic in the questionnaire constitutes information exchange between actors. In this topic the interviewee was asked first of all to state with which other actors factual information for formulating water management strategies was exchanged. As examples of these types of information the following was stated:

Information included	**Information excluded**

• Reports on the status of the water resources and water development projects	• Directives, annual reports, advertisements, newsletters, other easily available public documents
• Scientific studies on socio-economic aspects relevant to water resources development	•
• Studies on the applicability of water resources management measures/techniques produced by either the interviewee's organization or organization stated by the interviewee	•

Table 5: types of information

Additionally the interviewee was asked to state what the direction of the exchange of information was. This could be done by stating that information either flowed *in*, *out*, or flowed *both* ways. To validate the answers by the respondents, the interviewer asked, at random, to specify what information was exchanged in some of the cases as stated by the respondent.

Secondly and thirdly, the respondent was asked to state which of the other actors were consulted, and with actors consulted the respondent, during the formulation of water management policy and plans, respectively. To validate the answers by the respondents, the interviewer asked, at random, to specify what was consulted in some of the cases as stated by the respondent.

Joint activities

The fourth main topic in the questionnaire constitutes joint activities between actors. In this section of the interview the respondent would be asked to state with which of the actors within the network joint activities were engaged. In this case a distinction was made between joint activities concerning water management planning, and water management implementation.

Joint activities were defined as follows and explained to the respondent beforehand:

- Joint planning
- Joint elaboration of strategies
- Planning and implementation of common projects
- Joint research activities
- Common publications
- Joint lobbying activities
- Etc.

To validate the answers given by the respondent the interviewer would at random ask the respondent to elaborate on the types of activities that were engaged in with particular actors.

Effective cooperation

The fifth main topic in the questionnaire constitutes effective cooperation between actors. The respondents were asked to state with which actors effective results were produced regarding water resources management. To specify what effective results are, the following definition was applied: effective results are those activities that have led to tangible impact on water resources

management in Indonesia. Individual interpretation of what could be considered as a tangible impact was desired in this case as it reflects the personal values of each of the actors interviewed. Once again a distinction was made between strategy and/or planning and the implementation process.

The following examples of tangible results in the planning and implementation phase were mentioned to each of the respondents before each question:

Definition	
Planning phase	Implementation phase
• General national policy formulation • Annual national plans • And other important strategies or planning activities	• Implementation of projects • Technical plans for realization of projects • And other implementation activities
Tangible results are understood as:	
• Formulation of a specific policy component • A change (or prevention of a change) in the structure of the water sector • The joint planning of a major project • Etc.	• The joint implementation of a water resources development project • The organization of a crucial event • Etc.

Table 6: examples of tanglible results

To validate the answers the interviewer asked the respondents to indicate what kind impact was achieved as the result of effective cooperation in some of the relations as stated by the respondent.

Interviewee selection

Selection of the interviewees was based on results from part 1 of the field research work. A comprehensive list of contacts at the agencies was compiled in this phase based on existing literature, preliminary interviews and expert suggestions. Primary selection criteria were:

- Sufficient knowledge of the Indonesian water sector
- Represents the organization/agency/actor and its activities well
- Basic to good English language skills

Determining factors in the selection and scheduling of interviews was not always within control of the author. A variety of other factors such as the availability and willingness of interviewee candidates to participate were a significant factor in scheduling the interviews. This has contributed significantly to the (lack) of success with the interview approach.

Data collection and processing

Interviewee answers were noted down by the interviewer and coded into a central excel file after the sessions. Each of the five sections in the questionnaire is presented in a separate spreadsheet [see annex D].Because the coded values do not make results immediately clear, the files have been visualized for the purpose of results presentation. Not every interview question and topic was equally suitable for the same type of visualization, which is why three main visualization techniques

were applied. These can be found and are further elaborated in the corresponding chapter of results, Chapter 6.

Chapter conclusion

With the methodology of this research explained in this chapter, the results of the analyses will now be presented in the following chapters. In chapter (5) and the following chapter (6) the findings and results of the research phases in Indonesia are presented. Two particular distinctions are made at this point that will structure these chapters. First of all, because of the separation made in the previous chapter in phase 1 and phase 2 of the data collection, a similar separation will be made in the presentation of these results. The data from these phases will be considered as two separate data sets. Data from phase 1, consisting of the explorative interviews with various experts, will henceforth be referred to as the ''external'' data. Reason for this is that the majority of the respondents in this phase can be considered externally involved in the policy formulation and execution process e.g.; they are not directly part of the environment in which this takes place. The second data set is the data gathered in phase 2 of the research. This will henceforth be referred to as ''internal'' data; gathered within the policy formulation and execution process. The respondents in this phase are critical actors within this environment are actively involved in the various stages of policy development. All of the actors in phase 2 are of Indonesian nationality.

Chapter 5: Findings from open interviews

5.1 Chapter Introduction

The analysis of the results of the open interviews in research phase 1 has resulted in the formulation of seven general statements. In the paragraphs below, each of these main statements will be elaborated upon, based on the individual statements given by the respondents in the open interviews. At the end of each statement a table is presented with each of the contributing interview statements. Additionally, each statement shows the frequency with which it was mentioned across all the interviews, and the category of the respondents that gave this statement.

These categories are defined as follows (the numbers in brackets represent the amount of interviews per category):

1. Indonesian government-based (6)
2. Dutch government-based (2)
3. International donor agency (I.e. World Bank) (2)
4. Private (i.e. independent consultant) (3)

It is important to note that some of the respondents are related to several of these categories, especially in the private category this is the case as these individual may have grown into consultancy after having been employed in one of the other categories before. Overlapping functions of individuals may also be the case as they may fulfill an advisory role to various institutes due to their expertise. In these cases, the author has chosen a primary category for such an individual based on their primary allegiance, experience and activities carried out.

Finally, in the tables representing the categories and frequencies of response, it may occur that a score is lower than the amount of respondent categories presented. This occurs for example in the case of statement 16, presented below:

Statement #	Statement	Frequency of response	Category respondent(s)
16	innovative policy is externally driven	2	2 / 3 / 4

The reason for this apparent inconsistency, is the fact that the frequency of response 2 consists of two half (“0.5”) and one full (“1”) responses. Half responses on a statement made by a given respondent are considered as such when the respondent’s statement is very closely related to(but not literally the same as) the statement in the table. An example of this is statement 16, in which one respondent mentioned that: “innovative policy is mostly not initiated by the Indonesian government, but the result”. In this case, the answer excludes “internally driven innovative policy”, but does not explicitly mention external parties (foreign governments, international donor agencies, etc.) as the parties’ primary responsible. Nonetheless the statement closely relates to the initial statement and is therefore “scored” as a half point answer.

5.2 Statement 1 - The relation between RBOs and their relation to national organizations is unclear

At various occasions during the field work in Indonesia the issue was raised that friction in the relationship between Balai Besar and Provincial Balai limited effective implementation of policy. The Balai Besar's primary allegiance lies with the Ministry of Public Works at the national level, whereas the provincial Balai is situated strictly at the provincial level. Both are considered river basin organizations, but it is not always clear where the authority of one ends and the other starts. The interviews support this claim in several ways. The Balai Besars, though legally considered river basin organizations for strategic river basins, are essentially an extension of the ministry of public works. Often they fulfill the role of the former field offices of PU, except that they have been significantly reduced in size after decentralization efforts. Much of the capacity (human resources and knowledge) of these former organizations has been decentralized to the provincial authorities where they now function as part of the provincial Balais. In addition, Balai Besars have no financial autonomy and operate on a budget provided by the ministry of PU. Due to the limited size of these organizations the Balai Besars are often not capable of fulfilling the tasks they are given. Increasing capacity by providing additional manpower is impossible because the ministry of PU does not want its administrative body to grow any further.

This leads the Balai Besar to delegate their tasks to the provincial Balais, who have significantly more capacity, knowledge and information to realize these objectives. There are however significant problems with this approach.

First of all the provincial Balais take these tasks upon them through hierarchical ties of the organization but they do not have the corresponding budget to fulfill these additional tasks. This means that they perform tasks on a limited budget which results in either subpar implementation, or lack of priority in said tasks, both of which are undesirable. Secondly, delegation of tasks is not formalized by law. In fact, some argue that it is illegal, as it is directly in conflict with the water law. Maintaining unclear definitions of the transfer of mandate without respective rules concerning responsibility or accountability is highly undesirable for the general public. Thirdly, the delegation of tasks results in an unclear relationship between the provincial Balai (who executes the policy) and the sector ministries (who formulate the policy). Without a clear relationship there is no clear framework for coordination between the two parties, risking a policy implementation process that is not sufficiently monitored or integrated with the policy formulation process.

Nonetheless the position of the Balai Besar is an important one. Balai Besars were "created" in the water law (2004) as a means for the national government to exercise sufficient control over water management in key river basins. After the decentralization law in 1999 it became apparent that not all river basins were capable of managing fully autonomous. Many river basins and local authorities lacked the knowledge and resources to take these tasks upon themselves. On the other hand, in the more strategic (read: valuable) river basins, local authorities grabbed this opportunity to exercise their power and formulate unrealistic budgets for their activities without much foundation on how to realize these budgets into feasible activities. The lack of insight in how requested budgets were spend by local authorities, and the suspected fear of corruption, led to the general believe that funding of local authorities was ineffective without stricter supervision.

In response to both these two occurrences the ministry of PU decided that more involvement was necessary. The effort to establish the Balai Besar has been frequently dubbed as a "re-centralization" effort on behalf of the ministry of PU. This political power decision by the ministry has not been

received equally well by all parties involved, but has nonetheless been deemed necessary to regain control of the extremely (too) fast decentralization process that was initiated in 1999.

Summary of statements given and their relative frequency:

Statement #	Statement	Frequency of response	Category respondent(s)
66	Balai Besars have no financial autonomy	1	4
74	the Balai Besar is only a political power decision, and does not adequately fulfill the role of governing instrument	1	2
50	central government has mandate but not the capacity to execute this mandate	2	2 /3
17	recentralization was necessary	2	3 / 4
63	executive power is at the top	1	4
69	Balai Besars are not capable of fulfilling their task/mandate	1	2
70	PU does not want administrative body to grow	1	2
75	PU thinks that roles of Balai Besar can be carried on to the provincial Balai without problems	1	2

Validity of responses

The total amount of respondents referring to statement #1 in their interviews was four. This is relatively low compared to the data in other general statements. Additionally, no category 1 respondents have mentioned anything regarding this category. This on its own is a remarkable observation, because of the significance of the general statement. Because of this care must be taken with any conclusions drawn from this data. Additionally the low number of total respondents further discredits the acceptability of the claims made in this general statement.

That said, the fact that category 1 respondents did not mention any of the issues in this general statement (or the low number of respondents) does not mean that it is not an issue at all. Quite on the contrary this “silence” could be an indication of the sensitivity of the subject, but without more substantial evidence this claim is hard to prove.

At this point it suffices to note the above, and to take care in interpreting the data.

Table 7: Summary of statement data

Category	Number of unique respondents per category:
Indonesian government-based	0
Dutch government-based	1
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	2

TOTAL	**4**

Interpretation of these results in research context

The relationship between Balai Besar and the provincial Balai is a crucial link in the chain of policy translation, due to the key role of the RBO to implement national policy on a river basin level. Due to the importance of this relationship it is alarming that friction between both parties appears to occur on some facets. Three problems stand out in this regard that lead to this perceived friction: (1) a budgetary problem that creates bottom-up dependencies and lack of autonomy; (2) delegation of tasks from Balai Besar to provincial Balai which lacks sufficient legal foundation and; (3) lack of capacity to fulfill said delegated tasks.

With respect to the main hypothesis posed in chapter 4, all three of these problems are examples of insufficient capacity to effectively translate laws and policy into action and successful water management practices. Lack of financial means to fulfill tasks, lack of clear institutions to facilitate transfer of authority and effective cooperation, as well as a lack of human resources and knowledge to implement policy are the respective capacity gaps in this particular example.

In all three cases, information and knowledge play an important role. First of all, the budgetary problem in this particular example is partially based on the lack of trust from higher to lower authorities. Creating more transparency into the actual activities of lower authorities by providing clear documentation of tasks, simple accounting of project-costs and budgets, risk analysis and planning of day-to-day activities, will enable higher authorities to transfer finances more readily and with reduced risk: an important step towards financial autonomy of RBO's and decentralized governance of water resources.

The second problem is that the lack of agreements between the parties involved results in the lack of an institutional framework, neither in the formal sense (law and regulations) as in the informal sense (agreements and contracts). It is unclear why the relationship between the different types of RBOs is not further defined. Neither in the water law, nor in supplemented regulations is this distinction made. Explanations as to why this is the case are numerous, but mere speculation. It is clear that some parties involved may actually benefit from an unclear definition in this matter, as it gives them more authority and influence. On the other hand it is also unquestionably true that it is unclear on all ends as to what such a definition should address and more importantly so: how it should be enforced.

With respect to the third problem, the lack of capacity to fulfill tasks first of all the result of government policy to reduce the administrative body. Second of all, the lack of capacity may be explained by the fact that too little is known about the true capacity requirements to fulfill these (additional) tasks. In the latter case coordination and clear sharing of information between RBOs is a necessity.

5.3 Statement 2 - Current budgeting and financing practices in the Indonesian water sector impair good policy formulation and implementation

During the open interviews the meaning and role of financial power in the form of budgets in water policy formulation and implementation was a reoccurring factor. The large size of Indonesia, the ever-growing need for water resources and vastly increasing population create challenges that require large amounts of financial resources to solve. Due to scarcity of financial resources as a whole, this results in a climate in which the securing of finances and budgets is an important element of survival for organizations, and defines their power and influence on others.

Due to decades of a strictly centralized governance regime, finances have been traditionally allocated (and obtained) at the highest level of governance. Even now after 10 years of decentralization efforts, the distribution and collection of finances remains a sensitive issue in the formulation of new law and policy. The water law for instance does not include any financial regulations at all: a deliberately choice, as the water law would not have been approved by parliament if it had attempted to include such regulations. A general belief exists, even today, that finances are best regulated centrally: at the nation's capital. The roots for this belief lie in both strong political interests as well as economic considerations.

Budget drafting and approval is traditionally done by the ministry of finance and a parliamentary budget commission respectively. They are based on the 5 and 20 year plans that are developed by the sector ministries. In case of water resources, the ministry of Bappenas (strategic national planning) traditionally outlines plans in cooperation with PU. Much critique has been given on the format of these plans. An often reoccurring statement with respect to these plans was that they merely constitute lists of projects, as this is the most secure way to secure budget for the coming years. The risk of these lists on the other hand is that there seems to be little to no cohesion between these projects and that an overall umbrella, for example in the form of a national water policy, is lacking. The lack of integration of plans is traded in for the freedom of generating as many projects as possible to secure annual financing. Another problem arising from these project lists is the fact that it only considers traditional and well-known activities. Including innovative policy proposals is considered risky and therefore unrewarding. The same argument holds for the reservation of budget for unforeseen circumstances such as cost-overrun on projects or cost coverage for natural disasters. Even though such budgets exist, it is often unclear how they are meant to be used and which parties are in control over them. The system at present provides all the wrong incentives and prevents innovative solutions and dealing with uncertainty in water management, both of which are absolutely essential to deal with water problems today.

Aside from the fact that the national budgeting system does not perform as well as it could, there is the issue of how these nationally secured resources are transferred to lower decentralized units of government. As was mentioned in the previous section of this chapter, significant problems arise in the allocation of finances between the Balai Besar and provincial Balai. Similary, other organizations in the lower echelons of public administration have difficulty obtaining funding for their activities. One of the biggest challenges in Indonesian water management right now is how decentralized units are supposed to manage water resources without the (financial) capacity to perform their duties.

One of the problems that the sector ministries face is that it is unclear how much budget should or can be allocated to decentralized actors. Because the majority of funding is secured by formulating single projects through the ministries, it is nearly impossible to redistribute this funding to operational budgets for water management authorities. What is required is clear communication

about the budget requirements of these authorities and the formulation of their activities and costs. Because there seems to be no clear coordination mechanism between activities of lower water management authorities (the provincial Balais, the municipality and district units responsible) and the sector ministries, budget allocation and activity formulation cannot be adequately balanced. A vicious circle arises in which on the one hand decentralized actors cannot perform their duties due to the lack of funding, whereas on the other hand no budget can be allocated to them because their duties cannot be formulated convincingly to the higher levels of government. The need for information exchange and coordination and the requirement for clearly defined mechanisms to structure these processes is wholly demonstrated in this case.

Summary of statements given and their relative frequency:

Statement #	**Statement**	**Frequency of response**	**Category respondent(s)**
6	budgeting is a crucial factor in power relations and distribution of power	2	1 / 4
19	centralized actors are in control over finances	6	1 / 4
34	Balais are too dependent on the budgets of central government	2	3 / 4
37	ministry of finance is responsible for budget allocation of water management	1	1
41	financing problems are the primary reason not to completely decentralize	3	2 / 3 / 4
64	parliamentary commission approves budget allocation	1	4
66	Balai Besars have no financial autonomy	1	4
11	there is no budget for inspecting dams/waterworks	1,5	2 / 3
23	delegation of mandate and finances are split	5	1 / 2 / 3 / 4
44	no budget for innovative/unexpected solutions	1	2
71	current licensing system does not function well	1	2
32	defining and committing to budgets and responsibilities is only considered a nuisance to everyone and considered disadvantageous to those involved	1	4
33	project based culture is needed to secure and hold on to budget	1	4
36	significant distinction between substantial and financial issues in the Indonesian water sector	1,5	1
52	directives = financial streams	1	3

Qualifying the responses

The total amount of respondents referring to statement #2 in their interviews was eight. Although at least mentioned by a respondent from each category once, half of all of these respondents is from category 1: Indonesian government-based. There are at least two plausible explanations for this. First of all, actors in this category can be considered much more knowledgeable about internal financial

processes, and thus more aware of the significance of the problem. Second of all, actors from this category benefit the most from mentioning this statement as an important limiting factor in realizing Indonesian water policy. It is a well-known fact that (especially in Indonesia) the amount of wealth is more or less directly proportional to the amount of influence one has. A constant struggle for power and influence is paired with an equal struggle to increase financial resources. Due to this mindset it is not surprising that Indonesian government-based actors consider this a large part of the problem to realize water policy in practice.

The fact that this mindset is dominant does however not mean that it is false. The budgeting system and flow of money is indeed a problem, which is confirmed by the other half of the respondents who mention this in their statements. The exact distribution per category is shown in the table below.

A final observation that can be made on the data presented above is the fact that responses from category 1 respondents never directly state that the current financial structure is in fact a problem. Reason for this may be cultural, in the sense that bad news or negativity in general tends to be avoided in conversation. This is a plausible assumption, especially given the fact that the combined statements of the respondents from this category do suggest that there is a separation between substance and finances in the water sector, which may be problematic.

Table 8: Summary of statement data

Category	Number of unique respondents per category:
Indonesian government-based	4
Dutch government-based	1
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	2
TOTAL	**8**

Interpretation of these results in research context

The need for information and knowledge exchange to enhance the relationship between policy-formulating and policy-implementing actors was already partially mentioned in statement 1. As is shown in this section, a similar problem occurs at the national level with the formulation of policy by the sector ministries. Through comprehensive list of projects, formulated as 5-year plans, budgets are secured from the ministry of finances. In cooperation with the ministry of BAPPENAS, these budgets are then drafted and validated. This way some coordination and exchange of knowledge is ensured as BAPPENAS evaluates the plans with the national spatial planning strategy. Unfortunately however, the 5 year plans are not part of a larger national water strategy. The 5 year plans form the core of national ministry policy as they have been for the past decades. Any deviation from this process is considered inappropriate and makes appropriation of funds more difficult. Much like the case of coordination between lower level governments, there is a need for transparency in activities and budgeting to convince the ministry of finances to approve plans and policy. To ensure this transparency, information about budget allocation, appropriation and spending must be sufficiently available, accessible and obtainable. Similarly the readiness to allocate (extra) budget is dependent

on how higher level government perceives the ability of lower level government to utilize this budget. It is in a lower-level governments' best interest to collect and transmit information about the potential utility gained from projects, how projects and processes will be managed and generally convince the responsible ministries that financial means are in safe hands. At present such information exchange does not appear to be occurring sufficiently. This relates to the following statement.

5.4 Statement 3 - Cooperation and coordination between organizations is insufficient

Cooperation is defined in this context as the joint efforts between two or more organizations to reach common goals. Coordination is defined in this context as the harmonization of efforts by two or more organizations to reach common goals. Although both concepts differ in definitions, they share the premise that they occur between organizations, and that these organizations benefit from them in some way to achieve their goals.

It is widely understood that both in the case of cooperation and coordination different approaches can be effective. Which approach is most suitable to which organization, is largely determined by the context it operates in. Factors as (corporate) culture, substance matter, economic and political complexity and other factors that define organizations and their context all determine which approach is the most appropriate. In most cases however the most suitable approach is not the result of deliberate choice, instead, it has developed out of a process of years of experience between organizations and the sheer need to cooperate and coordinate.

Cooperation and coordination in the Indonesian Water Sector proves no different: Indonesian culture has a profound effect on how ministry officials meet and cooperate. What this effect is exactly and how it affects the efficacy of water management decisions will be elaborated upon in part 2 of this chapter where the findings of phase 2 of the research are presented.

At one instance key figures at top universities were mentioned to play the role as advisory council in policy formulation processes. Top university employees and professors are highly regarded in Indonesia, and their input on difficult decisions is therefore highly valued. However, this relationship is hard to prove as these counsels have a very informal character. Nonetheless, the presence the Indonesian academic world in the water sector seems to be growing. Solutions to big projects and problems such as for example the mud-flow disaster in East-Java in May 2006were sought for at the ITB, the prime technological university in Indonesia. Increased cooperation between universities to tackle water management related problems, for instance education and capacity training, are also ongoing as can be seen in efforts like CK-NET INA: a NGO program that coordinates inter-university programs related to water management and urban planning activities.

Conflict resolution capacity

Conflict between organizations is also dealt with informally and internally, judicial intervention between parties is merely cumbersome and complicated, and therefore avoided. On the one hand this approach suggests that there are definitely processes present in the drafting and execution of water management policy, additionally, these processes seem to have the capacity to resolve conflict without external intervention. Being aware of the presence of these processes is important as it provides a basis for negotiation and discussion: critical components in the formulation of innovative

and sustainable policy. From a more sinister point of view, the lack in need of external intervention could also imply that powerful actors dominate decision processes in such a way that there is simply no counter-force from actors that disagree. The lack of documented disagreement does not prove the lack of disagreement in general.

Recentralization was necessary

As shown in the previous paragraphs it was frequently mentioned that the water law was at least in part a re-centralization effort that brought back some of the decentralized authority to the national level. The motives for this decision have been questioned by many of which some more honorable than others. One of the more "popular" explanations for example is the fact that the ministry of Public Works used the water law to recapture some of the influence they had prior to the 1999 decentralization law. During this period the ministry actually got dissolved to become a much smaller ministry that was to purely focus on policy formulation, not implementation. This happened during the two years (1999-2001) of presidency under president Abdurrahman Wahid (Gus Dur), who attempted to get grip on one of the most corrupt and influential ministries in Indonesia. By re-instigating the Balai Besar as an operational unit in the most important river basins through the new water law, the Ministry of Public Works regained control over expense budgets and influence in these regions.

A more overlooked, but equally valid, reason to re-centralize lies in the problems that occurred at the decentralized level. The quick decentralization process that commenced in 1999 offered very little opportunity for local authorities to prepare for their new tasks. The lack of clear plans for how decentralization of the water sector could be accomplished in practice contributed to this problem as well. As a result many local authorities were unprepared for the job at hand. Without the capacity or knowledge to take over duties otherwise performed at higher levels of governance, local authorities nonetheless welcomed their new budgets for these tasks, resulting in vague management plans and activities and untraceable financial streams. The sheer magnitude of this new problem and the lack of control of central authorities have been seen as one of the main reasons to partially re-centralize water management authority and regain control over the sector and its resources.

Some cultural aspects of IWRM fit very well with IND culture

One of the advantages that some of the respondents mentioned that Indonesia has in the implementation of IWRM is the fact that Indonesian culture contains several aspects that are in line with the principles of IWRM. Frequently mentioned in this regard is the fact that Indonesians value a sense of community, shared responsibility and social obligations. Both of these are present in IWRM principles such as community involvement in decision-making and attention to social dimensions.[5]

Local government forums exist, but are not used optimally yet

At the lowest administrative levels: the Kelurahan (village) and Rukun Warga (RW – ca. 500 households), tools for community participation in decision-making exist in form of community working committees (CWCs) and through the MusRenBang process (Musyawarah Perencanaan Pembangunan; Annual Government Community Participatory Planning Forum) (Partners voor

[5]http://www.gdrc.org/uem/water/iwrm/1pager-01.html

Water/EVD, 2008[6]). These two examples are the closest to direct public participation in Indonesian administrative government, but are as of yet, not successfully applied within Indonesian Water Management.

Information exchange is very much based on the issue at hand and the project that is dealt with

Information exchange between actors in Indonesian water management is considered sporadic, informal, ad-hoc and without structure. Depending on the topic and project at hand, inter-agency and inter-departmental discussion sessions can take place. Structural information exchange –or institutions that support this- of data, ideas and activities between actors with water management duties does not take place. The topic is elaborated further upon in the next chapter.

Summary of statements given and their relative frequency:

Statement #	Statement	Frequency of response	Category respondent(s)
1	advice from key figures at top universities	1	1
3	culture determines how ministry officials meet and	3	1 / 4
51	conflict is handled internally, no judicial intervention	1	3
17	recentralization was necessary	2	3 / 4
45	some cultural aspects of IWRM fit very well with Indonesian culture	2	2 / 4
61	the basis for cooperative planning already exists in Indonesia	1	4
86	local government forums exist, but do not perform well yet	1	4
91	information exchange is very much based on the issue at hand and the project that is dealt with	1	1

Qualifying the responses

Similar to the previous statements made in this chapter, there is an equal spread between statements given by Indonesian government based actors as statements given by non-Indonesian government-based actors. This at least proves that there is common understanding with respect to the issues at hand. Within the non-Indonesian government-based actors there is a majority of actors that lie within the Private category (three out of two). Reason for this may be the fact that the actors situated in this category have more understanding of internal coordination and cooperation processes in local government through their specific fields of work.

Once again it must be noted that responses from category 1 respondents in this section do not actually directly state that coordination and cooperation in water management policy processes is *insufficient*. The answers provided from these respondents are usually more positively formulated and are in that sense somewhat open to interpretation. For example it was stated that at one point that “information exchange is … based on the issue at hand” and at another that “culture determines

[6] Progress Report 1: Continued Dutch Assistance with non-structural Measures Jakarta flood management – appendix terms of reference – JFM2 – Community participation

how ministry officials meet and cooperate". Taken separately both these statements seem perfectly reasonable and do not indicate a problem in the way in which parties communicate. If these answers are however interpreted within the context of the other answers by the respondents during the interview, it becomes evident that these answers may also indicate that communication and information exchange is very much used opportunistically and as a means of trade. In other words, whereas information (exchange) is generally considered scarce, this scarcity also provides opportunity for barter and leverage.

Table 9: Summary of statement data

Category	Number of unique respondents per category:
Indonesiangovernment-based	5
Dutch government-based	1
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	3
TOTAL	**10**

Interpretation of these results in research context

Current coordination and cooperation processes are the result of a transitional period between traditionally centralized and new decentralized governance. The general trend, as supported by the results in this section, is that coordination and cooperation between responsible agencies is present but scarce, hesitantly initiated and informal in character. All three of these characteristics show remarkable resemblance to some kind of bartering process. This limits the quantity and quality of information being freely available to agencies in their decision making processes. This opportunistic behavior with respect to information exchange is understandable if observed from a perspective of a single rational actor attempting to maximize his/her utility, however there is a risk of information being too "expensive" (or simply unavailable) to well-meaning efforts in solving Indonesia's water problems. Lack of cooperation through knowledge and information exchange may well lead to inefficiencies in water policy formulation and implementation processes.

Formalization of coordination and cooperation between agencies through new institutions may reduce some of the factors underlying the present hesitance, improve decisions, reduce capacity utilization, and lead to more efficient and effective water management practices.

5.5 Statement 4 -Policy formulation and implementation processes have not changed with the sector reformation

The most frequently mentioned issue with policy formulation has been that little to none has changed with respect to the era before the sector reformation. This seems to be at odds with the ultimate goal of sector reformation which is to change traditional policy and move towards more sustainable and suitable management solutions.

One issue mentioned about the current planning system for instance, is that it is not yet incorporated into the 5 and 20 year plans that are still fundamental to national policy. The 5 year plans in

particular received much critique in terms of their innovativeness. They more often resemble a list of consecutive projects than that they form an integrated strategy.

Two types of policy were distinguished during the open interviews: conservative policy and innovative policy. Conservative policy is policy that has been carried out throughout the years by the sector ministries; this can also be considered to be traditional policy. Innovative policy is policy that is new and has not yet been formulated or implemented before. At present conservative policy is dominant and state-driven. It constitutes of the majority of policy generated and executed by the sector ministries. Innovative policy on the other hand is rare and inconsequent as well as externally driven. Mostly foreign governments, consultancies or large development agencies as the World Bank or the Asian Development Bank are responsible for initiating and driving these ideas.

Several reasons that account for this difference have already been mentioned in the previous sections. The primary reason being that conservative policy is mostly project-based and dominant because it is a necessary activity for parties to secure their finances. Little incentives exist for parties to invest resources in the development of innovative policy as the cost-benefit ratio is simply too low. Resistance from other parties, limited resources, little chance for success and lack of stimulation and recognition from fellow parties are the primary reasons why it is not beneficial for parties to invest time and money in pursuing innovative ideas.

Nonetheless innovative policy is considered to be necessary by all parties involved (including Indonesian parties). The efforts of international donor agencies prove meaningful and effective, but the fact remains that without the financial resources and capacity offered by these agencies, Indonesian parties are not willing (or able) to commit.

There is therefore an urgent need for capacity to initiate and facilitate processes for innovative development policy in which four factors stand out: (1) the financial autonomy to carry out these processes; (2) the support and recognition by the administrative environment to carry out these processes; (3) the knowledge to carry out these processes and; (4) institutions that support these processes.

Some foundations for integrated planning mechanisms are already present through the water law and several Indonesian governance principles. One of these principles is SUDILACOM, which stands for Survey, Investigation, Design, Land Acquisition, Construction, Operation and Maintenance. It is a general principle in development projects, but more of a guideline than prescribed policy. It is not consistently applied in WRM practices.

Summary of statements given and their relative frequency

Statement #	**Statement**	**Frequency of response**	**Category respondent(s)**
16	innovative policy is externally driven	2	2 / 3 / 4
53	official policy is formulated by the sector ministries	4	2 / 3 / 4
13	two types of policy: conservative and innovative	2	1 / 2 / 3
14	conservative policy is dominant and state-driven	1,5	2 / 3
15	innovative policy is rare and inconsequent	1,5	2 / 3

20	formulation of policy is mostly opportunity-based	1	3
26	there is not sufficient capacity to recognize and formulate problems	0,5	2
27	capacity to initiate and facilitate processes is needed	2	1 / 2 / 3
29	official planning system is not yet incorporated into 5 and 20 year plans	1	3
30	official planning system is not yet incorporated into a larger vision	1,5	3 / 4
42	information gathering is crucial for system design	1	2
54	5-year plans are not innovation but lists of projects based on long existing procedures	2,5	1 / 3 / 4
57	Culture influences the perception of problems	1,5	1 / 4
59	There is a planning mechanism but it is not properly applied (SUDILACOM)	1	1
60	An integrated approach to problem solving is missing	1,5	2 / 4
62	There is no cohesion between community action plans and higher order plans	1	4

Qualifying the responses

The overall spread of responses per category is similar to the other general statements, a majority of the unique respondents per category lies in category 1, with which Indonesian-government based respondents constitute about half of the total unique respondents.

Contrary to previous response qualifications it appears in this case that category 1 respondents agree with the other category respondents about the issues regarding policy processes. Concerns about current planning and long-term strategy formulation of water management are shared by all interviewed individuals, no matter which category they belong to.

Table 10: Summary of statement data

Category	Number of unique respondents per category:
Indonesiangovernment-based	4
Dutch government-based	2
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	2
TOTAL	**9**

Interpretation of these results in research context

Results in this section principally state that although the water sector has formally reformed, the chain of events in policy formulation to implementation has not. This stands in contrast with the intentions of water sector reform as one would expect that sector processes change with sector

reorganization. The lack of definition or design of such a process and corresponding institutions in (the) water law may be an important reason as to why this is the case.

With respect to research question 2, this translates into the lack of institutions on how, when and where information should be shared and made available. As at present no such rules exist, it is not surprising that information is lacking in quality and quantity at the moments where decisions in the chain of events from policy formulation to implementation are made.

Finally, it can be argued that innovative policy requires distinctly different, and possibly more, information and knowledge than conservative policy formulation and implementation. If this is the case, then this would offer an additional explanation as to why innovative policy is less internally driven than conservative policy (with respect to the usual explanation which is the lack of financial means to do so).

5.6 Statement 5 - The lack of accountability and responsibility deter publicly desired water policy

As much as culture determines the interaction between actors, it also determines the way in which authorities claim responsibility for their actions. Through the sense of community, the need for shared responsibility as well as the tendency to avoid bad news, a climate is created in which actors avoid taking public responsibility for the failure of their actions. Examples of this have been shown over and over in the case of major disasters over the past years. Annual flooding in the nation's capital, dam breaches, mudflows and landslides are all examples in which public parties have failed to take responsibility for these disasters, even though traces of mismanagement and human failure are evident in every case. More often these unfortunate events are accounted to chance or in some cases, acts of god. The general mentality in these cases is to move on swiftly and to not dwell longer than necessary. Acceptance of events occurs quickly, through which the general public does not feel the need to pursue those truly responsible. These cultural habits are by no means exclusively reserved for Indonesia; many countries in the world operate under similar conditions, often quite successfully. This particular point does however raise an important question: how do you keep authorities (in countries that that face such challenges) accountable for their actions without pressure of the public? The answer lies in institutions that regulate accountability, responsibility and feedback mechanisms for water management decisions.

At present none of these mechanisms and institutions are sufficiently available. Responsibilities of authorities are not clearly defined. This is over-evident at the river basin management level. The existence of (at least) three different river basin organizations in the form of Balai Besar, Provincial Balai and regional/municipal water management authorities in the same watershed causes lack of clarity on how to deal with integrated water management issues on the one hand, and the distribution of tasks on the other.

One example that was given of this problem is who deals with the operation and maintenance of water ways in the JABODETABEK area. The province (DKI Jakarta) is principally responsible for overall maintenance of the major water ways. On the other hand the local authorities are responsible for the many smaller water ways that connect to the major ones. There is however no clear definition of which waterways are major or minor, and due to the vast complexity of the waterway-system it is sometimes even unclear what should be considered a waterway in the first place. The lack of

definition in responsibilities results in poor maintenance of channels and waterways causes problems for waste management and results in floods.

Similar problems occur at national level, where overlap and uncertainty occurs in the tasks of the major ministries. Traditionally regulation of rice farmers is in hands of the ministry of agriculture, but since these present one of the biggest water users in the country their influence on other aspects of water management is significant. Similarly, the ministry of forestry is primarily responsible for zoning and licensing deforestation. However, the ministry of BAPPENAS is primarily responsible for zoning and national spatial planning issues which includes water. The ministry of housing and settlement (KEMENPERA) has as its main task to regulate population and housing, which has major impact on water systems in general. The ministry of Public Works on the other hand deals with the prevention of floods, in which spatial planning, deforestation and zoning in general all play an important role. As all of these ministries act by themselves and little integration takes place on the execution of projects, the overall effect is far from optimal and in fact causes more problems than it solves.

An additional problem that comes with the insufficient definition of responsibilities is that of delegation of tasks. As described earlier, the Balai Besar lacks the capacity to implement some of their tasks and therefore delegates them to lower authorities. In delegating these tasks it is however important to define who is to be held responsible, and who carries out the mandate. Delegation does not mean carrying over the responsibility for the tasks, but in some cases it has been reported that this is exactly what occurs. Shifting around responsibilities is a fundamental mistake in water management as it becomes unclear who is ultimately accountable for decisions made.

So why is there such lack of transparency and clarity in rules and regulation? A partial answer to this question was given by before already: the fact that culture plays a dominant role. Another explanation was however given as well: namely the fact that all the choices and definitions are only considered a nuisance to the parties involved. No party wants to commit to more than they can handle, and no party wants to take on additional responsibilities without the power to decide over these issues. It is clear from this that no party involved wants to take the first concession, as there is no clear process (or rules for such a process) on how to continue. It is clear that a larger driving force is required that can create the confidence for the parties involved to take the necessary steps.

Whereas lack of definition of responsibilities causes problems in management decisions, lack of accountability for these decisions causes lack of feedback and therefore quality of those decisions. The lack of accountability starts with that fact that water management decisions at present are not transparent. Transparency is however important to justify decisions to the public, which in turn enables feedback on decisions made and can therefore increase the quality of decision-making. An additional advantage that comes with transparency that it would significantly enhance the public image of public authorities, which is damaged by the general perceptions of corruption, nepotism and collusion.

A related concept is the fact that at present there are no formalized review mechanisms in place to evaluate water management decisions. This is primarily the case in traditional policy by the national authorities (In development policy, which is externally driven, a focus on long-term follow-up on projects has become a key-ingredient to most projects). The lack of such review mechanisms can be explained by first of all the lack of transparency and available information. Without these prerequisites any efforts to evaluate processes becomes increasingly difficult to accomplish.

Secondly, the lack of capacity to execute such review mechanisms as well as the lack of regulations and clear definitions on who should be responsible for such reviews, contributes to the problem.

Summary of statements given and their relative frequency

Statement #	Statement	Frequency of response	Category respondent(s)
8	responsibilities are not clearly defined	5,5	1/ 2 / 3
38	overlapping responsibilities between RBOs	1,5	1
10	cultural factors result in lack of authorities taking responsibility	2	1 / 2
31	lack of incentives for processes to come to publicly desired outcomes	1	3
43	no transparency in justifying decisions (at all levels of governance)	1	2
77	delegation and mandate are two different things that are interpreted as the same by some	1	2
9	There are no review mechanisms for water works	1	2
32	Defining and committing to budgets and responsibilities is only considered a nuisance to everyone and considered disadvantageous to those involved	1	4

Qualifying the responses

The six unique respondents in this statement are once again evenly spread over Indonesian government and non-Indonesian government based actors. This demonstrates overall agreement on the statement between these two categories. What does stand out in this case however is the fact that no respondents from the private category mentioned the statement as a significant issue in Indonesian water management. One possible explanation as to why this may be the case is that the statement is a relatively sensitive subject that actors from the private category do not want to touch upon or mention in their own interest, but this cannot be confirmed based on the data at hand.

Another interesting observation is the fact that 5 out of 6 respondents are all from a public, government-based, actor. This is understandable as the issue of accountability and responsibility is an important one in public spheres.

Category	Number of unique respondents per category:
Indonesian government-based	3
Dutch government-based	2
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	0
TOTAL	**6**

Interpretation of these results in research context

Accountability and responsibility can only be enforced with sufficient information about processes and activities of actors. The lack of accountability and responsibility (and transparency in processes and activities in general) of actors can partially be explained by the fact that no accountability mechanisms exist and that responsibilities are not clearly defined. A more important reason however is the fact that too little is known about activities and processes and that the existence of such mechanisms or definitions is futile to begin with. With more information about processes and activities, more actors (including the general public) are capable to assess the quality of decision making and water management as a whole, thus increasing social control, and potentially limiting bad decisions.

Moreover, increasing the amount of people with insight into processes and activities may sharpen boundaries and definitions, or at least initiate a (public) debate about the role and authority of specific actors that currently remain disputed.

With respect to research question 1, the lack of accountability and responsibility is closely related to the structure of the actor network. The large amount of actors that operate individually blurs the boundaries of responsibility and accountability, which in turn leads to ineffective decisions and sector management.

5.7 Statement 6 - Existing institutions contribute to the problem

One of the key reasons why the introduction of IWRM in the Indonesian water sector was proposed was the belief that institutionalization of its principles would enable an environment in which sustainable integrate water management could take place and through which the most significant challenges in the sector could be solved.

Unfortunately instead, the general belief in the interview was that at present, existing legislation, policy and regulation, contributes more to the problem than it resolves. Primary reason for this is incomplete and unclear legislation and institutions. This in turn is the result of rapid reformation processes over the past years and the fact too much has been formulated too fast without thinking through the consequences. The introduction of certain principles of IWRM through the water law has proven so radical that they are subject to debate. This debate is still ongoing and prevents the inclusion of fundamental subjects into the water law. Financing and decentralization of responsibility and authority are just two of such subjects, both of which are fundamental to achieving IWRM.

Another example of mismatching policy and sector demands is PU's hiring policy. PU has mentioned at various occasions that it does not want its administrative body to grow any further. This stop has been necessary due to departmental budget cuts. This policy seems to contradict the structural lack of capacity to perform water management activities which has become so widely acknowledged. Hiring and training young educated staff is after all one of the ways to increase organizational capacity. This too demonstrates the lack of integration between the suggested water management framework and the actual desires of the parties involved.

An oft-mentioned reason for the lack of decentralization success, including the lack of success of the water law, has been the fact that it is still too early to evaluate the process. Learning effects are inevitable in such a radical process of change, and therefore sufficient time is required for

implementation of new principles in governance. The partial re-centralization effort through the water law was a necessary process to regain grip on this process of change which was moving ahead faster than governments could cope with in practice. Nonetheless it is widely understood that decentralization is still necessary to cope with water management issues at large, but the question remains how this transition can be achieved smoothly.

At present there are still some examples in legislation that cause problems. At several occasions it was mentioned how the water law and decentralization law are in fact in conflict with each other on certain topics. An example of such a conflict is observed in the Indonesian irrigation sector, where it becomes unclear who holds the right to determine the management of water resources. Whereas the decentralization law mentions that the farmers themselves hold this authority in form of the T3A arrangement (a traditional administrative arrangement for rice farming specifically), the water law contradicts this law by saying that it is in fact the local government authorities who are to make this decision. The result is a power struggle and where the figure authority may differ per region, depending on who is more influential. Such a clear contradiction in two such fundamental laws is an oddity to begin with, but the fact that it causes problems in which is otherwise considered the most developed and advanced segment of the Indonesian water sector raises questions what the effects may be on the less developed segments.

The current legislative framework therefore causes problems due to its incomplete and segregated design. But how is it possible that this framework supposedly does not work in Indonesia whereas it does seem to work in other countries? Several of the respondents have mentioned that the traditional incentive-based economic system (often applied by external parties) does not prevail in the Indonesian context. There are other values at stake than that are considered by these traditional systems and these cause choices to be sometimes perceived as “irrational” by outsiders. Lack of transparency in these choices, as mentioned in the previous section, also contributes to this problem.

Due to this “black-box” system it becomes difficult to create incentive-based solutions as simply not all values, needs and interactions are known to the designer.

There are no rules to manage the disaster budget

Lack of rules also contributes to existing problems. An example is the national disaster budget that is reserved for unexpected catastrophes. There are no clear rules on when this budget is to be used and what the criteria of usage are. This comes down to the fact that in practice a presidential decision will be required to use the budget at any given time. This cumbersome requirement has as a consequence that the budget can practically only be used for extreme disaster events, leaving the money untouched for smaller water disasters, such as the Situ Gintung dam breach in Jakarta in 2009.

The current financing structure for the water sector also contributes to the problem as was already described in a previous section in this chapter. Too little attention has been paid to the relation between new water legislation and the existing financing. Unfortunately the former will not work as intended without changes to the latter. However due to the sensitivity of the subject, changes to the financial structure in general are at present unlikely. Lack of other, clear and coordinated financial structures will continue to limit the success of Indonesian water governance.

In conclusion, the presence of the current legislative framework and its complexity threaten the efficacy of Indonesian water sector. In order for actors to cope with this framework rules and law are interpreted loosely and are applied opportunistically. The fact that some parties benefit from this freedom, is unquestionably true, but the fact that it also contributes to a larger, public, problem remains unchallenged as well.

Summary of statements given and their relative frequency

Statement #	**Statement**	**Frequency of response**	**Category respondent(s)**
58	irrigation sector is considered the most developed sub-sector of the Indonesian water sector	1,5	1
39	ministry of home affairs is primarily responsible for setting up organizations	3	1 / 2 / 3
2	water law was (partial) recentralization effort	5,5	1 / 2 / 3 / 4
5	lack of decentralization success is because of learning effects and short time span	1,5	2
7	decentralization is absolutely necessary for Indonesia	1,5	2 / 3
12	development of public administration is lagging behind to other developments in the water sector	1	2
17	recentralization was necessary	2	3 / 4
24	economic system does not always prevail	1	3
31	lack of incentives for processes to come to publicly desired outcomes	1	3
56	people are considered to be too “honest” in the water sector (not the proper approach in formulating solutions)	1	3
70	PU does not want administrative body to grow	1	2
21	old structures are so firmly embedded that it is difficult to realize innovative governance	0,5	3
25	rational choice may not always be rational	1,5	2 / 3
28	there are no clear rules on how to manage the disaster budget	1	3
33	project based policy culture is needed to secure and hold on to budget	1	4
47	policy originates from institutions not the law	2,5	2 / 3 / 4
72	Indonesian water governance is not so “theoretical”, rules and laws are loosely interpreted	1	2
78	water law gives certain criteria but how the lawmaker should implement these is currently unknown	1	2

Qualifying the responses

Similar to the previous statements the split in unique respondents per category is almost 50-50 between respondents from that are Indonesian government based and those that are not. Surprising in this part is the fact that even though the data shows that nearly half of the respondents in this

general statement are Indonesian government-based, these respondents only corresponds to three actual statements (58, 39, 2; see table above). This means two things: first of all Indonesian government-based actors appear to have (very) similar answers once asked on identifying issues in this category, and second of all, non-Indonesian government based respondents seem to be able to identify a much larger spectrum of issues (five times as much).

The agreement of Indonesian government-based respondents on the three statements is not surprising, these seem to be widely acknowledged as all other respondent categories appear to also state these issues in their interviews. The second point is more interesting, as it appears that with respect to Indonesian water institutions, non-Indonesian government-based actors are able to identify much more problem areas. Why this is the case is hard to say based on the data at hand, but plausible explanations may be the lack of critique of category 1 respondents on their own institutions, or the lack of insight in them. A third explanation, which requires a little more attention, may be the fact that Indonesian government-based parties simply do not perceive their institutions as problematic. Obscure as this may appear to outsiders, it is a reality that Indonesian governance in general has remained relatively similar throughout the year, and in some cases has proven extremely successful (for example rapid economic growth in the 1990's).

Category	Number of unique respondents per category:
Indonesian government-based	4
Dutch government-based	2
International donor agency (I.e. World Bank)	1
Private (i.e. independent consultant)	2
TOTAL	**9**

Interpretation of these results in research context

Similarly to the previous section, the results here state that existing institutions contribute to sub-optimal sector performance instead of alleviating them. Whereas the previous section states that this is the result of a lack of institutions (more notably the lack of definitions of processes), this section states that institutions currently in place are counter-productive. Several reasons for this are mentioned in this section: a predominant tendency to uphold "old" institutions on the one hand, and a learning curve to work with new institutions on the other.

These two reasons in turn related to research question 2. First of all a learning curve can be flattened if all actors have access to all information. This enables shared learning experiences and prevents each actor having to "reinvent the wheel". In other words, information and knowledge sharing (for instance through a collaborative project in which new methods are applied) reduces the collective cost of adapting new institutions. Second of all, the fact that the learning curve is too steep drives actors to uphold "old" institutions, as they are the only working (and presently effective) mechanisms they know. Lack of information and knowledge therefore results in the current actor behavior, which in turn results to sub-optimal sector performance.

5.8 Statement 7 - The role of the water councils is still disputed

Water councils do at present not yet fulfill the role that they were meant to fulfill. The national water council has in the several years of existence been unable to grow beyond a secretariat where ideas for cooperation and integration of activities are thought out. The current members of the council exist of two primary groups: government organizations that are part of the council as described by law, and non-government organizations that were selected through a tedious process. Consensus is that the most active group in the council is the latter, as it provides them a platform to discuss ideas at the highest level of governance. The former group, on the contrary, has positioned itself more passively as it feels that the platform lacks the trust of sufficient resourceful and parties with authority to be effective.

The lack of trust, and therefore membership, by influential parties (influential with respect to water resources management that is) in the platform, such as the state ministry of forestry, is the result of several factors. For one these parties doubt the neutrality of the national water council (which partially originates from the fact that the secretariat is housed within the ministry of public works). Secondly, the national water council is itself the product of a power struggle between actors, diminishing the role of the less powerful stakeholders. Thirdly, in the case of the example of the state ministry of forestry, these parties already maintain and participate in their own councils where policy is discussed and formulated. Fourthly, the lack of a clear program for activities outlined by the national water council contributes to overall confusion about the role and activities of the council as a whole.

Development of the water councils as the lower echelons of government (at the provincial, Balai and district/regional level) is at present even more uncertain. Whereas some areas in Indonesia prove more developed than others (for instance the river basins to the west of Jakarta with the involvement of big parties such as the provinces of East Java and DKI Jakarta, PJT1 and PJT2), there are still large areas in Indonesia that lack even the organizations for river basin management, let alone the coordination platforms for these organizations. In addition, water councils at the Kabupaten/Kota level (corresponding to the municipality) are considered optional, depending on the need and urgency of the situation. Who decides when there is a need or urgency is unclear.

Focusing on the more institutionally developed areas of Indonesia it becomes clear that the existence of water councils is present, but that overall performance of these forums is suboptimal. Gaining insight into the activities of these councils and their impact on policy formulation and implementation as a whole has however proven difficult. Their existence is often set in an informal context and little documentation is present, in addition the formality or influence of the council may depend per area. Performance issues aside, the existence of these platforms does at the very least provide the option for cooperation and dialogue between stakeholders: a tremendous step forward in terms of IWRM implementation compared to merely a decade ago.

Finally, it is important to note that there is no subordinate relationship between the water councils in the state hierarchy. Every council operates independently and power in the councils is determined by the relationships between the actors that operate in the councils. Because the selection procedure of the council member is unclearly defined it is not surprising that the most powerful council members tend to maintain that power in the group. Even in the council that should act as the foremost example (the national water council) this problem is evident.

Summary of statements given and their relative frequency:

Statement #	Statement	Frequency of response	Category respondent(s)
40	Role of the water councils is still disputed	2	2 / 4
87	The National Water Council is itself the product of a power struggle among actors	2	1 / 4
88	Non-government actors are more involved in the national water council than the other actors	1	1
90	There is no subordinate relation between the national and provincial councils	1	1
85	National water council is now only a secretariat, not a platform for discussion	1,5	1 / 4
89	Councils at the kabupaten/kota level of governance are optional depending on the need/urgency of the situation	1	1

Qualifying the responses

The data shows a relatively even spread amongst all categories with the exception of category 3, in which no responses were given. A particular reason for the absence of this category cannot surely be given, but is most likely attributed to chance.

A second observation that can be made in the data is that category 1 respondents are represented in nearly every statement in this general statement: apparently the water councils are considered quite a significant issue to Indonesian government-based respondents. Why water councils and their perceived status are more important to Indonesian government-based respondents than the other categories remains uncertain.

Category	Number of unique respondents per category:
Indonesian government-based	2
Dutch government-based	2
International donor agency (I.e. World Bank)	0
Private (i.e. independent consultant)	2
TOTAL	**6**

Interpretation of these results in research context

The role of the water councils is primarily to bring together parties and allow platforms for coordination of activities: a prime solution for improving the flow and accessibility of information between actors. The fact that the water councils have not been able to prove themselves as reliable organs to perform this function leaves this demand unanswered.

This does not mean that the water councils cannot achieve this goal, but they need to significantly boost their image and gain the trust of the actors involved. A more impartial role of the council at the national level may be essential to achieve this.

The councils at the lower levels of government need to be empowered to play a more proactive role in regional and local water management. This empowerment is not merely a matter of increased capacity and resources, but also the recognition by regional and local stakeholders of the importance of the council to aid in their day to day activities. Demonstration of this importance in turn requires success at the national level as this organ sets an important example.

Water councils at present do not aid sufficiently to quality and quantity of information at the moments where water management decisions are made by individual actors as they are not sufficiently part of the policy formulation process. Neither do they perform as intended (yet) by the water law, even though they uphold the position as described in the law.

5.9 Chapter conclusions

In this chapter seven general statements which encompass the 91 individual statements of 13 individuals from different actors in the Indonesian water sector are presented. At the end of each general statement section, a short paragraph is described which explains how this statement relates to the research questions. Both are summarized below.

#	General Statement	Relation to Research question
1	The relation between RBOs and their relation to national organizations is unclear	Lack of clear relations between RBOs and national organization makes it unclear what information should be transferred at what time and with what purpose
2	Current budgeting and financing practices in the Indonesian water sector impair good policy formulation and implementation	information about budget allocation, appropriation and spending must be sufficiently available, accessible and obtainable to secure funding for projects on the one hand, and ensure proper allocation on the other
3	Cooperation and coordination between organizations is insufficient	Coordination and cooperation between responsible agencies is present but scarce, hesitantly initiated and informal in character. This limits the quantity and quality of information being freely available to agencies in their decision making processes. Formalization of coordination and cooperation between agencies through new institutions may reduce some of the factors underlying the present hesitance, improve decisions, reduce capacity utilization, and lead to more efficient and effective water management practices.
4	Policy formulation and implementation processes have not changed with the sector reformation	Although the water sector has formally reformed, the chain of events in policy formulation to implementation has not. At present no rules exist with respect to how, when and where information should be shared and made available. This conflicts with an increased need for new and possibly more information and knowledge to formulate new innovative policy.
5	The lack of accountability and responsibility deter publicly desired water policy	Lack of accountability mechanisms, evaluation and feedback results in a lack of ownership of projects and responsibility of authorities to the public cause and publicly desired outcomes
6	Existing institutions contribute to the problem	Adaption of new institutions is slow and has a steep learning curve. Lack of shared learning experiences, slows this process down unnecessary and works counterproductive
7	The role of the water councils is still disputed	Water councils at present do not aid sufficiently to quality and quantity of information at the moments where water management decisions are made by individual actors as they are not sufficiently part of the policy formulation process. Their disputed role does not enable them to act as a connector of actors.

Chapter 6: Findings from Social network analysis

6.1 Introduction

In this section the findings of the questionnaires are presented. These findings are split into 5 categories, based on the categories formed in the questionnaire. For a more thorough description of this questionnaire and the interview procedures the reader should refer to chapter 4 of this thesis.

The findings presented in this section are based on *internal data*, a distinction made in previous chapters, but important to reinforce at this point. All the respondents interviewed with aid of the questionnaire are situated *within* the Indonesian actor network that generates policy. More specifically this is the part of the network that is legally appointed to generate formal policy. This distinction is opposed to the *external* actors that are also part of this network, but do not have this formal authority (for example donor agencies or governments that may have considerable influence on policy formulation and implementation, but not the formal authority to realize these tasks within the state of Indonesia). The findings presented in this section are therefore primarily a representation of how policy networks function as seen by the Indonesian authorities themselves, and do not reflect the opinions of external parties (as was the case in the previous section of this chapter). This fact has both advantages and disadvantages, which will be elaborated upon in chapter 7 of this thesis.

6.2 Data and respondents

The questionnaires are based on a respondent base of five influential actors in the water policy network. This amount deviates from the respondent base that is traditionally expected to perform reliable social network analysis, and therefore careful consideration must be used in interpreting results. The main reason for the limited database where significant challenges in the research phase and data gathering. These challenges included limited availability of key actors, questionable reliability in the responses from those interviewed, language barriers and lack of knowledge to sufficiently answer the questions of the questionnaire. The latter point was by no means the result of lack of a qualitative education or intelligence of the respondents (quite on the contrary), but more that of a lack of research and understanding of the water policy network in general.

With the above in mind this analysis should therefore be seen primarily as an attempt to outline this water policy network in more detail and create some of this understanding. This in turn creates material for reflection and evaluation by those involved in this network, and even if not all of the findings are equally valid, it at least creates a platform for discussion in which those findings may be disproved.

6.3 Influence and reputation

A distinction in the questionnaire was made in this regard with respect to the influence and reputation of actors. With this in mind the following trends where seen based on the answers of the respondents.

First it was stated by nearly all respondents that the influence of both the ministry of Public Works and Bappenas could be considered equal in the planning and decision phase of Indonesian water policy. Given the limited presence of water in the portfolio of Bappenas and the size of the Ministry

over the past years, this is a somewhat surprising finding. Nonetheless the close involvement drafting up national strategies and planning and being involved in the drafting and approval processes for financing of projects, can explain the perceived influence of the ministry by respondents.

On the contrary, in the implementation phase of water policy it is clearly the Ministry of Public works that still proves to have considerable influence and reputation. This is expected given the long history and size of the ministry. More surprising however is the perceived influence of the Balai Besar in this matter: it is ranked second to the ministry of agriculture and forestry, in almost all instances. One would expect a more influential role of these river basin organizations, especially given the fact that RBO's are generally considered to be the most effective tool to deliver IWRM on a river basin scale, which in turn is one of the primary goals of the Indonesian water law. A similar trend can be seen at the provincial level in which the Balai PSDA (the provincial authority for water resources management) is generally rated behind the "regular" provincial authorities and only the local offices of the national ministries.

The "traditional" actors concerned with water policy and authority still seem to be perceived as the most influential on water policy formulation and water policy implementation. Especially the influence of the ministries that rule the largest water users (agriculture and forestry) stand out in this regard. The influence of new actors that ought to be in charge of more integrated water policy activities remains limited in this regard. It is important to note at this point however that even though this influence may appear limited with respect to the traditional players, the new actors do appear to have made a name for them and gained at least some influence. Given the short time spanning the existence of these new actors this could be considered quite an achievement as well, and an important indicator that sector reformation is indeed ongoing.

All respondents agree with the fact that influence on water policy formulation processes has become easier, this is supported by the fact that a much larger variety of respondents indicate that the influence of the "new" actors on this phase is considerable.

Influence at the national level

In the table below the combined ranking of actors (aggregate of all interview responses) is shown for actors at the national level. It is unsurprising that the Ministry of Public Works and the ministry of Bappenas are ranked 1st and 2nd respectively in both water policy planning and implementation. What is surprising is the fact that the National Water Resources Council is ranked 4th (almost equal to the ministry of agriculture) with respect to the influence on water policy planning. This stands in contrast to findings in chapter 5, where the role of the national WR council was disputed and deemed almost insignificant on the policy formulation process. A possible reason for this result could be the fact that the respondents to the questionnaire were much closer related to the National WR council than the respondents of the open questionnaires which may have resulted in biased answers. On the other hand, it is indisputably true that some very influential individuals are present in the National WR Council. The Council may therefore not *function* effectively (as intended) but does (at least on the individual level) have significant influence on water policy formulation and planning. This reinforces the finding that the Council has significant potential, but needs to reposition itself in the overall actor-network.

A second important finding in this table is the relative influence of the Balai Besar in the water policy implementation. Although not surprising in theory (this is to be expected by formulation in the water law), it is in practice, as it was often mentioned in the open interviews that the Balai Besar does often not have the capacity to fulfill their mandate. The significant influence can be explained by the fact that the Balai Besar is so closely related to the Ministry of Public Works and operates at the national level.

Table 11: Aggregate ranking amongst respondents on national level

National			
Greatest relative Influence on water policy planning	**Sum of total ranking**	**Greatest relative Influence on water policy implementation**	**Sum of total ranking**
Ministry of public works	5	Ministry of public works	5
Bappenas	8	Bappenas	12
Ministry of agriculture	15	Balai Besar	13
National WR council	16	Ministry of agriculture	18
Ministry of forestry	29	National WR council	28
Ministry of environment	30	Ministry of forestry	28
Balai Besar	31	Ministry of internal affairs/home affairs	29
Ministry of internal affairs/home affairs	35	Ministry of environment	35
Ministry of mining and energy	40	Ministry of mining and energy	38
Central government environmental impact control board	49	Central government environmental impact control board	40
National disaster management agency (BAKORNAS)	52	National disaster management agency (BAKORNAS)	43

Qualifying the results

The data shows that there is a significant "gap" of influence on water policy planning between the first four and last seven actors. This is understandable, as the highest ranked four actors (PU, Bappenas, Agriculture and the National WR council) have the largest water resources portfolios and are historically the most influential parties. At the other side of the table, the influence on water policy implementation, this gap seems to be smaller, which suggests a more equal spread of power and influence. This is understandable given the fact that water is a cross-sector portfolio: all ministries still have authority over their own portfolios which include a part of water. Actual implementation of water projects therefore requires much more involvement of individual parties, leveling the playing field.

Influence at the provincial level

In the table below the combined ranking of actors (aggregate of all interview responses) is shown for actors at the provincial level. The governor holds the prime position in both influence on water policy planning and water policy implementation. This is somewhat surprising as the governor (as an individual) does not concern him/herself much with actual water management practices. In light of the strong hierarchical ties in Indonesian government it is however not entirely unsurprising that he/she is ranked first above all others. The second result that stands out is the relative influence of

the provincial WR agency on both policy planning and policy implementation. It must be noted at this point that the provincial WR agency used to be an extend of the local project offices of the Ministry of Public Works, which made them one of the foremost actors of water management project implementation at the provincial level. The perceived influence of this actor still remains to be strong. Surprisingly enough the PTPA (Provincial level water management committee) which ought to be situated between Governor and WR Agency is placed relatively low with respect to other actors.

Table 12: Aggregate ranking amongst respondents on provincial level

Provincial			
Greatest relative Influence on water policy planning	**Distance between actors**	**Greatest relative Influence on water policy implementation**	**Distance between actors**
Province - governor	5	Province - governor	5
Bappeda	15	Balai PSDA	12
Provincial WR Agency	15	Provincial WR Agency	14
Balai PSDA	19	Bappeda	19
Provincial divisions	21	Provincialdivisions	21
Provincialwr council	28	PTPA	28
PTPA	29	Provincial WR council	32
Provincial Environmental Impact Control Board (Bapedalda)	39	Provincial Environmental Impact Control Board (Bapedalda)	39

Qualifying the results

General agreement about the first ranked position of the provincial Governor seems to exist among the respondents. Less agreement occurs in the individually ranked positions between the 2nd and 7th position, this is indicated by the relative low distance between scores in this range. The last position (Bapedalda) is shared by all respondents. The small size and relatively low impact that the efforts of this board have on the water sector result in a lowly ranked influential score: all respondents ranked this actor last on both categories.

Influence at the local/regional level

In the table below the combined ranking of actors (aggregate of all interview responses) is shown for actors at the local/regional level. Similarly to the rankings at the provincial level, the district WR agency stands out by ranking 1st and 2nd on influence on water policy planning and implementation respectively. Once again the perceived influence of traditionally dominant actors seems to be considerable.

The influence of the WUAs, especially with respect to water policy implementation is also considerable, especially given the fact that the status of WUAs is uncertain in many regards (see chapter 5). This uncertainty may very well explain the significantly lower ranking of the WUAs with respect to the influence on water policy planning.

Finally, the placement of non-governmental actors at the lower end of the rankings is to be expected as NGOs are not an integral part of the policy chain.

Table 13: Aggregate ranking amongst respondents on local/regional level

Local/regional			
Greatest relative Influence on water policy planning	**Distance between actors**	**Greatest relative Influence on water policy implementation**	**Distance between actors**
Local government (regency/municipality)	5	District WR Agency	5
District WR Agency	12	Local government (regency/municipality)	10
Regional Water Councils	15	WUAs	16
Irrigation Commission	18	Irrigation Commission	21
WUAs	24	Regional Water Councils	24
Drinking water companies	30	Drinking water companies	29
Industry	35	Industry	35
Regional disaster management agency (formerly SATKORLAK)	40	Regional disaster management agency (formerly SATKORLAK)	40

Qualifying the results

The spread between individual rankings is constant in both cases. This implies that there is general agreement about the rankings of all respondents and little deviation in the general ranked position of actors in the list. The general agreement can be explained by two reasons: (1) of all decentralization efforts and sector reform the local/regional level of governance seems to be the most unchanged and stable, allowing respondents to rank actors with relative confidence, and; (2) all respondents occur at the national (four respondents) and at the provincial (one respondent) level of governance, who have a shared vision on how influential actors are at the local/regional level.

Summary of primary findings in this category:

- Ministry of Public Works and Bappenas have equal influence in planning and deciding on water policy
- The ministry of public works is primarily responsible for the implementation of water policy
- “traditional” water policy actors are still the most influential
- “New” actors have gained some influence on both policy formulation and implementation after the sector reformation

6.4 Meetings

The overall frequency of meetings amongst actors was mentioned to be surprisingly high. At one instance one of the respondents even opted for the option to include a higher frequency category than originally included in the questionnaire (upping from “twice a month and more” (category 3) to a “weekly” (category 4)). The total frequency rate for each actor generally seemed almost overconfident. Reason for this relatively high frequency of meetings was explained by one of the respondents as “one of their primary tasks”. In nearly all cases respondents were however unclear about the specific reasons and outcomes of these meetings as they were too diverse and inconsequent, respectively.

An interesting remark was made by one of the respondents with respect to the meetings category. Upon asked why specific meetings (as indicated by the respondent) where held, it was answered that

having meetings was part of his job. Instead of having meetings to accomplish a specific goal, it seemed to the respondent that having meetings was a goal by itself. This conception of meetings may seem inefficient and excessive: information is exchanged without a perceived goal in mind. Nonetheless the perception makes sense from a process point-of-view: these meetings may very well be a process approach to problem solving, in which each meeting represents an “arena” or “bin” in which solutions and problems may find themselves. Given the lack of a structural or methodological approach of policy formulation, this may very well be the most effective way.

Additionally, actors from the national government tended to indicate that meetings with lower levels of governance occurred almost equally as frequent as at their “own” level. This stands in contrast with results presented from the phase 1 research findings, in which it was frequently stated that top-down communication occurred infrequently. Reasons for this inconsistency in data may lie in the low respondent base on the one hand or lack of clear definitions on the other. With the inability to produce clear reasons for -and outcomes of- meetings, it is hard to say what the effectiveness of meetings are in policy formulation and implementation processes.

Summary of primary findings in this category:

- Meetings between /amongst all actors occur very frequent
- Meetings of actors from higher echelons with lower echelons occur frequently (despite evidence of the contrary in phase 1 research).

Qualifying the results

Of all categories in the questionnaire the meetings category may have been the least conclusive. All respondents stated that meetings occurred often between all major actors. For each respondent at the national level it was clear that meetings occur the most at the national level and provincial level, with a slightly higher rate at the former. Meeting between national and local/regional levels of governance occur less frequently.

The interviewer has noted in nearly all occasions that the meetings section was also perceived as the least clear. In nearly all cases further elaboration of the definition of “Meetings” was necessary.

In light of these points, aside from the generally obvious and expected results, not too much value should be taken from the results of this section.

Interpretation of these results in research context

With respect to information exchange for policy formulation and implementation what can be found from the data gathered in this section is that meetings take place frequently, and often without clear objectives. Whereas his may seem inefficient, there is value in the fact that these meetings take place. They provide opportunities for information exchange be it deliberate or not, and can play an important role if considered from a process point-of-view. Given the lack of a structural or methodological approach of policy formulation, this may very well be the most effective way.

6.5 Information exchange

Exchange of information at the national level between ministries is mostly two-way and mutual. Inquiring for information (in the questionnaire referred to as *consulting*) happens by all the relevant ministries but the frequency at which this occurs differs per actor and is based on the subject matter.

Information exchange between actors of different layers of government, on the contrary, is mostly top down. Provincial parties mostly receive information from the national agencies. Mutual exchange occurs only between the highest (hierarchically situated) actors such as the provincial governors, or the local offices of the ministries. Remarkably information from the Balai PSDA's is not consulted by the ministries directly. Information exchange does take place between Balai Besar and Balai PSDA, which may explain the previously mentioned absence of direct exchange to ministries. If this is the case then the Balai Besar plays a key role in the divulgence of information between national and provincial level.

Figure 6 underneath shows the exchange of information between actors of all levels of governance in the water policy network. The map clearly shows that exchange of communication between national and provincial level hinges around the Ministry of Public Works and the Balai Besar. The red arrow indicates that a relation between Balai Besar and the Ministry of Bappenas also exists, but this was only mentioned by one of the two parties and not mutually confirmed. A more elaborate explanation on how these visualizations were made can be found in Annex F.

Another important observation is the fact that at the provincial level, all responsible agencies need to deal with both the Balai Besar and the Provincial Balai (Balai PSDA) in terms of information exchange. Curiously information exchange between Balai Besar and Balai PSDA however has only been confirmed by one of the two actors.

Only one regional/local actor was mentioned with respect to the exchange of information and that is the District WR Agency. Information is only directed towards this actor, and only takes place through the Balai Besar.

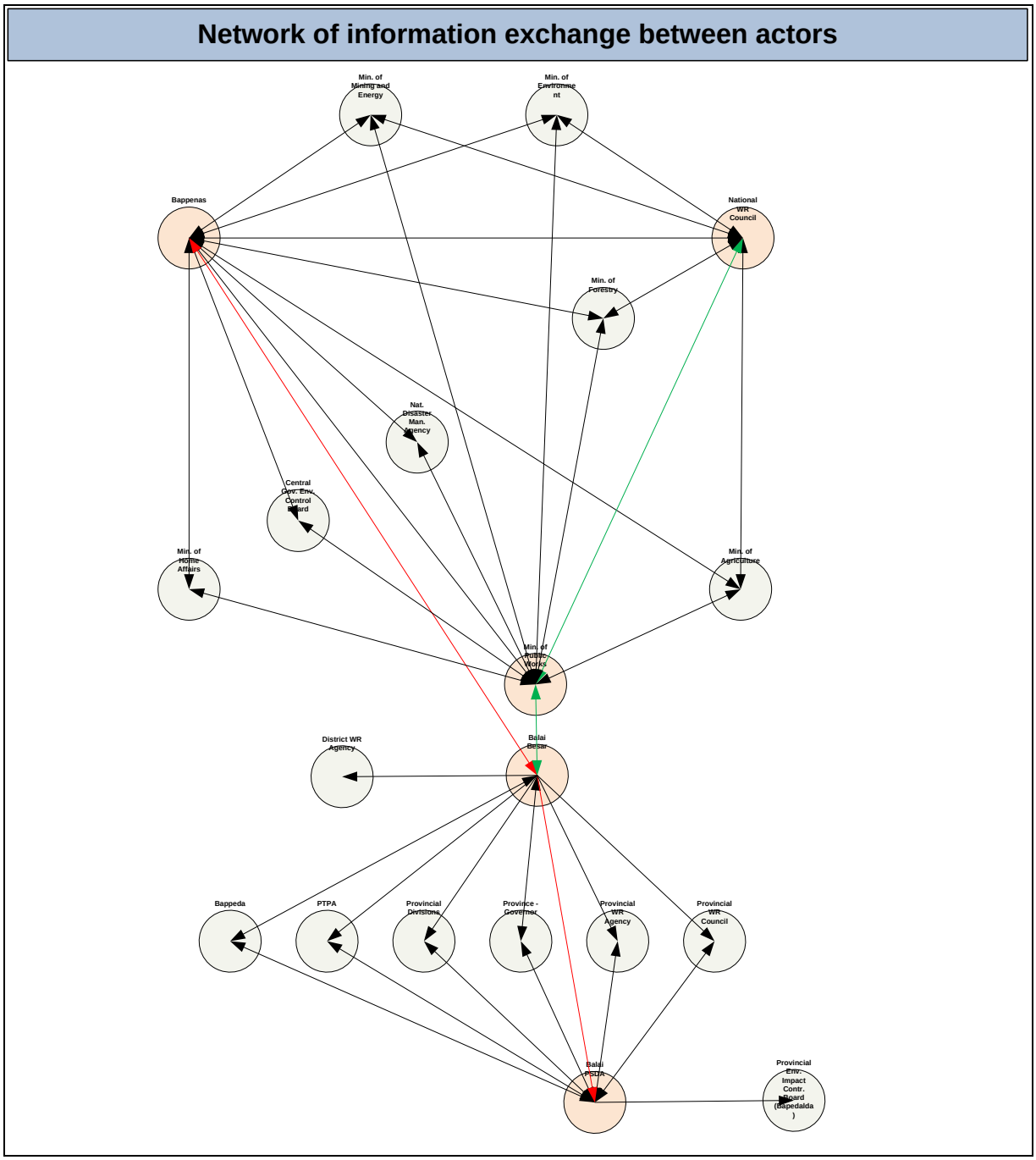

Figure 6: Information exchange between actors in the Indonesian water policy network

Summary of primary findings in this category:

- Information exchange between ministries is predominantly mutual
- Information exchange from ministries to lower echelons is predominantly one-way (directed downwards)
- The Ministry of Public Works and the Balai Besar are the center of all up-down information exchange
- Information exchange between Balai Besar and Balai PSDA is disputed
- *Consulting* takes place mutually at the central government

- *Consulting* lower echelons of government takes place little to none
- *Consulting* from lower actors takes place only upwards

Qualifying the results

As stated previously not all relationships could be mutually confirmed. This is first of all the case because only the relations between those interviewed could be tested, as only five respondents were able to participate in the questionnaire, this leaves out a lot of relations that are based on only one actor's input. Secondly, two of these relationships could not be confirmed as they were indicated to be inexistent by one of the two actors. Why this is the case can only be speculated upon. The (lack) of indication could be due to a false answer, given by mistake or inaccuracy. The researcher has however attempted to eliminate such a possibility through careful definition of terms and going through actors and answers one-by-one. Another plausible explanation may be that one of the two actors has answered more positively than another, indicating that a relationship may exist whereas the other actor does not consider this a relationship to the same degree. Proving the reasons why an answer was given remains speculation, however due to the set-up of the questionnaire and the consideration taken by the interviewer results are presented purely by the data given by the respondents.

Interpretation of these results in research context

The results presented in this section refer directly to research question 2, where it is stated that the quality and quantity of information at decision making moments directly affects the efficacy of the process of policy formulation towards policy implementation. Several findings stand out in this section that relate to this.

First off all, there seems to be sufficient exchange of information at the national level between key actors in the water sector. Given the hypothesis, this would suggest that policy formulation should be occurring effectively. As was frequently mentioned in the open interviews however, this is not the case. This does not directly disprove the hypothesis however, as the fact that information is exchanged, does not mean that the right –and sufficient- information is shared to facilitate the aforementioned process.

Secondly, the findings show that top-down and bottom-up exchange of information between levels of government occurs mostly through a single link: the Ministry of Public Works and the Balai Besar. Keeping in mind some of the problems that have been presented in the previous chapter regarding capacity requirements at this link, it seems unlikely that this single link is sufficient to exchange information to facilitate the correct translation of all national policy into policy implementation in the nation's river basins. What does need to be kept in mind at this point however is the fact that the limited amount of participants in the questionnaire may significantly influence the reality sketched in this network map. Nonetheless the image drawn and conclusion made at this point does fit with some of the observations made in the previous chapter.

Lastly, a rather inefficient construction seems to be present regarding the exchange of information between the Balai Besar and all provincial parties and the Balai PSDA and all provincial parties: all actors maintain relations between these two RBOs. Given the close relationship between the two

Balais as shown in the previous chapter, this seems cumbersome to all parties involved. There are two cases here in which this could be problematic. First of all if the *same* information is shared between the Balais and the provincial actors, then inefficiency is taking place that burdens the provincial actors with extra work. In the second case however, if *different* information is shared between the Balais and the provincial actors, then the question arises whether or not the right information is shared and if information may be lost along the way. The fact remains that both Balais have similar tasks and responsibilities (whether or not transferred from one to another or not) and that both require the same information to make decisions. In both cases above however the translation of policy into action is affected and sub-optimal. Institutions that govern this particular relationship can improve on this.

6.6 Joint activities

Joint activities are broadly defined in the questionnaire as "joint planning; elaboration of strategies' research activities; common publications; lobbying or; planning and implementation of common projects". In most cases respondents had difficulty in giving specific examples of these activities as they are rare and inconsequent. Due to the broad definition, respondents tended to mark activities with most of the major actors involved as positive. Two main trends could be identified in the data, which is visually presented as network maps in Figure 7 and Figure 8.

First of all, actors at the provincial and local/regional levels of governance are generally not involved in joint processes with higher (hierarchically positioned) actors. If joint operations take place, then it's between parties of the same hierarchical level. This is not a surprising finding given the importance of hierarchy in Indonesian (governance) culture: sharing tasks between hierarchies is often considered not-done as it lowers the perceived value of higher tier actors.

The second main trend that could be observed in the data is that those actors that did engage in joint activities between parties are the technical ministries: those with a clearly defined subject matter (agriculture, mining and energy, public works). This may be because technical ministries require each other's capital or knowledge in fulfilling certain tasks, more so than non-technical ministries do. This is plausible given the overlap and shared responsibilities of water management across these ministries.

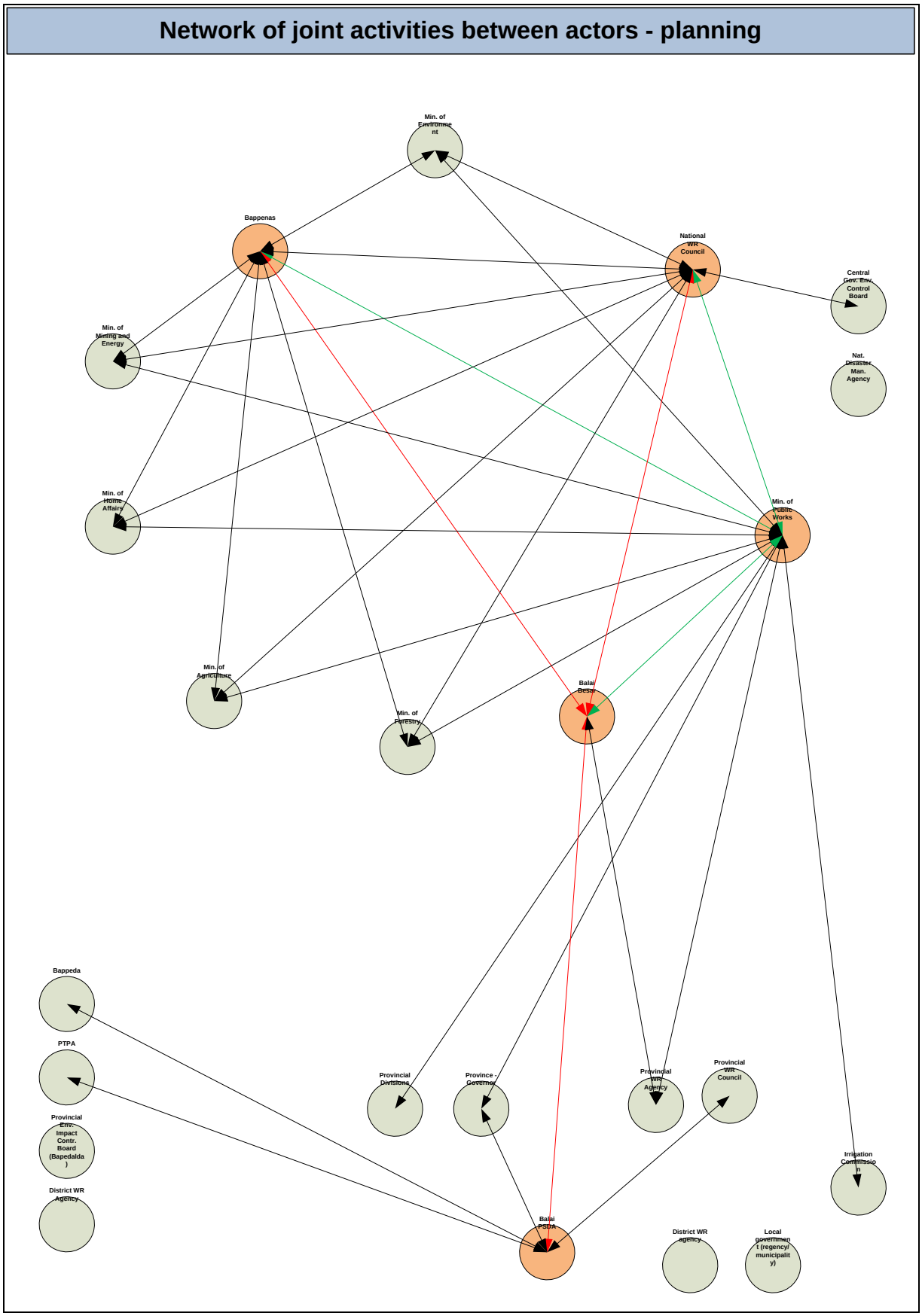

Figure 7: Network map of joint activities of actors in water policy formulation

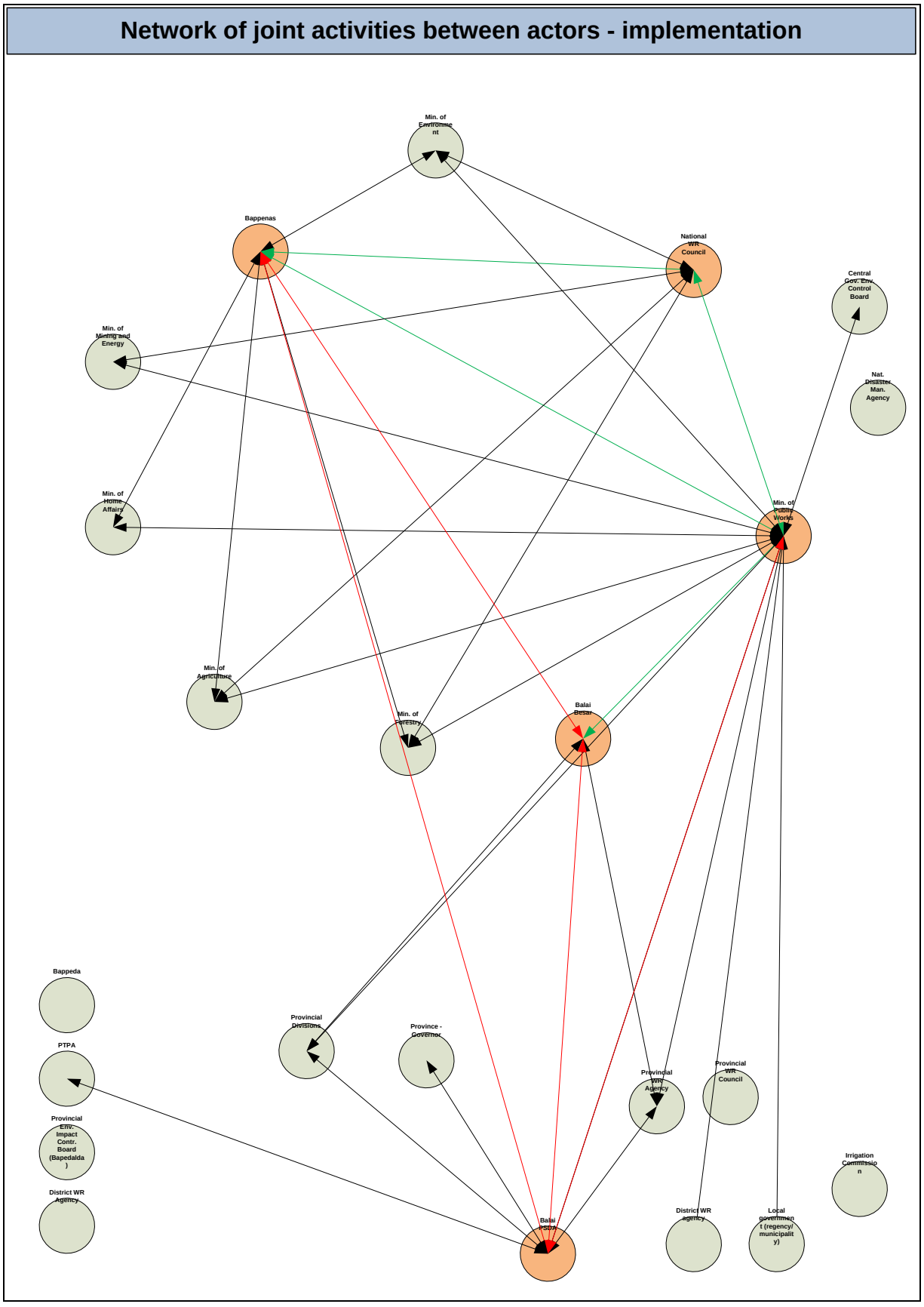

Figure 8: Network map of joint activities of actors in water policy implementation

Summary of primary findings in this category:

- Lower (hierarchically positioned) actors are not involved in water management planning processes
- Only the "technical" ministries engage in joint activities in planning and implementation processes
- Network maps for planning and implementation are not the same

Qualifying the results

Several remarks must be made with respect to the data in this category. First of all, the absence of questionnaire respondents from the regional/local subset makes a large part of the network "invisible": it is unclear how these actors engage in joint activities. Second of all, this creates the impression that a lot of cooperation takes place in higher hierarchies and not in the lower the lower tiers; this should not be interpreted as such. Thirdly, the data reveals three key actors that engage in top-down joint activities: PU, the Balai Besar, and the Balai PSDA. However only of these positions (PU) can be mutually confirmed by all respondents. This is the case for both planning and implementation.

Interpretation of these results in research context

Joint activities between actors are one of the ways in which information can be exchanged, either consciously or subconsciously.

From the network analysis in this part it can be seen that there are slight, but important, differences in the network maps between planning and implementation. Simply put, this means that the joint activities between actors that implement water management solutions are not jointly involved in the planning of these activities. This particularly occurs between the Balai PSDA and the Ministries of Bappenas and PU, and in lesser extend with several provincial units

This may not necessarily be a problem, but it does raise the question whether these joint activities are considered during planning or policy formulation. It is not hard to imagine that information about these implementation processes is lost. Another question that can be raised in this regard is why these joint activities are necessary in implementation, but not in planning. If it is because of a need of capital (human resources, knowledge, financial or otherwise), then this needs to be considered during planning and policy formulation because apparently responsible parties are not able to fulfill tasks by themselves. The fact that the relations described above (Balai PSDA – Ministries) could not be confirmed by all parties does not discredit the above. On the contrary, this positively identifies these relations to be questionable and uncertain.

The above shows that the actors that exchange information (through joint activities) regarding water management planning and policy formulation are not the same as the actors that do this for water management policy implementation. Through this unbalance it is unclear what happens with information about implementation, and if it's considered into the planning activities. Potentially, vital information is lost at this point during decision making processes, and contributes directly to research question 2.

6.7 Effective cooperation

Although very similar to the previous subsection, “effective cooperation” was defined more broadly than “joint activities”. Key in this section was the word effective: the production of tangible, meaningful results through cooperation with another actor in the sector.

The network maps resulting from the analysis of the subsection “effective cooperation” of the questionnaire show similar results to the previous subsection (“joint activities”). In case of policy formulation and planning, the network maps are almost identical. Curiously enough, some relations were presented between ministries and lower tiered actors that were not mentioned in the previous subsection. Potentially this may have been the result from the wider definition, although this cannot be said for sure upon inquiry, the respondents in question were not able to produce convincing evidence.

The network map for implementation of water policy on the other hand proves quite different from the one in the previous section. The complexity of the network, as seen by the many relations indicated, is a result of the general consensus amongst the respondents that effective cooperation occurs with nearly all actors in the water sector. Simply said, this means that cooperation between actors in water policy implementation yields tangible results in all cases. However due to failure by the respondents to produce convincing examples of effective cooperation (as asked randomly by the interviewer), the results of this network diagram (implementation) and the analysis seem of little use.

Finally one specific relation can be highlighted at this point: the relation between Bappenas and the Balai Besar. This relation seems to be missing in the water policy implementation network map, but *is* mentioned in the water policy implementation network map. Apparently no effective cooperation in planning and policy formulation exists between these two actors, even though they engage in joint activities (as seen in the previous section). Why this is the case is unclear.

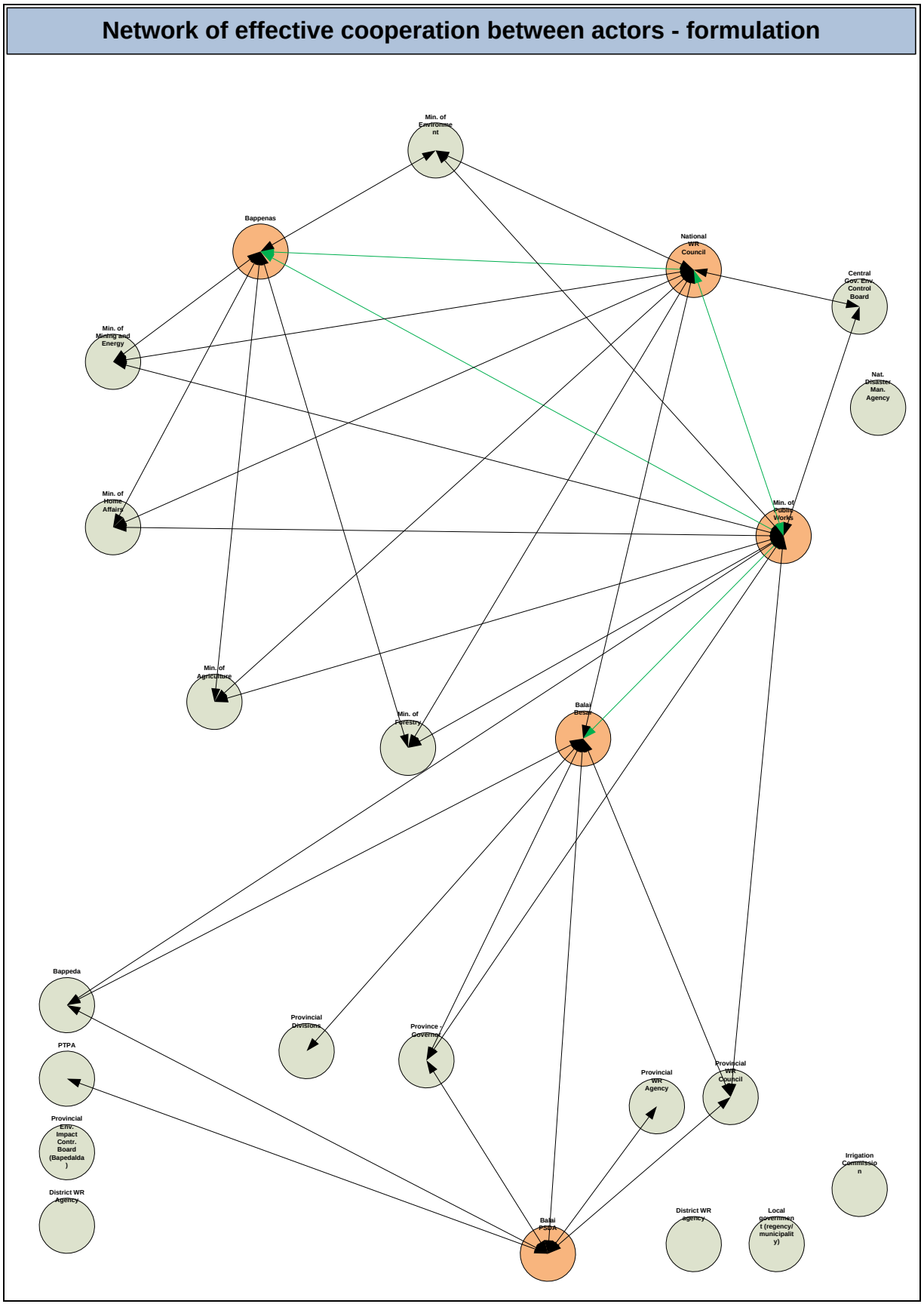

Figure 9: Network map of effective cooperation of actors in water policy formulation

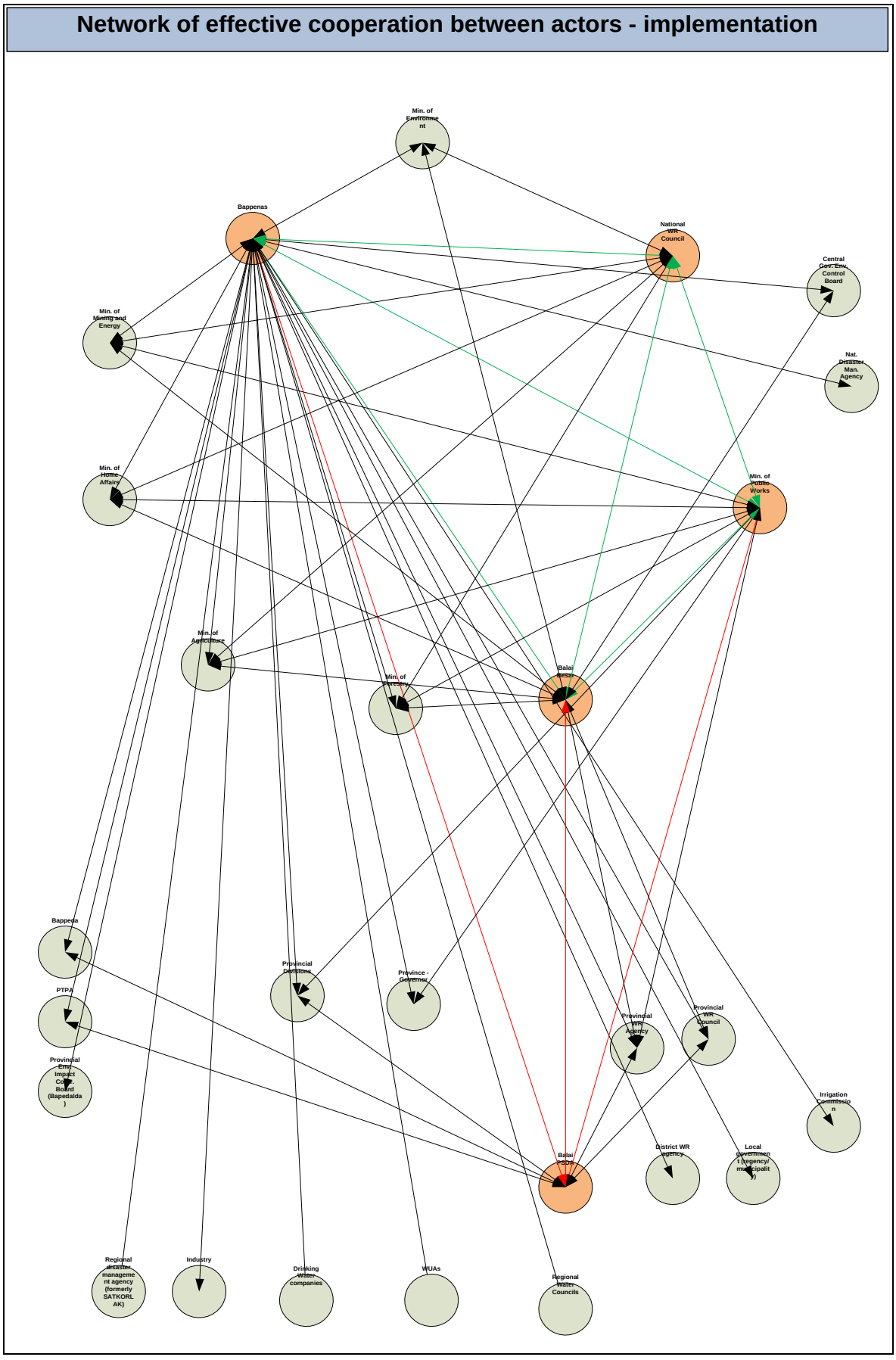

Figure 10: Network map of effective cooperation of actors in water policy implementation

Summary of results

- Cooperation between actors has predominantly impact on the WRM implementation process
- Cooperation on the field of strategy and planning is limited and only between the "technical" ministries

Qualifying the results

Although similar to the previous subsection, the network map for water policy formulation (Figure 9) has one big difference which is beneficial for the qualification of these results. This difference is the fact that all relations between the interviewed actors can be confirmed mutually. At the very least this adds some confidence in the general structure of the network between ministries. At the ministry level of water governance in Indonesia, the policy network is heavily interconnected.

With respect to water policy implementation (Figure 10), the relations to the Balai PSDA could once more not be mutually confirmed. Additionally, a large number of relations was given in this section that have not been given in previous sections. Most of these relations could not be mutually confirmed as they present actors that could not be reached during the interviews. As mentioned earlier there is a chance of over-confident answers in this section, particularly as no specific examples of these relations could be named upon enquiry.

Interpretation of these results in research context

Overall it has been very difficult to come to meaningful additional findings in this chapter. This is in part the result of overlap with the previous section, and in part due to the broad definition used, and the lack of evidence provided by the respondents. Nonetheless parts of the analysis, particularly the findings with respect to water policy formulation, can be used to reaffirm the findings of the previous section ("joint activities") .

6.8 Chapter conclusions

The primary focus of this chapter has been to present the findings of the performed Social Network Analysis based on questionnaires held with key actors in the Indonesian water sector. The following points represent the main results of this analysis:

- Communication and information exchange takes place intensively at the ministry/national level, but not always with clear purpose or intent
- Communication and information exchange with lower tier actors takes place through three influential actors: the Balai Besar, the ministry of PU and the Balai PSDA. (it is important to realize that there is only one Ministry of PU, but that there are many Balais across Indonesia, and that not all river basins have a Balai Besar)
- The two Balais maintain separate (but the same) contacts to lower tier actors, this may suggest inefficient (double) sharing of information across these actors, which increases the risk of miscommunication and information loss
- The role and position of the Balai PSDA in this process seems to be less certain than that of the other two (no mutual accordance)
- The lower down the tiers, the less information is exchanged across that tier (losing interconnectivity)

- Little can be said about the quality of information exchanged or the impact that information quality has on decision-making processes
- More information exchange takes place for the implementation of water policy than for the formulation of water policy
- Relations between actors in policy formulation do not all correspond to relations for policy implementation, suggesting a potential loss in information, particularly in terms of feedback and evaluation of projects

Chapter 7: Discussion and reflection of findings

7.1 Chapter Introduction

The aim of this chapter is twofold. First of all, this chapter is to reflect on the findings in the previous two chapters with respect to existing theory and research with similar focus. Secondly, it is meant to present some of the research challenges faced, and if these challenges may have affected the validity of results. The latter will be described at the end of the chapter in section 7.3.

7.2 Thesis findings versus comparable existing research

In the section below the results presented in the previous chapters will be compared to similar studies performed in other water sectors across the globe. Whereas the scope and intent of research may vary across these studies, they all investigate water policy networks. The studies presented in Luzi e.a. (2008) have been a valuable inspiration to this thesis research, which makes comparison with this work easier than other papers presented in this case. Some differences between Luzi and this thesis research must however be mentioned at this point and are briefly described in Table 14 underneath.

Table 14: Differences between Thesis research and Luzi (2008)

	Luzi (2008)	***Thesis research***
Focus of research	Quantitative	Qualitative
#respondents	>50	5
Type of analysis	Numerical/Statistical	Visual/Manual
Type of research	Observed	Involved

Comparison to similar studies

In similar studies (Luzi e.a., 2008) where water policy networks in Egypt and Ethiopia were evaluated, comparable results were found. In this study, it was also found that government agencies are positioned centrally in the networks and play a primary role in the development and implementation of water policy. The second conclusion that Luzi e.a. make is that inter-sector cooperation is weak. This is only partly true in the Indonesian case: contact and cooperation between the sector ministries is in fact very frequent, although the results may not be as fruitful as hoped. Ineffective cooperation is not so much due to the lack of cooperation and effort on part of the various actors, but more due to the lack of institutions or managers to facilitate these processes. A third finding presented in their paper is the significant role of international donor agencies (IDAs) in the policy network. Although not apparent from the immediate data (IDAs are not as much a part of the policy network as they are the facilitating, motivating, connecting force), the power of IDAs in Indonesian water policy is proven by its history. Through the IMF and the World Bank both decentralization and formulation of the Water law have been made possible. As stated earlier Luzi e.a. (2008) conclude that SNA is “a useful tool to highlight cooperation patterns in the water sector, but its utility for explaining policy processes without supplementary qualitative information is limited.” .

In this regard the author of this thesis believes that this thesis research has expanded on the ideas of Luzi e.a. by incorporating more qualitative information through the use of open interviews and more immersive research, and focusing less on quantity (nodes) and statistical analysis of the networks. The emphasis shifts therewith from *how* networks are structured as to *why* they are structured as

such, and what consequence that has on policy processes and information exchange in these networks.

Similar to findings presented by Luzi e.a., but contrary to findings by Bressers et.al. (1995), the network structure and sector reform in general have not been driven from society or societal movements. Instead, as has become clear from the open interviews, change has been primarily driven by international donor agencies such as the World Bank and the IMF. The actual implementation of this change did occur within Indonesian government themselves (for instance the realization of river basin organizations) but actual public participation has been limited. The distance between government and society with respect to water policy remains large.

The policy network as presented in Chapter 6 therefore remains one that resembles "statism" or "elitism", as described by Van Waarden (1992) and Daugbjerg and Marsh (1998) (as read in Luzi, 2008). Because the water policy network is merely a subset of a much larger Indonesian (policy) network, which is characterized precisely as described above –and because these characteristics are the result of long historical and cultural influence- it is not surprising that change of the water policy network, even after reform, is slow. In fact, it may be highly unrealistic that this would occur as rapidly as a few years. Changing network structure, and therefore the way in which communication, coordination and information exchange takes place, requires a much longer period of time and does not only concern the water policy network, but the entire network it is embedded into. In fact, one might argue Bresser's point about societal movements in this case: perhaps because change was externally driven and not internally by society itself, actual acceptance and integration of the new system into Indonesian society and (government) culture remain unseen.

Luzi e.a. mention that fragmented planning processes in Egypt and Ethiopia are the result of weak and conflictive "inter-ministerial linkages". In Indonesia, fragmented planning processes and policy formulation are clearly present, as has become clear in the open interviews. However, the network analysis shows that interconnectivity between Indonesian ministries is large. Large interconnectivity may therefore not be an indicator for large integration of efforts. This can be explained by the fact that policy networks alone (their structure) is not solely responsible for the quality of policy output. Factors such as political will, personal perceptions and stakes and socio-economic factors also play a major role in these policy processes. That said, the fact that interconnectivity is large does provide an enabling environment in which policy can be integrated, what is missing is the will of actors to take part in such a process, and rules and institutions to facilitate said process.

Another parallel between the Luzi studies, particularly the Ethiopian case, and this thesis research lies in the curiosity that even while decentralized water authorities (RBOs) exist, significant stimulation of the sector occurs through donor agencies and internal processes, relations between actors exist, and overall urgency of the issue is high, little is actually accomplished in the field of integrated water policy processes. An explanation offered by Luzi for this curiosity is that higher internal research and planning capacity apparently plays a more influential role than a comprising network with access to external knowledge and expertise.

From a political point of view this explanation makes sense: knowledge generated by responsible parties is more likely to be used than knowledge that needs to be accessed externally. Actors may not be aware of this knowledge or of its importance due to little involvement. This makes it less likely that such knowledge is used in decision-making processes. In more general terms, internal research

and willingness to understand and accept that a water policy network does not operate optimally, increases awareness and problem ownership by the respective actors.

A final point of similarity can be made with respect to the relatively little involvement of stakeholders in policy networks and processes. Even the creation of stakeholder platforms in the form of water councils has as of yet proven ineffective in creating integrated and stakeholder oriented water policy formulation and implementation. If anything the creating of some of these councils has created distance between actors due to a lack of trust in the platforms to accurately represent and realize he participants' views. Embedding these platforms into the water policy network so that they can be part of both policy formulation and implementation phases is empirical to realize solid integrated water resources management solutions.

7.3 Reflection on research challenges

In any (MSc Thesis) research it is inevitable that the researcher faces certain challenges that may affect the approach or outcome of his/her research objectives. No different was this the case for the author of this report, more so as he engaged both into a new academic field (the field of social network analysis) as into a foreign environment (Indonesian government culture) in which to apply this research.

Social network analysis is a broad field that has been successfully applied to water management and water sectors. Nonetheless its successful application is dependent on numerous factors, including a large database, lengthy preparation, knowledgeable, objective and readily available respondents. It has become clear soon within the period of research in Indonesia that not all of these factors could be satisfactory met due to a variety of reasons. How these reasons have affected the final results presented in this paper will be explained in the following sections.

7.3.1 Research problem formulation and definition - Open vs. Closed approach

The problem formulation for this research was one of many changes. Early on the struggle between concepts, points of views and different interests greatly increased the complexity and amount of angles from which this research could be formulated and defined. For example, the UNESCO-IHE point of view on capacity building and development was adapted at an early stage, but turned out to be difficult to combine with the field of policy analysis. Due to this, the research questions were also subject to discussion and change throughout: finding the right focus and locus for this research turned out to be difficult. On the one hand, an open research approach without expectations and hypotheses was considered which would allow a clean observation of the Indonesian water sector without coming to early conclusions and a risk of self-fulfilling prophecies. One drawback to this approach however was a lack of focus on theory and fitting the research project within already existing work and studies. On the other hand, a more rigid and predefined focus on theory and subject matter (information and knowledge, policy networks and the application of SNA) was worked out. The aim of this approach was to create clear boundaries for the research and come to potentially clearer and more specific conclusions and recommendations. The drawback of this would be a too limited focus without considering other possible factors that could explain an underperforming water sector. In fact, with too much focus and the use of hypotheses, there would be a clear risk of reaching very obvious conclusions that would probably confirm the preconceived expectations anyways.

The struggle to find a golden middle way between these two extremes was a long one, and carried out until the very last days of this research work. Even now, some readers may see traces of the advantages or disadvantages of one of the two extremes at one point or another in this thesis.

Nevertheless, the author feels confident that this struggle was not in vain. For one, being aware of the potential pitfalls of both approaches, and actually attempting to gain the best of two worlds should have had a positive impact on the results of this research. In many cases the "golden middle way" was in fact found, for instance when splitting up the field work into two separate types of data sets and interviews. In this case a deliberate choice was made to gain data through a more open and informal research approach without too much intervention, whilst in the second research approach a closed and predefined questionnaire with specific focus was used.

A second example is the use of hypotheses and research questions. Whilst hypotheses were used at an early stage to indicate the suspicions of the author, it was soon realized that these hypotheses also had a limiting effect on finding actual explanations. At this point it was necessary to go "back to basics" and ask the simple questions as to what was really going on in the water sector. Once again a deliberate choice was made to include both extremes to some extend in this work: in chapter 1 a clear main research question was posed and two sub-questions deduced. At the same time in chapter 3, three research hypotheses were formulated to indicate some focus and direction and summarize what was found from literature, and what could be expected from the data analysis.

7.3.2 Open interviews

Open interviews were conducted in an informal manner and with (purposeful) limited structure. There were two main objectives to these interviews. First of all they were meant gain understanding of the functioning of the Indonesian water sector. Indonesian government and governance is everything but transparent and hugely complex. Limited time in the research location prevented actual participation in the sector, and therefore the current method was applied. The second objective of the interviews was to identify key problems and challenges that occurred in the sector as understood by the interviewee.

A clear advantage of the non-structured approach to interviewing was that it enabled interviewees to focus on the issues they considered the most important and state the problems they thought were the most significant. A disadvantage to the approach on the other hand was the lack of a clear frame of reference to compare interviews with each other. Of course the latter was mostly alleviated by the data analysis methodology, but it still remains interesting in hindsight how candidates would have responded to the statements or propositions made in this research, and who could identify best with what.

A second challenge in this part of the research was the potential risk of strategic answers of the candidates. A guarantee of anonymity and informal setting enabled the interviewees to speak more freely, but it was nonetheless evident at times that candidates (at times) were cautious in their answers that got close to their professional interests.

Especially the last point mentioned may raise questions as to the objectivity and validity of answers and the study as a whole. The author is however convinced that the aggregate result of answers into the seven main statements is representative of the Indonesian water sector as a whole. Whilst some statements may be considered milder or stronger than desired by some experts, the direction and

magnitude of these statements is shared by all and clear. This by itself can be considered an important achievement as although the statements may not be strong a call for immediate action, they do show political agreement which by itself is an incentive and catalyst for action.

7.3.3 Questionnaires

Contrary to the conducted open interviews, the questionnaires were much more formal and structured. The objective of this research part was much more focused on the generation of data for more quantitative analysis (with respect to the qualitative nature of the open interviews). This choice too came with some challenges, which will be briefly described below.

Attitude of respondents

A general observation during the conduction of the questionnaires was that respondents tended to give socially acceptable answers to the questions asked. In this sense socially acceptable means what the organization, and more importantly, society, considered what the organization should be answering. Gaining insight into the actual workings was made much more difficult because of this. Similarly, it was observed that generally answers were given that favor their superiors opinion. Little to no criticism was given, and answers were always positive to extremely positive if they evaluated the quality of the work of the own organization.

One of the problems with the structured style of the questionnaires is that there was very little room for follow-up on answers that could be considered biased. The questionnaire offers only rigid answers as possibilities and there is no room for politics. This makes it increasingly important to design the questionnaires well and to foresee the observed behavior as much as possible. The author recommends that in future, with one or two pre-rounds of questionnaires should enable the researcher to learn about potential candidate behavior, and design the questionnaire accordingly. It must be noted at this point that this “testing” phase was skipped because the questionnaires were already tested and applied in earlier research. This highlights the importance of testing questionnaires when applying them in different environments than they may have been designed for.

Whether or not the observed bias in answers from the respondents significantly affects the results is difficult to conclude. To test to what degree this has occurred significantly more research is required into the workings of the interviewed parties. Actual involvement of the researcher in policy formulation processes and discovering policy networks in this way may yield more insight into this.The observed bias was taken into consideration in the interpretation of the results and attention was paid that conclusions made were not too much affected by this.

Questionnaires/interviews were considered long (+/- 45 minutes)

Almost all the interview candidates considered the questionnaire sessions to be on the long sides. Lasting on average 45 minutes the 1 hour scheduled meetings were sufficient, but the sessions were considered relatively intense.

Two problems were observed because of this. First of all, the attention-span of interviewees started to slip and less interest was shown towards the end of the interviews. Secondly, answers were given more rapidly and with less thought towards the end of the sessions. With this happening the risk of increased “wrong” answers increased significantly towards the end of the interviews. Wrong answers

in this case are both answers that are factually wrong (and mistakenly given) or answers that are deliberately given quickly (without consideration or factual check) to speed up the interview.

It is hard to deal with the above observations in terms of analysis of the data. The observed behavior cannot be factually confirmed by the interviewer, he can only rely on what he is given during the sessions. All that can be said at this point is that there lies a potential risk in the approach because of the relatively long questionnaire sessions. This was kept in mind during the interpretation of data in the sections at the end of the questionnaires.

Selection of respondents

Selection of respondents for the questionnaires was done on basis three sources: (1) literature review/scan; (2) the open interviews and; (3) other experts' recommendations. A single candidate was selected to represent their organization.

One of the problems that became quickly evident was that the selection of a single candidate to represent an entire ministry may not have been the most appropriate way to go. During the questionnaire sessions it was often mentioned that answers may have differed (slightly) depending on specific divisions, departments or groups within the same organization. There may therefore have been slight bias in the answers of the respondents depending on their place within the organization. On the other hand, the selection procedure of these candidates was done with considerate care which guaranteed a very knowledgeable and representative individual for the interview of the organization at hand. Therefore, even though more individuals would have been better to represent the complexity and diversity in the interviewed organizations, at least the individuals chosen were able to partly distinguish these differences and answer accordingly.

Limited amount of respondents

The last and probably most important point with respect on reflection on the questionnaires is the limited amount of respondents found for the analysis. With only five respondents, representing five organizations, only a limited map of the policy network can be constructed. The main problem with interviewing only a small subset of the overall actors in the network is that on the one hand not all relations may be found, and on the other hand that existing/found relations cannot be verified in all cases. Care must therefore be taken in the interpretation of the social network analysis.

On the positive side however, the five respondents that were interviewed to represent (by general consensus) the five most important actors in the network. This should ensure that the most (important) network relations are mapped and that a large and important part of the water policy network is now visible.

Nonetheless considerable care has been taken in the interpretation of results which should be reflected by the conclusions of this research.

7.3.4 Application of Social Network Analysis in Indonesia

The choice for applying Social Network Analysis in this research had its advantages and disadvantages. The application of such a rigorous and quantitative methodology in a MSc thesis alone is a challenging task. Ideally it requires a large amount of respondents and thorough statistical

analysis to be valid and say something about the significance of relations between actors and the network structure as a whole. This was clearly not achieved and the reasons for this were twofold. On the one hand the objectives of this study require a qualitative component as well: in order to explain what causes underperformance in a reformed water sector more is required than a statistical network analysis alone. Within the boundaries of this MSc research doing both would simply not have been attainable. On the other hand the Indonesian water sector itself may not be the most suitable for a traditional application of SNA. Many of the reasons for this were already explained above: a lack of critical attitude of employees to their employees and the system, limited availability of potential interviewees, the unclear definitions of actors, their tasks and responsibilities all make it very difficult to create an accurate image of the Indonesian water policy network. Next to that remains the question whether or not SNA is a useful assessment tool in a sector that is subject to rapid change. Policy networks are already dynamic by nature, but in a reformation process this may be even more so the case. The static results that are generated by a SNA may be of limited value in explaining exactly what the direction of change is and the degree to which structure can be related to sector performance. The author persists to believe that making such an analysis is insightful and valuable; if alone to demonstrate tensions and potential problem areas in relationships between actors to assess the current state of affairs.

It remains the question as to how much all of this can be contributed to Indonesian culture and context alone. In fact, the application of SNA in water sectors in general may be a challenging task, irrespective of country, culture, sector development status or other contextual factors. The studies performed by Luzi e.a. (2008) show that successful application of SNA in water sectors in developing countries is possible, but the results they attain are of little practical value without considering a qualitative analysis to assess what causes relations or specific network structures to be ineffective. The author of this thesis agrees with their conclusion that SNA for purposes of water sector evaluation should always be complimented by a qualitative study, that is at least, if practical recommendations and conclusions for that water sector are to be formulated.

The application of SNA in this research has provided insight into the current structure of Indonesian water policy structures. The analysis confirms some of the expectations and worries stated by various professionals in the sector in that relations may be fuzzy, poorly defined or nonexistent altogether. However, the findings of the analysis on their own do not provide sufficient material for practitioners to change water policy for the better. This could only be achieved by adding a second research phase with a more qualitative focus. The combination of these two phases has resulted in insightful and important findings.

7.4 The place of the theoretical framework of this thesis in the context of other theory and literature

In any study of policy analysis, public administration or governance the researcher has a multitude of paradigms, theories, methods and perceptions to their disposal. Entirely depending on the subject of research, scope and focus of the case studied, domain or context within which the research takes place, and even the educational and professional background of the researcher, the choice of paradigm, language or perceptions may differ.

No single such an approach or choice is superior to the other as all of them in the end describe the same reality. Nonetheless some approaches are definitely more developed or researched than others, and so may some have their potential pitfalls and flaws better documented than others.

Defending the choice of such paradigms or perceptions is not always easy because of the large amount of variables involved. For the sake of comparison and argument, this section has been written to place the theoretical framework of this research (networks and policy processes) within a larger context of research on governance, public administration and policy analysis. The following points are reasons why the author considers that this is important:

- This section defends the chosen theoretical framework and paradigms by recognizing its place in a more comprehensive overview of literature and theory (as opposed to a arbitrarily chosen framework and paradigms as seen fit)
- This section explains how this research can be compared and related to more traditional institutional theory and public administration analysis
- This section is meant to provide a bridge between different research fields and is not limited to water resources management, network analysis or public administration/governance, or resource allocation alone
- This section provides the reader with links to other literature and findings than might be found solely on basis of the references and theory used within this thesis research.

Policy network analysis in the context of public administration and governance research

Kiser and Ostrom (as read in Toonen (1998)) and also Williamson (although differently named and considered as “layers”) distinguish between three types of decision making levels in Governance/Pubic Administration

1. *Operational choice*: day to day actions within a framework of rules and institutions
2. *Collective choice*: situations of joint decision making on policies and other collective arrangements, which structure behavior at the operational level
3. *Constitutional choice:* processes of collective and joint decision making about rules and principles guiding operational and collective choices. This is about meta-decisions: decisions on how to take collective decisions and conduct joint decision making

These three levels are not meant to be seen in hierarchical order, none precedes the other, and they merely differ in scope. Nor do the levels describe a single organization; instead, they offer a framework of decision-making of multitude of actors and stakeholders involved.

2008 research by UNESCO-IHE on capacity gaps in the Indonesian water sector distinguishes three similar levels that determine water sector performance, more notably the individual level, the institutional level and the enabling environment. This research focuses mainly on the operational level however. And expresses the need for further research into the ‘enabling environment’ [Schwartz, 2008].

Toonen (1998a) shows the following framework based on Ostrom’s three worlds and show how different types of analysis in public administration are suitable for specific levels of government:

Focus: \ Locus:	1.'Constitutions' Institutions and organizational configurations	2.'Policies' Policy and decision-making	3. 'Management' Implementation and operation
1.Constitutional choice: Institutional analysis: robustness and viability	'Wilson's point of depature' *vs.* New institutionalism	'Common pool resource (CPR) management'	'The intellectual crisis in PA'
2. Collective choice: Policy and decision-making: Integrity and legitimacy	'Implementation structures'	*'Network approach'*: New instrumentalism or Self-governance ?	'Garbage can models'
3.Operational choice: Management analysis: responsiveness and instrumentality	'Taylorism in PA'	'Rational policy analysis'	'New public management' *vs.* 'Democratic administration'

FIGURE 5 *A framework for plurality in PA: random illustrations*

Figuur1: three worlds vs foci, Toonen (1998)

Toonen's figure clearly demonstrates how at the level of collective choice and policy and decision-making a Network approach may be applicable.

Information and knowledge in networks with respect to the nature of a resource/good

Research in the role of information and knowledge in networks has been performed in other studies (i.e. Cowan and Jonard, 2004) which was mentioned previously in this thesis in the discussion of the significance of information and knowledge with respect to network structure. In their research for instance, Cowan and Jonard investigated how information and knowledge is transferred in networks. They do so by investing a market and economic systems, where price (information) is the main form of information. They state that "While economists understand that, and in an abstract sense how, a market processes information, there has been little explicit examination of it. In particular, network or communication structures under which agents operate and transmit or exchange knowledge and information have received little attention. But the details of who is connected to whom will clearly affect what type of information is passed, how much, and how efficiently. All of these can have an effect on the aggregate performance of the system being modeled". Despite clear parallels between the research of Cowan and Jonard (2004) and the research presented in this thesis with respect to

the role of information and knowledge and sector performance, there is an important difference in both cases that should be highlighted at this point.

Cowan and Jonard (2004) focus on investigating how information and knowledge is exchanged in an economy and according to economic systems. There is a fundamental difference between this system and the system of governance that concerns water management. In economic systems it is assumed that every actor (or agent, as they call it) acts according to rational choice theory and seeks maximization of their own utility. This also includes bartering of information of knowledge, that is, that information or knowledge is only handed out if it is beneficial to the actor in question. In water resources management on the other hand, the margins between actor´s objectives and needs are less well defined. Ideally, management of water resources is optimized when society´s needs are fully satisfied. This means maximization of society´s utility would be the primary goal, and not that of the individual. If actors were to act independently and in their self-interest then the classic dilemma of a "tragedy of the commons" occurs.

This highlights the importance of the nature of the good that is subject of research. Whereas the focus of Cowan and Jonard was based on the allocation of a private good through pricing and demand and supply information statistics, Water management concerns both the management of a common pool resource (i.e. fresh water or water for irrigation) as the management of public goods (i.e. protection from floods). A subtle difference in dimension (in this case the nature of a good) can have profound impact on the application and conclusions derived from different types of analyses.

Concluding remarks

In this section a brief overview of linkages to other fields of research has been presented. It shows that the network approach to policy analysis and social network analysis have a suitable place in the broader field of research on public administration and public governance. Similarly, it has been shown that water resources management and water policy analysis can easily be tied to economic analysis or Ostrom's theories on common pool resource management. Finally, it has been concluded that the choice for one theoretical framework or another can depend entirely on the conditions and dimensions of the problem and subject in question. Research into water institutions, water governance, water resources management or water policy can be achieved from many points of view. A potential risk with this multitude of approaches is however, the fact that research into water sectors may become highly fragmented into specific fields of research. It is therefore all the more important that such choices made are put into perspective in terms of other fields of research and more comprehensive overviews of theory to ensure that they are not lost. With this section the author of this thesis has hoped to achieve exactly this.

Chapter 8: Conclusions and recommendations

8.1 Introduction to conclusions

In this thesis research, policy formulation and implementation processes in the Indonesian water sector were examined. Despite a series of reforms in Indonesian water governance over the past decades, water problems in the archipelago keep occurring and the effect of policy formulation and implementation remains debatable.

In this final chapter the conclusions for this study will be presented and several recommendations will be given. First, the research objectives and questions will be revisited. Then, the main findings in this thesis are summarized, and concurring conclusions from the combined research phases are drawn from them and presented in brief paragraphs. This is followed by recommendations for further research, recommendations for the Indonesian government, and finally a brief overview with opportunities for the Dutch water sector. Although it may seem that each of these sections is aimed at a very specific target audience, recommendations may be useful for any stakeholder or interested reader. The readers should by no means feel obliged to skip one of these sections merely because he/she can't identify with the target group.

8.2 Research objectives and questions revisited

To gain insight into policy formulation and implementation processes, the Indonesian water sector was examined and two types of data were acquired. First, a qualitative set of interviews with experts in the field was conducted to gain insight into the perceived problems and problem areas. Second, a social network analysis was carried out amongst the key actors involved in policy formulation and implementation processes, with the aim to see to which extend information and knowledge are distributed in this policy network.

This study presents qualitative network characteristics for a single case study and considers the linkages between network characteristics and water policy processes as well as their outcomes in a qualitative manner.

In summary the research objectives of this thesis were as follows:

- To provide insights into how policy formulation and decision-making processes take place in Indonesia
- To map the Indonesian water policy network
- To see if problems at this level of Indonesian water governance can account for a lack of results after recent changes in government, institutions and law
- To relate these findings to what is already known in a larger framework of water governance in Indonesia
- To come to recommendations on how to improve performance in the Indonesian water sector

With these objectives and the background in mind the following research question was formulated in chapter 3.

1. *Why do signs of improvement in Indonesian water management remain unseen, despite vast sector reform in recent years?*
    i) *To what degree does the present structure of the water policy network influence the formulation and implementation of water policy?*
    ii) *How does the extent to which information and knowledge are distributed in this policy network affect the formulation and implementation of water policy?*

It was decided that the emphasis of this research should lie on the main research question and sub-question b. Several reasons were given as to why this should be so (see chapter 3). However, the primary notion being that the distribution of information and knowledge in water policy networks is expected to be of more significant influence than the network's structure with respect to the effectiveness of policy formulation and implementation process. In the end, it was found that this was not necessarily the case. Both the distribution of information and knowledge in the policy network as well as the structure of the water policy network itself, influence the water policy processes equally. In fact on some points one cannot be understood without the other. It is therefore not so much the question as to which of the two factors contributes the most to sector underperformance, but more so how they enforce each other.

8.3 Summary of findings and Conclusions

In chapter 5 and 6 the findings of the data analysis and processing have been thoroughly described. In summary the main findings of the analyses were as follows:

- ✓ Lack of clear relations between RBOs and national organization makes it unclear what information should be transferred at what time and with what purpose
- ✓ Coordination and cooperation between responsible agencies is present but scarce, hesitantly initiated and informal in character.
- ✓ Although the water sector has formally reformed, the chain of events in policy formulation to implementation has not. At present no rules exist with respect to how, when and where information should be shared and made available. This conflicts with an increased need for new and possibly more information and knowledge to formulate new innovative policy.
- ✓ Lack of accountability mechanisms, evaluation and feedback results in a lack of ownership of projects and responsibility of authorities to the public cause and publicly desired outcomes
- ✓ Adaption of new institutions is slow and has a steep learning curve. Lack of shared learning experiences, slows this process down unnecessary and works counterproductive
- ✓ Water councils at present do not aid sufficiently to quality and quantity of information at the moments where water management decisions are made by individual actors as they are not sufficiently part of the policy formulation process. Their disputed role does not enable them to act as a connector of actors, even though they remain highly regarded and appear influential.
- ✓ Communication and information exchange takes place intensively at the ministry/national level, but not always with clear purpose or intent
- ✓ Communication and information exchange with lower tier actors takes place through three influential actors: the Balai Besar, the ministry of PU and the Balai PSDA. (it is important to realize that there is only one Ministry of PU, but that there are many Balais across Indonesia, and that not all river basins have a Balai Besar)
- ✓ The two Balais maintain separate (but the same) contacts to lower tier actors, this may suggest inefficient (double) sharing of information across these actors, which increases the risk of miscommunication and information loss
- ✓ The role and position of the Balai PSDA in this process seems to be less certain than that of the other two (no mutual accordance)
- ✓ The lower down the government tiers, the less information is exchanged across that tier (losing interconnectivity)

- ✓ Little can be said about the quality of information exchanged or the impact that information quality has on decision-making processes [on basis of the social network analysis]
- ✓ More information exchange takes place during the implementation of water policy than for the formulation of water policy
- ✓ Relations between actors in policy formulation do not all correspond to relations for policy implementation, suggesting a potential loss in information, particularly in terms of feedback and evaluation of projects

Conclusions in relation to Sub-research question A

a. To what degree does the present structure of the water policy network influence the formulation and implementation of water policy?

The research has provided several findings that provide answers to this research question. First of all, it should be established that, based on the literature review and observations in the field, there is in fact a relationship between structure of the water policy network and the process of water policy formulation and implementation. It is however, not always clear (even from literature) what network structure is considered optimal for what types of problems and governance. Secondly, it was found that the current network structure does not yet in all cases correspond to the intended structure as defined by Indonesian law. Several findings support this notion.

The Indonesian water policy network has gone through some drastic changes over the past decade; new actors were formed, old actors fused together or changed back again, all while in meantime policy formulation and implementation processes had to continue and were not designed to cope with the change. Despite water sector reformation over the past decade, the chain of events in policy formulation towards implementation therefore has stayed the same. This is in part understandable due to the fact that adaption of new institutions has been found to be slow. The introduction of new actors (i.e. the Balai Besar and new Public Private Partnerships at the provincial level in form of PJT1 and PJT2) in the water sector in concordance with the water law causes friction with other actors (i.e. the provincial Balai PSDA) and a lack of uniformity. The interaction, overlap, coordination and cooperation of all these agencies has not been clearly defined or anticipated in Indonesian water law, where the concept of "River Basin Organization" is rather broadly defined. Another example is the role of the Water Councils which, although highly regarded and considered influential, do not partake sufficiently in policy formulation or implementation processes. Their disputed role does not enable them to act as a connector of actors yet, even at the National level, which is considered the most developed council. A final discrepancy between actor network structure and intended structure lies in the lack of accountability mechanisms, evaluation and between policy formulation and implementation. Although mentioned in the water law, this type of information is exchanged in a similar way as is the case with all other information (as mentioned in the previous section) and considered random and without clear intent or purpose.

It is clear that all of the points above deviate from the "intended" or "designed" structure that has been largely defined in the water law. The reasons for this deviation are not always clear. Sometimes a clash between old and new systems appears to be the case, which can be explained as a result of slow adaptation of a change in governance. In other cases, parties sometimes appear to benefit from a certain amount of overlap or uncertainty to establish themselves more firmly in policy formulation and implementation processes. In this regard, it is difficult to assess to what degree these deviations

and apparent inconsistencies contribute to inefficiency in water policy formulation and implementation processes. What is evident however is that the water law was "designed" with a specific purpose in mind and that with deviation of the proposed structure there is significant risk to defy that purpose altogether. This risk alone is a cause of uncertainty and inefficiency in policy formulation and implementation processes, as it severely undermines the credibility of outcomes of these processes.

The incompatibility between new water policy network relations on the one hand, and policy processes that are required to continue working on the other, can be seen as a significant factor that contributes to sector underperformance. Fortunately, networks are considered dynamic and adaptable and their formation a process over time. Over time an effective network structure could therefore develop by itself out of necessity. Nonetheless, it is critical that awareness of this discrepancy is created and that a solution is created from within (internally driven), and not laid down by external parties.

Conclusions in relation to Sub-research question B

a. *How does the extent to which information and knowledge are distributed in this policy network affect the formulation and implementation of water policy?*

The research has provided several findings that provide answers to this question.

As previously mentioned in this report, the quality of a decision is likely to increase with the quality and completeness of information and knowledge available to the decision-maker before making that decision. Some of the findings of this research, at least in part, support this notion. For instance communication and information exchange takes place intensively at the national level, where the most of the decisions in the planning and policy formulation process are made. Information exchange at lower levels of government centers on the most influential actors, which in turn, are responsible for the majority of decisions at this level. One contradicting finding however is that information exchange appears to be significantly more intensive during policy implementation than policy formulation processes. One would expect that this would be the other way around given the fact that policy formulation has higher information requirements than its implementation. That is, information demand should be highest at the moment where decisions (in this case to decide on policy) are made. This leads however to an important point and additional finding, namely that little can be said about the quality of information exchanged or the impact that information quality has on decision-making processes based on Social Network Analysis. This implies that even though more (in the quantitative sense) information exchange may take place during a specific task (i.e. water policy implementation), this does not necessarily mean that better decisions are taken. The quality of that information is equally important in this sense. Assessing the distribution of *quality* of information and knowledge in policy networks has not been possible through the application of social network analysis.

A second point which was found is that information flow and its distribution appears to be unstructured and does not always take place with clear purpose or intent. Indonesian culture in general is well-known for its emphasis on the community and strong social interaction within the group. This could be one explanation with respect to the unstructured way in which information

flows, or even the reason as to why meetings take place without clear purpose. It must be noted that there are also certain incentives in place that could promote the "meeting-culture" without clear purpose or intent. For instance through the observation that having meetings and starting projects are financially beneficial to individuals. No evidence that support these claims could however be found with the analyses in this research.

Policy makers in the Indonesian water sector are therefore highly dependent on what information comes along and is available at the moments of decisions, this comes closest to the notion of the "Garbage can model of organizational choice "(Cohen, March and Olsen, 1972), where decision making depends on opportunities, and information availability is very much a random process.

Thirdly, several structures were found that could lead to potential information loss or miscommunication, especially at the level of policy implementation and lower levels of government. The social network analysis suggests losing interconnectivity between lower level actor and higher level actors, and an increase in parallel –or double- relations. This, combined with a high density of information and knowledge exchange, greatly increases the likelihood of ineffective policy implementation, as well as a loss of information with respect to feedback and evaluation for future policy.

In conclusion, the following three remarks can be made with respect to this research question. First, it is apparent that information and knowledge flows through the water policy network and are of importance in water policy formulation and implementation. To a certain extent there definitively is a relation between the availability of information and knowledge on the one hand, and the effectiveness of the process of policy formulation to implementation on the other. The exact impact of this however remains uncertain, because little can be said about the influence of the quality of that information on and in these processes. The second point found was that information and knowledge exchange and distribution could be considered a random process, and that at present, it cannot be guaranteed that the correct information is available at the correct time and place in Indonesian policy formulation and implementation process. The final and third point concerns the fact that due to losing interconnectivity, a high density of information exchange and parallel relations between higher level government actors and lower level government actors, greatly increase the risk of miscommunication and inefficiency in policy implementation processes.

Conclusions in relation to Main-research question

1. *Why do signs of improvement in Indonesian water management remain unseen, despite vast sector reform in recent years?*

With answers given to the sub-research questions above, it is now possible to address the main –research question with respect to the findings in this research. It is evident that some form of inefficiency takes place in the way in which information and knowledge is distributed and used in policy formulation and implementation processes. Similarly, it is also evident that the way in which the water policy is currently structured does not fit very well with the proposed structure mentioned in the water law. In addition, the current structure of the water policy network is not in all ways in concordance with the general ideas of water governance reformation of Indonesian IWRM experts over the past decade. Both these findings clearly impact the degree of quality of decision making and

policy formulation in the Indonesian water sector, and both contribute to some extend to underperformance of the Indonesian water sector.

The question that remains now is as to why this is the case. The findings of this research have demonstrated that the Indonesian water sector has had trouble adapting to a new type of governance structure, and that new solutions come with new challenges. Changing a governance culture and corresponding institutions takes time and compatibility may not always occur. The clash between new and old systems is apparent and situated in a complex network of actors with vastly different political motives that are not as easy to change. The fact that change in the water sector was externally driven has also not been beneficial to its adaption time. Only when change is driven and accepted from within society can it actually adapt and accept changes at all levels and in all processes.

This research has shown that there are there are some fundamental issues at hand in Indonesian water management that cause systematic underperformance. Although sector reformation has introduced several principles of integrated water resources management into the Indonesian water sector, positive results in terms of water policy and solutions remain unseen because they are limited by ineffective policy processes and water policy network in transition.

With more attention to how these processes should occur, what information and knowledge is required at what times and what should be shared and what not, much can be gained in terms of performance of the Indonesian water sector. Increased attention and investment in mechanisms that allow for this distribution will significantly increase performance of the Indonesian Water sector and the transition of water governance which was kick-started in the last decade.

On the other hand, the current water policy structure is a result of rapid change and lack of acceptance of this change in Indonesia itself. The Indonesian water sector is still in transition, and many discrepancies and “sub-optimal” entities can be explained by the fact that they are the only way for water policy formulation and implementation to continue while the sector changes slowly.

With sufficient time this adaption will take place eventually and more efficient network structures as well as policy processes will be developed. However what must be realized is that the present structure is far from effective and does *not* contribute to the development of sustainable water policy and solutions. It is the responsibility of Indonesians and the international community alike to see to it that the transition into a solid and sound water sector is realized over the next decade and that many of the issues found in this research are addressed. That said, it must be highlighted that change of the sector must come from within the sector. Although external parties can provide the resources, knowledge and aid in the design, the willingness to change must be initiated by the Indonesian water sector itself.

8.4 Recommendations for the Indonesian government

The following recommendations have been made for the Indonesian government based on the findings in this research. The paragraphs below are structured as follows. First the recommendation is given, secondly, the reason as to why this recommendation is beneficial is elaborated upon, and finally the relation to the findings in this research is stated.

Recommendation 1

Place more emphasis on the role of information and knowledge in policy formulation and implementation processes by introducing standards

It has become clear in this research that information and knowledge are important in Indonesian water policy decision-making processes and affect its effectiveness. The distribution and exchange of information is however uneven, sporadic and without purpose or intent. Introducing standards (or even a simple definition) as to what information and knowledge is required when and at what point in these processes may significantly boost the effectiveness of policy formulation and its outcomes

Recommendation 2

A Pledge for more transparency and information of accounting of projects from lower authorities to higher authorities

Increased information exchange about spending and allocation of resources on new projects is beneficial for parties at both levels. This would increase the chance of (financial) autonomy for lower authorities, and reduce the fear of corruption and delegation of finances and authority for higher authorities. Findings in chapter 5 have shown that financial constructions between ministry and RBOs limit the RBOs capacity to operate effectively. More transparency in accounting practices of projects and better information exchange with regards to this issue are needed to change these financial constructions.

Recommendation 3

Increased evaluation practices of policy formulation and implementation, inclusion of the perceptions of water users in these evaluations

It has been found that there is little feedback and revision of implemented policy and newly formulated policy. This reduces the coherency of water policy as a whole and does not spark innovation or progress. Increasing and standardizing evaluation practices of particular new policy and initiatives may yield interesting results with respect to how policy formulation and implementation processes take place.

Recommendation 4

Stimulation of cooperation in the form of shared learning experiences, in the form of pilot projects (both in policy formulation and implementation) between the major actors in the water policy network

Although similar to recommendation 3 and also a form of feedback and evaluation, shared learning experiences focus more on sharing challenges and possible solutions to problems in policy formulation and implementation processes. It was found in this research that adapting to new water governance structures is a slow process and has a steep learning curve. This learning curve can be significantly reduced when experiences are shared amongst all actors in the network. This will also lead to more mutual accordance in the water policy network and reduce opportunistic individual solutions of actors which may interfere with the efforts of other actors.

Recommendation 5

Increase coordination of tasks and information exchange about activities between actors on lower levels of government

It was found that the most information was exchanged at lower echelons of government, but that this was mostly the result of "double-sharing" as a result of three influential actors (Balai Besar, Balai PSDA, PU) all maintaining the same relations. Coordination between these three actors as to what information is exchanged with whom would drastically increase efficiency of policy formulation and implementation processes at this level. This would also decrease the risk of information loss.

Recommendation 6

Guarantee the objectivity and independence of water councils, and communicate their role as a "connector" in the water policy network

It was found that the role of the water councils at present is still somewhat disputed. Some parties have questioned the objectivity and independence of the councils because of their composition or situation. Nonetheless their influence and on policy formulation and implementation processes has been considered vast amongst nearly all the actors. The councils do at present not fulfill a clear role as facilitator for water policy or "connector" in the water policy network, even though they have the influence and capacity to do so. This is therefore more a problem of image than capacity. Communicating their role as "connectors" in the water policy network and being in service of the water sector as a whole (as opposed to influential actors alone) may enable the water councils to regain their credibility and fulfill their role as intended.

8.5 Recommendations for further research

Recommendation 1

In order to come to more meaningful and clear recommendations, it is necessary to emerge in the policy formulation and implementation network. The subtle political considerations of parties are more easily assessable this way.

The research has shown that not everything is as simple as it seems in Indonesian water policy. The water policy network is heavily connected with a political network of actors that remains hidden to most of the water network. To gain better insight into why decisions are made and the motives of individual actors, it is necessary to emerge in the processes themselves and become part of them.

Recommendation 2

Research into the development of the Indonesian water sector and its institutions should be done over a much longer period of time in order to accurately assess the impact of changes in water legislation and practices.

One of the clearest conclusions of this thesis research is that change in governance in Indonesia (but also in other countries) is slow and takes significant time. The outcomes of redesigned governance systems and processes may take decades to assess with certainty. Over a short period of research it

is difficult to eliminate the influence of learning effects on inefficient policy formulation and implementation processes.

Recommendation 3

The water policy network can be mapped much more extensively for several Indonesian provinces. Differences between provinces may yield additional insights.

Due to the massive differences in scale of administrative boundaries, populations, issues and resources the structure of water policy networks may greatly differ per province. Inefficiency may occur much less developed areas with less issues and administrative personnel. Smaller policy networks may function more effectively. Similarly, it was found that areas in which agriculture play an important role (i.e. east java) the role of the water user associations and farmer groups is much more influential and shifts the influence of actors in these regions. Once again it would be interesting to see how this translates into terms of water policy network structures.

Recommendation 4

The implementation of a pilot research project in which policy formulation and implementation processes can be conducted in different ways, for instance through a simulation game, may yield additional insights into information requirements and the effect of information quality on decision-making processes.

The concepts of information and knowledge distribution in water policy formulation and implementation processes remain conceptual and are not equally tangible for all the actors involved in Indonesian water policy. To create awareness and come to additional insights, a practical application may yield interesting results. Experimenting with actors in simulated policy processes may shed light on the information (quality and quantity) requirements involved, as well as how these processes are structured and could be improved.

Literature

Börzel, T.A., (1997), *What's so special about policy networks? – An exploration of the concept and its usefulness in studying European governance,* European Integration Online Papers (EIoP), Vol.1 (1997) No. 016.

Bressers, H., O'Toole, L.J., Richardson, J., (1995*), Networks for water policy, a comparative Perspective.* Frank Cass & Co, London.

Cap-Net, UNESCO-IHE (2008). Performance and Capacity of River Basin Organizations – Cross Case Comparison of four RBOs, http://www.cap-net.org/databases/references, last accessed 24/04/2008

Cowan R. , and Jonard, N., (2004), *Network structure and the diffusion of knowledge,*Journal of Economic Dynamics and Control, Vol. 28(8), pp. 1557-1575

Daugbjerg, C., (1997) *Policy networks under pressure: pollution control, policy reform and the power of farmers.,* Ashgate Publishing, Aldershot

Dinar, A., K. Kemper, et al. (2007). "Whitewater: Decentralization of river basin water resource management." Journal of Policy Modeling**29**(2007): 851-867.

Dinar, A. and R. M. Saleth (2005). "Can water institutions be cured? A water institutions health index."Water Supply**5**(6): 17-40.

Herman, T. (2005). Implementation of Integrated Water Resources Management (IWRM) in Indonesia, The World Bank.

Hermans, L. M., G. E. G. Beroggi, et al. (2003). "Managing water quality in a New York City watershed." Journal of Hydroinformatics**5**(3): 155-168.

Hermans, L., G. E. v. Halsema, et al. (2006). "Building a mosaic of values to support local water resources management."Water Policy**8**(2006): 415-434.

Hermans, L. M., 2005, *Actor analysis for water resources management – putting the promise into practice*, Eburon, Delft 2005

Hermans, L. and W. A. H. Thissen (2009). "Actor analysis methods and their use for public policy analysts." European Journal of Operational Research(196): 808-818.

Indonesian water law of 2004, (2004).Undang-UndangRepublik Indonesia Nomor 7 Tahun 2004 TentangSumberDaya Air, April 2004, Jakarta, Indonesia

Luzi, S., M. A. Hamouda, et al. (2008). "Water Policy Networks in Egypt and Ethiopia." The Journal of Environment Development **2008**(17).

March, J. G. and J. P. Olsen (1989).Rediscovering Institutions: The Organizational basis of Politics. New York, Free Press.

Ministerie van Verkeer en Waterstaat (2009), Nationaal Waterplan (NWP), Den Haag, 2009

Ostrom, E. (1990). Governing the Commons.The Evolution of Institutions for Collective Action. Cambridge, Cambridge University Press.

Ostrom, E., Gardner, R. and Walker, J., 1994, *Rules, Games, and Common-Pool Resources,* Ann Arbor The University of Michigan Press.

Ramu, K. V. (2007). Institutional Framework for Managing Water Resources in National River Basins in Indonesia. Washington DC, The World Bank.

Ravesteijn, W., (1997), *De Zegenrijke Heeren der Wateren,* Delft University Press, Delft – The Netherlands

Ravesteijn, W, and Kop, J., (2008), *For Profit and Prosperity – the contribution made by dutch engineers to public works in Indonesia,* Aprillis, Zaltbommel - The Netherlands

Sabri, A. Y. (2009). Performance of River Basin Organizations in Indonesia: A Case Study of Balai Besar Wilayah Sungai (BBWS) Citarum. Delft, UNESCO-IHE. **MSc**.

Saleth, R. M. and A. Dinar (2004).The Institutional Economics of Water - A cross-country analysis of institutions and performance. Cheltenham, UK, Edward Elgar Publishing Limited.

Saleth, R. M. and A. Dinar (2005). "Water institutional reforms: theory and practice." Water Policy**7**(2005): 1-19.

Suhardiman, D., (2008), *Bureaucratic Designs – The paradox of irrigation management transfer in Indonesia.* Wageningen UR, Wageningen - The Netherlands

Teeuwen, B. (2010a) *Towards a Harmonization Strategy for the Water Resources Legislation,* Draft report for the Ministry of Public Works of the Netherlands, May 2010

Teeuwen, B. (2010b) *Overview of reports Indonesian water legislation,* period of 2006-2010 list of studies/reports performed

The World Bank, 2006*, A decade of measuring the quality of governance*, Governance Matters 2006 Worldwide Governance Indicators, The International Bank for Reconstruction and Development – The World Bank, Washington, DC. 2006

The World Bank (1999). Report and recommendation of the president of the international bank for reconstruction and development to the executive directors on a proposed water resources sector adjustment loan in the amount of US$300 million to the republic of Indonesia. Rural Development and Natural Resources Sector Unit, April 23, 1999

The World Bank, (2009), *Jakarta Urgent Flood Mitigation Program – Jakarta Emergency Dredging Initiative JEDI,* Sustainable development departmenteast asia and pacific region

Toonen, T.A.J. (1998), Networks, *Management and Institutions: Public administration as 'normal science'*, Public Administration, Vol. 76, Summer 1998 (229-252)

Toonen, T. A. J., Bogason, P. (1998b), *Introduction: Networks in Public Administration*, Public Administration, Vol. 76, Summer 1998 (205-227)

UNESCO-IHE (2008). Towards a Masterplan for Capacity Building in the Indonesian Water Resources Sector. Delft, UNESCO-IHE.

Varady, R. G., K. Meehan, et al. (2009). "Charting the emergence of [`]global water initiatives' in world water governance." Physics and Chemistry of the Earth, Parts A/B/C**34**(3): 150-155.

Van Waarden, F., (1992), *Dimensions and types of policy networks,* European Journal of Political Research, Vol 21(1-2), pp 29-52.

Suggested and relevant literature

Abers, R. N. (2007)."Organizing for Governance: Building Collaboration in Brazilian River Basins."World Development**35**(8): 1450-1463.

Abers, R. N. and M. E. Keck (2006). "Muddy Waters: The Political Construction of Deliberative River Basin Governance in Brazil." International Journal of Urban and Regional Research**30**(3): 601-22.

Baloch, M. A. and A. Tanik (2008)."Development of an Integrated Watershed Management strategy for Resource Conservation in Balochistan Province of Pakistan."Desalination**226**: 38-46.

Baser, H. and P. Morgan (2008), Capacity, Change and Performance, European Centre for Development Policy Management.

Bouwer, H. (2000). "Integrated water management: emerging issues and challenges." Agricultural Water Management**45**(2000): 217-228.

Bryson, J. M. (2004). "What to do when Stakeholders matter - Stakeholder Identification and Analysis Techniques." Public Management Review**6**(1): 21-53.

Bush, P. D. and M. R. Tool (2003).Foundational concepts for institutionalist policy making. Institutional Economics and Policy Making.P. D. Bush and M. R. Tool. Boston/Dordrecht, Kluwer Academic Publishers.

Cauwenbergh, N. v., D. Pinte, et al. (2008). "Multi-objective, multiple participant decision support for water management in the Andarax catchment, Almeria." Environmental Geology**2008**(54): 479-489.

Goodin, R. E., Ed. (1996). The Theory of Institutional Design.Cambridge, University of Cambridge.

Grimble, R. and K. Wellard (1997). "Stakeholder Methodologies in Natural Resource Management: a Review of Principles, Contexts, Experiences and Opportunities." Agricultural Systems**55**(2): 173-193.

Hooper, B. P. (2005).Integrated River basin Governance.Learning From International Experiences.London, IWA Publishing.

Hooper, B. P. (2006).Key Performance Indicators of River Basin Organizations.Visiting Scholar Program, US Army Corps of Engineers - Institute for Water Resources. **2006-VSP-01**.

Hofstede, G. (1980) *Culture's Consequences,* Beverley Hills, Cal.: Sage Publications

Keeney, R. L. (2004). "Framing public policy decisions."Int. J. Technology, Policy and Management**4**(2): 95-115.

Klijn, E.H., (2006), *Managing Stakeholder Involvement in Decision Making: A comparative analysis of six interactive processes in the Netherlands,* J Public Administration Res Theory, July 2006, vol.16(3), pp417-446

Leach, W. D. and N. W. Pelkey (2001). "Making Watershed Partnerships Work: A Review of the Empirical Literature."Journal of Water Resources Planning and Management**127**(6): 378-385.

Makin, Ian W., Yvonne P. Parks and WouterLinklaenArriens, (2004), Supporting the Development and Efficient River Basin Organizations in Asia. A Discussion of the Application of Organizational Benchmarking approaches. Prepared for a NARBO Consultation Workshop Batu-Malang, Indonesia, International Water Management Institute.

Poolman, M. and N. v. d. Giesen (2006). "Participation: Rhetoric and Reality. The Importance of Understanding Stakeholders Based on a Case Study in Upper East Ghana."Water Resources Development**22**(4): 561-573.

Thissen, W. A. H. and P. G. J. Twaalfhoven (2001). "Towards a conceptual structure for evaluation policy analytic activities."European Journal of Operational Research **129**(2001): 627-649.

Annex A – Government regulation required under law 7/2004

Tabel1: Subsequent regulations required under law 7/2004 (As read in (Sabri 2009))

Section	Aspects of consideration	Status
A. Aspects that shall be administered under government regulations (*PP*)		
• *Chapter I : General Provisions*		
- Article 10	Water use right.	Accommodated in PP 43/2008 (Groundwater)
- Article 11, Point 5	Water resources management scheme (*Polapengelolaan SDA*).	Accommodated in PP 42/2008 (Water Resources Management)
- Article 12, Point 3	Management of surface and groundwater.	Accommodated in PP 42/2008 and PP 43/2008
• *Chapter II : Authorities and Responsibilities*		
- Article 13, Point 5	Criteria and procedure to determine the river area and the groundwater curvature.	Accommodated in PP 42/2008 and PP 43/2008
• *Chapter III : Conservation of Water Resources*		
- Article 21, Point 5	Protection and preservation of water source.	Accommodated in PP 42/2008
- Article 22, Point 3	Water preservation.	Accommodated in PP 42/2008
- Article 23, Point 4	Management of water quality and water pollution control.	N/A – Ministry of Environment?
- Article 25, Point 3	Conservation of water resources.	Accommodated in PP 42/2008
• *Chapter IV : Exploitation of Water Resources*		
- Article 27, Point 4	Provision and procedure to stipulate the water source zone.	Accommodated in PP 42/2008
- Article 28, Point 3	Designation of water allocation.	Accommodated in PP 42/2008
- Article 31	Provision of water resources.	Accommodated in PP 42/2008
- Article 32, Point 7	Utilization of water resources.	Accommodated in PP 42/2008
- Article 36, Point 2	Development of river, lake, swamp and other surface water source.	Under preparation
- Article 37, Point 3	Development of groundwater.	Accommodated in PP 43/2008
- Article 38, Point 3	Utilization of cloud by means of weather modification technology.	N/A

Section	Aspects of consideration	Status
- Article 39, Point 3	Utilization of in-land sea water.	Accommodated in PP 42/2008
- Article 40, Point 8	Development of drinking water provision system.	Accommodated in PP 16/2005 (System Development for Provision of drinking water)
- Article 41, Point 6	Development of irrigation system.	Accommodated in PP 20/2006 (Irrigation)
- Article 42, Point 2	Development of water resources for industry and mining purposes.	Accommodated in PP 42/2008
- Article 43, Point 2	Development of water resources for energy purpose.	Accommodated in PP 42/2008
- Article 44, Point 2	Development of water resources as in-land transportation network.	N/A
- Article 50	Utilization of water resources.	Under preparation
• *Chapter V : Control over destructive force of water*		
- Article 53, Point 4	Prevention of damage and disaster due to destructive force of water.	Accommodated in PP 42/2008
- Article 54, Point 3	Handling on damage and disaster due to destructive force of water.	Accommodated in PP 42/2008
- Article 57, Point 3	Restoration of destructive force of water.	Accommodated in PP 42/2008 and PP 43/2008
- Article 58, Point 2	Control over destructive force of water in river, lake, reservoir and/or dam, swamp, ground water curvature, irrigation system, rain water and in-land sea water.	Accommodated in PP 43/2008 (Groundwater), Other PPs of River & Lake, Swamp, Dam & Reservoir are still under preparation.
• *Chapter VI : Planning*		
- Article 60, Point 2	Procedures and requirements in planning of water resources management.	Accommodated in PP 42/2008 and PP 43/2008
- Article 61, Point 5	Inventory of water resources.	Accommodated in PP 42/2008
- Article 62, Point 7	Water resources management planning.	Accommodated in PP 42/2008
• *Chapter VII : Implementation of Construction, Operation and Maintenance*		
- Article 63, Point 5	Authorization of construction activities on water sources.	Accommodated in PP 42/2008
- Article 64, Point 8	Operation and maintenance of water resources.	Accommodated in PP 42/2008

Section	Aspects of consideration	Status
• *Chapter VIII : Water Resources Information System*		
- Article 69	Water resources information system.	Accommodated in PP 42/2008 and PP 43/2008
• *Chapter IX : Empowerment and Supervision*		
- Article 76	Empowerment and supervision in water resources management.	Accommodated in PP 43/2008
• *Chapter X : Financing*		
- Article 81	Financing of water resources management.	Accommodated in PP 42/2008
• *Chapter XI : Rights, Obligations and Roles of Community*		
- Article 84, Point 2	Role of society in water resources management.	Accommodated in PP 42/2008
B. Aspects that shall be administered under presidential decree (Keppres)		
• *Chapter II : Authorities and Responsibilities*		
- Article 13, Point 1	River territory and groundwater curvature.	Under preparation
• *Chapter V : Control Over Destructive Force of Water*		
- Article 55, Point 2	National-scale of water related disasters.	By Case
• *Chapter XII: Coordination*		
- Article 86, Point 4	Composition of organization and work order of coordination platform for water resources management (water resources council).	Accommodated in Presidential Regulation 12/2008
C. Aspects that shall be administered under ministerial decree/regulation		
• *Chapter IX : Empowerment and Supervision*		
- Article 71, Point 1	Standard of special education in field of water resources.	N/A
- Article 72, Point 2	Necessary policies and guidelines for research, science and technology development in water resources sector.	N/A
• *Chapter XII: Coordination*		
- Article 87, Point 5	Guidelines for establishment of coordination platform in regional level (Province, District/Municipality and river territory)	Accommodated in Minister of Public Works Regulation 04/PRT/M/2008

Annex B – Additional actors in the water sector

The description and distinction between RBO's in this annex is based on Alearts, 2008; Kurniawan, 2009; Arwik, 2009; and Sabri, 2009.

Types of RBO's: PJT – Perum Jasa Tirta

These are special administrative units that can manage river basins on Java. Currently, only two such organizations exist conveniently called: PJT1 and PJT2. PJT1 operates the Brantas and Bengawan Solo river basins while PJT2 operates the Citarum river basin. PJT's are special as they are governed in joint governance between state and enterprise/corporations .The State Ministry of State Owned Enterprises takes responsibility over these organizations.

Types of RBO's: Balai PSDA – Balai Pengelolaan Sumber Daya Air

These units function as the provincial authority for water resources management. At present there are 42 PSDAs in Indonesia.

Types of RBO's: BBWS and BWS – Balai Besar Wilayah Sungai and Balai Wilayah Sungai

Under the authority of the Ministry of Public Works and as a direct result of the water law 7/2004 these organizations function under central/national government and are in charge of river basins considered as "category A" as denoted in the water law. These organizations can cover a single or multiple river basins. These organizations replace executive/project departments of the DGWR

BBWS are in charge of "major" category A basins, while BWS are in charge of "minor" river basins. Furthermore there are two types of BBWS: Type A and Type B. Currently in Indonesia there are:

- 11 BBWSs (8 of type A, 3 of type B)
- 19 BWSs

Apart of the fact that such a variety of RBOs exist in WRM in Indonesia, another dimension of complexity is added by the fact that that these types of RBOs in some cases coexist in the same river basin. In case of the Citarum River Basin three of these RBOs function at the same time in the same region.

Annex C – Questionnaire format

Questionnaires for interviews

General information:

Date:

Organization:

Interviewee:

Position:

Interviewer:

Purpose of analysis and research

- explain purpose and background -

Instructions:

The following questions are about the relations that your organization has to other organizations regarding management of water resources. The answers will be used to perform quantitative network analysis.

There are 5 questions that correspond to 5 types of relationships. Details on the relationships are not required for quantitative network analysis

Please answer the questions to the best of your knowledge. Answer on behalf of your organization with respect to other organizations rather than answering as an individual on personal relations.

If any questions arise during the questions please do not hesitate to ask the interviewer.

Important remark:

All data gathered will be treated strictly anonymously and used for research purposes only.

(1) Influence and reputation

(a) In your opinion which of the following actors have the greatest influence on deciding upon water management strategies and planning in Indonesia?

Please point out the 10 most influential actors in the first column.

(b) In your opinion which of the following actors have the greatest influence in the **implementation** of water policy strategies in Indonesia?

Please point out the 10 most influential actors in the second column. ***If an actor is missing in your opinion, please add this actor to the list and point it out to the interviewer.***

Actors can be pointed out twice if they are important in planning ***and*** *implementation.*

(c) Please elaborate on your choices by explaining why you made your choices in (a) and (b)

Definition	
Planning phase	**Implementation phase**
- General national policy formulation - Annual national plans - Ant other important strategies or planning activities	- Implementation of projects - Technical plans for realization of projects - And other implementation activities

Actor	**Greatest influence in planning and decisions of water policy**	**Greatest influence in implementation of water policy**
Central Government Authorities		
1. Ministry of Agriculture		
2. Ministry of Public Works		
3. BAPPENAS		
4. Balai Besar Wilayah Sungai 5. Ciliwung Cisadane BBWSCC		
6. National WR Council		
7. Ministry of Mining and Energy		
8. Ministry of Internal		

Affairs/Ministry of home affairs (Bangda)		
9. Central Government Environmental Impact Control Board		
10. Ministry of forestry		
11. Ministry of environment		
12. National disaster management agency (formerly: BAKORNAS)		
…		
Provincial Authorities		
13. Balai PSDA		
14. Province - Governor		
15. Provincial WR Council		
16. Provincial divisions		
17. PTPA		
18. Bappeda		
19. Provincial WR Agency		
20. Provincial Environmental Impact Control Board (Bapedalda)		
…		
Local Authorities		
21. Local Government (regency/municipality)		
22. WUAs		
23. Regional Water councils		
24. District Water resources Agency		
25. Irrigation Commission		
26. Drinking water companies		
27. Industry		

28. Regional disaster management agency (formerly SATKORLAK)		
…		
DKI Jakarta		
29. DINAS regional planning agency (BAPEDA DKI Jakarta)		
30. Public works (Dinas Pekerjaan Umum, DKI Jakarta)		
31. City planning service (Dinas Tata Kota, Dki Jakarta)		
32. Social service (Dinas Social, DKI Jakarta)		
33. Health Service (Dinas Kesehatan, Dki Jakarta)		
34. Housing Service (Dinaas Permahan, DKI Jakarta)		
35. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)		
36. Provincial WR Council (to be established		
…		
UNKNOWN		
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR		
…		
Consulting firms		
…		
NGOs		
…		
Universities		
…		

(2) Meetings

(a) With which of the following actors do you (or other professional staff members in your organization) regularly participate in **meetings** concerning issues of **water resources management** (planning and/or implementation)?

Please specify how often you meet with each actor according to the following categories:

4. Very seldom	Once in a six months and less
5. Sometimes	Once in a month up to twice in six months
6. Often	Twice a month and more

If you never meet with an actor please leave it blank. ***If an actor is missing in your opinion, please add this actor to the list and point it out to the interviewer.***

(b) Please elaborate on your choice by summarizing the reason for –and outcomes of- your last meeting with some of these actors

Actor	**Meeting frequency**	**Reason for meeting**	**Outcome of meeting**
Central Government Authorities			
1. Ministry of Agriculture			
2. Ministry of Public Works			
3. BAPPENAS			
4. Balai Besar Wilayah Sungai Ciliwung Cisadane BBWSCC			
5. National WR Council			
6. Ministry of Mining and Energy			
7. Ministry of Internal Affairs/Ministry of home affairs (Bangda)			
8. Central Government Environmental Impact Control Board			
9. Ministry of forestry			
10. Ministry of			

environment			
11. National disaster management agency (formerly: BAKORNAS)			
…			
Provincial Authorities			
12. Balai PSDA			
13. Province - Governor			
14. Provincial WR Council			
15. Provincial divisions			
16. PTPA			
17. Bappeda			
18. Provincial WR Agency			
19. Provincial Environmental Impact Control Board (Bapedalda)			
…			
Local Authorities			
20. Local Government (regency/municipality)			
21. WUAs			
22. Regional Water councils			
23. District Water resources Agency			

24. Irrigation Commission			
25. Drinking water companies			
26. Industry			
27. Regional disaster management agency (formerly SATKORLAK)			
…			
DKI Jakarta			
28. DINAS regional planning agency (BAPEDA DKI Jakarta)			
29. Public works (Dinas Pekerjaan Umum, DKI Jakarta)			
30. City planning service (Dinas Tata Kota, Dki Jakarta)			
31. Social service (Dinas Social, DKI Jakarta)			
32. Health Service (Dinas Kesehatan, Dki Jakarta)			
33. Housing Service (Dinaas Permahan, DKI Jakarta)			
34. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)			
35. Provincial WR Council (to be established			
…			

Others			
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR			
…			
Consulting firms			
…			
NGOs			
…			
Universities			
…			

(3) Information exchange

(a) With which of the following actors do you exchange **factual information** that is essential for formulation **water management strategies** (planning and/or implementation)?

- Examples of essential information include:
  - Reports on the status of the water resources and water development projects
  - Scientific studies on socio-economic aspects relevant to water resources development
  - Studies on the applicability of water resources management measures / techniques produced by either your organization or the other organization
- Excluded types of information are:
  - Directives, annual reports, advertisement, newsletters, other easily available public documents

Please specify whether you provide the information to the other actor (OUT) or receive information from the other actor (IN). For some of these, please state what type of information you provide or receive. ***If an actor is missing in your opinion, please add this actor to the list and point it out to the interviewer.***

Actor	**In/Out**	**Types of information exchanged**
Central Government Authorities		
1. Ministry of Agriculture		
2. Ministry of Public Works		
3. BAPPENAS		
4. Balai Besar Wilayah Sungai Ciliwung Cisadane BBWSCC		
5. National WR Council		
6. Ministry of Mining and Energy		
7. Ministry of Internal Affairs/Ministry of home affairs (Bangda)		
8. Central Government Environmental Impact Control Board		
9. Ministry of forestry		
10. Ministry of environment		
11. National disaster management agency (formerly: BAKORNAS)		

…		
Provincial Authorities		
12. Balai PSDA		
13. Province - Governor		
14. Provincial WR Council		
15. Provincial divisions		
16. PTPA		
17. Bappeda		
18. Provincial WR Agency		
19. Provincial Environmental Impact Control Board (Bapedalda)		
…		
Local Authorities		
20. Local Government (regency/municipality)		
21. WUAs		
22. Regional Water councils		
23. District Water resources Agency		
24. Irrigation Commission		
25. Drinking water companies		
26. Industry		
27. Regional disaster management agency (formerly SATKORLAK)		
…		
DKI Jakarta		
28. DINAS regional planning agency (BAPEDA DKI Jakarta)		

29. Public works (Dinas Pekerjaan Umum, DKI Jakarta)		
30. City planning service (Dinas Tata Kota, Dki Jakarta)		
31. Social service (Dinas Social, DKI Jakarta)		
32. Health Service (Dinas Kesehatan, Dki Jakarta)		
33. Housing Service (Dinaas Permahan, DKI Jakarta)		
34. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)		
35. Provincial WR Council (to be established		
…		
Others		
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR		
…		
Consulting firms		
…		
NGOs		
…		
Universities		
…		

(b) Which of the following actors **do you consult** during formulation of water management policy and plans?

(c) Which of the following actors **consult you** during formulation of water management policy and plans?

Actor	**Who do you consult?**	**Who consults you?**	**What was consulted?**

Central Government Authorities			
1. Ministry of Agriculture			
2. Ministry of Public Works			
3. BAPPENAS			
4. Balai Besar Wilayah Sungai Ciliwung Cisadane BBWSCC			
5. National WR Council			
6. Ministry of Mining and Energy			
7. Ministry of Internal Affairs/Ministry of home affairs (Bangda)			
8. Central Government Environmental Impact Control Board			
9. Ministry of forestry			
10. Ministry of environment			
11. National disaster management agency (formerly: BAKORNAS)			
…			
Provincial Authorities			
12. Balai PSDA			
13. Province - Governor			
14. Provincial WR Council			
15. Provincial divisions			
16. PTPA			
17. Bappeda			
18. Provincial WR Agency			

19. Provincial Environmental Impact Control Board (Bapedalda)			
…			
Local Authorities			
20. Local Government (regency/municipality)			
21. WUAs			
22. Regional Water councils			
23. District Water resources Agency			
24. Irrigation Commission			
25. Drinking water companies			
26. Industry			
27. Regional disaster management agency (formerly SATKORLAK)			
…			
DKI Jakarta			
28. DINAS regional planning agency (BAPEDA DKI Jakarta)			
29. Public works (Dinas Pekerjaan Umum, DKI Jakarta)			
30. City planning service (Dinas Tata Kota, Dki Jakarta)			
31. Social service (Dinas Social, DKI Jakarta)			
32. Health Service (Dinas Kesehatan, Dki Jakarta)			
33. Housing Service (Dinaas			

Permahan, DKI Jakarta)			
34. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)			
35. Provincial WR Council (to be established			
…			
Others			
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR			
…			
Consulting firms			
…			
NGOs			
…			
Universities			
…			

Regarding questions (b) and (c):

- Consulting includes:
    - Gathering assistance in skills (to fill knowledge gap)
    - Gathering assistance in understanding (to fill knowledge gap)
    - Gathering assistance in other aspects that does not include factual information
- For some of these relations, please determine what was consulted

(4) Joint activities

(a) With which of the following actors do you engage in joint activities concerning the **water management planning process?**
(b) With which of the following actors do you engage in joint activities concerning the **water management implementation process?**

Joint activities are understood as:

- Joint planning
- Joint elaboration of strategies
- Planning and implementation of common projects
- Joint research activities
- Common publications
- Joint lobbying activities
- Etc.

Please point out the actors that you engage with in joint activities. Please elaborate on your choices by explaining which joint activities you have performed with some of these actors. ***If an actor is missing in your opinion, please add this actor to the list and point it out to the interviewer.***

Actor	**Joint activities in water management** *planning* **process?**	**Joint activities in water management** *implementation* **process?**	**What activities?**
Central Government Authorities			
1. Ministry of Agriculture			
2. Ministry of Public Works			
3. BAPPENAS			
4. Balai Besar Wilayah Sungai Ciliwung Cisadane BBWSCC			
5. National WR Council			
6. Ministry of Mining and Energy			
7. Ministry of Internal Affairs/Ministry of home affairs (Bangda)			
8. Central			

Government Environmental Impact Control Board			
9. Ministry of forestry			
10. Ministry of environment			
11. National disaster management agency (formerly: BAKORNAS)			
…			
Provincial Authorities			
12. Balai PSDA			
13. Province - Governor			
14. Provincial WR Council			
15. Provincial divisions			
16. PTPA			
17. Bappeda			
18. Provincial WR Agency			
19. Provincial Environmental Impact Control Board (Bapedalda)			
…			
Local Authorities			
20. Local Government (regency/municipality)			
21. WUAs			
22. Regional Water councils			
23. District Water resources Agency			
24. Irrigation Commission			
25. Drinking water companies			

26. Industry			
27. Regional disaster management agency (formerly SATKORLAK)			
…			
DKI Jakarta			
28. DINAS regional planning agency (BAPEDA DKI Jakarta)			
29. Public works (Dinas Pekerjaan Umum, DKI Jakarta)			
30. City planning service (Dinas Tata Kota, Dki Jakarta)			
31. Social service (Dinas Social, DKI Jakarta)			
32. Health Service (Dinas Kesehatan, Dki Jakarta)			
33. Housing Service (Dinaas Permahan, DKI Jakarta)			
34. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)			
35. Provincial WR Council (to be established			
…			
Others			
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR			
…			

Consulting firms			
…			
NGOs			
…			
Universities			
…			

(5) Effective cooperation

(a) With which of the following actors do you cooperate in a fashion that – in your opinion- has lead to a **tangible impact on water resources management** concerning **strategy or planning**?

(b) With which of the following actors do you cooperate in a fashion that –in your opinion- has lead to a **tangible impact on water resources management** in the **implementation process**?

Definition	
Planning phase	Implementation phase
• General national policy formulation • Annual national plans • And other important strategies or planning activities	• Implementation of projects • Technical plans for realization of projects • And other implementation activities
Tangible results are understood as:	
• Formulation of a specific policy component • A change (or prevention of a change) in the structure of the water sector • The joint planning of a major project • Etc.	• The joint implementation of a water resources development project • The organization of a crucial event • Etc.

Please point out the actors with which you cooperate. Please elaborate on your choices in (a) and (b) by providing examples of effective cooperation for the actors chosen. ***If an actor is missing in your opinion, please add this actor to the list and point it out to the interviewer.***

Actor	**Impact on WRM – Strategy or planning**	**Impact on WRM – implementation process**	**What was the impact?**
Central Government Authorities			
1. Ministry of Agriculture			
2. Ministry of Public Works			
3. BAPPENAS			
4. Balai Besar Wilayah Sungai Ciliwung Cisadane BBWSCC			
5. National WR Council			
6. Ministry of Mining and Energy			
7. Ministry of Internal Affairs/Ministry of			

home affairs (Bangda)			
8. Central Government Environmental Impact Control Board			
9. Ministry of forestry			
10. Ministry of environment			
11. National disaster management agency (formerly: BAKORNAS)			
…			
Provincial Authorities			
12. Balai PSDA			
13. Province - Governor			
14. Provincial WR Council			
15. Provincial divisions			
16. PTPA			
17. Bappeda			
18. Provincial WR Agency			
19. Provincial Environmental Impact Control Board (Bapedalda)			
…			
Local Authorities			
20. Local Government (regency/municipality)			
21. WUAs			
22. Regional Water councils			
23. District Water resources Agency			
24. Irrigation			

Commission			
25. Drinking water companies			
26. Industry			
27. Regional disaster management agency (formerly SATKORLAK)			
…			
DKI Jakarta			
28. DINAS regional planning agency (BAPEDA DKI Jakarta)			
29. Public works (Dinas Pekerjaan Umum, DKI Jakarta)			
30. City planning service (Dinas Tata Kota, Dki Jakarta)			
31. Social service (Dinas Social, DKI Jakarta)			
32. Health Service (Dinas Kesehatan, Dki Jakarta)			
33. Housing Service (Dinaas Permahan, DKI Jakarta)			
34. Traffic and transport Service (dinas lalu lintas dan angkutan Jalan Raya, DKI Jakarta)			
35. Provincial WR Council (to be established			
…			
Others			
Baden Kerja Sama Pemerintah (BKSP) JABODETABEKJUR			

…			
Consulting firms			
…			
NGOs			
…			
Universities			
…			

Annex D – Interview findings and categories

A separate excel sheet is available with the analysis of interview data of the open interviews and the data received from the questionnaires. This data sheet is available upon request at the author of this research.

Including this file into the actual thesis document is not possible due to the sheer size of the spreadsheets. All findings from these spreadsheets have been presented in chapters 5 and 6 of this thesis.

In short the contents of this spread sheet will be described below:

Open interviews

The open interview data was translated from the interview minutes into concrete statements made by the interviewees. Approximately 100 statements were generated this way and organized in the spreadsheet. After reorganizing and applying the scoring system (explained in chapter 5), the tables as presented in Chapter 5 were generated.

Questionnaires

The responses on the questionnaires were scored and coded and organized into separate excel data sheet tabs, with respect to the five sections of the questionnaire. Using these codes, the data was then visualized according to the rules as explained in Annex F. For a more elaborate explanation on the way in which the questionnaire was used and designed please refer to Chapters 4, 6 and annex C.

Annex E – List of interviewees

Open Interviews

Name	Employer	Function
Aard van Ness	DHV	Senior consultant
Paul van Hofwegen	World Bank Indonesia	Senior policy advisor
Bart Teeuwen	Ministerie Verkeer en Waterstaat	Independent contractor, institutional expert
Jan Yap	CK-NET INA / World Bank Indonesia / IHE	Independent consultant
Guy Alaerts	World Bank Indonesia	Senior consultant
Roy Timmer	Royal Haskoning	Senior consultant
Nico Darismanto	Min PU / Royal Haskoning	Ex- senior policy maker, independent consultant
Jaap van der Velden	Dutch Embassy	Water resources specialst
Henni Hendarta	DHV / PU	Indonesian water specialist
Hendra Murtidjaya	CK-NET INA	Consultant
Hongjoo Hahm	World Bank Indonesia	Senior policy advisor
Wendi Kadir	CK-NET INA	Network manager

Questionnaires

Name	Employer	Function
Candra Samekto	Bappenas	Development Planner
Imam Anshori	National Water Council	President
Eddy Djajadiredja	PU	Secretary of DGWR
Mudjiadi	Balai Besar	Chief BBWS
H. Achmad Godjali	Balai PSDA	Tech. Director

Annex F – Data visualization

Visualization of the social network analysis data from the questionnaires took place under a specific set of rules, mentioned below.

Visualization and position of actors

First of all, nodes in the diagrams (see the diagram below as a reference example) present individual actors, marked by a circle. The color of the circle is determined by whether or not the actor was questioned in the questionnaire or not. A red circle represents an interviewee, a blue circle does not. The position of each actor has two main dimensions: (1) the diagrams are built up from top to bottom with the actors from national government representing the top, and local government the bottom, it has therefore a limited hierarchical structure; (2) the exact position of the actors has been determined to simplify the network diagrams as much as possible, by limiting the amount of cross-overs of relations in the diagram. More importantly, the position of each actor has been chosen to remain constant over all the diagrams made for the sake of comparison.

Relations between actors

A relation between two actors exists when indicated by one of the actors in the network. A relation is marked by a line with an arrowhead. The arrowhead expresses the direction of the relation. In case of the example these are two-way as they indicate information exchange (which is usually two ways). A line is marked *green* when the relation has been confirmed by both parties. A line is marked *red* if a relation is only mentioned by one of the two actors and not by the other. Green and red lines can therefore only occur between two nodes that have been colored red

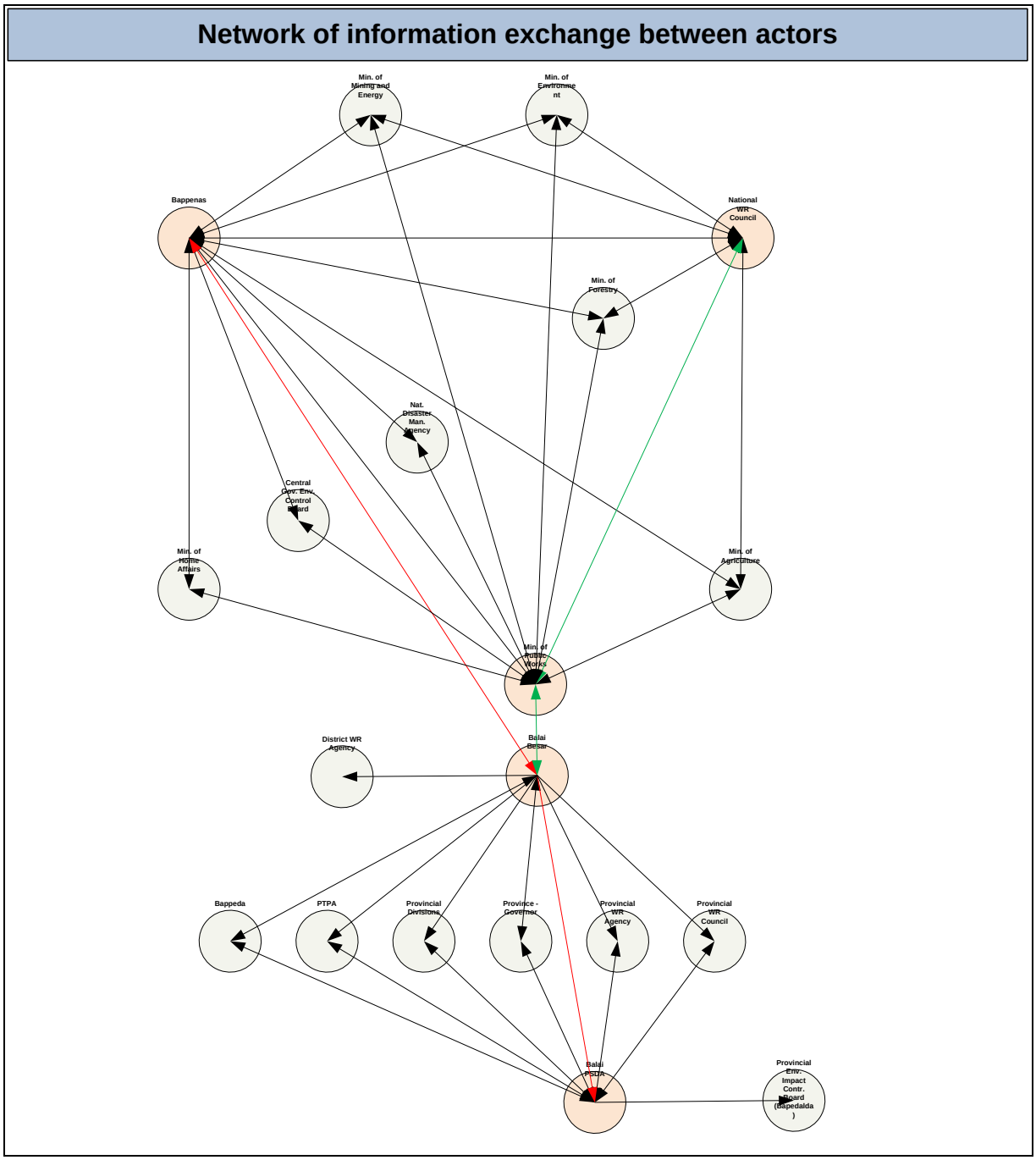

Figure 11: example figure for data visualization