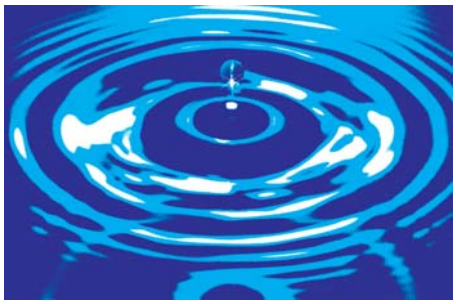

Technical Report: Second Order Water Scarcity in Southern Africa

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Authors

Introduction: Dr Julie Trottier

Zambia Case Study: Paxina Chileshe

Research Director – Dr Julie Trottier

South Africa Case Study:

Chapter 9: Dr Zoë Wilson, *Eleanor Hazell with general project research assistance from Chitonge Horman, Amanda Khan, Emeka Osuigwe, Horacio Zandamela*

Research Director – Dr Julie Trottier

Chapter 10: Dr Zoë Wilson, Horacio Zandamela *with general project research assistance from Eleanor Hazell, Chitonge Horman, Amanda Khan, Emeka Osuigwe, and principal advisor, Patrick Bond*

Research Director – Dr Julie Trottier

Chapter 11: Dr Zoë Wilson with Kea Gordon, Eleanor Hazell and Karen Peters with g*eneral project support: Chitonge Horman, Mary Galvin, Amanda Khan, Emeka Osuigwe, Horacio Zandamela*

Research Director – Dr Julie Trottier

Chapter 12: Karen Peters, Dr J. Zoë Wilson

Research Director – Dr Julie Trottier

Chapter 13: Elenor Hazell and Dr J. Zoë Wilson

Research Director – Dr Julie Trottier

Chapter 14: Dr J. Zoë Wilson, Eleanor Hazell with general and specific research assistance from Wiseman Luthuli, Scebi Mkhize, and Jason Musyoka

Research Director – Dr Julie Trottier

Chapter 15: Dr J. Zoë Wilson with general and specific project research assistance from Kea Gordon, Eleanor Hazell, Chitonge Horman, Amanda Khan, Wiseman Luthuli, Scebi Mkhize, Jason Musyoka, Emeka Osuigwe, and Horacio Zandamela

Research Director – Dr Julie Trottier

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1 Second Order Water Scarcity in Southern Africa

By Dr Julie Trottier

1.1 Introduction

Water is the object of competitions among many social actors. These competitions occur over several scales embedded in one another, among formal and informal actors, among customary and "modern" actors, and among actors of various nationalities, languages or ethnic groups. Moreover, these competitions are embedded within other competitions and conflicts that concern stakes other than water.

Very little is known about the strategies local actors in Southern Africa deploy and about the competitions, the cooperations and conflicts which they are entering concerning water. The interface between customary institutions and formal institutions is very poorly known. This means that the water law put out by the national government rarely corresponds to the law and regulations implemented on the ground, locally. It means that many institutions that do not appear in any government document concerning water management, actually play a crucial role in determining water access, water use and water allocation.

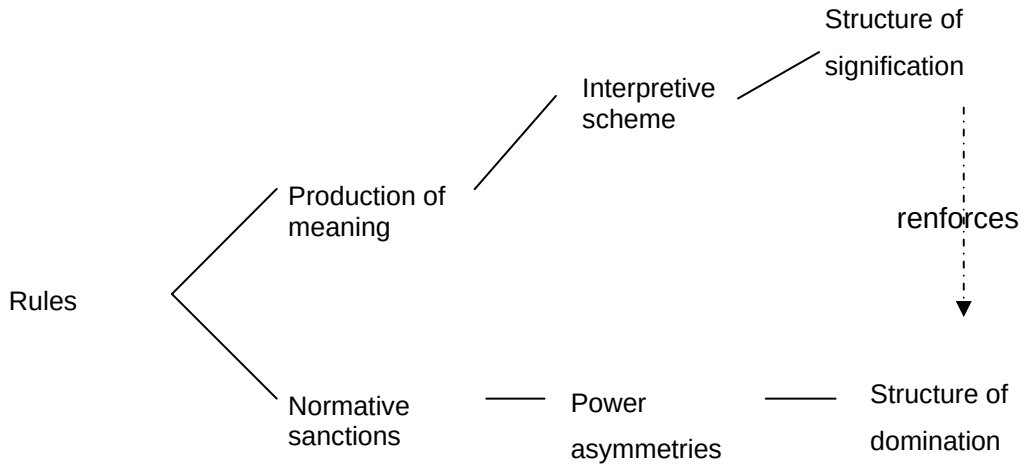
These competitions have generated second order water scarcity in Southern Africa, i.e., a lack of social and political adaptive capacity to manage water successfully to the satisfaction of all stakeholders. (Turton and Ohlsson 1999) The paucity of knowledge concerning this web of power relations, within which control over water is embedded, has prevented social actors involved in water development from improving their strategies in order to reduce this second order water scarcity. Instead water development projects have kept focusing on first order water scarcity, i.e., the lack of resource itself. Most often, these developments have had limited effect because of the rampant second order scarcity.

This project developed a new approach to apprehend the construction of water scarcity grounded in structurationist theory. It developed a methodology to decipher this intricate web of power relations extending over a variety of scales, to discover the actors active within it without predetermining their existence or the legitimacy of their existence, and, finally to return this knowledge to those active within these interactions. It developed a hydropolitical map of Zambia and South Africa both as a communication tool to exchange with the actors involved in these constellations and as a knowledge construction tool. It harnessed structurationist theory within a qualitative research approach. This allowed us to question the commensurability that is hegemonic within both water research and the practice of water management and the use of maps as depictions of reality. The following sections detail these points in order to situate the contribution of this project to water research in general.

1.2 Structurationist theory and water management

This project perceived rules governing the management of water as the structural properties of social systems, which, like any social rule, take two essential shapes: that of normative sanctions and that of production of meaning. The normative sanctions translate directly the power asymmetries within a society and perpetuate the structure of domination within it. The production of meaning occurs through the construction of interpretive schemes which, when hegemonic, support a structure of signification. The latter reinforces the structure of domination.

The concept of 'rational water management', for example, constitutes an interpretative scheme within a structure of signification that de-legitimizes shamanic interaction with irrigation and supports a structure of domination that advantages university trained engineers. These structural properties of social systems constrain agency. They determine the degree of freedom of the actors, their capacity to act and even to think and be aware of their condition. Structurationist theory stresses that with every action, a social actor reproduces the structures within which he functions. Yet, within every action, he also benefits from a certain degree of freedom, no matter how limited, to transform these structures. This occurs mostly through the production of meaning.



Within water management sciences, the concepts of 'scarcity', 'efficiency', 'optimisation' and many others constitute interpretive schemes that support a specific structure of signification where the state is the most important actor in the elaboration of rules and where the economy is monetarised. It therefore supports a very specific structure of domination. The interpretive schemes to which many developing world populations subscribe are very different from the ones promoted by the water management sciences. Elaborated by a local production of meaning, they support a structure of signification embedded in their culture. The latter reinforces a structure of domination that usually expresses itself via property regimes that are very different from those promoted by 'modern' water laws. These structures of domination are not necessarily better than those supported by water management sciences, but they advantage very different social groups.

Imposing a structure of signification to a given population because international conferences have established the 'good' principles of water management is impossible. The structure of signification at work within a population is a social continuity. Vivienne Jabri's use of discourse analysis in order to explore the manner in which socio-political relations are produced and reproduced allowed her to treat war as a social phenomenon to which the whole of society participates. (Jabri 1996) Her approach is especially useful for the study of water management which constitutes by necessity a structure of domination and must embed itself in a structure of signification to which the population subscribes if it is to be carried out. This recognises the reality that water management is always a form of governance, not a form of government. In other words, the approach from structurationist theory allowed us to apprehend the multiple centers exerting power in the elaboration and implementation of rules concerning water representation, use, access and allocation. It allowed us to break free from the overestimation of the power of state government in water management. Indeed, most national water legislations are comprehensive. Yet, most are not implemented in reality.(Trottier and Slack 2004)

The approach that was developed allowed a real dialogue, a true participation in water management research for low key water actors in South Africa and Zambia. The present hegemonic discourse on water stresses the importance of participation, but constrains it so much that it can only exist as a complete adhesion to the structures of signification and domination that this discourse attempts to impose. The approach developed in this project did not predetermine what was good for a given population. It treated it as a subject rather than an object in order to understand the structures of signification it adhered to and the manner this constrained the efforts it could deploy when attempting to develop its access and use of water.

1.3 Commensuration and water management

Research on water scarcity has been overwhelmingly dominated by commensurability for the past fifty years and so has the practice of water management. Commensuration is the process of transforming different values or units into a common metric. (Espeland 1998) It involves measuring different properties normally represented by different units with a single, common standard or unit. It does not permit the expression of incommensurate values. It does not admit the existence of elements that have an intrinsic worth. Commensuration is a process that reduces large amounts of information to a single number. It was initially developed as a sincere attempt to make decisions in water management more democratic but it has been especially popular with administrations because it allows for expediency. Espeland demonstrated how the hegemony of commensuration within water management has deeply affected the capacity of ordinary citizens to participate in decisions that affect their lives especially when these are brokered by powerful bureaucracies. The manner commensuration is deployed within a model by water managers will be determined by the structure of signification they adhere to. This has a deep impact first on the values that are necessarily embedded within a model and, second, on what can actually be perceived as existing.

Even when a manager or a researcher seeks to portray reality as objectively as he can, he cannot avoid resorting to his own values when structuring the various variables within his model. The water poverty index allows different weights to be applied to both the components and the subcomponents because it seeks to offer as refined an assessment as possible over a variety of scales.(Sullivan, Meigh et al. 2003) It combines data on local water resources, access, use, social and economic capacity and water-related environmental quality. Yet, its very construction reflects the priorities of the researchers who designed it and of the managers who will resort to it. This index may not represent the most crucial aspects of water poverty according to the population involved. Modern utility theory is based on a formal analysis of preferences and decision rules. The rational choice it refers to implies breaking decisions down into their component parts and then systematically aggregating these to derive a decision. The manner this is carried out necessarily reflects the values of the person who is doing it. Rational choice models and numerical indicators cannot be neutral. They systematically distort meaning for some groups.

The hegemony of commensuration has meant that only those phenomena that could be measured could be taken into account, could be recognized as existing. Conversely, this meant that an actor who wanted a factor to be taken in consideration had to transform it into something measurable. This has often led to double accounting of water quantities, itself a driver of basin overbuilding that begets shortages that call for more water resources development. (Molle 2006) It has also fostered the malleability of cost-benefit analysis that led to irrigation optimism. (Jones 1995)

More crucially, the hegemony of commensuration has prevented us from understanding the processes that drove the construction of second order water scarcity. It has provided many manners of measuring various aspects of water scarcity and water supply without allowing us to examine the underlying theoretical framework whereby the various values were weighted and

assembled. It allowed the spread of hegemonic concepts concerning principles of universal applicability according to which water had to be managed as if all populations around the planet shared the priorities of those who enunciated these principles.

Commensuration emerged as a dominant approach to water for several reasons. Government departments and donors appreciate numerical indicators to justify spending budgets. Researchers who resort to commensurability can schedule deliverables easily when proposing research to donors. They thus succeed much more readily as development brokers than their colleagues who propose qualitative approaches. (Trottier 2006) Their production, especially that aimed at donors, therefore exceeds largely that of social scientists who deploy qualitative methods. These do not offer the same expediency because they emphasise the non generalisable character of their results. They allow, however, a re-examination of the theoretical framework whereby we can explain water scarcity.

1.4 Qualitative Research

This research harnessed qualitative research methodologies to apprehend the construction of water scarcity. Qualitative research methods are necessarily inductive in nature, as opposed to quantitative research ones. They use theoretical sampling while quantitative methods use statistical sampling.(Bryman 1999) This has a profound impact on the nature of the research questions that can be articulated and answered within each approach. A theoretical sample is necessarily unrepresentative. The results generated from the study of such a sample, such as a case study, cannot be generalized. It can only inform the theoretical framework that is deployed. A statistical sample, on the other hand, can be constituted to be representative of a wider set of situations and the results generated for its study can be generalized. This capacity to yield generalizable results has led most research on water scarcity to adopt a quantitative approach. This presented the advantage of providing results with the concommittant disadvantage that these results rarely allowed an improvement of the theoretical framework that was deployed.

Social scientists resorting to qualitative methodologies have been very cautious to avoid an inadequate generalisation stemming from their results. Yet, they have had to admit that few social phenomena can now be studied as isolated cultural or social processes and that the interaction among phenomena over a great range of scales must be taken into account. (Comaroff and Comaroff 2003) This bridging of the scales remains one of the most difficult issue in social sciences. The approach developed in this project attempted to do this via an inductive approach that allowed the actors to identify themselves the stakes that shaped their perceptions and their actions. This allowed us to avoid the trap laid out by the deductive approach whereby the stakeholders and the priorities are pre-determined before any field result is acquired. The deductive approach entails the prior elaboration of detailed categories before any data is gathered. Results must be squeezed into these categories no matter how poorly they match them.

1.5 Mapping

Post modern critics have described maps as forms of totalization of knowledge. They can indeed constitute a depiction of water scarcity that suits specific actors, silences others whose presence or strategy seems undesirable and framies the issues, the problems and the solutions. They can participate, therefore, in the construction of inevitability that must necessarily precede the construction of large infrastructure.(Garb 2004) A map is a visualisation of a discourse. It necessarily lies about reality. The very challenge of producing a hydropolitical map consisted in developing an empowering tool that could allow a visualisation of the structures of signification and the structures of domination as they were perceived and experienced by those actors involved in spelling out the rules concerning water management and in their implementation.

Narrative based maps have been used in the development world for over thirty years. They usually consist of a small scale map representing the smallest administrative unit in a country, with only a very few features, such as a river or a main hill, appearing on it. The persons interviewed are then invited to add themselves on the map the features they consider important. This is a useful inductive method that often allows the researcher to discover communication routes the importance of which he had not suspected, economic activites he hadn't foreseen, relations between activities that suddenly appear very rational when they had previously been criticized as inefficient by the 'developers'. A narrative based map reflects the perception of one individual only. Systems have been developed of onion paper layering whereby the narrative based maps of several individuals are laid on each other to show the totality of the perceptions among those interviewed. This is a useful technique at a small scalar level. It proves less useful as we tackle a higher scalar level of analysis.

In an attempt to reconcile the visualisation of reality with the multiplicity of perceptions and strategies deployed by the actors composing this reality, Adele Clarke developed situational analyses, social worlds maps and positional maps. (Clarke 2003)

A situational analysis is elaborated on the basis of grounded theory. (Glaser and Strauss 1967) Inductive research methods such as semi-structured interviews and field observations are used until saturation is reached, ie until the same actors and elements systematically re-appear. The results of these interviews and observations are then interrogated with the following questions : Who and what are in this situation ? Who and what matters in this situation ? What elements seem present in this situation ? What seems present but unarticulated ? The situational analysis then starts with the compilation of as many as possible of the individuals, collective, discursive, political, spatial, temporal, symbolic and other elements such as technologies, information systems, or infrastructure. The analysis gradually evolves from a brainstorming into an ordered space into which elements are clustered on the basis of the questions that are listed above.

The social worlds map details how these actors represent themselves and the arena in which they are involved. Actors systematically belong both to a social field and to an arena. An arena is the subset of the field where the actors all know each other's identity and all identify the stake around which their relations are structured. An arena is unavoidably also part of a field that contains other actors and other stakes, the existence of which the members of the arena are not all aware of.(Biershenk, Chauveau et al. 2000) The social worlds maps uncovers the discourse space among the actors, ie the legitimate terrain of debate, what is 'sayable' about a situation.

Finally, positional maps lay out the major positions taken and those not taken by collective and individual actors. This map highlights the multiplicity of positions and the contradicions inherent in individuals' and collectivities' discourses. It highlights the web of relations that constitutes the hydropolitical constellation when it is used to investigate the various discourses and strategies concerning water representation, water access and water use.

This project resorted to GIS mapping when it was useful, but it also called upon other tools such as narrative based maps, situational analyses, social worlds maps and positional maps in order to investigate the hydropolitical constellation in both South Africa and Zambia.

1.6 Outline of the Report

The first section of this report details the work done on Zambia and the second section is devoted to South Africa. This order reflects the chronological order followed in this project. Although both countries were initially supposed to be studied simultaneously, a series of unforeseen events led the research to be started on Zambia in January 2003, months before the start of the project in May 2003, while the research on South Africa only started much later, once the University of Kwazulu Natal came on board of the research team. This allowed the research team dealing with South Africa to learn from the experience acquired in Zambia and produce a refined methodology.

1.6.1 Section 1 – Zambia

Chapter 2 details the shifting paradigms of decision making in Zambia as they evolved through the colonial period, the one party state era and the multiparty state era. It details how the type and level of interaction changed among which actors. It traces the history of the different paradigms for decision making developed for urban and rural areas. It explores the issue of land ownership and customary law in rural areas and its impact on the management of water. It situates privatisation in the 3rd Zambian republic, the manner the liberal paradigm foresaw its role and the manner it actually developed it. It also situates actors such as NGOs and government departments who play widely differing roles in rural and urban areas.

Chapter 3 details the methodology followed in the research on Zambia. A very wide country gathering officially 73 tribes , Zambia was nevertheless studied as a national unit and case studies were investigated in twelve locations spread throughout the country. The methodology paid attention to the distribution of tribes and ethnic groups, to the division of the country among provinces and between urban and rural areas. It also paid attention to the division of the country into distinct areas where specific donors intervene, thereby leading today to the evolution of different water situations.

Chapter 4 details the case studies where water was predominantly devoted to agricultural use, to livestock or to industry. The largest water consuming sector in Zambia is agriculture, accounting for an estimated 75% of the overall consumption. Irrigation is typically used by commercial farmers growing wheat, sugar, tobacco, winter maize and horticulture while small scale farmers mostly depend on rain fed agriculture. Irrigation, whether practiced thanks to poverty reduction schemes or by commercial farmers, is effectively exempt from the legal requirement of obtaining water rights. Commercial farmers are charged only for the surface water that they ues. The water abundance that presently characterizes Zambia is therefore threathened structurally by the boom in commercial agriculture for exportation. Only the Kafue basin, where mining is developed, appeared as a likely target for introducing water markets in Zambia.

Chapter 5 details the case studies where water was predominantly devoted to domestic use. The issue of financial self sustainability for water schemes and the technology choices appeared very differently in rural, peri-urban and urban areas. The manner ‘democratic’ decision making is carried out within the schemes is discussed. So is the mismatch between the requirement to pay monthly amounts in peri urban schemes when the population is not salaried on such a basis.

Chapter 6 discusses the array of local responses to shifting paradigms in water management in Zambia. It explores the formal and informal aspects of decision making and

questions the definition of a 'community'. For example, donors need a minimum number of users to justify a water point, they also insist on rules concerning the eviction of non paying members from a water using community. This leads to the constitution of 'communities' to justify a project that does not reflect the real community as it is lived by the water users. The parachuted requirement to exclude for non payment is also in contradiction with the social relations that stabilize a community.

Chapter 7 gathers the research detailed in the first five chapters with a hydropolitical map of Zambia. This map demonstrates that the boundaries of hydropolitical units or socio-hydraulic units do not match river basins. The clusters of actors that emerge as a function of a shared position cuts across the formal administrative boundaries as well. The standard recommandations emerging from the international conferences on water follow a deductive logic and are based on principles deemed to be of universal value. The hydropolitical map of Zambia reveals that they are mostly inappropriate in order to tackle second order water scarcity.

Appendix A provides a quantitative overview of water resources in Zambia

Appendix B provides an overview of water legislation in Zambia

Appendix C provides a list of daily volumes of domestic water in Zambia

Appendix D provides a list of the international water initiatives

Appendix E provides a list of the large scale water projects in Zambia

Appendix F details the water sector budget allocations in Zambia

Appendix G provides a list of the NGOs and government agencies active in Water

Appendix H shows a sample interview guide

Appendix I shows a sample letter to town clerks

Appendix J lists institutional contacts in Zambia

Appendix K provides the list of elements identified in the situational map

1.6.2 Section 2 – South Africa

Chapter 9 discusses maps, their key features and functions. It discusses why situational maps are an effective tool to understand conflictual, competitive and cooperative landscapes. It explores the complex relations between maps and power and the manner interests shape maps. More crucially, it discusses the manner a map can be developed as an empowering tool rather than as a tool of manipulation. It discusses the multiscalarity that is necessary to provide a realistic hydropolitical map and the manner this can be achieved. Finally, it provides the preliminary situational map elaborated by the team at the beginning of its research.

Chapter 10 details the evolution of the structure of water governance in South Africa. It discusses the changes brought about by the end of apartheid, especially the evolution of the municipal boundaries and its impact. It introduces the national water act and some of the innovative partnerships that followed it. It identifies a list of formal water organisations, including consultants and international firms, governmental bodies and stakeholders.

Chapter 11 details the manner municipal and provincial boundaries in South Africa do not correspond to hydropolitical boundaries. The numerical data gathered concerning water obscures

the inequalities, essentially because it is categorized according to newly redrawn boundaries aimed at erasing the former divisions prevalent during the apartheid era. It discusses the variables that are put forward to establish a typology of hydropolitical situations and discusses the selection of the case studies to be examined in detail.

Chapter 12 details the Grabouw case study, a small peri-urban area in the Western Cape where an estimated 50000 people are now living in an area comprising rural, agricultural, industrial and urban elements. It includes Xhosa, Afrikaans and English speakers. This case illustrates well how an administratively defined water using community and a decision making community is rarely a unitary and bounded unit. The diversity of stakes, perceptions and strategies emerging from this case study contributes to explaining why a uniform policy can only be doomed. The participatory research methodology pursued here induced real dialogue that can, however, inspire alternative approaches for water management in such a setting.

Chapter 13 details the Mseleni case study, a remote rural municipality in the north of Zulul territory close to the Indian Ocean. Discursive constructions of technology featured prominently in this case where the pipe network was highly disfunctional and where was devoted to domestic use as well as to water cattle, grow crops and run small businesses. The situational analysis and positional map produced here have led to reflections for the development of rapid hydropolitical assements.

Chapter 14 details the Durban, newly renamed eThekwini, case study. As the municipal boundaries of Durban were redrawn following the end of apartheid, the municipality suddenly included large expenses of rural areas with very low density inhabitations while periurban areas kept growing. The municipality has developed an innovative approach to water supply that has been lauded internationally, yet has been the object of severe criticism from Durban's social movements. The case study sheds light on this paradox.

Chapter 15 gathers the research detailed in the first six chapters into a hydropolitical map. The participatory research developed within this approach proved very useful in respecting the heterogeneity of the South African situation while describing the existing stakes and strategies. The relevance of this tool for government departments was proved by the fact eThekwini (Durban) municipality participated actively to make this research possible in order to benefit from its results. This led the South African team to specialize on the elaboration of a methodology for rapid hydropolitical assessment as a road to a political voice for people who are usually made invisible within standard research methodologies.

Appendix A provides a compilation of water maps in South Africa

Appendix B provides a preliminary compilation of social worlds map established at the beginning of the research.

Appendix C provides a preliminary list of the key water related organisations in South Africa

Appendix D details the preliminary working annotated bibliography

Appendix E shows the national water resource strategy diagram of South Africa

Appendix F provides the institutional overview of the water sector of South Africa

Appendix G provides the institutional overview of water service provision in South Africa

Appendix H details the nineteen water management areas

Appendix I provides briefs of the case study sites

Appendix J shows the social world map of eThekwini

Appendix K illustatres the postional map of eThekwini

Appendix L shows a network of actors in eThekwini

Appendix M is a list of the Umlazi consultative group

Appendix N provides the interview protocol followed

1.7 References

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Zambia case study

By Paxina Chileshe

Research Director – Dr Julie Trottier

Acronyms

ACP – Africa Coffee Plantation

AfDB – Africa Development Bank

AHC – Asset Holding Company

ASP – Agriculture Support Programme

BRE – Barotse Royal Establishment

CBO – Community Based Organisation

CDD – Community Development Department

CSO – Central Statistics Office

CU – Commercial Utility

CWSC – Chipata Water and Sewerage Company

DCI – Development Cooperation Ireland

DDC – District Development Committee

DfID – Department for International Development (UK)

DWA – Department for Water Affairs

DWASHE – District Water And Sanitation Health hygiene Education

ECOSOC – Economic and Social Council (UN)

ECZ – Environmental Council of Zambia

FAO – Food and Agriculture Organisation

GTZ – Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)

HIPC – Heavily/ Highly Indebted Poor Countries

ICWE – International Conference on Water and the Environment

IFI – International Financial Institutions

IMF – International Monetary Fund

IWRM – Integrated Water Resource Management

JICA – Japanese International Cooperation Agency

KTC – Kawambwa Tea Company

LCC – Lusaka City Council

LWSC – Lusaka Water and Sewerage Company

MACO - Ministry of Agriculture and Cooperatives

MAFF – Ministry of Agriculture Food and Fisheries

MDGs – Millennium Development Goals

MEWD – Ministry of Energy and Water Development

MFNP - Ministry of Finance and National Planning

MLGH – Ministry of Local Government and Housing

MMD – Movement for Multi party Democracy

MoH – Ministry of Health

NGO – Non Governmental Organisation

NORAD – Norwegian Agency for Development Cooperation

NWASCO – National Water and Sanitation Council

NWP – National Water Policy

NWRMP- National Water Resources Master Plan

NWWSC – North Western Water and Sewerage Company

PRSP – Poverty Reduction Strategy Paper/ Programme

PWASHE – Provincial Water And Sanitation Health hygiene Education

RDC – Resident Development Committee

RIF – Rural Investment Fund

SADC – Southern African Development Community

SIDA – Swedish International Development Agency

UNESC – United Nations Economic and Social Council

UNICEF – United Nations Children's Fund

UNIP – United National Independence Party

VDC – Village Development Committee

WASHE – Water And Sanitation, Health hygiene Education

WHO – World Health Organisation

WRAP – Water Resource Action Programme

WRM – Water Resources Management

WSS – Water Supply and Sanitation

WWSC – Western Water and Sewerage Company

ZAMCOM – Zambezi River Commission

ZAMSIF – Zambia Social Investment Fund

ZESCO – Zambia Electricity Supply Corporation

ZNFU – Zambia National Farmers Union

2 Shifting paradigms in Zambia's water sector

The application of Political Ecology in this research aims to critique the dominant approaches to water management and their responses at the local level. The Zambian water sector is the field in which we explore the decision making and actor interactions[1]. It is constituted by a constellation of institutions, organisations, actants and actors[2]. The actors use water in the traditional sense of end use and in non traditional forms such as imposing ideas and influence on others. The end water users mainly focus on the access to both surface and ground water resources to meet various needs. They are the subject of the case study chapters. This chapter explores how the actors use actants to exercise their power and shape the Zambian water sector. An actant refers to non-conscious actors within the sector.

The actants examined in this research range from administrative boundaries, location of the water resources, project or budgetary support, international drives and paradigm shifts. Administrative boundaries partly determine the voice of authority over particular water resources. They are closely linked to the location of a water body though they differ with those set by the resource controllers. Project or budgetary support influences the management of resources through mechanisms of transporting water and influencing patterns of use in various places of population concentration. It often provides residents with access to clean and safe domestic water. International drives play a similar role to project support; they attract funds to meet internationally set targets such as halving the number of people with no access to clean water. Paradigm shifts influence the management typologies used in the water sector. The participatory paradigm ideally brings a local focus to project implementation and encourages local level management as opposed to central control systems.

This chapter examines the levels of decision making and the impacts of approaches adopted in water projects. It illustrates the shift in responsibility from the supplier and the service provider to the end user within the participatory paradigm and commercial models of service provision. It traces the shifting focus of development aid and its emphasis. It draws attention to the social capital of communities targeted for water projects and the capacity building acclaimed by implementation teams and participation advocates. It ends with an investigation of second order water scarcity, a concept that emphasises the need for social capital to deal with resource scarcity where it occurs. Investigating orders of scarcity begins with a depiction of water resources distribution in Zambia. It allows us to question whether actual water shortage exists or whether structures and agency have a more dominant role in the classification. Thus it examines the social constructs of scarcity in different locations and provides some insight into adopted coping strategies.

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[1] A field is a configuration of objective relations between positions; a system of relationships which is independent of the populations which these relationships define (Olivier De Sardan, 2005). Bourdieu defines it as a market in which actors possessing various types of capital vie with each other. It has its own institutions, specialised agents, hierarchy of positions and language. This research applies Olivier De Sardan's definition based on its inclusion of relationships independent of the local actors.

[2] Institutions are a set of rules by which groups of actors manage their affairs or function. They are formal or informal procedures, routines norms and conventions embedded in organisational structures (Wells 1970).

2.1 Decision making levels

Decision making in the Zambian water sector occurs at various levels spanning the national, district and community tiers. Policy formulation and regulation occur mainly at the national level. Both processes are documented and accessible to the actors at this level through the various government ministries and regulators. The documents exist in English, the official language of Zambia. The use of English restricts the audience of the policy and regulatory documents to the formally educated members of society. Regulation in the water sector is currently limited to: the allocation and use of surface waters, urban domestic supply and the pollution of surface waters. The responsible bodies are the Water Board, the NWASCO and the Environmental Council of Zambia (ECZ) respectively. They are all based in Lusaka, the capital city. Formal structures also exist at provincial and district levels through state agencies and the CUs. Decision making occurs at the local levels especially in rural and peri-urban areas where formal and informal structures and networks sometimes coexist.

The community focus in this research emphasises the use of local knowledge in exploring the decisions made and the modes of resource appropriation at the grass roots. One of the aims of the research is to explore the ways in which grass root actors claim and express their interest in water resources and the strategies they adopt to appropriate them. National level decisions may filter through to the community via channels such as project implementation guidelines. However, actor interpretations at the interfaces between the separate decision making levels contribute to the activity at grass root level differing from the expectations documented at national level.

2.1.1 Levels of information and knowledge

Placing emphasis on the community we will analyse three levels of decision making in depth: community, district and national. The information flowing between these levels would ideally be multi directional. In practice the community level officials, fieldworkers, submit reports to the district officials who report to the provincial officers who finally report to the national tier. The main link between the separate tiers, other than the reports in various ministries, is the Water and Sanitation Health hygiene and Education (WASHE) concept that is used by project implementers and facilitators. The community water projects exist only in the rural and peri-urban areas. Some formal decisions at the national level are also passed down through directives. Evidently information usually flows in one direction as does the knowledge, giving the impression that mainstream knowledge is concentrated at the national level. The fieldworkers routinely submit reports repetitively pointing out the same problems in their local areas. They feel these problems are overlooked and the information they submit is allegedly sidelined in most decisions. Power and knowledge are inevitably linked in this scenario. The controlling centre makes decisions based on its knowledge without that of the grass root workers.

The state agencies and high level stakeholders constitute the national tier and control the agenda of the water sector[3]. The Water Board allocates the resources to large scale users after consultation with other stakeholders such as the Department for Water Affairs (DWA), the

[3] A stakeholder is an actor who has a recognised interest in the water sector. The recognition comes from controlling organisations such as Government departments and is illustrated in the invitation of these actors to decision making forums. A high level stakeholder is one whose voice is actually included in policy documents and influences decisions.

Department for Infrastructure and Services and the Irrigation department[4]. These departments belong to the MEWD, the MLGH and the Ministry of Agriculture and Cooperatives (MACO) respectively. The regulators are autonomous statutory bodies created through Acts of Parliament. The Ministry of Lands controls the land on which water is found.

2.2 The Sector overview

In some rural and peri-urban areas water and land are inextricably linked. Officially in Zambia both land and water are vested in the President who authorizes the commissioner of lands to act on his behalf in land matters. The Water Board awards user rights for water that are distinct from ownership rights[5]. The title issued on land is leasehold and not freehold. Land is classified as State land, Reserve land or Trust land; entailing different leases (Amankwah and Mvunga, 1986).

State land allows a lease hold of up to 99 years. The commissioner of lands at the Ministry of Lands awards this title. Tenure in Trust land, also sometimes referred to as traditional land, is more complex. The land was demarcated for traditional leaders in the colonial days[6]. The chief was the custodian of the land on behalf of his subjects. The revision of the Lands Act in 1975 placed all land under the authority of the President[7]. Therefore Trust land can be converted into State land if the chief or traditional ruler, who effectively still maintains consultative authority, agrees. Traditional rulers grant right of occupancy of up to 14 years. Conversion to State land involves a visit from a surveyor and obtaining a blue print for the portion of land (Amankwah and Mvunga, 1986). The surveyor's report is kept at the Ministry of Lands' register. Whether the land is State or Trust land, any occupant or holder of a lease must register its water bodies and any intended use at the deeds register at the Ministry of Lands. Large volumes of water use, above 500 cubic meters per day, require the land owner to obtain water rights from the Water Board[8]. The cap on the minimum amount exempts domestic water use for individuals and communities but covers water suppliers in the urban areas. The Water Board ideally only grants the rights after visiting the location and ensuring that users downstream will not be adversely affected by the use for which water rights are obtained[9]. The DWA provides technical advice to the Water Board.

[4] Allocation is a mode of appropriation of resources. Other modes are representation, use, access modalities and the transfer of these modalities (Trottier 1999, based on work by French authors Weber and Revert) .

[5] User rights embody no title held by the owner of the rights and are applied in communal property while ownership rights secure title deeds classifying the resources as private property.

[6] The title of traditional leader refers to leaders that existed before the colonial era and those that were created by the colonial authority.

[7] The Lands Act was amended in 1975 but from 1970 onwards, all traditional land was converted into trust land and placed under the authority of the President. The main change was the inclusion of the Barotse province which was previously administered by the Litunga, the King of the Lozi people.

[8] Interview with secretary of Water Board. This is not a steadfast figure but is quoted in the Water Board documents mainly to exclude domestic water volumes

[9] Like most government departments, the Water Board has limited manpower and financial resources which hinder it from carrying out its duties effectively.

Reserve land usually covers national parks and forest reserves which, according to the State, ideally should not be inhabited[10]. The largest land classification is the Trust land which makes up close to 70% of Zambian land[11]. The commissioner of lands consults the local chief who must give consent to all decisions regarding this type of land. State land known as crown land in the colonial era accounts for less than 10% of the land mass in Zambia (Amankwah and Mvunga, 1986). Investment in land appears to be determined by the period of land tenure. Individual commercial farmers have deeds for their land and are thus encouraged to invest in the land. The 99 year lease is viewed as long enough for the farmers to recoup their investment. Traditional land tenure is usually considered short and does not seem to encourage individual occupants to invest in their land[12]. Traditional land owners however do not necessarily see land as an investment[13]. It can be passed on to the next generation and its use and productivity are valuable.

The MACO drive to increase agricultural output in Zambia has drawn attention to issues of traditional land tenure and the state encourages the occupants to obtain deeds and invest in their land[14]. However, some practitioners feel an increase in agricultural output especially in rural areas is not a panacea for poverty. They propose it is accompanied by other drives including marketing and distribution infrastructure (Olivier de Sardan 2005, 139). The economic development plans during the 1970s and 1980s showed half baked drives are biased towards the urban populations (Hamalengwa 1992; Bates 1976; Tordoff (ed) 1980)[15]. Other studies have also shown the process of obtaining title excludes the poor in most cases and the rural residents place more value in land productivity than ownership[16]. Additionally, the practitioners are aware of the importance of development plans being supported by the target populations and their leaders. However, they tend to focus on the actors they identify as stakeholders.

2.2.1 The main stakeholders

Traditional and community leaders play significant roles in the areas within their jurisdiction. In the peri-urban setting where Resident Development Committees (RDCs) are formed, a leader is elected by the community members. The RDCs make development project proposals on behalf of their communities and have other responsibilities such as neighbourhood watch and dispute resolution[17]. They draw their legitimacy from the election process and also from the local council, which provides their training and encourages communities to form such groups. They are recognised by NGOs and other organisations that work with communities. They are involved in all

[10] Some communities live in game management areas found on the periphery of National Parks. The boundaries of the National Parks are not consistently demarcated and communities sometime encroach into the game parks.

[11] Discussion with surveyor at Ministry of Lands.

[12] Interview with lands officer at Ministry of Lands.

[13] This result emerged from a study of Zambia's land law carried out in 1980. The study was led by Professor Mvunga, a lecturer in law at the University of Zambia. It was a follow up of his PhD thesis subject. Personal communication.

[14] The drive is funded by donors like SIDA and NORAD.

[15] See the post independence years section in the Historical Chapter

[16] International Food Policy Research Institute working papers, Amankwah and Mvunga (1986)

[17] Discussions with RDCs in Lusaka and Kabwe. The RDCs are effectively development brokers among other things, a role elaborated on in the technical report discussion chapter.

community projects in their areas and need to be consulted on all activities in their area of residence[18].

In most rural areas the community leaders are appointed by a chief or inherit the leadership. Some subordinates question the authority of some hereditary leaders especially when they compare with and romanticise past leadership. They raise questions if a leader is seen to be lacking some essential qualities[19]. In cases involving headmen, the local chief usually settles any dispute or contestation. Even though the leadership of some hereditary leaders may not be respected as a form of authority, most subordinates consider it legitimate based on historical practices, traditional beliefs and culture. However, the legitimacy does not prevent replacement of the leader using appropriate channels[20]. The legitimacy and authority of some chiefs was cemented with the British indirect rule (Mamdani 1996, 54). If a subject or group of subjects did not agree with the authority or recognise the legitimacy of the chief, they were not always able to separate from the tribe and settle elsewhere[21]. The colonial rulers controlled the settlements through the fixed demarcations of the tribal or traditional land. The chief maintains a diminished form of authority in the independent state[22].

The state controls resources centrally and formulates policy within its knowledge frameworks. It is the negotiating arm in transboundary waters. Its role has evolved since independence. During the one party state era (1973-1991), the party and its government were one and the same. The party structure fed into the state structure and the organisation of Zambia was based on the organisation of the main political party, the United National Independence Party (UNIP). This arrangement has its shortcomings.

2.2.2 The one party rule and service provision

In the one party state era, the political chairmen controlled the access to facilities such as communal water taps in their areas of residence. The section, constituted by 25 houses, was the smallest unit in the party structure. The authoritarian rule during that era enabled the political chairman to dictate who could access public facilities in their areas. Some members of the public considered this power an infringement on their rights to communal facilities. Incidentally, the chairmen focused on the control that the powers gave them[23]. They were usually elected on a popular vote and endorsed by the district committee. Most owned bars, shops or businesses in their locations. They usually made use of their economic power to secure their political power.

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[18] The RDCs are promoted by Local Authorities and have previously been used by NGOs to mobilise community support for projects.

[19] According to an article in the Post Newspaper on 13th June 2005, Chief Mpezeni of the Ngoni people was asked to vacate the palace by the members of the royal family claiming he had embarrassed the tribe and had been a bad example of a leader. The chief had appeared in court, was cleared of a defilement case and was reportedly of poor health. This prevented him from carrying out his duties. The chief however denied the accusations and refused to vacate the palace as requested.

[20] The council of advisors, a body appointed by past and current chiefs, has the powers to approve the replacement of a traditional leader.

[21] The warrior tribes like the Bemba, Ngoni and Lozi had hierarchical structures of leadership.

[22] This may be viewed as a perpetuation of indirect rule, though the state labels it as nation building.

[23] Interview with Youth Secretary, UNIP, Lusaka.

In Humanism, the ideology promoted during the one party state era, natural resources are exploited for the benefit of the people. Incidentally, exploitation in the right measure requires trained and knowledgeable personnel. Trained local people were rare at independence so the expatriate workforce was essential to continue the economic activity in the country (Tordoff (ed) 1974; Bates 1976). From 1968 to 1972, a nationalisation exercise entailed the businesses and parastatals being run by Zambians[24]. The parastatals were used as revenue sources for the country and its people. However, some parastatal managers misappropriated part of the revenues (Amankwah and Mvunga 1986; Hamalengwa 1992). A boom in the copper prices on the world market from the 1960s until the mid 1970s benefited Zambia, copper was the main export earning foreign exchange. During the 1980s patterns of mismanagement compounded by low prices for copper on the world market contributed to the economic plans for Zambia not bearing fruit[25]. Some residents began to openly criticise the state and levels of poverty were rising.

In the late 1980s the Zambian economy was adversely affected. The Government had borrowed heavily on the world market while copper was still fetching a good price. It used the funds to build factories in different parts of the country and for other development activities (Tordoff 1980). It considered the IMF and World Bank conditions, particularly the debt repayment schedules unbeneficial for the Zambian people. In its view, they contradicted the ideology of Humanism[26]. The UNIP and Zambia had had one leader since independence. The African autocracies that existed at the time and the coups that had taken place in some West and Central African countries were part of the international media reports. In 1990 a call was made to return to multiparty politics in Zambia[27]. The UNIP resolved to hold elections in 1991, bowing to international and local pressure. Soon after introduction of a multiparty democracy the government was coerced to follow the Washington consensus to liberalise the Zambian economy[28]. The parastatals were privatised to increase efficiency and profitability by bringing in technical experts and the much needed investment capital[29].

[24] Later assessments of the parastatals showed they benefited the urban elite even though they were aimed at improving rural livelihoods (Hamalengwa, 1992).

[25] The mismanagement of parastatals was evident to most Zambian citizens. The heads of the parastatals were political appointments making them answerable to the ruling Government. The parastatals did not benefit the ordinary citizens but the elite and circle of the political rulers.

[26] At this time Kenneth Kaunda openly denounced the powers of the IMF and the World Bank during the structural readjustment programs inflicted on Zambia.

[27] The call was led by trade unionists using the support of the miners on the Copperbelt. The miners have historically been seen as a powerful voice in Zambian politics and civil society through the labour movement. Miners' strikes affected the economic situation of the country, giving them a powerful voice in various political and economic matters.

[28] The Washington consensus was a response to the potential defaulting on international debt by Mexico in the late 1980s. The Washington based IFIs provided lowest common denominator policy advice covering; fiscal discipline, a redirection of public expenditure priorities towards fields offering high economic return and potential to improve income distribution e.g. primary health care, primary education and infrastructure.

[29] This view is undoubtedly neo-liberal following the Washington agenda favoured by IFIs. The underlying ideology is how best to structure capitalist economies to provide private enterprise, free markets, economic growth and the global expansion of capitalism through free trade.

During the one party state era a policy to unify the citizens and detribalise politics existed[30]. Service provision such as water was in effect paid for by the state through subsidies from the supplier and not by the consumer. With the multi party politics, a feeling of unity and allegiance to the state is no longer predominant; most citizens seem to identify with their parties and then the nation. During the one party state, political chants proclaimed “one Zambia, one nation, one nation, one leader”. In the multiparty state, the political chants call for change and improved economic activity.

2.2.3 The Multiparty state

The multiparty politics have had some positive impact on the organisation of the country and the degree of reliance or dependence on the state for service provision[31]. Some believe the ruling party members wield more power than those in the opposition[32]. Additionally, the power and authority that was formerly wielded by political party chairmen in the one party state is now in the hands of the political chairmen from the ruling party or the party with the most representation in a particular area[33].

The method adopted by the state to decrease state dependency is an overnight weaning of the citizens not a gradual one that may be more appropriate according to some actors[34]. The government is no longer obliged to reward the single party cadres and freedom fighters as may have been the case following independence (Bates 1976, 162). However the benefits of this shock treatment are that Zambians have had to wake up and begin making decisions that affect them at the local level. They are woken to the search for ideas and solutions that benefit them locally. This sentiment was repeatedly expressed by local NGO teams and community development workers[35]. It should cautiously be viewed in the context it is given particularly because not all citizens agree on this. For water resources management it ideally increases community awareness and participation regarding the environment and natural resources. It may eventually lead to improved accountability. The community is less likely to blame some obscure government policy or directive for their plight. This level of responsibility is initially challenging but progressively receives approval as ideas and experiences are shared[36].

The liberalisation of the economy in the mid 1990s and the public sector reforms to improve service delivery resulted in the commercialisation of the water sector. The CUs and autonomous water departments in the Local Authorities supply water to the urban areas. Undoubtedly the

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[30] The opposition party ANC was banned in Zambia for allegedly being tribalist and favouring the tribes from southern Zambia.

[31] The separation of the political party and the government is viewed as positive by most Zambian citizens especially that multiparty systems ideally favour democracy and different opinions.

[32] Interview with Publicity Officer, MMD, Kitwe.

[33] This situation has been reported in some of the shanty townships of Lusaka where communal taps are controlled by political party chairmen.

[34] Complaints of neglect can be heard from some rural residents or residents of towns like Kabwe with little economic activity since the closure of the mines in 1994.

[35] These groups feel the projects they implement will have more positive and sustainable impact on communities if they are more proactive.

[36] Extension workers in the government agencies report some opposition to the new ways of carrying out projects when they introduce them to the target population. The attitudes do change as the target populations sees some benefit of the new methods and listen to narratives from other rural areas where projects have been successful.

number of taps and water points has increased since the early 1990s and the political section lines discarded in the ruling political party, the Movement for Multiparty Democracy (MMD). The ability to pay for services has become a more significant determinant of access to water in urban areas. Residents who can pay are able to secure individual taps. Most of them still view water as a social good that should be subsidised. The commercialisation of the sector compounds the concept of water as an economic good. Some residents subtly struggle to bring the two notions together. They feel they should not pay for water but can be convinced to pay for treated water[37]. Some view the CUs as profit centred organisations that charge high prices for water. The concept of water as an economic good is also introduced in the agricultural sector where small scale agriculture is promoted as a business not a survival tool[38].

The Local Authorities control the CUs. They own 100% of the shares in the utilities and effectively still make the decisions on water supply in the urban areas. In places where the CUs do not exist, "autonomous" water departments are created[39]. Internally these departments are seen as effective steps towards commercialisation. The MLGH issued the directive to form autonomous departments. It no longer supports the Local Authorities in the supply of water[40]. Historically it supplied water treatment chemicals and subsidised the repairs of the machinery required in water distribution, such as pumps, especially in the smaller councils. After creating autonomous departments managers report increases in revenue collection resulting from improved operations[41].

The introduction of multi party politics and the liberalisation of the economy coincided with a shift in the role the state plays in service provision. The state provided services through the local government during the one party state era, in accordance with the socialist leaning Humanism. Its role has shifted towards the neoliberal policy where it facilitates or creates the right environment for other non state organisations to provide services (Taylor 2004). The neoliberal ideas refer to minimal regulation and promotion of commercial activity by creating the correct investment environment[42]. Civil servants discourage state dependency by reiterating the government lacks resources to meet all the demands of the Zambian people. They emphasise, the citizens must be willing to do something for themselves. Some CU managers believe those who are willing to pay the money can have as much water as they want[43]. The belief stems from the cost return focus of the CUs and the pressure placed on them by the state and the NWASCO, to make profits and their organisations to be financially viable within 10 years of operation. The profits made go towards service extension, improvement of service standards and loan repayments.

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[37] Most urban residents feel the water rates are rather high even though they admit water must be treated effectively and they are not aware of the cost of treating the water.

[38] The promotion is being spearheaded by the MACO.

[39] The water departments are meant to be autonomous but revenues from water are usually used to cover financial shortfalls in other council departments. The revenues are meant to be used as temporary cover but money is rarely returned into the coffers of the water department.

[40] Funding to Local Government no longer included grants for water and sanitation activities; the change in funding mechanisms also effectively removed the subsidies in water supply that were central Government funded.

[41] Local authorities like Mansa and Lundazi both recorded increased water revenue, of 200% and 300% respectively, after the formation of the autonomous water departments. The autonomy means that water revenues are invested into water supply services and not used for other activities in the Local Authority.

[42] The correct environment is determined by the Washington agenda.

[43] Interview with Director of Southern Water and Sewerage Company, Livingstone.

The neoliberal constructs also extend to community participation, ownership and accountability that are desired attributes for water projects. Their definitions are selectively applied to align with the particular views and to suit the needs derived from those constructs. They are applied to water projects that provide water points in the rural areas and peri-urban areas ranging from communal taps, boreholes with hand pumps to dams. These projects are facilitated by the state or donor agencies and implemented by NGOs and government agencies. The facilitator plays several roles in a project: determining the location, type and agenda of project, technology applied, sourcing of labour and technology etc. They often manage the project with limited local level input.

2.3 Water Projects and Assessments

Progress in the water sector such as service extension, rehabilitation of infrastructure and irrigation projects in most developing countries is publicly funded. The use of the public funds is linked to the central governments securing loans from the International Financial Institutions (IFIs) such as the IMF, World Bank, Africa Development Bank (AfDB) and donor agencies. International NGOs also play a role in sourcing funds for water projects. The World Bank and the AfDB have funded at least 14 large scale water projects in Zambia over the last 40 years (Appendix E)[44].

The AfDB published its experience in water supply and sanitation projects prior to 1990 (AfDB 2001). The key issues noted were: inadequate project planning, absent comprehensive sector studies and integrated water management, piecemeal projects largely driven by immediate needs or political expediency, lack of performance indicators and supporting baseline, poor quality feasibility studies and detailed design, lack of participatory planning and limited skill mix in teams[45]. After the assessment AfDB programmes claim to focus on demand driven approaches and community participation. However, it engages directly with the state and not local communities. Thus the State registers projects often targeted at urban centres.

The World Bank water sector policy document focused on decentralising the delivery of water services and adopting pricing that induced “efficient” use of water (World Bank 1993). It stressed the need for a supportive legal framework, adequate regulatory capacity and a system of water charges that endows water entities with operational and financial autonomy for the efficient and sustainable delivery of services. The World Bank’s professed overarching objective is to reduce poverty by supporting the efforts of countries to promote equitable, efficient and sustainable development. However, Taylor (2004) notes its principal function as laid out in its founding articles in the promotion of capitalist development. Its poverty reduction strategy entails support for the provision, in an economically viable, environmentally sustainable and socially equitable manner, of potable water and sanitation facilities.

Attempts to define poverty reduction present several challenges. They imply measurability and the use of policies to control poverty levels. According to World Bank documents, measuring poverty is nationalised in data files using a poverty line determined by income levels and expenditure of individuals. Equity is based on the equal opportunity concept emphasising that people’s chances in life should be determined by their preferences and efforts rather than less controllable factors like race, sex, family background, social group or place of birth. The measurement and interpretation of equity in policies is left to the national agencies which

[44] It is difficult to calculate what proportion of the national budget these loans represent, mainly because the monies are released over a number of years and thus cannot be accounted for in one budget year. In some instances not all the monies are released for various reasons as determined by the lenders.

[45] The teams were dominated by engineers with bias towards technical issues but limited social skills.

manipulate them accordingly. Efficiency is usually related to economic productivity particularly in the use of natural resources. However, practitioners interpret it in various ways to serve their end goals. Sustainability is a constructed concept covering three basic components of the economy, society and the environment. The first component is evidently core to most definitions, placing it at the fore of most policies and activities. The World Bank's vision may appear noble and neutral but its activities and policies have been criticised by some academics and NGOs particularly because of the implied superior knowledge of the staff and predestined solutions that ignore local conditions.

The World Bank policy document covers the key themes mentioned in the AfDB publication and deploys a comprehensive analytical framework for public water management evaluation and comparison in the context of national water strategies. It was drawn up after an analysis of the water sector programmes funded by the Bank and the impact they had had, comparing the initial objectives with the outcome. It aimed to improve the performance of future programmes and to sustain the progress made. Since its publication and other landmark events such as the African Ministers forum, Coopers and Lybrand carried out a water sector study in Zambia and proposed long term strategies for the urban sub-sector; the commercialisation enshrined in the NWP.

The MEWD spearheaded the NWP, which was accompanied by several Acts of Parliament looking at domestic water regulation and pollution monitoring in national waters. A local team from the MEWD, the MLGH and academics conducted the Water Resources Action Programme (WRAP) recommending ways of exploiting the economic potential of Zambia's water resources. According to them, though national strategies in water programmes make use of public funds the local populations need to be able to sustain the progress made and ensure cost returns[46]. Following the Dublin principles, water is recognised as an economic good which is scarce in localised areas. The conceptualisation of water as a scarce and economic good is reiterated in various fora, particularly by Ministry officials and managers of the CUs.

The notion of cost returns is linked to the theme of community participation in programmes and projects. Community members where these are implemented feel part of them and view them as their own. This perception promotes the sustainability of progress made after the handover if the local community is able to maintain any developed infrastructure. Participation focused projects stemmed from the acknowledged failure to achieve intended results through transfer of technology policies. It is an effort to move to a more user centred and appropriate technology transfer and is seen as a prerequisite to create effective forms of local organisations to manage and govern resources such as water. Participation became a development buzzword in the 1980s focusing largely on engaging intended beneficiaries in projects; cost sharing and the co-production of services emerged as dominant modes of participation (Cornwall and Brock 2005).The cost sharing is expressed as community commitment and viewed as a symbol of support for the project.

Community members participate in projects even though they are not involved in their formulation. Participation can take place at various levels and in separate domains including: project or programme creation, planning, implementation and execution. Some critics of World Bank projects classify them as top down given they are created and planned without the participation of the end users. Participation in most projects is only at the execution and implementation stages. The Poverty Reduction Strategy Papers (PRSP) may be able to bring in a more local approach to the creation of projects though the World Bank and other financing

[46] WRAP Documents available on http://www.zambia-water.org.zm/wrap/downloads.htm (Accessed on 23rd February 2004)

institutions make the final decision on whether to fund a particular proposal or not[47]. Additionally, Gould (2006, 2) notes they provide incentives for elected leadership as they give room for manoeuvre, in return the government commit themselves to a multi-faceted program of state reform, particularly public financial management.

2.3.1 Participatory paradigm shift

Midgley (1986, 16-20) suggests "the community participation theory evolved partly in response to criticisms of community development, which was viewed as inadequate given its roots in colonialism. Colonialists had a dual mandate to civilise while exploiting, use forced labour under the pretext of it being an indigenous institution and the need to establish desirable and responsive political structures". He concludes that "community development had bureaucratic administration and superimposed directions that stifled innate capacities of ordinary people to determine their own destiny and perpetuated the structures of inequality". In his view advocates of community participation have been influenced by populist ideas. "Popular participation theory suggests ordinary people have been exploited by politicians and bureaucrats who exclude them from the political affairs and development processes. Their simple way of life is threatened by the forces of modernisation and rapid social change and they face increasing hardship as a result of economic and political mismanagement".

Cornwall and Brock (2005) note that "most development organisations working within the UN framework promoted popular participation in the basic needs development approach. This approach suggested that the focus of aid should shift from investment in capital formation to the development of human resources". They point out "the ECOSOC in 1975 urged governments to adopt popular participation as a policy measure in national development strategy and encourage widest possible active participation of all individuals and NGOs in setting goals, formulating policies and implementing plans". In their view the mainstream participation did not refer to the shifts in power which was viewed as radical but to engaging communities in sharing costs and burdens of development. They go on to say "community participation became a channel for operationalising popular participation but rather than seeking to involve the citizens in defining their own development focus was placed on engaging intended beneficiaries in development projects. Participation rarely went beyond cost sharing and consultation". Some critics of participation suggest it was actively promoted by the IFIs because of the opportunities it afforded for countering grassroots resistance to reforms such as Structural Adjustment Programmes (Midgley 1986).

The lack of local community participation, particularly in Zambia, can be traced back to the 1970s and 1980s. "During this period the economy and development of Zambia was centrally planned leaving no room for public participation and emergence of local level democratic institutions. Before independence, the colonial administration relied heavily on traditional authorities as means to implement colonial policies" (Queiroz 1997). Traditional authorities refer to chiefs and headmen.

> "The historic disregard for broad-based participation, coupled with the limited opportunities for education and a paternalistic, central government, stifled the emergence of capable local level institutions and individuals, and pre-empted the emergence of local-level democratic processes. In the present day this situation limits the ability of communities to organise themselves into effective natural resource management units and compromises their lobbying effectiveness. Add to this the lack of capacity and a legal framework that confers excessive control on central government and we have a situation

[47] The PRSPs were created at the Annual World Bank Group and IMF meeting in September 1999. They became of international discourse after the Monterrey Consensus of 2003. The Consensus looked at effective channelling of development aid.

> where local communities are not empowered to protect or manage local natural resources. Thus the lack of grass-root capacity ranks as a principal root cause of environmental problems in Zambia" (Queiroz 1997).

Stifling the emergence of local level governing institutions cannot be denied particularly considering the effects of the one party state. However, some of the historic reasons that may have led to the current situations cannot stand the test of time. In other parts of the world, for example in the industrialised western countries, environmental awareness and the general increase in the mistrust of scientific solutions have led to calls for local level solutions[48]. The levels and types of awareness undoubtedly vary and paths of attaining a specific awareness also vary. Queiroz refers to formalised natural resource management units that are not identifiable in most rural areas. This does not mean that rural citizens do not have the ability to manage their natural resources; they have done this informally for several decades. The international NGOs actively participate in the drive to increase community participation in resource management while applying various approaches to development, which is usually assumed to be linear.

Awareness raising includes local politicians who usually do not have the will to prioritise the water sector. Mepham (2003) points out governments in less industrialised countries typically spend a low proportion of their national budgets on water and sanitation. He further adds that even within the area of basic social services, which as a whole receives only 13% of the budgets, water and sanitation tend to lose out to other priorities such as health and education. He illustrates that investment in water and sanitation does badly compared to other types of infrastructure using an example from 1996 when investment in water and sanitation constituted only about 0.4% of the developing countries GDP. In Zambia the water and sanitation proportion of the national budget in the last decade averages about 1.4% (Appendix F)[49].

The Zambian Environmental Threats Assessment[50] (Queiroz 1997) identified other key institutional problems such as the limited alternative sources of livelihoods forcing rural households to utilize resources in an unsustainable manner, institutional frameworks that are unable to undertake cross-sectoral management planning, weak government and non-government institutions that are unable to either regulate or facilitate sustainable natural resource management. It pointed out the weak local-level institutions that are unable to transmit grass-root expectations, lobby for greater local community empowerment, or sustainably manage natural resources. It drew attention to the lack of awareness on the part of policy makers in sustainable natural resource management and the lack of an appropriate legal and regulatory framework.

Institutional weakness occurs at various levels, from the national to the community tier. Civil society plays a crucial role in the strengthening of institutions particularly in communities[51]. It is linked to the social capacity and the responsibility of the individuals and society as a whole.

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[48] The west here refers to industrialised countries of Western Europe, the United States of America and Canada.

[49] This figure is based on budgeted amounts and not the amounts actually spent. The actual amounts spent are usually lower than the budgeted amount mainly because some funds are not released or are diverted to other projects (Water Aid 2003). Amounts actually spent are difficult to locate and account for in national documents.

[50] The Environmental Threats Assessment was undertaken by the USAID Regional Economic Development Services Office for east and Southern Africa. The office was set up in 1972 as a service oriented organisation to provide technical and support services to client USAID missions.

[51] Civil society comprises various groups and organisations that are formal and informal promoting a variety of interests (Midgley 1986). They are continuously morphing with some being created as others disintegrate. In Zambia this includes the labour movement, church organisations, NGOs, community groups etc.

Citizens share the communal responsibility based on their decisions at a household level and contributions towards their communities[52].

2.3.1.1 Responsibility shift to local level

Citizen responsibility, specifically its increase, is not directly addressed in the Zambian water sector[53]. It is constructed as a move away from state dependency. State officials repeat the message that the state will meet the citizen halfway. Repackaging the message of asking not what your country can do for you but what you can do for your country[54]. It also follows the self reliance discourse from the 1980s that was more a do-it-yourself belief in practice (Midgley 1986). It encourages citizens to care for the assets and infrastructure in their areas of residence. The state officials and development agents promote the discourse of responsibility during various stages of project implementation. They view increased responsibility as inevitable using the arguments of limited resources and sustainable projects. They continuously remind the community members how fortunate they are to have projects in their locations and the need to nurture them. Nurturing and maintaining the project symbolises appreciation by the target groups. However the increased responsibility is one way of avoiding local level resistance; community members apparently share the responsibility. It is a foundation for the local level management of projects and resources that is encouraged by the donor agencies[55]. It is easier to maintain in communities with capacity to support and maintain the various projects[56]. The vulnerable communities lacking such capacity continue to rely on outside assistance.

Capacity building is included in the development package[57]. It empowers some vulnerable members by developing skills for income generation and proposing development projects. Both community participation and commitment is necessary for the capacity building programmes to have any impact on the development of an area. Additionally they increase citizen responsibility for the development projects and reduce the levels of state dependency. According to Schacter (2000) “capacity building is not necessarily a new phenomenon, development agencies referred to it in earlier projects but its role has become more central since the early 1990s”. He points out that “criticisms of the insignificant impact of aid particularly in Africa led to a review of the focus of the development agencies and approaches used such as lack of recipient involvement in the planning and designing of intervention. A dependency relationship was maintained between the recipient and the development agencies that viewed projects as proceeding in a linear manner from problem identification to the implementation” (Schacter 2000).

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[52] One of the duties of a citizen given in the Zambian constitution states: “contribute to the well being of the community where the citizen lives, including the observance of health controls”

[53] Responsibility here refers to the cost sharing, proactive action and resourcefulness required from citizens by various actors such as the state departments and development agencies.

[54] This does not necessarily mean the end of the state but encourages citizens to help themselves and not depend on outside intervention even though the government is increasingly dependant on outside intervention itself.

[55] Donor encouragement is usually in the form of conditions attached to funding.

[56] Capacity in this case covers organisational, management and accounting skills as well as financial and manpower resources.

[57] The UNDP defines capacity building as “the process by which individuals, organisations, institutions and societies develop abilities (individually and collectively) to perform functions, solve problems and set and achieve objectives”.

In Schacter's view "increased emphasis on capacity building by development agencies is targeted at improving the public sector performance. The agencies view performance as a crucial ingredient for achieving targets of poverty reduction, providing better services and economic growth". Some consultants, mainly from the World Bank and donor agencies, analysing the public sector performance stress: the high wage bill, levels of corruption, quality of bureaucracy, weak mechanisms of accountability and effects of globalisation. They continue to impart their "superior knowledge" on the effective operation of public sector in aid of recipient countries. Most NGOs perceive capacity building as skills development by target populations and minimising the dependency on external intervention. However, Uvin (1981) argues the skills developed tend to support and enforce particular structures in the target populations. In government aid projects an elite group of local actors is usually engaged by the consultants, increasing their influence and resources. In the community water projects book keeping and writing project proposals are two of the key skills taught to the community. These skills require proposals to be submitted to a financier who in most cases will be an NGO and the record keeping is also targeted at some form of auditing, internal or external.

Incidentally, ways of ensuring the "appropriate" capacity is built on the long term require further attention. Just like willingness to pay differs from ability to pay, there is a difference between the apparent capacity and real capacity. The latter depends on the community and on the institutions formed to enable members to make use of the capacity[58]. Project proposals may be submitted but if no feedback is given to the communities in good time the capacity may be wasted and eventually lost.

2.3.2 Social Capacity

Social capacity is a community's ability to create and utilize resources such as networks and trust in a coordinated and cooperative manner[59]. The networks and trust are classified as part of the social capital, which is essential for community level management of natural resources and projects. It is illustrated in various ways, all pointing towards human assets within a society. In the Zambian water sector, the NGOs focus on capacity building in the rural and peri-urban areas. They encourage community members to participate in projects and manage their own resources. Incidentally, rural life is based on social capital, most activities are carried out in groups; farming, washing, cooking, harvesting, story telling, drinking etc. Presumably, most rural communities possess more bonding than bridging social capital. The former relates to associating with similar people such as family members or people with similar interests. The bridging capital refers to interactions with people who have diverse social and economic backgrounds and is more beneficial for building trust (Drekker and Uslaner 2001, 179)[60].

The target communities may possess the social capital but are sensitized on how it can be maximised by incorporating external resources such as project funding. They are usually far away from administrative centres that are frequented by the practitioners and supporters of local

[58] Reference is made here to social capital, which can be defined as a concept represented by informal norms that promotes cooperation between individuals (Fukuyama, 1999). There are ways of contributing to social capital for example through strengthening of social networks which can be recognised by policy makers and development agents.

[59] World Bank, (1997) Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development, Washington DC. This is a more general definition compared to several academic definitions that focus on the functions of social capital.

[60] The difference between the two types of capital is used to explain the lack of prosperity in rural communities where social capital is expected to be strong and thus have a positive impact.

initiatives[61]. The initiatives are usually concentrated in the urban centres where voices of the elite and educated can be heard and where formal structures in political and social organisations are recognised, for instance the established CUs supplying water, where complaints from clients can be addressed. Water watch groups are also established to give the clients a more united and assumingly powerful voice in the standard of service they receive and pay for[62].

The structures in rural areas are more informal and vary from one community to another. They evolve with the ideas and perceptions of the members. "When people interact with each other they begin to trust each other and find it easier to keep commitments. As a result, a community with higher levels of trust is expected to have better governing performance, more prosperity and economic growth" (Dekker and Uslaner 2001, 176). The sustainability of the projects undertaken in rural areas hinges on the commitment from the residents and the use of the established networks, though they are informal. These networks are explored in the case studies[63].

NGOs working in the rural water sector recognise the importance of the informal networks and endeavour to incorporate them in the water committees formed around water projects. Donor agencies increasingly adopted NGOs as aid channels through the project support preference as opposed to budget support. They were an option for reducing fund redirection by recipient governments, which was partly blamed for the lack of positive impact from aid. However, some donors questioned the legitimacy of the NGOs to make decisions on development projects. They viewed the increased international NGO activity as undermining the national sovereignty[64]. The NGOs claimed to represent the marginalised and the otherwise voiceless members of society. One way of proving their legitimacy was to encourage links with the grassroots and engage them in project proposals and implementation.

2.3.3 Development Aid

Several national and international NGOs work in the water and sanitation sector in Zambia channelling donor funding towards specific prioritised projects and areas. Some citizens believe NGO run projects are more participatory and have a local level focus compared to those funded by the IFIs and implemented by state agencies[65]. International discourse recognises the role of NGOs in strengthening the voices of the vulnerable and their ability to act as pseudo governments in some countries where corruption levels are high (Pfeiffer 2003, Bryant 2002)[66].

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[61] MPs usually visit the urban settlements more frequently than the rural settlements and peri-urban settlements. The local authority staff also lives in urban settlements and are aware of goings on in these settlements more than the peri-urban settlements that also fall under their jurisdiction.

[62] These are groups of concerned citizens who are effectively volunteers and not elected representatives. However, most residents prefer to complain directly to the customer's service departments of the CUs.

[63] Case study chapters in technical report.

[64] The former British International Development Secretary, Clare Short, was very vocal on this issue.

[65] Rural area residents praise the work of NGOs like World Vision and CARE International. The residents thank the NGO staff for coming to their aid when government basically ignores their plight.

[66] The presence of NGOs in some countries where donor agencies and IFIs considered corruption high resulted in a debate about the legitimacy of the organisations. Some

Water related NGOs operating in Zambia include CARE Zambia, World Vision, and Irish Aid, (Appendix G). Their projects usually focus on providing water and sanitation services to the poor[67]. The World Bank and AfDB focus their funding on capital intensive and nationally strategic projects such as the extension of services in residential areas, rehabilitation of run down infrastructure and the building of Hydro-electric power stations. The central governments are provided with loans for the projects based on the potential of economic development and reduction of poverty.

Development assistance plays a crucial role in building the capacity of national institutions, providing a lever for other forms of finance and bridging the gap of funding from central governments. However, the capacity would ideally be built on both ends using compatible objectives. Uvin (1998, 151-153) argues that outcomes of specific projects result from unclear and usually unspoken mixture of behaviours from both donors and recipient governments. He concludes it is difficult to attribute full responsibility for aid outcomes to any one party. In his view "the two cornerstones of the relations between the parties are the sovereignty of the recipient and the ideology of development given its institutional, psychological and political manifestations". Other authors in the field of development argue that development assistance undermines the capacity of the national institutions. Their arguments are in a particular context focusing on the power of the donors to impose policies (Marvin and Laurie 1999). However not all policies have a negative impact, in some cases the positive impact is significant. The recipient governments can sustain the capacity developed during projects particularly if they are internalised. The training given to some officials and citizens using aid projects potentially produces positive impact particularly when the low human investment of state workers is considered. The infrastructure installed during projects is also beneficial; maintenance costs are lower than installation costs.

The World Water Commission estimates that meeting global water security by 2025, including universal water and sanitation coverage would require approximately $180 billion annually for the next decade[68] ,[69]. The definition of global water security is an effort to move away from the debate around the commodification of water by implying a consensus for a water secure world, which the proponents link with privatisation policies. The current amount being spent is estimated at $80 billion (Mepham 2003). According to the Official Development Assistance (ODA), the

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representatives from development aid agencies felt the NGOs were being given too much power to make decisions in countries where they were not elected thus making them illegitimate authorities.

[67] Defining poverty is a challenging proposition for most local NGO teams. It is usually confined to income activities or the lack of them and more increasingly to livelihoods. However as Uvin (1998) elaborates when the poor define poverty it includes means of production, insecurity, vulnerability, empowerment, justice, education, access to information, human dignity and equity.

[68] The Commission was set up in 1998 by the World water Council and organisers of the second World water Forum in The Hague. It was chaired by Ismail Serageldin, a vice President at the World Bank and included representatives from Suez-Lyonnaise. The World Water Council was created in 1995 by the United Nations and the World Bank. The commission supports the privatisation of water supply and encourages Governments to stop subsidies and limit themselves to enabling a stable political environment for the private sector to provide piped supplies (World Socialist Web Site; www.wsws.org)

[69] According to the World Water Commission report titled "A Water Secure Future: Vision for Water, Life and the Environment", global water security means every human being, now and in the future, having access to safe water for drinking, adequate sanitation, and enough food and energy at reasonable cost. Providing adequate water to meet these basic needs must be done in an equitable manner that works in harmony with nature. For water is the basis for all living ecosystems and habitats and part of an immutable hydrological cycle that must be respected if the development of human activity and well being is to be sustainable.

assistance for water and sanitation is not targeted adequately to those countries in greatest need. In the 1990s the least industrialised countries received less aid for water and sanitation than the middle income countries[70]. Mepham stresses that resources allocated also need to be used effectively. Some programmes funded by development aid achieve only modest impact in return for high expenditure. He refers to Mozambique where a Japanese funded bilateral water and sanitation project cost $180 per head compared with a per capita cost of about $13.50 for a similar Water aid-funded programme in the same country. The costs vary with the level and type of technology compounded by "technical expert" wages. The high cost of some donor funded programmes is a barrier to reaching milestone targets. Applying appropriate technology in the less industrialised nations would reduce maintenance costs and also help in sustaining the positive impact of projects. The effective channelling of donor funds has been part of the international discourse since the late 1990s and fora such as the Monterrey Consensus held by the UN specifically tackled this issue.

The Monterrey Consensus took place in March 2003 and was attended by heads of member states and governments. As a U.N. Financing for Development conference, it identified the need to introduce a local focus to donor projects and targeting aid at the reduction of poverty while untying the aid from the interests of the donor countries and harmonising their procedures. It drew attention to the locally drawn up Poverty Reduction Strategy Papers (PRSPs), which outline the needs of less industrialised countries and their proposed solutions. The Papers ideally have a high local contribution, attracting donor agencies to support these ideas. They provide the basis for assistance from the World Bank and the IMF as well as debt relief under the Heavily Indebted Poor Countries (HIPC) initiative. The World Bank and IMF proposed the HIPC initiative and governments around the world agreed to it in the latter half of 1996. It was the first comprehensive approach to reduce the external debt of the world's poorest, most heavily indebted countries, and represented an important step forward in placing debt relief within an overall framework of poverty reduction[71]. The PRSPs are designed to be country-driven, comprehensive in scope, partnership-oriented, and participatory. The guidelines stipulate that they should be written every three years by national governments. The Annual Meeting of the World Bank Group and the IMF (September 1999) created them when it agreed that its concessional lending and debt relief should be based on nationally-owned participatory poverty reduction strategies.

Five core principles structure the development and implementation of PRSPs[72]. The strategies should be:

- country-driven — involving broad-based participation by civil society and the private sector in all operational steps[73];

[70] The mechanisms and processes in aid allocation depend on numerous factors such as priorities of the donors and recipient countries. The least industrialised countries probably focused more attention of health and education programmes than specific water and sanitation. The aid for water programmes was also affected by the lack of national water policies and local political will in these countries.

[71] World Bank Website www.worldbank.org

[72] World Bank Website www.worldbank.org

[73] This first strategy has generated a lot of debate from both practitioners and academics analysing the PRSPs after 4 years of their introduction. Some practitioners believe advances have been made by creating political space for local civil society actors often pushing them to be better organised to influence political processes. However others feel the space created is dominated by International NGOs with well resourced, highly professional exponents of the global

- results-oriented — focusing on outcomes that would benefit the poor;
- comprehensive in recognizing the multidimensional nature of poverty;
- partnership-oriented — involving coordinated participation of development partners (bilateral, multilateral, and non-governmental);
- based on a long-term perspective for poverty reduction.

Gould (2006, 1) describes the poverty reduction consensus "as a campaign of the self-styled "international donor community" to transform relationships between creditor agencies and the governments of the less industrialised countries". He continues that mainstream actors in the aid industry celebrate the PRSP partnerships as a revolutionary breakthrough in the global development effort. He concludes they are a signal that the recipient governments are ready to enter into the partnerships which qualify them for future concessional lending from the IFIs. Furthermore he identifies some of their pivotal components that rely on endorsement by the IFIs, which also define the criteria of the mid term expenditures. In his view they are new names for key macro economic policy conditionalities that have remained intact (Gould 2006, 2).

Donor agencies also claim to recognise the need for improved institutional arrangements and effective governing structures in the less industrialised world. Therefore some of them focus on strengthening state institutions and the software of projects. Some actors may view this as a new form of colonialism. It would be classified as such if the Donor agencies impose their ideas and overlook local initiatives and proposals to deal with local challenges. However, if they provide support for local initiatives they build on local assets and build real capacity. This ideal situation is no doubt challenging considering the fact that the "advisers and experts" already have preconceived ideas on what constitutes improved institutions and effective governing structures; influenced by neoliberal policies. The software deals with the second order aspect of development projects, covering capacity building at national and local level. Software targets are more complex to measure than hardware targets of say water supply infrastructure. This factor of second order aspects of projects presents a challenge for the different agencies working in the water sector.

2.4 Second Order Water Scarcity

Second order scarcity refers to the social resources required to successfully adapt to first order scarcity. It is the lack of economic and social adaptive capacity to manage a resource successfully according to the actors' definition of success. First order scarcity is the scarcity of the resource itself, in this case water (Ohlsson 2000). The second order nature revolves around society and its responses to scarcity. Perceptions of scarcity differ in different societies, locations and regions. The work done by Mehta (2001) in Kutch, India is only one example of the different social constructs of scarcity. She builds on the work done by Leach and Mearns (1996) about environmental narratives and concludes that "while water scarcity is a "real" enough problem with biophysical manifestations, it can also be manufactured in a way to serve the interests of the powerful actors like bureaucrats, politicians and farmers". The following sections explore the second order water scarcity in Zambia.

2.4.1 Water Resources

Zambia lies partly on the Central African plateau between 1000 and 1600 metres above sea level. Its topography is described as largely rolling to slightly undulating with infrequent hills and mountains especially along the Eastern border. Its natural vegetation is the savannah woodland, which is mainly dominated by the Miombo, Mopane and Munga woodlands[74]. From a hydrological

civil society. There appears to be an emerging concept showing participation as no panacea (Global Policy Forum, Social and Economic Policy)

[74] Zambia Country paper: Wetland Classification for Agricultural Development in Eastern and Southern Africa: the Zambian Case.1998. FAO Sub-regional Office for East and Southern Africa: Harare

perspective, it can be segmented into six major surface water drainage basins namely: the Zambezi, Kafue, Luangwa, Chambeshi, Luapula and Tanganyika basins (Queiroz 1997). Each basin contains extensive wetlands, lakes, rivers and streams. The country can also be sub-divided into three agro-ecological regions (Mukanda 1998). The first region covers the semi-arid rift trough areas found in the Luangwa, Lunsemfwa and Zambezi valleys and the low altitude plateau areas of the south western region. It has high temperatures, high evaporative losses and short crop growing seasons. The second region includes the central plateau which stretches from the east to the central part of the country. It has rainfall ranges of 800 to 1000 mm. The third region covers mostly the Northern part of the country which is the high rainfall region. Zambia's tropical temperatures are moderated by altitude (Mukanda 1998). The three annual seasons are known locally as the hot and wet season (December to March), the cool and dry season (April to August) and the hot and dry season (September to November).

Rainfall in Zambia averages between 1100mm and 1400mm (Queiroz 1997). In the western half of the country, it increases from 700mm in the southern part to 1500mm in the northern part, Figure 2.1. In the northeast section of the country the rainfall gradient increases from east to west. Over 90% of the rainfall is received as convective storms during the hot and wet season. Prolonged droughts are frequently experienced in the drier Southern, Western and Lusaka Provinces (Queiroz 1997).

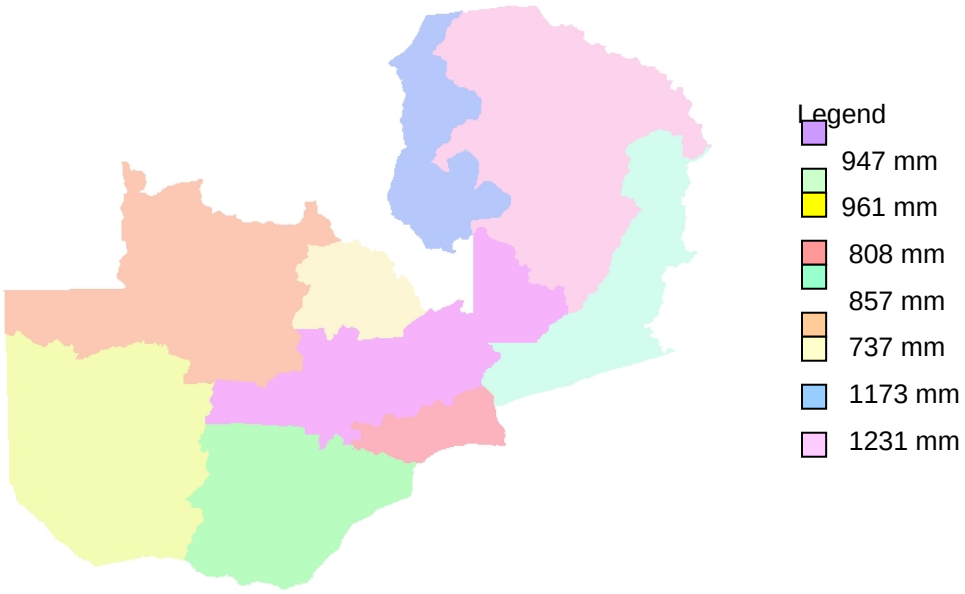

Figure 2.1 Annual Average Rainfall by Province

Water shortages are more frequent in the drought prone areas[75]. Residents in the southern part usually lack enough water for domestic use and to carry out daily activities such as watering gardens and providing for livestock, especially during the dry season. They have to walk longer distances to get water to meet their daily needs from boreholes that are drilled at health centres or schools through community water projects[76]. Access to water resources and use is constrained

[75] Shortage is an absolute term directly related to the quantity of water available for different uses.

[76] A community water project is funded by an external organisation such as an NGO or Donor agency with a small contribution from the Government for the latter. The community is expected to contribute 10 to 20% towards the project costs as a symbol of commitment to the project and an ingredient for project sustainability. The project can take the form of domestic water supply

by the quantities and qualities available along with various other factors linked to governance and distribution. Zambia has large volumes of water potentially available to its citizens but the challenges lie in both the distribution of water resources and the localised modes of resource appropriation; emphasising the need for a local focus.

2.4.1.1 Surface Water Resources

Water covers 11 890 sq km of the Zambian surface area[77] with a total surface water potential estimated at 237 million m^3 /day[78]. This is the area of all lakes, dams, open rivers, streams and wetlands. Figure 2.2 shows the main rivers of Zambia and their tributaries. The population of Zambia is 10.3 million[79]. Using this population and the potential total surface water, the annual potential per capita amount of surface water is approximately 8404.3 m^3. According to the quantitative definition of water scarcity that was given by Falkenmark; water stress occurs when the annual per capita water supply of a country is less than 1700m^3 and water scarcity occurs when the amount drops below 1000m^3, Zambia does not demonstrate water scarcity[80]. The United Nations Environment Programme defines water scarcity as; a situation where the amount of water withdrawn from lakes, rivers or groundwater is so great that water supplies are no longer adequate to satisfy all human or ecosystem requirements, resulting in increased competition between water users and demands. At provincial level the per capita amounts of water are significantly lower in the southern and western provinces and dependent on surface flows from the northern part; some local demands cannot be met during the dry season.

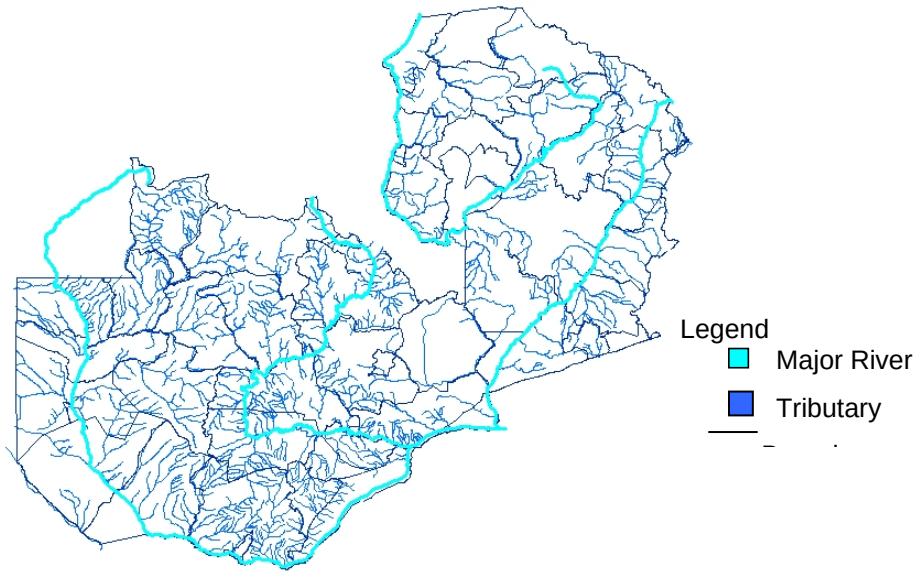

Figure 2.2 Main Rivers of Zambia and their tributaries

infrastructure, irrigation infrastructure or multi purpose water point used for domestic water, irrigation and fishing.

[77] Source: http://www.projectzambia.org/statistics.htm (Accessed on 01/02/03)

[78] Annex 5 WRAP Documents.

[79] CSO 2000, Population and Household Census, Lusaka: CSO.

[80] The type of scarcity defined here refers to amounts of blue water or surface water and is scarcity of the first order. Falkenmark's estimates have been over stated and in some cases used as the only indicators of scarcity. However, several authors have challenged their basis and use as sole indicators (Trottier in Trottier and Slack 2004, 132).

2.4.1.2 Ground Water Resources

Zambia's total ground water storage is estimated at 1, 740x10^9 m^3, while the ground water recharge is estimated at 160x10^9 m^3/ year (NWP 1994, 12)**.** In more recent studies the total average groundwater recharge is estimated at 57.5x10^9 m^3/ year[81]. The quantified water resources of Zambia give an indication of the available resources for the different water uses in Zambia[82].

2.4.2 Localisation and concentration of population

According to a study carried out by Chipungu et al in 1994, estimates showed that at least 200-400 litres/ day/person were accessible in urban areas and roughly 100- 200 litres/day/person was available in rural areas[83]. Accessibility in the urban areas refers to water that is readily obtainable for use. Availability on the other hand refers to potentially accessible resources. For example ground water may be available but not readily obtainable by some community members unless a borehole is installed. Additionally a river may be flowing past a residential area but if the water quality is poor, the water is not useful for domestic purposes. Availability of water resources does not always directly relate to their accessibility.

Water shortages occurring locally in the rural areas refer to the proximity to a natural water body or ground water source. Populations living close to perennial water bodies or readily accessible groundwater rarely experience water shortages. However, potable water cannot always be obtained from surface water bodies especially in the rural areas in the Kafue basin where water down stream of the mining, farming and industrial areas has high levels of minerals and nutrients like nitrates. Most residents assume clear water means good water especially groundwater based on its taste, being historically obtainable from wells and its reportedly soft nature[84]. Groundwater is believed to be purified naturally as it drains into the ground giving it a pure taste.

Given that not all surface water bodies are perennial and groundwater is not always accessible in some parts of the country, water providers and users face challenges in storing enough water especially in consecutive drought years. Local farmers estimate minor droughts occurring every five years and at least a major one every ten years. The meteorological department of Zambia has recorded a major drought roughly every ten years (Nkomoki 1998). In most urban areas the local water supplier manages the water reservoirs. In the rural areas the MEWD and the MACO usually build large and small scale dams for irrigation purposes and advise local residents to use them as multipurpose water points including water storage and fishing. The dams are found in villages with irrigation schemes concentrated in the Eastern, Central, Northern and Southern provinces. These storage options are coping mechanisms, primarily for water suppliers and communities, in the event of shortfalls in water quantity[85]. Other mechanisms include boreholes drilled by engineering firms, state departments or NGO teams to a depth where water is guaranteed even through the drought periods. The DWA has listed minimum borehole depths for

[81] Annex 5 WRAP Documents.

[82] Additional information on the water resources of Zambia is included in Appendix A.

[83] Cited by Chabwela and Mumba in Sherbivin, A, de., Dompka, V., (Eds). 1998. *Water and Population Dynamics: Case Studies and Implications Policy*. Washington Dc: IUCN, PRB, USAD, AAAS. Pp. 138 – 142.

[84] Chemically soft water has little or no amounts of dissolved salts and contains minimum amounts of calcium carbonate.

[85] Coping mechanisms are introduced as short term measures for the community to survive particular events. They are different from adaptive mechanisms that are more long term and may involve relocating populations, changing the crops grown in a particular area to suit seasonal conditions.

all Provinces, (Appendix A). The quality of water from boreholes is usually good and requires no further treatment before use. However, the District health officers advise residents using these water points to add chlorine to water before drinking as a precautionary measure to protect them against water borne diseases such as cholera.

2.4.2.1 Concentration of different user groups

According to the National Water Resources Master Plan (NWRMP), current water consumption amounts to less than 2% of available water resources and less than 3% of the surface water resources[86]. Projected increases in water demand for 2015 indicate total consumption will increase to 4% of available water resources and 7% of the surface water resources[87]. The NWRMP notes that the water quality may be problematic in some areas such as the mineral rich Copperbelt Province and farming block in the Central Province, which include high copper concentrations and nutrient loads that approach unacceptable levels, Figure 2.3. Advocacy for Environmental Restoration has been investigating the quality of water in the Kafue river basin along side other stakeholders (Kambole 2002) [88].

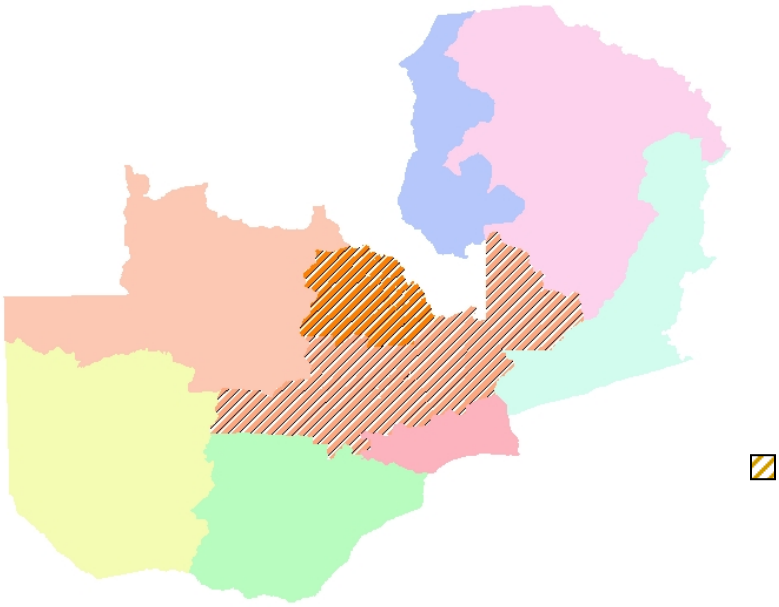

Figure 2.3 Provinces with high nutrient loads

[86] The NWRMP was a Japanese International Cooperation Agency (JICA) supported programme which was aimed at quantifying the water resources of Zambia.

[87] The technical experts in the NWRMP team made the projections based on population increases, economic development, changing lifestyles in urban areas and improved livelihoods in rural areas. The NWRMP was intended to be a foundation for the NWP using the principle that knowing what resources are available will enhance the planning capacity for water resources management and use.

[88] This is a local NGO working with communities in the Kafue basin especially in Chalimbana which is within close proximity to the cement producing factory, Chilanga Cement.

Most economic activity in Zambia is located along the line of rail and the major road network, which were primarily built on watersheds. These areas usually have enough surface and ground water resources to support the economic activity except during consecutive drought years. High volume domestic water users are concentrated in the urban centres of Zambia[89]. Approximately 45% of the Zambian population resides in urban areas[90]. In the rural areas, water used for irrigation and livestock significantly contributes to the volumes used since they are higher than the domestic requirements. In the urban centres most residents depend on rain fed farming in fields close to their areas of residence. Some also have backyard gardens for vegetable production during the dry months. Livestock owners are concentrated in the Southern and Western Provinces. Fishing is dominant in the Luapula and Western Provinces.

2.4.3 Traditional Water Uses

The four traditional water uses in Zambia are: industry and mining, livestock, irrigation and domestic use, see Table 2.1. As expected, most of the water resources available are used in irrigation. The second largest water consuming sector is domestic supply, see Figure 2.4 and Figure 2.5. The volumes of water used in Zambia are relatively higher than other countries in the SADC region[91]. According to the SADC database, South Africa has high water use figures given its industrial development and higher population. Zambians use approximately 12% of the South African figures, comparable to Angola and Tanzania. However, Tanzania's population is three times that of Zambia and also uses larger volumes of water primarily for irrigation; it has a larger area under irrigation.

Table 2.1 Distribution of Total Water Use

Distribution of Total Water Use (10^6 m^3/ yr)				
Domestic	**Mining and Industry**	**Livestock**	**Irrigation**	**Total**
271	170	90	1690	2221

Distribution of Groundwater Use (10^6 m^3/ yr)				
Domestic	**Mining and Industry**	**Livestock**	**Irrigation**	**Total**
75	13	42	59	189

Source: SADC Groundwater Monitoring Networks

[89] Domestic water use in urban areas includes watering of lawns, washing of cars, filling of swimming pools and other activities that are not done in rural areas.

[90] CSO 2000 Population and housing census; Tait 1997.

[91] SADC has 14 member states including Zambia, Zimbabwe, South Africa, Tanzania, Mozambique, Angola, Botswana, Namibia, Malawi, Swaziland, Lesotho, Mauritius, Seychelles and Democratic Republic of Congo

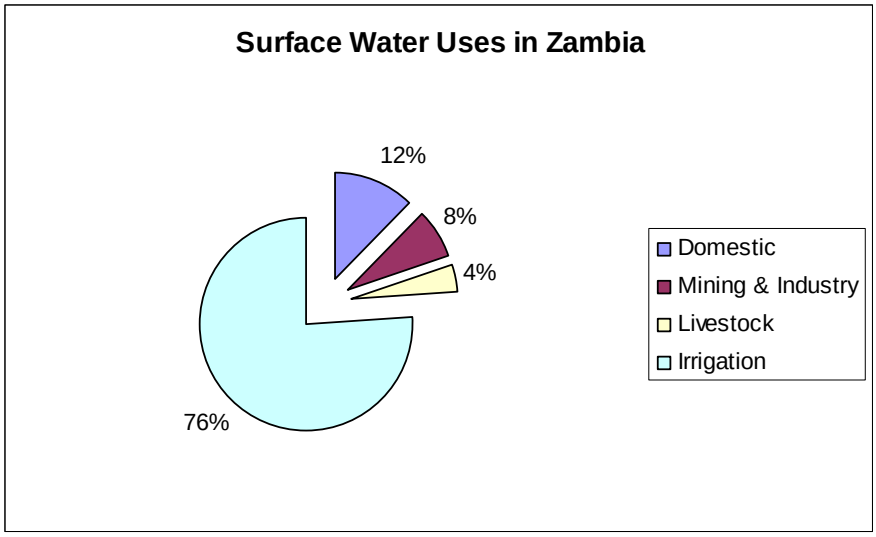

Figure 2.4 Surface Water uses in Zambia

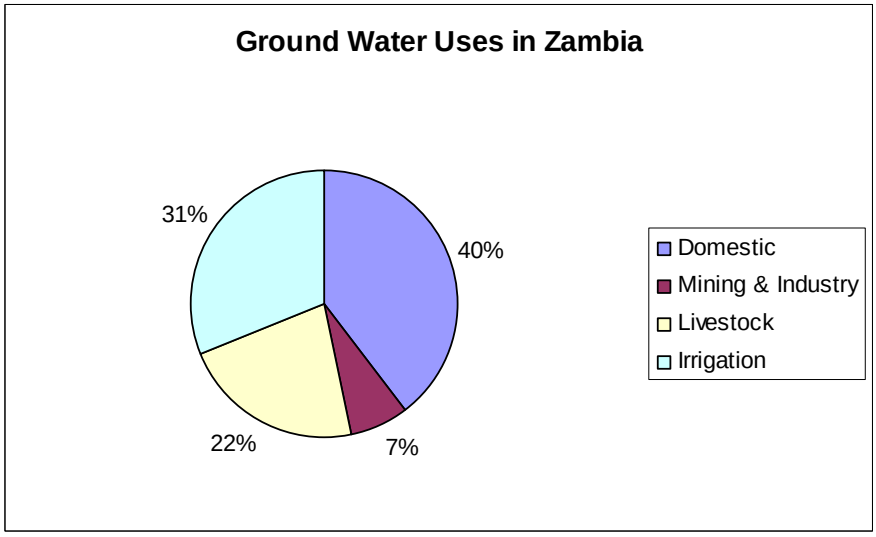

Figure 2.5 Ground water uses in Zambia

The 2015 forecasts in the NWRMP can be accounted for by increases in population, industrial activity and irrigation farming. Groundwater is increasingly used in urban areas especially by those CUs wishing to supplement their surface water sources. However, the Central Statistics Office (CSO) revised predicted increases in population after the toll of HIV and AIDS. In the 2000 census, population remained almost stagnant from the 1990 census; a growth rate of 2.3% had been expected. The NWRMP predictions will probably also be adjusted. Expansion in industrial activity and irrigation farming, which are part of the national development plans, are directly affected by HIV and AIDS through the productive workforce.

2.4.4 Non end water uses

The debates around water resources quantification and management create a field for the non end uses of water (Trottier 2006). The IFIs influence national water policies in less industrialised nations. As such they participate in the structuring of local economies and resource management.

Donor agencies also influence national policies and use water as a channel for their aid, which is usually attached with conditions that go beyond resource management and affect society and national economics (Gould 2006, 139). Recipient countries use water as a tool for attracting aid particularly through international drives like MDGs, which are a widely accepted consensus supported by donor countries and the IFIs. International NGOs and advocate groups analyse the impact of policies, offer alternative approaches to concepts such as social development and also use the community projects as channels for funds. Practitioners and actors such as the development brokers from local NGO teams, state officials and local experts that link communities with financing organisations use water as a source of income (Trottier 2006). Academic researchers explore issues in resource distribution and management and draw attention to positive and negative aspects of policy and decision making. The non traditional uses provide tools for the multi scalar analysis of decision making from the international level to the local level. The internationally influenced national policies are aimed at economic development and its potential social benefits.

2.4.5 Economic growth and water use

Economic growth, in its different forms, requires increases in both the flow and use of resources i.e. human, capital and natural resources. An increase in commercial farming implies an increase in cultivated land and both rain fed and irrigation farming. The latter requires increased use of surface and groundwater resources. Fertile land suitable for agriculture is concentrated in the Central, Eastern and Southern Provinces of Zambia. Most of the land used in commercial farming secures 99 year lease holds; a policy used to encourage investment and maintain state control of the land. It is mostly State land particularly in the Central Province; a region with an existing high demand on the water resources. The Southern Province is partly a drought prone area. The Eastern Province has a comparative potential for increased farming outputs.

In the Central Province, the increasing demand on water resources from agriculture, industry, hydro electric power, aquatic life, wildlife and domestic needs compels a forecast for a potential water market structure. Water rights are likely to be auctioned and the most economically beneficial use of water resources allocated the rights, following the allocative efficiency argument[92]. The WRAP team considers it an apt foundation because their mandate covers the economic exploitation of Zambia's water resources. The concentrated economic activity in the Kafue basin, which covers the Central Province also has an impact on the water quality. Industrial effluent is discharged in the basin thus the users downstream are adversely affected by high concentrations of nutrients and mineral loads.

Domestic use of water is a primary use according to the Water Act (Cap 198). It takes precedence in cases of dispute. Water quality is increasingly sensitive for domestic water providers. High nutrient concentration increases the treatment costs for water before it can be distributed to the clients. Dialogue and involvement of various actors in the Kafue basin is incorporated in a project looking at water quality and its management in the Kafue river basin[93]. Ten institutions established it in 2001 aiming to improve water resources management for food security and environmental sustainability with a special focus on poverty and hunger reduction and improvement of human health. The Kafue river is a strategically important river in Zambia on at least four levels; it supports a large percentage of the population, supports a significant amount of industrial activity, supports a large variety of wildlife and aquatic life and is located within the national borders. Incidentally, the Kafue basin project cements the state interests in the basin while maintaining the dependency relationship with the local communities.

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[92] Proposed in the water demand document from WRAP team.

[93] Dialogue on water, Food and Environment: Exploring Options- Building Awareness – establishing Partnerships. Kafue basin: searching for Livelihood options – Advocating Institutional Reform. The partners include WWF, FAO, ICID, GWP and the Government.

2.4.6 Conclusion

This chapter set out the context in which we explore the decision making and levels of interaction among actors in the Zambian water sector. It focused on the actants in the sector, their influence on the decisions made, the type and level of interaction among the actors. It illustrated the impact of the location of a particular actor on the source of water and the management of resources. In urban locations set formal arrangements govern water supply and management. The water suppliers obtain raw water from a nearby surface water body or from the ground and treat it before distribution to the end user. In the rural areas the community members are more involved in sourcing raw water for their various needs. A political ecological framework emphasises the local situation and allows us to link methods of management with locality. It also raises the question of whether various decision makers have identified and built on the local assets in the management system.

The levels of decision making and actor interaction examined illustrate policy is formulated at the national level and directives channelled through the state structure to the district level. Flow of information is predominantly in one direction, top down. The water sector regulation is also at the national level though in this case information sometimes flows in two directions. The supplier provides information to the national regulator who provides reports to gauge their performance. In the rural areas the water supply is based on a community and only weakly regulated through water project implementation. This introduces a debate for the appropriate level of regulation and whether potential community self regulation is likely to prevent blanket solutions. These questions are explored in the case studies.

The chapter also draws attention to challenges in jurisdiction and authority resulting from land ownership questioning the legitimate authority, compounded by the fluid boundaries of a community. The traditional leadership is considered legitimate in rural areas because of cultural beliefs and tribal customs. It does not exist in the urban and peri-urban areas. The authority of the traditional leaders has diminished since independence in 1964. Elected leaders now cover even the rural areas; the interests of the people are ideally represented by both the MP and the chief. The leadership role at the interface of community representation is explored in the case studies questioning the compatibility of the two types of leaders and the legitimate voice of the local populations.

Chiefs are influential in endorsing parliamentary candidates and political leaders usually seek their support in the disguise of paying them homage. They are directed to stay out of main stream politics according to the constitution of Zambia[94]. They are gatekeepers and usually nothing can happen in their areas of jurisdiction without their consent. The NGOs carrying out water projects and state agencies consult them and seek their consent before starting a project in an area. The construction of the project must suit the chief and his subjects, resulting in most projects being development projects. Sometimes chiefs are politically aligned, raising legitimacy questions especially if the state appoints them. It also leads us to question whether the construction of development projects is counter productive for effective traditional leadership. These questions are addressed in the main discussion sections.

The intertwined nature of the party and government in the one party state era resulted in political party chairmen having control over resources like water at communal taps in the urban areas. The socialist inclined Humanism resulted in the state subsidising most services. Most of the authority and influence of the party chairmen was lost after the conversion to a multi party state and the beginning of the 3rd republic. However we need to question whether all groups benefited from this democracy or are some groups favoured more than others. This question is addressed in the discussion chapter of the technical report.

[94] Article 129 of Zambian Constitution.

In the 3rd republic the economy of Zambia was liberalised and the water sector commercialised with the Government aim of improving service delivery and increasing the number of people with access to clean and safe drinking water. The commercialisation implied a reduction in the use of public funds in the sector especially in the urban areas where a significant number of consumers have the ability to pay for unsubsidised services. In the rural areas the water supply is dependent on the apparently limited public funds compensated by the activities of donor agencies and NGOs. These areas have a larger portion of the population with no access to clean and safe drinking water and water for livelihoods such as small scale farming is of particular importance. The dependency on NGOs leads us to question whether the state is relinquishing its responsibility to provide services for all its citizens and the logic applied. These questions are elaborated on in the main discussion chapter.

The responsibility of the citizens has undoubtedly increased since the liberalisation of the economy. They are expected to pay close to the full cost of supplying their water in urban areas and also maintain the water infrastructure at their households. In the rural areas selected members of the community are responsible for the maintenance of water supply infrastructure. The whole community plays a role in preventing vandalism and caring for the infrastructure especially during its use. The increased responsibility is a result of internal pressures, because of the limited financial and human resources, and international pressure. The donor agencies and the IFIs promote community level management and ownership of projects in the hope of improving project sustainability and maximising the impact of projects in different locations as part of the participatory approach to projects. We will examine the participatory approach and the decision makers within it in the discussion chapter.

Ensuring project sustainability requires a level of social capacity and commitment from the community. Project implementers like NGOs focus on capacity building at the local level. Social capacity is also a focus for some donor agencies like the DfID who are focusing on strengthening the capacity of state institutions. This has a bearing on the effectiveness of the locally grown poverty reduction strategies that are ways of shifting donor support from projects to the budget of the national government. In the budget support the donors finance locally drawn up projects and programs. This has implications on the sources of funds for international NGOs who benefited from the project support. The implications are explored in the discussion chapter.

This chapter detailed the water resources in Zambia emphasising the first and second order nature of the localised scarcity particularly in the southern and western parts. It illustrates some of the questions raised in the physical quantification of resources and the various local end and non end uses. The quantification focuses on the first order scarcity implying that a country with sufficient water resources satisfies the needs of the local end users. The second order scarcity focuses on the social resources incorporating the social capital of the community and allocation of the resources at various levels. It allows us to explore the roles of the actors at various levels and question the decision making and resulting potential beneficiaries or disadvantaged.

3 Methodology

This research applied qualitative methods, which value the narratives of individuals, organisations and groups of actors. The research acknowledges the narratives and a researcher's account of these are embedded in interpretations. The challenge is to dig below the surface and explore why they exist. Their contribution is maximised through semi structured interviews, selected as a raw results gathering method, supplemented with focus group discussions and field observations.

This research is a multi site study that potentially contributes more to the body of knowledge starting from the grass root level. It provides opportunities for revealing contrasts and similarities between sites, which promotes the in-depth analysis of local conditions and their impacts on the research subject (Hannerz 2003). It particularly enabled the inclusion of all nine administrative provinces of Zambia; every provincial headquarter was visited. The steps in site selection and information collection methods are laid out in this chapter.

The chapter starts with methods sections that detail the site selection process, setting out where the research was carried out and the information collection methods. These are followed by illustrations of conducting the research in the given locations including some perceptions of the research and experiences at the sites. The chapter ends with an analysis of the various types of responses by the interviewed actors.

3.1 Methodological Position

This research involves a diverse group of actors. The power relations among the actors are expected to change over time. They are dependent on internal factors such as human interaction, resource availability and actor perspectives within the sector. They are also dependent on some external factors. Bryman and Burgess (1999, xii) note that the qualitative nature of research such as this, "allows the exploration of the human interaction and fluid frameworks of decision making and power relations". They also add that "qualitative research rules out the positivist approach and other "hard" science based theoretical perspectives, which usually focus on patterns that are external to human behaviour and generalising laws to predict, explain and control events".

This research explores the local knowledge applied in the decision making and the actor interactions. The knowledge is developed over time and represents the actor's understanding of their situation and ways of coping with it. The actor perceptions and interpretations are exhibited in the strategies deployed. The information, even if its collection methods are participatory, requires rigorous analysis from the researcher allowing a multi-scalar view, exploration of links and causes in it and interactions among various actors. The personal accounts given in the interviews are further used to explore the strategies deployed by the actors. The roles of formal and informal institutions are also analysed using the same framework.

The analysis of the raw results attempts to understand human behaviour and details how each member of society understands his actions. It leaves room to integrate evolving theories such as those relating to power and social relations. The term evolving here implies a selection of theory that is guided by the raw results being analysed as popularised by Grounded Theory (Strauss and Corbin 1998). Even though more elaborate and meticulous development of theory is expected in Grounded Theory, in this case it was used to guide the evolvement. The emergence

of theory from the raw results is a key feature in qualitative research. It rejects the notion of starting out with theories to prove or disprove (Bryman in Bryman and Burgess (eds) 1999, 39). The postmodern approach also avoids the grand narratives. The importance of a narrative is developed from the participants that are in the situation and not from secondary sources of information. The research illustrates the diversity in a given situation and awakens curiosity in the decision making process and the power relations as it develops.

Qualitative studies are sometimes seen as rather subjective when compared to quantitative studies. Bryman (in Bryman and Burgess (eds) 1999, 38) links this to "their nature and the desire of most qualitative researchers to become close to their subjects and to be an insider". The closeness sometimes interferes with the interpretations that prevent a researcher from entangling their own perceptions and understanding of the situation with the findings. It is even more difficult to separate the self in cases where a researcher is conducting fieldwork in their country of origin. Ideas of romanticism begin to formulate unless she can detach herself from the case study sites. The attachment affects the validity of the raw results and knowledge collected as these are potentially influenced by the researcher's perceptions.

The validity of knowledge was considered during the design of the semi-structured interview guide and incorporated in the use of the rolling structure of the interviews and focus group meeting guides. A researcher relies on the sharing of knowledge and relaying of personal accounts, even though it maybe arguable in some cases. Zambian citizens are well known for being kind and friendly. Some residents' link this to the country being land locked, sharing borders with eight other countries. A common belief is that in day to day life, it eventually pays to be kind to or to help out a neighbour or stranger. This belief and others like it, that are usually taken for granted, proved worthwhile during the fieldwork. On most occasions the fieldwork went very smoothly even when the researcher was visiting a town or community for the first time.

3.2 Site Selection

The International Institute of Sustainable Development research guide section on study site selection emphasises the importance of representing various points along a continuum, sufficiently far apart to show major distinctions (Rennie and Singh 1996). Distinctions in cultural practices are expected in the individual provinces of Zambia; each one is dominated by separate tribes and ethnic groups. The tribal relations are more influential the rural areas than the urban locations. Diversity in the urban areas is compounded by internal migration and inter-tribal marriages. The multi site study enabled the cultural distinctions to be explored. Provincial headquarters were included as the main site in each province based on the fact that they are the co-ordination centres for provincial strategies, document preservation and decision making.

In the water sector a provincial water engineer is responsible for co-ordinating activities in the various districts. The provincial headquarters has a team of staff that work with the provincial water engineer. The team operates from the centre but can be sent out to work in other districts. Some provincial headquarters are also the base of the CUs supplying domestic water to urban residents. They are all accessible using the main road network; providing another advantage for the selected study sites. The geographical location of the sites is shown in Figure 3.1. The population characteristics and main economic activities are listed in Table 3.1.

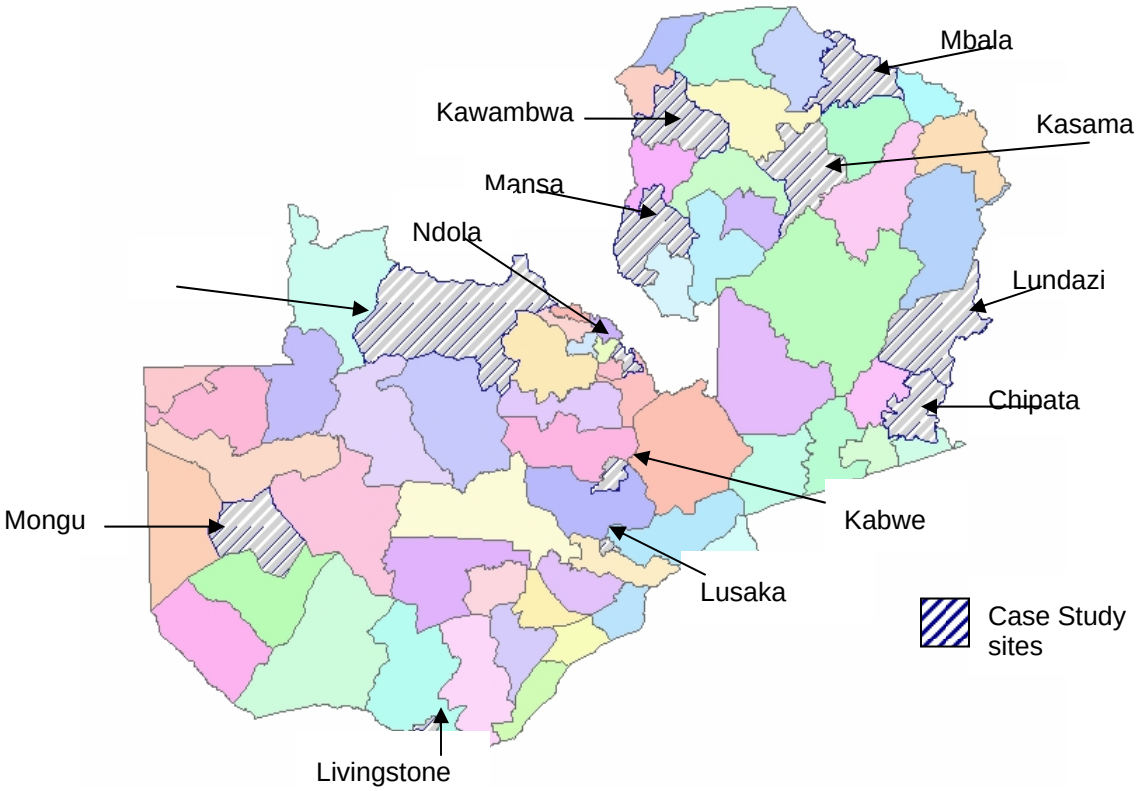

Figure 3.1 Districts of Zambia

The case study site selections lie at three separate levels. The first level is Zambia as a state, the second is the town or city and the third is a community either within or on the outskirts of the town. The town refers to the urban centre or specific area where the administrative units are found. As such some third tier case study sites are found within the district but not within the town. Most towns in Zambia have the same name as the district, the larger administrative unit inherited from the colonial era. A district has one administrative centre with an urban centre and a rural area surrounding it. Several districts make a province. The nine provinces make up the country, Zambia.

The Local Authority in each district divides it into separate townships. Their number and size varies according to the population and the local economic activity. Lusaka, the capital city, has the largest population and number of townships. Its figures are closely followed by towns on the Copperbelt Province. Mining activity on the Copperbelt continues to attract migrants, seeking work in the mines or supporting industries, from other parts of the country. In most urban areas, the residents of a particular township may have relatively the same affluence.

Table 3.1 Study Sites Locations

Town	Province	Pop. 2003	Main Economic Activity	Main Domestic Raw Water Source
Chipata	Eastern	92.1	Farming, Trading	Lutembwe Dams
Kabwe	Central	219.6	Former Mining, Farming, Fishing	Mulungushi River and Ground water
Kasama	Northern	72.4	Farming, Trading	Lukupa River and Milima Stream
Livingstone	Southern	111.2	Farming, Tourism	Zambezi River
Lusaka	Lusaka	1265.0	Industrial, Farming	Kafue River and Ground water
Mansa	Luapula	51.0	Fishing, Trading	Mansa River
Mbala	Northern	16.9	Farming, Trading	Lake Chila and Lucheche Stream
Mongu	Western	37.1	Farming, Fishing	Ground water
Kawambwa	Luapula	10.0	Farming	Natural Spring
Ndola	Copperbelt	349.3	Former Mining, Trading	Kafubu River, Old quarry, Dam
Solwezi	North-Western	4.0	Farming and Mining	Solwezi River
Lundazi	Eastern	12.0	Farming, Trading	Lundazi Dam

Population of Towns and Cities in 1000

Adapted from: http://www.world-gazetteer.com/c/c_zm.htm (Accessed on 10/02/03)

In the mining and former mining towns, where the full scale mining operations have been closed down, the Local Authority divided the townships according to the place of work of the residents. The miners all lived in mining townships while those working for private industries, the civil service and the Local Authority lived in government or non-mining townships. In the non-mining towns, the township locations were solely based on the planning of the Local Authority with no significant reference to the place of work of the residents. The division of the residential areas has changed since the privatisation of the mines and other parastatals in the late 1990s. The place of residence is no longer associated with the place of work. These divisions affected only two of the study sites, Ndola and Kabwe.

The economic activity, population and ethnic mix of the case study site have an impact on the actor interactions and strategies deployed for access, control and allocation of water resources. Ethnicity is a sense of identity with a larger social, cultural or linguistic group (Foltz in Bell and Freeman (eds) 1974, 103). In many instances it is contextual, multiple and fluid. Related to the concept of ethnicity are the concepts of language and tribe. A tribe is more closely knit group usually identified by a common way of life or cultural practices and sense of group identity and distinctiveness (Kotecha and Adams 1981, 48). Officially 73 tribes are recognised in Zambia. It is usually assumed each one has its own language. Some languages grouped according to

common grammatical and vocabulary characteristics are given in Table 3.2. The location of the various tribal groupings is given in Figure 3.2. Each ethnic group is likely to have beliefs and values regarding water, its sources and its uses. The tribes of southern Zambia such as the Tonga are herdsmen, water for livestock is important to them. The tribes of north western Zambia such as the Ushi are fishermen. The water quality in lakes and rivers that support the aquatic life is important here. The internal migration within Zambia makes the clear cut distinction among ethnic groups according to regions difficult. Increased internal migration is linked to the emergence of the wage economy that accompanied the opening up of the mines in the Copperbelt province.

Table 3.2 Groupings of the Tribes of Zambia

Group	Tribes	Province
A	Aushi, Chishinga, Lunda, Shila, Tabwa, Bisa, Lala, Kunda, Kabende, Mukulu, Ng'umbo, Twa (Bangweulu), Ambo, Luano, Unga, Bemba, Swaka, Lamba, Bwile, Lima	Luapula, Northern and Copperbelt
B	Lozi	Western
C	Kwandi, Kwanga, Mbowe, Mbumi, Simaa, Imilangu, Mwenyi, Nyengo, Makoma, Liyuwa, Mulonga, Mashi, Kwandu, Mbukushu	
D	Lunda, Kosa, Ndembu	Luapula and North Western
E	Luvale (Lubale, Lovale), Luchazi, Mbunda, Chokwe	North Western and Western
F	Mambwe, Lungu, Inamwanga (Namwanga), Iwa, Tambo, Lambya	Northern
G	Wandya, Nyika	Eastern
H	Nkoya, Lukolwe (or Mbwela, Lushangi, Mashasha)	
I	Nsenga, Ngoni (Mpezeni)	Eastern
J	Chewa (Nyanja), Ngoni (Nyanja)	Eastern
K	Tonga, Toka, Totela, Leya, Subiya, Twa (Kafue), Shanjo, Few, Ila, Lundwe, Lumbu, Sala, Lenje (or Lenge), Twa (Lukanga). Soli	Southern and Central
L	Tumbuka, Fungwe, Senga, Yombe, Ngoni (Magodi)	Eastern
M	Goba (or Korekore), Shona	Southern
N	Chikunda	

Source: http://www.zamtel.zm/zambia/page3.htm (Accessed on 17/03/03)

Covering every tribe would have been an ambitious project. The selected case study sites determined the inclusion of a particular tribe. The groups in Table 3.2 represent tribes that not only have common grammar and vocabulary but also similar values and origin in some cases. For example in group A the Bisa and the Ng'umbo tribes both broke off from the Bemba tribe during their migration within Zambia (Brelsford 1956). Though the historical account of the breaking up of dominant tribes like the Bemba may differ according to the narrator of the oral history, there is a general consensus on the common origin. Groups A, B, D, E, F, I, J, and L were covered in at least one of each study site.

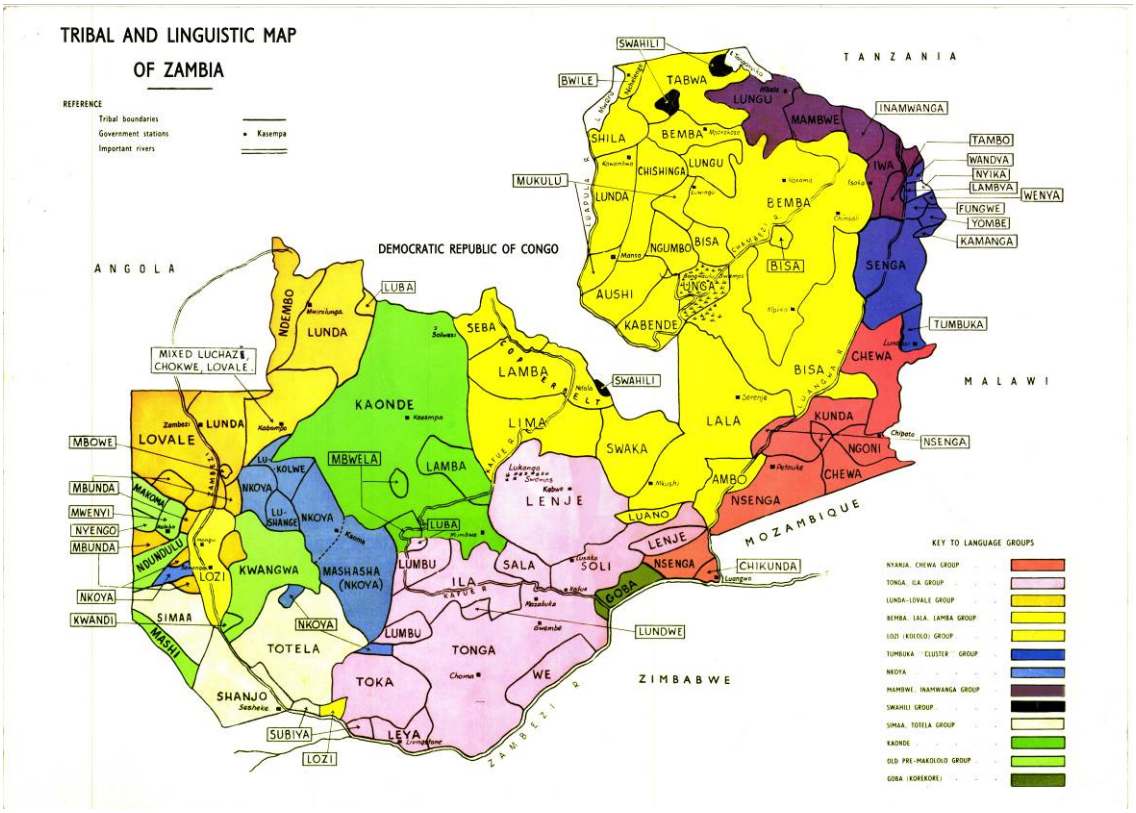

Figure 3.2 Tribal Map of Zambia

3.3 Raw results Collection

Raw results collection began with the use of secondary material in the literature search carried out during the first few months of the research. The sources included published books, journals, reports, conference proceedings and electronic resources. The material was used to establish existing knowledge and give some direction to the research and the type of empirical results to be collected.

3.3.1 Secondary Material

Secondary material was obtained before and during the field visit. The reports obtained from various government offices and the National Archives of Zambia were the main source in the field. Archive material provided details of the decisions made at the national scale in the water sector. It was used to identify significant changes and reforms in the sector as well as the potential reasons behind them. It placed them in context and provided a chronological understanding of the evolution of the sector. The archives also contained national budget reports that were used to obtain trends in the budget allocation for water related projects and show patterns of changes in finance directives. For example the changes in the grants and loans given to the Local Authorities prior to the mid 1990s affected the planning situations regarding water and sanitation at this level. Previously the Local Authorities received allocations for water and sewerage projects. The change in budget allocation coincided with the creation of the CUs, which are expected to source funds for water and sanitation projects outside the central government budget.

Other sources of secondary material included project reports from international organisations such as the World Bank, NGOs and other project teams working in the water sector. Regional organisations like the SADC have websites that provide information on water resources[95]. Websites from various organisations and working groups such as the WRAP were also useful[96]. The material was used to identify actors and potential interviewees from interest groups other than the general public.

3.3.2 Actors and Stake Holders

In order to achieve some of the main objectives of this research, a large cross section of actors needed to participate. An actor in this research refers to everyone with identifiable interest in water as a resource[97]. It covers the individual users, commercial users and suppliers, small scale suppliers, government ministries and agencies and other institutions. The term actor dispels the power connotations that are associated with the use of the term stakeholder, which is predominantly used by government agencies, NGOs and donor agencies. The groups that were initially identified included: the CUs, the MLGH, the Water Board and the DWA in the MEWD, the Ministry of Environment and Tourism, the NWASCO, the ECZ, Farmers, Village Heads, Community leaders, the general public, Private Companies, Parastatals such as the ZESCO, project teams such as the WRAP, NGOs, Donor Agencies, Conservation Officers, Wildlife Officers, Tourism Operators and District Officials.

The actors identified provided the initial interview targets in various towns where their organisations and institutions were located. The communities where the interviews and focus groups were conducted were selected with the help of the Local Authority staff who suggested those that would give a variety of raw results for the research. Those with similar arrangements regarding water provision and related issues were put forward as a group. The researcher randomly selected one community from each group as she had not visited most of the locations before. Further interviewees were identified during the visit to a site.

3.3.3 Primary Results

The semi-structured interviews conducted with the actors constituted the primary results sources. Potential interviewees were identified using a compiled list of actor groups such as users, suppliers and organisations in the water sector. The researcher further divided groups according to their specific role: the type of user for instance farming or domestic etc, type of supplier for example water utility, Local Authority etc and the type of organisation for instance policy making, NGO etc. She drafted separate interview guides for the various groups of actors (Appendix H).

The interview guideline for residential interviewees or domestic water users and agricultural users contains three sections covering the sources of water used, the responsibility for individual water sources and the strategies deployed to ensure access to water. The first section collects general information about the interviewee such as length of residency in the area, key factors that led to the decision to live in a particular area and main uses of water. The second section looks at any limitations or guidelines that exist for the use of a water source and interaction with other water users. The final part looks at the strategies used by the users to ensure access to water and any

[95] This information is actually provided by the separate government agencies and compiled by the SADC committee.

[96] The WRAP is a mostly donor funded project looking at the economic exploitation of Zambia's water resources with a focus on institutional and legal frameworks.

[97] It is acknowledged that not all interested parties participated in the research but an actor was selected from each group identified as a stakeholder

suggestions of changes they would like to see in their areas regarding water supply. The organisational interview guideline is arranged in a similar manner to that of the residential group. The first part looks at the role the organisation in the water sector. The second section looks at the limitations and guidelines for the organisation's role and its interaction with other actors in the sector. The final section focuses on the strategies deployed to ensure they fulfilled their role effectively and any changes they would like to see in the water sector.

The analysis of the results from the residential group concentrated on the strategies deployed by the various users and their levels of interaction. They are associated with the source of water for the user, the quantity of water required and its use. The analysis for the organisations focused on their role and position in the decision making levels and hierarchy. Some roles overlapped especially at the national level. In some organisations, multiple interviews proved useful in verifying the information collected and separating individual and personal views from the organisational perspective.

3.3.3.1 Interviews

Semi-structured interviews are flexible in the sense that they allow information sharing as and when they take place (Kvale 1996, 5). Their non-rigid format allows the interviewee to bring up any information that the researcher may not have thought of prior to the interview. "The interviewees are also given a considerable latitude for answering questions in the sequence they are asked" (Bryman and Burgess 1999, xviii). These qualities were beneficial during the collection of local knowledge. The interviewees were able to suggest other avenues of interest especially those applicable to their local situations.

The semi-structured interview is also useful because it can be used as a rolling structure (Kvale 1996, 7). The questions can be adjusted after each interview to include those that were not initially included in any prior interview guide. This was a useful aspect in this research. Some members of the general public were able to relate to issues from other communities and also give examples of projects that had taken place elsewhere that may be beneficial to them. The residents of Kabwe and Ndola had seen some water schemes when visiting relatives in Lusaka. They were able to suggest possible impacts of such schemes in their communities. The suggestions would most likely not have been made if a structured interview was in use or a questionnaire administered in a survey format.

The survey format method is concluded to be more applicable in studies or research where numbers of respondents are important. The saturation principle that can be applied to interviews and coding was found to be more applicable in this research (Strauss and Corbin 1998). It refers to the lack of new material being produced from more interviews and results in the variation of the number of interviews carried out in each location. The interviews are wound up if no new information comes up and the researcher moves to the next community.

The length of interviews varied according to the interviewee and the group they belonged to. Interviews with members of the general public lasted approximately 30 minutes while those with representatives from government and other organisations lasted about 90 minutes[98]. The

[98] The times given here are approximations of the interview lengths and should not be taken to mean strict timing was adhered to. Some interviews lasted for over three hours because of the wealth of information and knowledge of an actor.

interviewees in various institutions were usually assigned by the head of operations or a director. Members of the general public were selected at random during field observation. The interviews with the general public were dependant on the availability of the interviewees[99].

The qualitative nature helped in the decision to use semi-structured interviews and focus groups as opposed to questionnaires. This research covered all provinces of Zambia; each town would have required the translation of the questionnaire into a local language. Internal migration also implies that a particular town would require questionnaires in several local languages unless they were only administered to members of the general public who had been to school and thus would understand English[100]. The researcher personally conducted the interviews and focus group meetings making the analysis more comprehensible.

3.3.3.2 Focus Groups

Focus groups were useful starting points in some communities. They have the advantage of interaction, flexibility and the possibility of a rolling structure (Morgan 1988, 2-4)[101]. They are useful as a method for collecting information from a relatively large group of people simultaneously. Conducting such discussions requires less time overall than one to one interviews. However, they require more time and resources to organise and conduct effectively. The researcher arranged most meetings in a short period of time by targeting the RDCs that are constituted by elected community leaders as the focus group participants. They were contacted through their secretary or chairman via the Local Authority. They had also participated in focus group discussions before and were acquainted with each other. This is not always a desirable quality of focus group participants. Familiarity with each other sometimes affects the information provided by the participants. They are likely to be extra cautious and selective in their discussion (Stewart and Shamdasani 1990, 20). However, in this case it was beneficial because they managed to complement each other when providing information during the meeting. The discussions lasted between one and two hours and were limited to peri-urban and urban areas where the RDCs exist.

3.3.3.3 Field observation

The observations in various communities complemented the interviews. After each focus group meeting a selected group of community leaders gave the researcher a tour of their area of residence. The general public members were interviewed during these tours. One disadvantage of this arrangement was the community leaders being present during the interviews but they encouraged the members to be honest and open when being interviewed[102]. It can be argued that the presence of the community leaders may have had an adverse effect on the openness and honesty of the interviewees especially if they anticipated any retribution any negative comments. Incidentally, the community leaders and the members thought that openness would benefit them all. This conclusion also holds in the case of water schemes especially those that were run by the community leaders. In some cases the researcher asked the scheme managers

[99] Availability here refers to the willingness to participate and the time involved.

[100] English is the official language of Zambia; formal education and business are done using this language.

[101] A rolling structure means the guide questions can be revised during the discussion or in a later session to include themes raised by the discussants.

[102] The encouragement was given verbally with reference to possible benefits of openness such as drawing attention to community problems regarding water with the hope of securing funds to help alleviate any suffering.

to remain at a distance while the interview was being conducted. They agreed to this request adding that open responses were also beneficial to them as a group and would help them improve the operations of the water scheme if need be.

Observation was also used as a triangulation method (Smith in Flinders and Mills (eds) 1993). This may not always be necessary in some qualitative research but the researcher noticed that during the focus group meetings each community wanted to seem worse off than the neighbouring ones. The perceived need to portray one's community as worse off than their neighbours was probably a result of the expectations of the research. Field observation also helps dispel some common narratives from local knowledge and secondary material. Common narratives are usually compounded by the opinionated views of experts.

3.4 Common Narratives

The need to carry out extensive field visits and the role of experts, usually from the outside, in relation to local knowledge is emphasised by Leach and Mearns (1996). They refer to "received wisdom, mainly on the state of the African environment, which is grounded in a specific cultural policy paradigm and is a set of ideas sustained through labelling, commonly represented in the form of a narrative". The discourse draws attention to the way in which relations of power constituted through everyday familiar acts can be taken for granted and thus go unnoticed.

Wood contributed to the power relations debate by arguing that "labels misrepresent and deliberately falsify the situation and role of the labelled[103]. In that sense labels can in effect reveal relationships of power between the giver and the bearer of the label". In his view they are usually a way of apportioning blame of the state of affairs on the labelled and are perpetuated in written texts and are sometimes adopted in international discourse. Most of these narratives were compiled from texts written by fieldworkers some of whom were colonial officials.

Hoben argues that "environmental policies promoted by colonial regimes and later by donors in Africa rest on historically grounded, culturally constructed paradigms that at once describe its solution"[104]. He goes on to say, "many of them are rooted in a narrative that tells us how things were in an earlier time when people lived in harmony with nature, how human agency has altered that harmony and of the calamities that will plague people and nature if dramatic action is not taken soon. The scenarios of how things were are based on the notion of carrying capacity and equilibrium"[105]. In the context of equilibrium, this is a traditional society in culturally regulated harmony with nature and thus remaining within carrying capacity. This discourse can be linked to the cautionary limits of resource use and later warnings against the development of consumerism given by experts who in some cases discounted the benefits of intensification. The professionalism of the expert legitimises the knowledge they produce. Roe states, "Crisis narratives are the primary means whereby development experts and the institutions for which they work claim rights to stewardship over land and resources they do not own". By generating and appealing to crisis narratives technical experts and managers assert rights as "stakeholders" in the land and resources they say are under crisis[106].

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[103] Cited in Leach and Mearns (eds) 1996, 7.

[104] Cited in Leach and Mearns (eds) 1996, 7-8.

[105] Carrying capacity is defined as the number of people and/ or livestock that a given set of ecological conditions can support. Once this number is exceeded the situation would lead to a spiral of declining productivity.

[106] Cited in Leach and Mearns (eds) 1996, 20.

The narratives of crisis are not unfamiliar in Zambia. The traditional slash and burn method of agriculture in the northern region was seen as causing large scales of deforestation and environmental damage during the early visits from experts[107]. It was later established that the local tribes of northern Zambia used to manage their land effectively by ensuring fallow periods when vegetation could reproduce especially since strict boundaries of tribal settling were almost non existent. The introduction of fixed boundaries by the colonial administrators reduced the time allowed for fallow periods due to the limited amount of land each tribe was allocated. The local practices had arguably evolved as adaptive strategies for the communities.

Crisis narratives also led to the water sector reforms and the improvement of public service delivery. The "crisis" point was reached in the late 1980s after decades of continuous dilapidation of infrastructure and management structures within the water sector. Most Local Authorities were unable to provide clean and safe drinking water to a significant percentage of the populations in their jurisdictions. The crisis in the domestic water service delivery also affected the installation of water points for livelihoods in urban and rural areas. In some rural parts of western and southern Zambia the situation was worsened by the intermittent droughts.

Narratives concerning the water resources of the drought prone southern Zambia usually hit the headlines when near starving populations require food aid from the international community in times of prolonged drought (Chipenzi and Lombe 2005; Kabwela 2005; Mangwato 2005; Mapushi 2005, Hambuba 2003). The northern part of Zambia receives more stable quantities of rainfall compared to the southern part (Appendix A). The southern centred droughts are intermitted with periods of floods which also result in near starving populations. As Mehta (2001) argues in her work the aspects of real scarcity will usually form a smoke screen over aspects of manufactured scarcity in drought prone areas. These narratives influenced the researcher's perspective on water scarcity in Zambia prior to the research.

The researcher's position in this research is influenced by numerous factors such as her upbringing, education and general life experiences within Zambia. Being raised on the Copperbelt Province, she was accustomed to numerous narratives, which she took for granted. Her education in the "privileged" mine owned trust schools and later secondary school potentially resulted in her perception of differences in the standards of services provided by Local Authorities and the mining firms. She was able to compare the services from the separate providers during visits to relatives who resided in other locations. Her tertiary education in an engineering field informed her perceptions of the potential solutions science offers for some of the perceived challenges in the Zambian water sector. During some earlier the fieldwork for an MSc she encountered several engineering based applications aimed at domestic water supply. She noted several failed projects and obsolete infrastructure. These visible limited efforts raised several questions that informed some of the research questions. Leach and Mearns (1996, 22) address some of the conclusions drawn from failed interventions. "Historically if a given policy or intervention package fails or is resisted by the "target group", it is implicitly assumed to be because the target group is recalcitrant or ignorant rather than because the problem was misconceived in the first place". One solution offered for dealing with the misconception of problems is to democratise the science as proposed by Funtowicz and Ravetz (1994); stakeholder involvement should be wider. However, this is considered to be a politically naïve view by some practitioners and "experts" that plan and implement water projects. Experts in various fields are criticised for not being answerable to anyone and having a career development focus.

[107] The slash and burn system is locally known as citemene.

Some of the researcher's preconceptions and expectations of the research were dispelled during the fieldwork. Her perceptions on the failed water projects, among others, were transformed by the research experience. The fieldwork concurs with Leach and Mearns views illustrating numerous failed water projects in Zambia are labelled as lacking community ownership and the community being dependant on outside intervention[108]. Incidentally, the intervention from donors or NGOs affects the legitimacy of the central government, which the Zambian citizens believe should provide their basic social needs. Some project implementers took steps to increase the breadth of consultation and encourage community participation in water projects through the compulsory community contributions[109]. The contribution is taken as a sign of community commitment and acceptance of a project. It is a well intended condition to be met before a project is undertaken in an area[110]. It does however have a negative impact on the remotely located and sparsely populated areas. The residents in these areas are usually not able to afford the 10 to 20% of the project cost that is required as the contribution. The more affluent communities who are able to contribute towards the project costs are favoured by this approach. The failed intervention, especially in the rural water sector, is compounded by the various competing donors and separate entry points and intervention techniques that they set, Figure 3.3. Most donors are not active in the same location concurrently. They often shift project focus in these areas with some progressively changing locations.

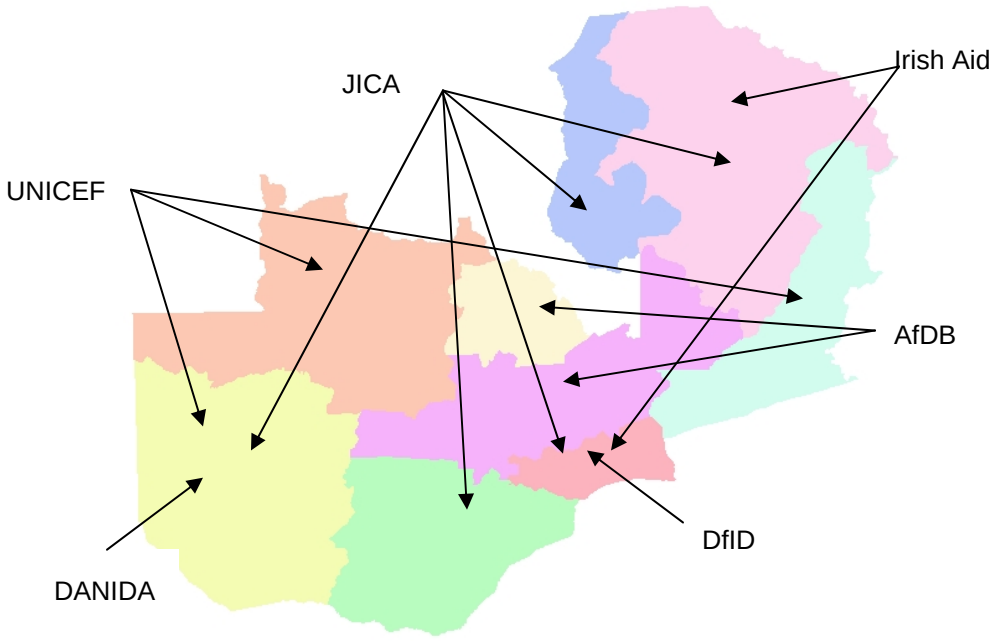

Figure 3.3 Snapshot of donor activity in Zambia

[108] Water schemes in George Township in Lusaka and the irrigation schemes in Eastern and Northern provinces are part of this group.

[109] This assertion is based on information provided by project implementers e.g. local NGO teams

[110] This is one of the conditions attached to project funding by various financiers.

A common narrative in the rural water sector is that government resources are limited and not likely to reach most rural areas that require intervention[111]. It was also dispelled during the fieldwork and the researcher's perception transformed. Some rural residents continue to cope without intervention. One coping mechanism is the use of herbs for diarrhoeal diseases especially when the nearest health centre is several kilometres away. Some residents would like to benefit from improved access to safe and clean domestic water. However, their expectations vary from those of peri-urban residents that are within close proximity to the urban areas. The case of improved water sources is seen as a channel for alleviating poverty by the Zambian government, IFIs and donor agencies. It is an international drive that is internalised nationally through the PRSPs. Improving access to clean and safe water is also a direct target in the MDGs. The Government agencies and NGOs campaign for water points especially through MDGs, though accountability of the resources allocated for these purposes is sometimes difficult. Given the time span of the MDGs as more water points are drilled, more points are required due to migration, population growth, technology life span, breakdowns and natural operational wear and tear. Project implementers are involved in a constant race to catch up leaving little room for advance planning and strategising.

Another common narrative, which significantly affected the perceptions of the researcher, is the power of the donor agencies amidst the existence of the PRSPs. Central government appears to maintain some control and management of development programmes and securing funds for projects. The proponents of poverty reduction programmes flag them up as a way of bringing decision making in development projects back to the central and local government. The funds for proposed development projects are however still controlled by donor agencies through funding conditionality and the final decision making regarding which projects to fund. The central government prioritises projects according to the mandates of various donors. This sometimes misled prioritisation of development projects to secure funds results in funds being redirected to other projects that the central government actually considers as priorities. The redirecting accounts for some of the differences between the national plans and the actual activities at grassroots level. Central control and management of development programmes affects the transparency and the governance of the water sector.

Common narratives are not only attributed to outsiders and experts but also to the local people working in various organisations especially in a central control system. This compounds the need for extensive field visits and multi site studies (Hannerz 2003).

3.5 Technique at site

The researcher contacted some of the potential research participants before the visit to their areas of residence or work. Initially letters were sent to the Town Clerks of the various study sites (Appendix I). They are the highest Local Government officers in each town and gate keepers; they authorise research in their locations. They also provide a link to their town and the various departments in the local council that work with the local communities. The letter that was sent to them gave a description of the research, the groups that were likely to be involved and the methods of information collection. It requested permission to carry out research in the particular town. Frequently by the time of the field visit, the Town Clerk had authorised the research and forwarded the letter to the relevant authorities within their jurisdiction. Some organisations in a town were controlled by the office of the District Administrator or Commissioner for instance the district health office. Permission to obtain information from these organisations was sought from

[111] This view is expressed by most civil servants and government agency employees.

the appropriate office upon arrival in the town. The District Administrator or Commissioner position is a political appointment.

The letter authorising the research was usually referred to the Water Engineering Department and in some cases to the local CU. Upon arrival in each town where this had happened, the researcher explained in further detail the type of information being collected and the objectives of the research. It was beneficial for the Community Development Department (CDD) in each town to be involved in the research and permission for this was duly granted in all study sites. The CDD deals with the general public on a more regular basis than the Water Engineering Department. It also has field officers in strategic locations throughout the town, which proved essential in providing introductions to the communities and the RDCs.

The researcher had previously made initial contacts in most organisations (Appendix J)[112]. These contacts introduced her to representatives from other institutions that had been set up since the last field visit in 2001, for example the WRAP task team that was looking at the economic exploitation of water resources in Zambia. Subsequent contact with the representatives was either a phone call or a personal visit to their offices. If they were not available for the interview an appointment was made for another day. Often an interview was possible on the same day.

The period of time spent at each study site varied between three and four weeks depending on the availability of research participants. The study site here refers to the second tier of sites which is the town. Smaller communities were usually visited once where as the larger ones were visited at least twice. The number of visits was determined by the availability of community leaders and other potential interviewees.

The initial contacts for communities were the CDD staff and the NGO staff. The CDD carries out projects in various communities as part of the WASHE concept. These projects sometimes involved NGO teams who usually fund them and also carry out community sensitization exercises. One factor in the case study selection was the accessibility of the sites. Some interesting cases were too far to walk to and transportation to some rural outposts was limited. Private arrangements had to be made but sometimes even these were not possible. The CDD and NGO staff usually requested an interview guideline to determine which communities would add value to the research. This request may result in some biases in the site selection and thus the raw results collected. However, the researcher responded to it after considering their influence as gate keepers in the communities. Additionally she visited some public places like bus stations and markets to interview members of the generally public outside their residential areas. Incidentally, the request for guidelines made the use of semi structured interviews advantageous as opposed to non structured interviews.

The approach in organisations like NGOs and companies differed from that used in communities. In most communities an introduction by a member or the CDD staff was enough to make the researcher acceptable. Speaking part of the local language also proved useful; the researcher was not seen as a total outsider. The outsider notion touches on the perceptions of the researcher, which are discussed in a further section (Research Perceptions). In formal organisations it was necessary to be introduced through the office of the Managing Director or the Head of Operations. This required a formal introductory letter specifying the information being

[112] The researcher made these contacts while carrying out fieldwork for an MSc dissertation in July and August 2001.

collected and the potential use of results (Appendix J). Authorization sometimes took more than a week to secure. The letter was submitted during the site visit and not prior to it.

3.5.1 Record keeping

During the first phase of fieldwork, July to October 2003, interviews were hand written on notepads. The notes were later transferred onto electronic media, ideally on the day of the interview so that any gaps were filled in. This also provided a chance to return to the interviewee for any clarification. Permission to take notes was requested on all occasions. The research was introduced to each interviewee adding that the information being collected was for academic purposes. The potential interviewees usually accepted to participate in the research and permitted notes to be taken as they spoke.

During the second phase of the field visit, April 2004 to February 2005, interviews were tape recorded when permission was granted. The recorded interviews were mainly from government agencies and ministries. Participants from commercial organisations usually declined to have their interviews recorded though in all cases they permitted notes to be taken. Some members of the public also expressed discomfort with being recorded, their interviews were hand written and later transferred to electronic media. Interviews were ideally transcribed while in the town.

3.5.2 Type of Responses

Generally most representatives were open about the role of their organisations in the water sector especially amid the sector reforms. They were willing to share the shortcomings of their institutions and the changes they would like to see in the water sector. Some occasionally stressed they were sharing their personal views and not those of their organisations. They also asked not to be quoted if they considered the comments made to be very sensitive. These requests were respected by the researcher.

The members of the public were also open in their responses. They considered the subject of water to be close to their hearts. Some of them acknowledged that water is life and were willing to take part in any research that would improve the water situation in their locations. The possibility of improving situations in various communities alludes to the expectations of the research. Some members expected the research to result in water projects being carried out in their areas of residence based on the fact that the researcher came from an academic institution outside the country. The direct expectation of the benefits from the research comes from past experience with NGOs that usually obtain their funding from overseas. The local NGO teams visit the project locations with some representatives from the overseas funding institutions. Furthermore, community members used certain words that can be classified as fund attracters such as “vulnerable” people making up a large part of the community or elderly, retrenched workers, retirees and orphans being a significant part of the local population. They perceive these vulnerable groups as attracters of NGO projects, which benefit the community as a whole. Issues surrounding water research are also seen as potential fund attracting subjects. The phrase dropping was particularly prominent in focus group discussions.

The perceptions of and expectations of the focus group participants were similar to the individual interviewees. Community leaders wanted their areas to appear worse off and in more urgent need of help than those surrounding them. This was dealt with by explaining the research aims and objectives and also by paying particular attention during the tour of the community. The expectations of the research varied according to the classification of an area as peri-urban, urban or rural. The rural and peri-urban residents expected intervention of some sort to result after the

information collection was complete. Occasionally, they boldly asked exactly when the intervention would be initiated. In the urban areas, the expectations were more inclined towards contributing to information collected by various groups especially for the water suppliers. They were keen to obtain an independent assessment on the type of service being provided and the expectations from their clients. Some were eager to show improvements in domestic water supply and questioned whether the improvements would be expressed by the clients. Clients expressing the benefits from improved service delivery would implicitly be supporting the idea of commercialisation of the water sector.

The researcher had the advantage of being a Zambian citizen and so was able to note some key phrases and names being dropped, in a sense, by the various groups for instance the use of the "vulnerable" groups. Even with this advantage the researcher was treated mainly as an outsider in each community[113]. During some focus group meetings the participants openly declared they wanted their community representatives to appear united. They did not want the researcher to have the impression they disagreed or were not united on what they want as a community. They feared a lack of unity would have an adverse effect on any future plans or recommendations of projects from the research. In addition they checked each other to the extent of stopping any negative aspects about the community being brought up. In one case the hand over from one RDC to another had not taken place resulting in some negative impact on some projects implemented in the community. When one participant mentioned this, another one quickly interrupted saying that the lack of official handover did not happen anymore.

The view of the researcher as an outsider has its advantages and disadvantages. The issue of openness may be better towards outsiders than insiders depending on the expectations and perceptions of the community members. In some instances, communities are not willing to share local knowledge with outsiders. During the field visit occasionally some members of the general public did not want to participate in the research. These were mainly elderly men who saw the researcher as an inexperienced young female with very little to offer their community.

The outward appearance of the researcher may also result in some potential participants perceiving her as having very little to offer. Cultural aspects of women wearing trousers are not accepted by some members of the older generation. The choice of wearing a pair of jeans for comfort and ease of mobility may have given some community members the wrong impression. It was useful to carry around a traditional wrapper to put over the trousers when the need arose. Some members of the public were not interested in participating in research. They claimed numerous studies had been conducted in their areas yet they had seen no benefit from participating. Furthermore, some community leaders mentioned the aspect of feedback to the research subjects. Reportedly in the past feedback from researchers had been limited to organisations, government bodies and the local council. These bodies did not pass on reports or information from the research to the participating communities. The lack of feedback has an adverse effect on any follow up or new research, especially on similar topics, in these locations.

3.6 Raw Results Analysis

The analysis of the raw results involved reading through the interview and focus group transcripts several times. The first read over generated an overview of the responses from the interviewees and focus group participants. The second ensured an in-depth impression of the responses from

[113] This is someone coming from outside the community to find out what happens or goes on in it i.e. someone not familiar to the community.

various groups and locations. The third assisted the selection of emerging key themes. The fourth involved coding of the interview transcripts using NUD*IST, a qualitative analysis programme that is able to handle large amounts of raw results and eliminate human error from the analysis. It does not however remove the hard interpretative work necessary in qualitative analysis. The various stages of analysis draw on ideas of analytic induction. This process invites the researcher to formulate hypotheses about the research problem and search out cases to test them (Bryant and Burgess 1999, xxvi). The hypotheses are reformulated in the separate stages especially when a case does not fit.

The analysis would have been even more thorough had all the interviews and focus group meetings been recorded on tape. However, during the first phase of the field visit no recordings were done due to faulty tape recording equipment. Additionally interviewees are often more self censored and conscious of being taped, thus note taking is likely to produce better quality of raw results. The focus groups would also ideally have been held in rooms with recording facilities. These were not available in the communities visited and the researcher had to make do with community halls and local school facilities. The experience from prior focus group participation meant that the groups were able to go at a pace that the researcher was comfortable with especially for note taking and asking for clarifications at various points. The groups were mostly self moderated with some participants mostly using the local language, which the researcher translated into English. The translation meant the loss of some richness of the phrases used in the local language but this was inevitable.

3.6.1 Research Perceptions

The approach to this research assumed that most participants would be willing to share their accounts in an open and honest manner. However the opposite was also possible. Reasons for not participating include the unwillingness to share accounts with outsiders from the community, expectations of the research being done with the final aim of initiating water projects in various areas, experience with past researchers or general non-interest in the research. The non-interest was dealt with by finding interested members who volunteered to participate or accepted an invitation to do so.

Any negative experience with previous researchers was rather difficult to deal with. The researcher attempted this by politely asking the participants to turn a new leaf and take each researcher as an individual. She dealt with the expectations of the participants by plainly explaining the purposes of the research to them and giving them a choice of taking part in the research. The outsider notion was also difficult to address though it was made more manageable by the fact that the researcher was Zambian and so some participants were able to relate to this. It was also important to learn at least the greeting in a local language. This was an ice breaker and most participants took it as a sign of genuine interest in their communities and lives.

Another aspect of community perceptions and expectations was the fact that the researcher was a relatively young female. This was likely to introduce notions of the research not offering any benefit to the community especially that she was not seen as part of a team. This aspect was also not easy to deal with. One option was to draw the attention of the participants to the use of local knowledge and its importance. The expectations were also adjusted since the research did not offer any material or financial gain to communities but the chance to contribute to a body of knowledge.

The fact that the researcher was a Zambian citizen had an impact on distancing herself from the research and the raw results collected. Separating personal judgements from actual responses during interviews and focus group meetings proved rather difficult in the initial stages of the field visit. The situation was helped by the use of verbatim interview transcripts during the analysis. Translation of the interviews and focus group information also needed careful attention to ensure personal judgements were not influencing the translations and that the words of the participant were used. A loss of the richness of some phrases occurred during translation, especially if it was done by a third party, but this was to be expected[114].

3.7 Conclusion

This chapter detailed the theoretical position of the researcher, the main methods used in the raw results collection and the reasoning behind their selection. The selection of semi-structured interviews hinged on the postmodern approach of the research; focusing on individual narratives and personal experiences. It was also guided by the mapping objectives of the research obtained from the activity at the grass roots, which sometimes differs from the ideal situation that policy and institutions point towards.

Individuals in an organisation or a community interpret their local situation in various ways. Their interpretations are their realities. This research took particular interest in the interpretations and hence the realities of the local actors. Following the postmodern nature of the research, it was crucial to understand that these are part of the actors' individual narratives. In some cases they cover organisations like NGOs that have a specific modus operandi.

Narratives have the potential of being too individualistic and can be misplaced when analysing a large volume of raw results. The potential for individual bias can be diluted by triangulation and verification of the information that was achieved by using focus group meetings and multiple interviews where possible and observation in all communities where interviews were conducted. Similar responses from individuals showed some verification of the information collected. Questions were also rephrased as a triangulation method.

Expectations and perceptions of the research were sometimes difficult to deal with especially given the appearance of the researcher. Cultural aspects such as females addressing males in a patriarchal society had to be contended with. It was beneficial to be confident and address each issue as it arose in a non confrontational manner. Usually questions that appeared too sensitive or personal were rephrased and the community assured that the information being collected was for academic purposes. Expectations of the research had to be adjusted and clarified in the introduction and repeated at the end of a meeting or interview session.

Introduction into a community or organisation followed several possible channels. Formal introduction was required in organisations through the administrative office. In communities, the introduction by a member of the community or the CDD or NGO staff sufficed. It proved beneficial to learn at least the greeting in the local language in each town. Community members took it as a symbol of genuine interest in the community, which was particularly important where residents felt they had been over researched with no benefits coming from past research activities. The local

[114] Third party translation was necessary in the locations where the native language of the researcher was not spoken e.g Mongu, Mbala, Livingstone, Chipata and Lundazi. The translation was done by a Community Development Officer or a member the local NGO team who accompanied the researcher on community visits.

language greeting was a way of gaining their trust and establishing relationships with them. This was just as essential as the researcher being friendly for them to be open in their responses during interviews and focus group discussions.

Interviews and focus groups were used to investigate the strategies deployed by the various actors to ensure water access, the type of water access and control of the water sources used. Field observation was used as a triangulation and verification technique to supplement the interviews. The next two chapters examine the actual raw results that were collected at the separate sites visited. They detail the findings at each site and give some interpretations and perceptions of the local situation regarding water resources, their use and management.

4 Case Studies – Agriculture, Livestock, Industry

The largest water consuming sector in Zambia is agriculture, similar to other regions. The specific volumes of water used are not known but estimates based on total national consumption are close to 75%, the internationally estimated figure[115]. Most of this water is used by commercial farmers growing wheat, sugar, tobacco, winter maize, and practicing horticulture. Most small scale farmers in Zambia depend on rain fed agriculture[116]. The Government, mainly using donor funds, set up irrigation schemes in various parts of the country in an effort to boost agricultural output. Often the MACO officials in Lusaka identify potential locations for irrigation schemes that are allegedly a channel of poverty reduction, one target in the MDGs[117].

The processes of setting up the various irrigation schemes, which are analysed in this chapter, impact the local communities in a number of ways. They affect the land use patterns and the social relationships between the members. Communities have water management methods established over time that the schemes are expected to "fit" into. However the fit is a gradual process requiring adjustments in the existing structures and practices. Additionally, poverty reduction aims at using the schemes for income generation. It monetarises the rural economy and implies a ready market for the produce, usually a neighbouring urban area that benefits disproportionately from such schemes. It also introduces a commercial model in predominantly subsistence farming areas. The infrastructures to accompany the model, such as transport and distribution networks, are usually overlooked. The large scale commercial farmers included in this chapter illustrate other overlooked aspects of the model transfer. Commercial agriculture includes livestock rearing for the purposes of this research. Livestock is dominant among the pastoral tribes living in southern and western parts of Zambia that have historically been free of tsetse flies and are suitable for animal husbandry. Commercial water use extends to industrial water users such as the copper mines on the Copperbelt.

This chapter explores some of the challenges faced by communities managing water resources and steps they have taken to secure their claim to water for livelihoods. It also explores the interaction among commercial water users whether at the small scale or the large scale. It examines the modes of resource appropriation in the agricultural and industrial sectors. We also examine the access modalities and their transfer in these sectors. The case studies in small scale agriculture reveal access modalities embedded in membership to a scheme or community while those in commercial uses illustrate a legal bias enshrined in water rights and operation licences.

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[115] Multilateral institutions like the World Resources Institute and International Food Policy and Research Institute quote this figure in their analysis of trends in water consumption and forecast pressures on water resources. A UNEP Director also quoted this figure at UNEP's 8th International High level Seminar on Sustainable consumption and production held in November 2004 in Monterrey, Mexico.

[116] While visiting Rome and during discussions with Pope Benedict XVI, President Mwanawasa expressed beliefs that the people of Zambia perceive a difference between water and rain fall resulting in their failure to utilise abundant water resources to sustain their livelihoods. Source: Post Newspaper, 21st June 2005.

[117] One of the MDGs is to eradicate extreme poverty and hunger by reducing by half the proportion of people living on less than a dollar a day and reducing by half the proportion of people who suffer from hunger.

4.1 Small Scale Agriculture

Small scale agriculture accounts for the bulk of the food production especially for staple food such as maize, in Zambia[118]. The small scale farmers are mainly found in the rural areas where land is allocated by a chief. Most of the staple crop farming is rain fed. It is also practiced on a subsistence scale in urban and peri-urban areas where access to land is more limited. Rural communities place more emphasis on farming; members not cultivating land are considered lazy. The analysis of agriculture in this section focuses mainly on irrigation schemes for small scale farming in rural areas.

Most Government funded irrigation schemes are inter-governmental partnerships or independent projects[119]. They are mainly located in the Eastern, Southern, Western, Central and Northern provinces, the regions suitable for farming according to national land use classifications[120]. The MACO views them as ways of promoting self sufficiency in rural areas, reducing poverty and dependency on rain fed farming and improving livelihoods. However, they promote the shift of subsistence farming towards market-oriented production, spreading markets to areas where subsistence agriculture dominates. They concurrently support the involvement of the private sector in small scale agriculture through out-grower schemes[121]. The market orientation maintains the dependency relationship between the rural producers and the urban centres that are the target market for the products. Admittedly irrigation infrastructure enables a second crop harvest compared to the annual one crop harvest in rain fed farming. However, factors such as the types of crops grown, type of irrigation infrastructure and the access to market for the crops limit the potential benefits from the irrigation schemes.

4.1.1 Rukuzhye Irrigation Scheme

Rukuzhye is a village in the northern part of Chipata district on the route to Lundazi, Figure 4.1. It is approximately 50 km outside Chipata town. The village's community managed irrigation scheme was set up in 1972 by the Ministry of Agriculture, Food and Fisheries (MAFF)[122]. The Ministry responsible for irrigation schemes later changed to the MACO[123]. A team of government officials visited various locations scouting for suitable areas before setting up the schemes. Suitability referred to soil fertility, land availability, significant target population, proximity to market routes, potential economic impact and potential interest for settlement. After identifying a suitable area, a team of agricultural officials visited it and held talks with the residents from surrounding areas and their traditional leaders. The meetings informed the community about the Government's decision to provide irrigation infrastructure in their area. They elaborated on why the area had been selected and the potential benefits to local residents. They presumably did not

[118] Documents produced by FEWS NET (Famine Early Warning Systems Network) estimate that almost 80% of production in staple food production comes from small and medium scale farmers. Source: FEWS NET Zambia Food Security Update, May 2006.

[119] Intergovernmental partnerships are bilateral agreements where the donor country provides funds and the technical expertise to carry out the project. The host government proposes the project and identifies the target area and population. Independent projects are funded by a group of donors usually through organisations such as the FAO and implemented by host government agencies or NGOs.

[120] The latest land use map of Zambia was produced in 1975. The MACO is conducting an updating exercise of the land use map.

[121] Out-grower schemes are detailed in later section, Chonya Cooprative.

[122] Irrigation schemes were part of a rural development policy to increase self sufficiency and food production in these areas. They were effectively producing crops for the urban markets (Amankwah and Mvunga, 1986).

[123] The name change was accompanied by a streamlining of activities removing the fisheries component and actively promoting cooperatives in farming areas.

specifically ask the residents whether agriculture and food security outside the rain season was a priority for them. They conducted a needs assessment without involving the community. The schemes were set up not long after independence (at least 8 years) and most residents felt they were a gift to the people from the Government. The residents did not feel they owned the irrigation projects. They were an idea from the Government and not from them. They were part of the self help programmes in the rural areas and a resettlement programme to maintain some of the population in the rural areas, preventing an escalation of rural to urban migration (Bates 1976, 164-168).

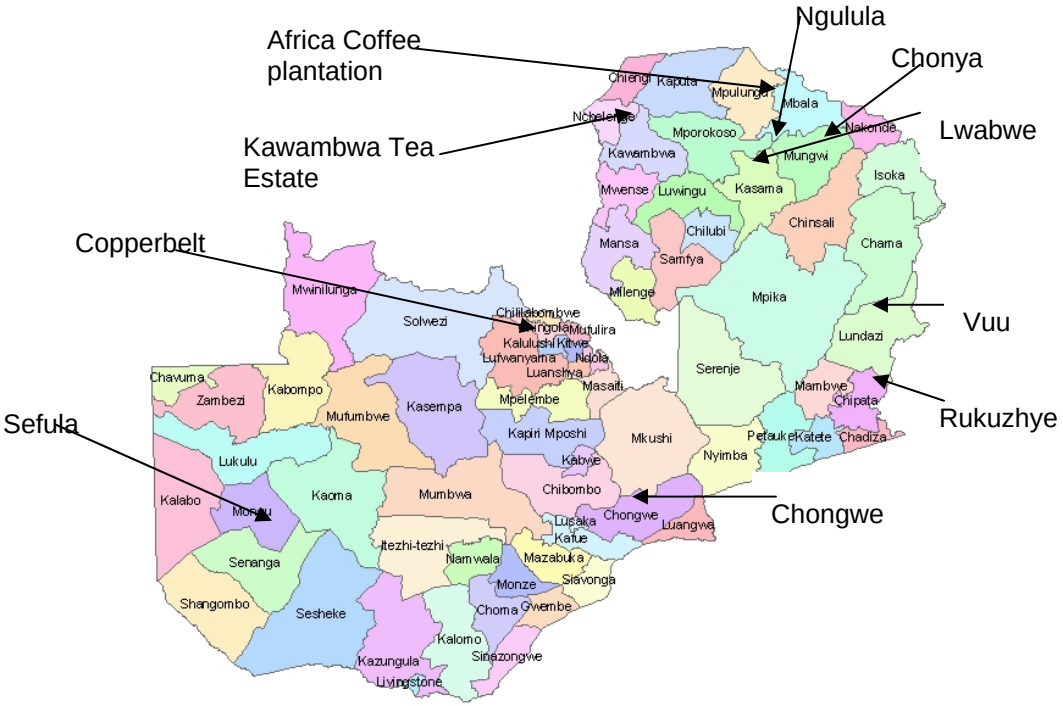

Figure 4.1 Districts of Zambia

At the Rukuzhye scheme the project technical team constructed an earth dam as a source of irrigation water. The water outlet is an overhead pipe connected to a valve on the dam wall. Water flows through the pipe by gravity into the main cement lined canal, shown in Figure 4.2. The main canal is 1.8 km long and leads to secondary canals, also cement lined. The scheme members build tertiary canals for the surface irrigation. They either siphon water from the canals or use the strategically located outlets that can be closed to adjust the discharge position from the canals. They each obtain a Lima of land allocated by the irrigation scheme committee[124]. At the time of the field visit, in June 2004, there were 38 scheme members. The members elect a new committee every two years. The scheme is meant for food security and income generating activities in the dry season. The dam is also used for fishing by some residents. Traditionally the people of Rukuzhye are farmers; they are mostly dependant on rain fed farming. They grow enough food for the dry season, which they dry store at their households[125]. The incumbent committee chairman at the time of the field visit owned a farm not far from the scheme.

[124] One lima of land is equivalent to 0.25 hectares; 1 hectare is equivalent to 0.41 acres.

[125] Growing enough food for a household until the next harvest requires a large amount of land, more than the lima available at the plots. Households become food insecure during drought periods that result in low harvest.

The scheme is located on traditionally owned land, which was allocated with the approval of the headman. When a member is no longer using his allocated plot, the land is returned to the committee. The plot cannot be inherited along family lines. The land belongs to the scheme and not individual members.

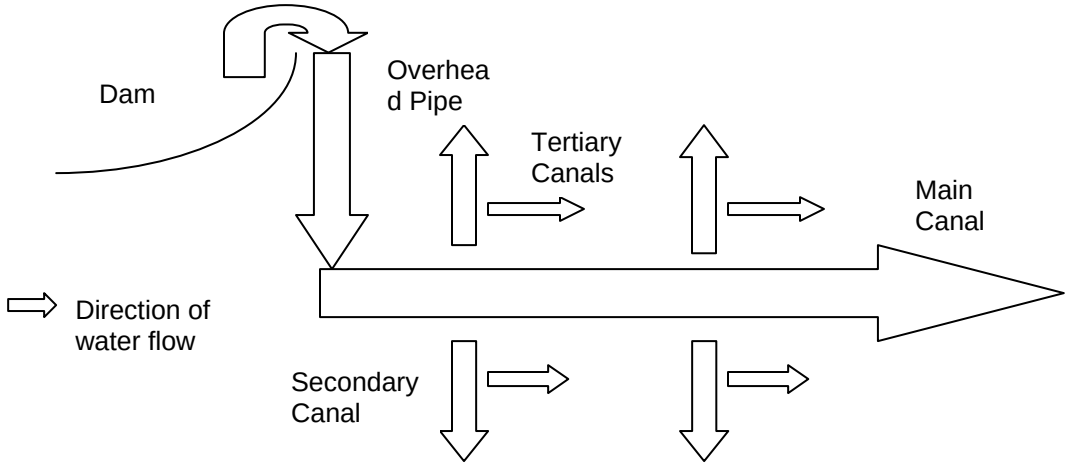

Figure 4.2 Rukuzhye Irrigation Infrastructure

Most scheme members grow vegetables like rape and tomatoes. The village headman owns an orchard on the land; officially he is not a member but uses the water from the dam. To become a member of the scheme a resident applies to the committee. If land is available it is allocated and the new member is briefed on the regulations governing the scheme. At the time of the field visit, the irrigation was carried out on a first come, first served basis. The headman was in charge of the key to open the valve that allows water to flow along the primary canal. When a member needs to irrigate his plot of land, he or she can obtain the key from the headman. If it is not available the farmer negotiates with the others who are irrigating their land at that time. At the beginning of the dry season (June, July), enough water flows through the canal for all the users. Towards the end of the dry season (September, October), the water levels are low. All members manage to irrigate their crops because of the low activity rates. Less than 50% of the scheme area was under cultivation at the time of the field visit.

The committee chairman felt the low activity rates were due to issues such as securing a market for the crops and the poor state of the irrigation infrastructure. He narrated that the primary canal is cleaned out annually but the exercise is difficult to coordinate. Some residents also reportedly have different priorities. A group of women joined the scheme after hearing about a loan system for inputs; most withdrew after the first harvest season mainly because they were interested in their household food security. They preferred cultivating crops like maize and other staple foods; crops not grown on the scheme. The MACO encouraged crops like garlic and paprika which have a good profit margin. The women however were not interested in income generating crops but ones they could use in their households.

The MACO rehabilitated the infrastructure at Rukuzhye in the early 1990s using project funds. A membership fee, which ideally would be used to maintain the infrastructure, exists on paper but is not enforced by the committee. A constitution exists but its enforcement also appears difficult. Any rehabilitation work is donor or central Government funded. The MACO officials believe the

fee can only be effective if the scheme is fully in use as an income generating venture for its members. They provide technical advice to individual farmers. The volumes of water used in the scheme are significant enough to warrant water rights obtained from the Water Board through the MACO. The lack of enforcement procedures by the Water Board means most irrigation schemes have no water rights. However, this does not affect the scheme operations in any way. The informal right of use is more influential.

Maintenance of infrastructure seemed to be a missing practice for most of the Government installed infrastructure. Community members appreciate the potential benefits of irrigation schemes but complain of the lack of supporting structures to ensure their success. It is not clear whether the members are able to maintain the infrastructure without profitable crops from their plots of land. Individuals making use of the infrastructure complain about the unavailable markets for their crops. They often grow the same type of crop and end up distributing it to their neighbours free of charge, thus removing the incentive for their neighbours to obtain plots. The maintenance of the infrastructure is linked to the ownership of projects and the enthusiasm of the members. Some felt ownership was being promoted in a draconian way by the Government; turning a blind eye to the pleas for help or only offering a link to potential project financiers.

The Government employees reiterate the lack of resources to bail out every community or rehabilitate the entire dilapidated infrastructure. They urged communities to be more responsible for the available infrastructure to improve their livelihoods. Responsibility refers to maintaining the infrastructure, carrying out repairs before it becomes irreparable and preventing vandalism. It implies neglect by the community members who disagree with this sentiment. They believe the responsibility for the infrastructure should be shared by the MACO officials and the users. Both groups share ownership of the infrastructure.

4.1.2 Vuu Irrigation Scheme

The Vuu Irrigation Scheme is situated in Lundazi district, Figure 4.1. It was set up in a similar way as the Rukuzhye scheme in the 1970s. Before it was set up, the residents depended solely on rain fed agriculture. The MACO rehabilitated it in 2001 as part of the International Fund for Agriculture Development sponsored Small Irrigation Water Users Project. It has a dam with two primary canal feeding points, a pipe connected close to the top of the dam wall and a gate valve on the edge of the wall. The valve is used towards the end of the dry season when the water level is low. The primary canal is lined with cement to reduce leakages and water wastage[126]. It feeds the secondary canals that are dug by individual farmers. Water is siphoned from the primary canal into the secondary canals that feed the tertiary canals on the allocated plots. All farmers use surface irrigation, which is relatively cheap; it requires lower capital compared to other types of irrigation. The MACO project teams dug fish ponds at the upper end of the primary canal to encourage fish farming activities. The MACO supplies the fish. Fishing activity also takes place on the dam.

A committee elected by the members manages the scheme. The chairman at the time of the field visit, in August 2004, had been in office for the last two terms. He allegedly practiced witch craft, which the MACO officials believed was the reason he maintained the position despite his non performance. The scheme members who were interviewed refused to comment on the allegations. The committee regulates the water use via a first come first served principle. The chairman keeps the key for the gate valve. A member wanting to irrigate his plot must obtain the

[126] This is a productive efficiency argument accepted by both farmers and MACO officials. The wastage term points to the return of water into the hydrological cycle without being used in irrigation activities.

key from him. If it is not available the member negotiates with others who may be irrigating their plots at the time. The scheme operates on an informal basis based on the relationships of the members. Each one pays an annual subscription fee of K10, 000[127]. At the time of the field visit the scheme had 25 registered members but only seven were active with cultivated plots. These seven members were the only ones that appeared to pay the annual user fees.

Most of the farmers in the scheme grow vegetables like cabbage, rape and tomatoes. Market availability is limited as are the profit margins when the nearby urban market is flooded with the produce. The MACO spearheads a drive to diversify the crop variety grown by the farmers to include potatoes and green maize[128]. Small scale farmers who can afford intermediate technology, like treadle and diesel pumps, are able to diversify their crop variety to include winter maize, paprika, garlic and potatoes. The extension workers demonstrated some pumps in the area via the Agriculture Support Programme (ASP) and advised farmers to purchase them, see Figure 4.3[129]. The crop variety increases the profit margins for the farmers. Some farmers use bucket irrigation when the water level in the dam is low. They use a stream that runs along the edge of the irrigation scheme area. However is only suitable for crops that have low field capacity and low water requirement because of labour demands.

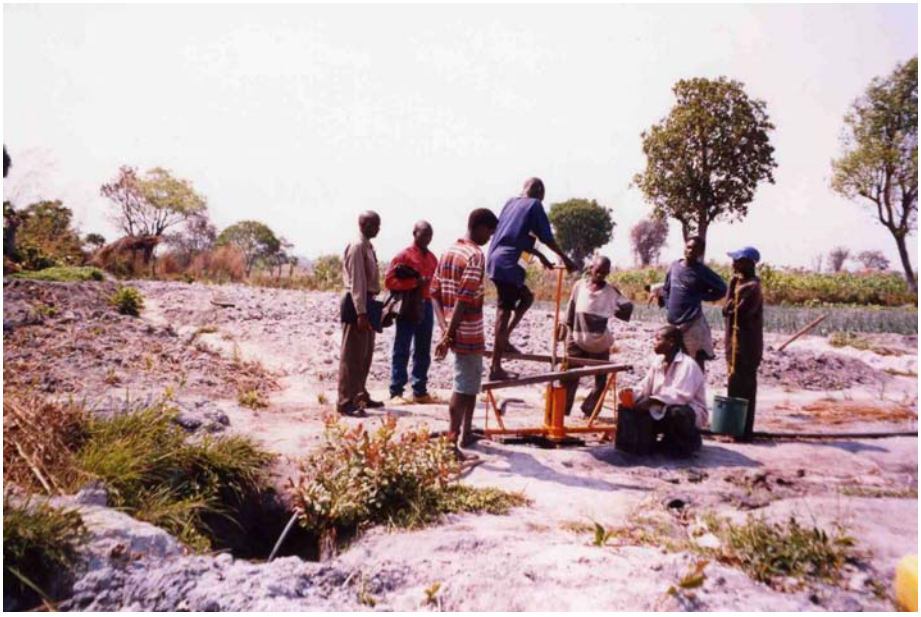

Figure 4.3 The Treadle Pump

[127] The scheme members decided on the fee and the local MACO team approved it.

[128] This drive is mainly from MACO to increase the production of maize, the staple food for most Zambians. Increased maize production would presumably mean a stable price for the commodity throughout the year. However according to SEEDCO, a seed marketing company in Zambia, green maize is similar to winter maize except the latter is mainly used in production of maize meal while the former could be consumed as maize on the cob. Source: Post Newspaper 3rd August 2006.

[129] The treadle pump works by the treading movement which creates suction for the water. Hosepipes are connected to the pump leading from the water source to the area under irrigation. The suction transports water from the source to the crops.

The water level in the dam is low when irrigation is desired the most, at the end of the dry season. Apart from fishermen and farmers, the dam is also used by livestock owners. The fishermen prefer low water levels so they can catch their fish easily. The farmers and livestock owners prefer high levels of water in the dam to sustain their farming activities and have enough drinking water for their animals in the dry season. The fishermen are sometimes accused of leaving the valve open overnight to lower the level of water in the dam when no-one is irrigating the plots. Some members reported the wrangle among the three groups of users to the MACO officers. The groups cannot seem to reach a compromise and point fingers at the MACO officials.

The dam has a siltation problem near the gate valve outlet point, resulting in low water flows. The MACO officials have concluded the members do not make effective use of the infrastructure at their disposal and ownership of the scheme does not seem to exist. The scheme chairman was not available for comment at the time of the field visit. The MACO officials perceive finger pointing to be a more common practice than problem solving within the scheme. The members blame the lack of activity at the scheme on outsiders[130]. The key for the valve is supposed to be kept by the committee chairman. This is often not the case and even though the chairman is a non-performer, according to the MACO officials, he always seems to be re-elected into office. They conclude that fears of witchcraft among the members hinder the development and effective management of the scheme. Though none of the members openly talk about witchcraft, mainly because it is difficult to prove, individuals suspected of the practice are considered powerful. Other residents do not want to antagonise them or challenge them, fearing adverse repercussions on themselves and their families. The perceptions and beliefs are exploited in the campaign for positions of responsibility like chairmanship. The decisions made in these positions cannot be challenged even if they are for individual gain as opposed to communal benefit. Thus the control and decision making is done by an individual and not the committee.

At the time of the field visit activity at the Vuu irrigation scheme was very low even though it was expected to be at its peak. The residents felt the Government should continue to support the schemes by maintaining the infrastructure and providing assistance in crop marketing. They also expect committee members to be trained by the Government in the leadership and management skills necessary for the sustainable operation of the schemes. They reiterated these schemes are introduced by the Government and funded by donor agencies or NGOs. Thus the responsibility of supporting these projects must come from the same organisations. Otherwise the projects fail and the communities are black listed by project implementers and facilitators for wasting limited resources. The MACO officials on the other hand feel the communities are too dependent on the Government. They add that the Government does not have the resources to continue to maintain irrigation schemes. When the schemes were introduced in the early 1970s the Zambian economy was growing and benefiting from high copper prices on the world market. Financial resources appeared plentiful and the Government allocated funds for development schemes in various parts of the country. However since the late 1980s the Zambian economy has been in continuous crises, the money pit no longer seems bottomless and, more crucially, development plans focus on areas where cost returns are more likely such as urban locations. The pie has shrunk while the number of pieces required appears to have increased. Additionally supposed budget cuts mean some areas being left out in the allocations[131].

The MACO officials expect community members to take responsibility themselves because the schemes are there for their benefit. They expect to be approached only after residents exhaust

[130] Outsiders in this case include the MACO officials and everyone who is not a member of the scheme in some cases the fishermen come from other communities.

[131] Some practitioners argue that the funds are not necessarily reduced but redirected to other sectors and programmes that are prioritised by the Government.

their own options. The fear of witchcraft they mention is a reality for the community but only a smoke screen for them. It clearly affects the management of the scheme and the interest of most members. Witchcraft practices also affect the levels of trust in the community, which is a symbol of social capital as defined by Putnam[132]. Suspicious behaviour, particularly if proof is difficult to establish reduces the potential and effectiveness of collective action; suspected individuals hold a significant amount of power. The lack of interest is not only exhibited by the scheme members but also the MACO officials; the demonstration plot owned by the MACO was not cultivated.

4.1.3 Sefula Irrigation Scheme

The Sefula irrigation scheme is in Mongu district in the Western province of Zambia, see Figure 4.1. It was set up using intergovernmental aid from the JICA to introduce irrigation to the traditional farming communities in the area that were accustomed to rain fed farming[133]. Sefula is located on the flood plains of the Zambezi River. Historically the community grew rice in the latter part of the year after some water had subsided from the flood plains. Only one crop was harvested each year.

The project implementation team converted a perennial stream into the scheme's main canal and constructed lateral secondary canals. The canals are lined with cement to prevent water seepage. The primary canal stretches for 1.9km and has a minimum water flow of 300 litres per second. The infrastructure controls water levels in the flood plains enabling the communities to produce two crop harvests each year. The project team handed the scheme over to the community in 1998 but intergovernmental support has continued through the JICA internships and technical support at the site. A MACO official at the site provides technical support and advice to the farmers.

The technical team encourages members to grow a variety of crops like wheat, winter maize and vegetables[134]. They demonstrate crops using a designated plot and encourage farmers using cultivation competitions. The crop selection and diversity is aimed at increasing the profit margins from the harvests. Competition winners are appointed as peer educators for fellow farmers. Most of the farmers interact outside the irrigation scheme. The daily scheme operations build on these personal relationships.

When the scheme was visited in July 2004, 300 registered members operated within a local water user group. Sefula is the largest farmer operated irrigation scheme in Zambia. A committee elected by the scheme members draws up and enforces the regulations for the group. The farmers use a first come first served principle for plot irrigation. It seems to work smoothly because the scheme was not being utilised to its maximum potential. The technical advisors have suggested a block rotation schedule for a time when irrigation is fully adopted by the farmers. The scheme members are traditional land owners and have customary land tenure of their plots[135].

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[132] Putnam (2000) in his widely quoted research in Italy looked at levels of social capital in the north and in the south. One of his conclusions was that trust is an important factor in social capital. Social capital refers to the networks in society that can be both formal and informal. However there is a debate as to whether this is really capital at all based on what gains it can accrue for the community that possesses it.

[133] Exactly why Sefula was selected for this particular scheme is not clearly documented.

[134] Encourage is a loaded term. In this case there was no mention of coercion by the MACO officials or the farmers. Encouragement is done through talks and demonstrations. The farmers admitted they were free to choose what crops they would grow on their plots of land in the dry season.

[135] Traditional land is only one of the land classifications in Zambia. The others are state land and reserve land. The state land is controlled by the Commissioner of Lands on behalf of the President. All land is vested

Customary land tenure lasts 14 years with authorization given by the chief who is the custodian of the land on behalf of his people. The authorization gives the applicant a right of occupancy to the land. In the Western Province of Zambia the local paramount chief is the Litunga of the Lozi people who are part of the Barotse Royal Establishment (BRE). The BRE controls the land rights, which are linked to the water rights in the Western Province. It signed a separate treaty with the colonial administration resulting in the land tenure and related issues differing from the rest of the country. In 1970 the traditional land in the Western Province was converted to reserve trust land to harmonise the land laws in Zambia. The Lozi people have always had strong cultural roots and the BRE is considered the legitimate custodian of the land. This legitimacy means the Litunga must be informed and offer open support to any project in his chiefdom.

Most local people were not willing to participate in the irrigation project when it was first proposed. They feared their land would be taken over by default. According to their understanding, if they lease out their land for three consecutive years they may lose their right of occupancy to the tenant. The three year limit results in some plots of land in the scheme lying dormant during the dry season when irrigation farming should be practiced. The dormant pieces of land usually belong to absentee land lords who are unwilling to rent out their plots of land. According to the MACO officers, the initial resistance to participate in the project was overcome using the influence of the Litunga. He held a meeting with his subjects encouraging them to participate in the scheme and reiterated the potential benefits of the scheme. He assured people their land would be secure. This had some short term positive impact on the scheme activity levels.

In traditional and state land, water rights are linked to the land rights. The occupier of the land must register the water bodies on their land and any intended use for them including estimated daily volumes. The land and deeds register is held at the Ministry of Lands. In some cases the natural water bodies are still used as boundary demarcations for land plots to maximise the number of users. Water rights are issued by the Water Board, a department in the MEWD, for up to 20 years. The rights for an irrigation scheme would be issued to the Water User Group and not to individuals. The Water Board officials report that the irrigation schemes in Zambia do not obtain water rights. The rights should be obtained through the MACO but this procedure is not followed. Water rights seem to be limited to commercial entities.

The approach used in establishing the Sefula irrigation scheme is similar to that used in the Government irrigation schemes that were set up in the early 1970s. The initial activity and uptake of the scheme was hindered by an apparent lack of community consultation regarding local beliefs, practices and perceptions. Legitimacy issues appear to have been ignored even with the strong culture of the region and authority held by the BRE. In contrast to other irrigation schemes the technical support from the donor continues at Sefula[136]. The project implementation team also built a local market block along with a rice de-husking plant using the donor funds. The continued support from the donor and the Government has reportedly had a positive impact on the operations of the scheme. The members feel their needs can be addressed by an appropriate body. The attitude and work practices of the donor influence the reaction from the MACO officials and the target communities. The continued presence of the JICA funded technical team that is

in the President. Traditional land requires consent from the local chief on any allocation and use matters. Reserve land covers forests and national parks.

[136] The reasons for the continued support are not known but the bilateral agreement with JICA is probably the main determinant. The technical advisers referred the researcher to the MACO officials when approached for an interview. They maintained they are only technical advisers and not the main decision makers in the scheme. The interns are paid by the Japanese government. Japanese rice varieties are grown at Sefula and supplied to the Japanese community in Lusaka.

perceived as hard working and dedicated reportedly results in similar levels of dedication from the officials and community residents. The activity at the scheme was recognised by the President of the Republic of Zambia, Mr Levy Mwanawasa who donated a tractor to the scheme. The MACO encourages farmers to increase their output and view farming as a business and not just as a means of survival. The long term viability of the scheme does come into question especially when donor support is completely withdrawn. It remains to be seen whether real capacity has been built among the scheme members[137].

4.1.4 Lwabwe small scale farmers

Lwabwe is a village on the outskirts of Kasama in the Northern Province, Figure 4.1. Most of the residents have pieces of land, close to their homes, for small scale farming. They grow a variety of crops like winter maize, tomatoes, onions, cabbage, cassava and rape. The MACO extension workers visited the area with the aim of changing the mind set of the farmers from viewing farming as a means of survival to a business. Incidentally the farmers perceived this as pledge of support from the MACO to increase their agricultural output and improve their food security. Some farmers welcomed the idea as an income generating venture. Further more, the MACO officers mentioned they would assist the farmers to increase their output, the surplus of which could be taken to market. They however, explicitly mentioned the change of mindset to the researcher. A few farmers managed to save up some money and purchase treadle pumps.

Before acquiring the treadle pumps the farmers used bucket irrigation during the dry months. Most farmers in the area continue to make use of their fields only in the rain season. Those who practice irrigation farming dig several wells that are strategically located throughout the cultivated area. The wells are only used for irrigation purposes. Domestic water is obtained from separate wells near the fields. According to the extension workers and the farmers, bucket irrigation limits the amount of land that can be cultivated and the variety of crops that can be grown in the dry season. Most farmers only grow green vegetables and tomatoes. The soil in Lwabwe is rather sandy and does not seem to retain water very well. This results in frequent watering during the hot season. The MACO technical services team advises the farmers to mulch their crops to help moisture retention in the soil.

The treadle pumps are considered a good investment even though they are expensive for most farmers. Some farmers managed to raise money to buy the pump from maize crop harvests sold to the Food Reserve Agency (FRA) in the previous season. Reportedly without the assistance from the ASP they would not have heard of the treadle pump and learnt how to use it. The pumps enabled the farmers to increase the amount of land cultivated in the dry season and also the crop variety. They also reduced the number of wells used for irrigation. Only two wells are in operation on one field that was visited as opposed to four or more when using bucket irrigation. More wells reduce the distance over which the bucket must be carried. The water table is quite high; water is available at a depth of three metres. The winter maize seems to require the most amounts of water and needs watering every other day. The use of the pumps is not labour intensive; three people are enough for a session of watering. Individual farmers refrain from allowing their neighbours to use their pumps because of the risk of breakdowns and mismanagement. They would like to see a return on their investment before experiencing any breakdowns. Some neighbours perceive them as self-fish but add it is their prerogative given that they have spent money on the pumps.

[137] Capacity refers to the ability to sustain the project in terms of scheme participation and output once the donor funds and technical support are withdrawn.

Some farmers erect elevated tanks meant for water storage and irrigation during the evening hours. The farmers appreciate the advice they receive from their extension workers but would also like to see more financial assistance being given to them in the form of loans. Most farmers assert they are able to invest in their farming activities because they are sure of their continued land occupancy. Some inherit the land from their fathers. Siblings tend to share the land equally.

The farmers still face some challenges especially with pests in their fields and finding a market for some of their crops. In the dry season the market for tomatoes is limited; most farmers harvest the crop at the same time. Those with treadle pumps are glad they do not have to worry about water and excess labour for irrigating the fields. They hire some help for the busy periods such as planting and harvesting and make use of relatives the rest of the time. Farmers have a local group, set up through the extension workers as part of the ASP, where they share ideas and knowledge on best practices. They find it beneficial especially for discussing local farming problems and extension workers also use it for the demonstration of intermediate technology.

The farmers in Lwabwe depend on ground water as opposed to surface water. They make use of the available resources in their area to support their livelihoods. They are proactive; not waiting for the Government to install irrigation infrastructure like dams, canals or furrows in their area. The extension workers are pleased with the efforts and enthusiasm shown by them. They affirm the farmers' concerns regarding markets for their crops and loan facilities need to be addressed. The loans permit more farmers access to the intermediate technology that enables them to sustain and improve their activities. The farmers' groups have also proved helpful. Some farmers of Lwabwe have received recognition from the MACO and are used as examples of success stories in small scale farming. The efforts from individual farmers have been complemented by the dedication of the extension workers at this site, compared to other case study sites such as Vuuu and Rhukuzhye.

The Lwabwe farmers make use of the local assets such as ground water and their social networks to share knowledge and ideas in the farmer's group. These are examples of the social capital of the community. The extension workers and MACO officials usually exploit this capital in some cases claiming its creation and development. However, the determination and ambitions of the individual farmers makes the work of extension workers and the MACO officials much easier.

4.1.5 Ngulula Vegetable Growers Association

Ngulula village is located in Mungwi district not far from Kasama in the Northern Province, Figure 4.1. It has a furrow running through it that was constructed before independence (1964). The furrow was initially managed by MAFF and handed over to the community in the late 1970s. Its source of water is the Ngulula River where a weir has been constructed to divert part of the water. Individual farmers create adjustable openings in the furrow wall and build secondary and tertiary canals on their plots of land. A community effort is sometimes required to assist farmers who may have limited labour resources. The farmers use surface irrigation, which is relatively cheap but has the potential of wasting water through seepage and evaporation[138].

When the scheme was managed by the MAFF, the personnel demarcated the land and extended the furrow to new plots of land. They supervised the extension and also the basic use including cleaning activities. Their departure in the late 1970s left a gap in the management of the furrow

[138] The farmers proposed to line the furrow with cement. This would increase amount of water available for irrigation in the very dry months i.e. September and October.

and surrounding land[139]. However, the community consciously attempted to incorporate the management into their existing social structure, with limited success. The headman who administered the land and also owns a plot near the furrow needed some assistance to manage the furrow. Some of the users formed a committee in 1987 to fill the management gap. It regulates the use of the furrow. Everyone who owns land near it is allowed to use the water for irrigation. Effectively this means the whole village has access to it. When the headman allocates new farming plots the new land owner extends the furrow. Ownership of land here refers to the right of occupancy for traditional land. To ensure equitable distribution of water, those downstream use it in the morning and those upstream in the afternoon. During the very dry months, September and October, the water reaching users at the end of the furrow is insufficient. Neighbours have to negotiate amongst themselves to ensure each one gets an allocation of water. Sometimes one farmer offers to irrigate in the late evening when others are not irrigating.

Some residents formed a vegetable growers association to share ideas on farming, marketing of crops and also managing the furrow. Membership to the association is not compulsory to all the users especially in view of changes in the occupancy of the plots of land along the furrow. Some occupants only practiced rain fed farming. The association has a revolving fund that is used as a central loan facility for the members. At the time of the field visit, in October 2004, the association had 13 members. Some initial members withdrew after failing to pay back the loans. The farmers learn from each other and in some cases come together to find markets for their produce. The agriculture extension officers provide support for the farmers mainly through the ASP.

The farmers face some challenges from the infertile soil especially where the top soil was washed away by some improper surface irrigation practices[140]. The other challenge is finding a market for crops like peppers, tomatoes and cabbages at harvest times. The transport to market is a hindering factor; the farmers carry produce on bicycles. They affirm it is difficult to make profits when the wholesale prices are very low especially for produce like tomatoes and cabbages. Irrigation water is reportedly only a problem when the flow levels are low in the very dry months of the year. Weed growth affects the water flow in the furrow. The users clean it at least once a year at a time when it is not in use, for instance during the rain season. Constrictions on some parts of the furrow also affect flow levels. Flows cannot be increased as the wall of the furrow may be affected and water wasted as a result.

In an effort to support small scale farmers the Government introduced a farming input subsidy for the farming seasons of 2003- 2005. This was a donor funded programme initially aimed at crop recovery after the droughts and resulting poor harvest in 2001 – 2002[141]. The increased harvest is expected to stabilise market prices for food crops making more households food secure. The agriculture input subsidy program reached Ngulula village but the amounts of inputs were limited. In some cases only five farmers in a village benefited from the programme. Sometimes the fertilizer was only provided for those farmers growing winter maize and not other crops. The farmers were initially not aware of the conditions attached.

[139] The departure was a move to encourage community management of the furrow. It was also an effort to reduce community dependency on outside intervention and government support.

[140] A gentle slope in the fields that was effective for surface irrigation resulted in the washing away of the top soil in flat beds. The ridge forming the boundary of the bed managed to trap some top soil. The MACO officials advised the farmers to include ridges within the beds.

[141] The programme started off with 250 farmers; by 2005 the number had dropped to 150. The drop is reportedly due to reduced resources.

According to the village residents, domestic water is sometimes obtained from the furrow, when the flow is high and water appears clean. When the flow is low and the furrow has weed growth, the community members use a perennial stream near their fields. The members applied for funding to line the furrow with cement to make operations more efficient. The MACO officials suggested the application based on their belief that unlined walls result in leakages and hence water wasting. However, the farmers do not subscribe to this argument unless they have a water shortage and the means to secure funding. They have other fields for rain fed farming where they grow mainly maize, groundnuts, beans and sweet potatoes.

The furrow users in Ngulula interact informally based on the relationships developed in their community. The committee expects community members to participate in the cleaning and maintenance of the furrow based on their responsibility as users and residents. Farmers that are downstream build on the relationships developed in the community in the negotiations to ensure access to irrigation water. The farmers are aware that in order to maximise the benefits from the furrow, they have to co-operate as residents and users. Reportedly some farmers occasionally hoarded the irrigation water upstream. This practice was addressed and discouraged during a community meeting chaired by the village headman. Some farmers benefit from their close proximity to urban markets in Kasama especially those able to sell their crops in the supermarkets. They assert the need for persistence and producing good quality crops to secure space on the supermarket shelves.

4.1.6 Chonya Cooperative

Chonya is a village in Mungwi district that shares a border with Kasama in the Northern Province, Figure 4.1. The village residents formed a cooperative, which is used as a platform for sharing ideas and working together as a farming community. The MACO extension workers spearheaded the initiative. At the time of the field visit, in October 2004, the cooperative had about 47 members who used a furrow for surface irrigation. The crop variety in each field is determined by the group to encourage crop rotation and prevent farmers from growing the same crop, hence limiting their market. The furrow has been in operation since 2002; catering for both domestic and irrigation uses. It passes along the edge of the village and through the farming plots. Individual farmers create openings in the furrow wall and build secondary and tertiary canals.

Reportedly a furrow constructed by a private contractor before the 1990s dried up in 1994 because of an insufficient slope from the dam outlet point and low water levels. It was used in a coffee growing project that operated as an out growers scheme[142]. The project managers gave each household a Lima to grow coffee. The project team supplied the inputs for the coffee growing and rewarded each household according to the harvest produced. The project came to a standstill when the furrow dried up. The residents applied for assistance for the construction of a new furrow after hearing about some agricultural projects in nearby villages. The support provided to these villages initiated the collective action to apply for the furrow construction. After six years of waiting, funding was provided by the Rural Investment Fund (RIF) through the MACO. A dam was constructed and a new furrow built using the funds.

[142] Out-growers schemes are increasingly used in cotton and tobacco growing in Zambia. A large company, usually a multi-national firm, provides the inputs for the farmers and sets a price for the harvest. Once the farmers bring in the harvest, the cost of inputs is subtracted and they are paid accordingly. The out grower schemes are seen as a way of reducing the burden of capital investment needed to buy inputs by small scale farmers. They tend to shift the risk of crop failure towards the farmer who has to repay the company for any inputs supplied. They also tend to benefit the large companies more than the local growers. The benefits are passed onto the end consumer of the product, usually located in urban centres or metropolitan cities, through reduced prices in the context of competition and consumer power.

The farmers grow tomatoes, maize, onion, okra, potatoes and cassava in their fields. They perceive the benefits of the furrow to include; increased crop variety, increased number of crop harvests and the increased income and food security from the produce. In 2002, the first year of use, the furrow dried up towards the end of the dry season. Experienced farmers attributed this to the high seepage from the unlined furrow. In the following two seasons the water in the furrow was enough even for those downstream. The furrow design ensures that excess water not used in the fields is returned to the Mifutu River, the water source and discharge medium.

The land in Chonya village is allocated by the headman who demarcates it for the irrigation farming. The settlement land obtained from the headman can be passed down from one generation to the next. The inheritance practice does not apply to the farming plots. A cooperative committee elected by members controls the plot occupancy. Each farmer who intends to join the cooperative applies for membership through it. It is the main regulating body for the irrigation farming activities with subcommittees for maintenance and projects. The former looks after the operations of the furrow and draws up an irrigation schedule. The number of hours allocated for irrigation varies between two and four hours depending on the plot size. The members accept the variation as a consensual decision for the harmonious operation of the scheme. The plots are reportedly allocated on a first come first served basis but personal relationships with committee members can be exploited to secure a larger plot. The project committee monitors the cooperative membership. It charges a membership fee and collects a subscription fee used in the maintenance of the furrow.

The challenges in Chonya are similar to those in other farming areas. The farmers complain about fluctuating markets for most crops. The local market is small and the location is far from the larger urban centre markets. The farmers also complain about the irrigation slot times. Most of them would like to irrigate in the early morning and late afternoon. At the time of the field visit the furrow was being used almost at full capacity; each farmer was making use of his plot of land. Some farmers use their fields for seed growing; a practice introduced as part of the ASP. They volunteered to be seed growers after noticing the income generation potential of the activity.

Most farmers in Chonya do not benefit from the Government supported subsidised agricultural input program. During the previous farming season rock rainfall destroyed the crops. The farmers did not receive any subsidised inputs. They appreciate the work of the extension officers and the ASP, which supports them from the planning stages of farming through to marketing their produce. They have other larger plots of land that they use for rain fed farming; where they grow mainly maize, groundnuts, beans and sweet potatoes to ensure food security through the dry season.

The farmers benefited from the RIF funds, which they accessed with the help of their extension workers and other MACO officials. They showed the willingness and commitment to make the project successful by organising themselves into a growers association. They also exhibited high levels of social capital using their various informal networks in influencing community decision making. The community selected representatives to draw up a project proposal for the furrow and contributed to the project through providing labour and tools for digging the furrow. The initial dried up furrow meant the village proposal needed extra scrutiny before the funds could be released. The MACO officials visited the area to establish the reasons for the furrow drying up. Reportedly the past experiences with the coffee project compounds the pressure on the cooperative members to ensure their activities are a success and the project is sustained. The cooperative committee is very active, which encourages the other committees to carry out their duties effectively.

4.1.7 Measuring Success

The case studies show some common challenges faced by irrigation schemes in Zambia. The Government initially classified some of those that have existed since the 1970s as resettlement schemes, where target populations would settle and engage in farming activities. They were welcomed by the residents from surrounding areas even though they were not consulted. The lack of consultation and imposing of ideas on local people illustrates the constructs of knowledge held by the state officials and its power (Long 2001). Reportedly most of the residents perceived the schemes as resources that they could use when the need arose. In times of drought each person prefers to have the capacity to grow crops before their stored food from the previous harvest is depleted and they become destitute. The long term impact of the schemes on the social structures and relations appeared insignificant initially. The residents and the Government officials expected it to be limited if any. The initial food security emphasis has increasingly shifted to income generation. The schemes build on relationships established outside them (Robbins 2004). Active and outspoken residents are often elected to chair the committees made up of indigenous members who exhibit a sense of belonging and long term presence in the area. Though they have regulations, a pre-requisite from the technical team advising the community, these are not strictly applied. The right to use the water is rather informal (Boelens in Boelens and Davila (eds) 1998). It results from land ownership or tenancy near the infrastructure and participation in the construction of the furrow or canal. Participation is seen as an investment to secure future individual rights to use the water, which are incidentally dependant on the maintenance of the infrastructure.

The user or membership fee suggested by project implementers has no long term impact in any of the schemes. It is not a priority for the community. This illustrates some of the multiple rationalities of the various actors involved in the setting up and maintenance of the scheme (Long 2001, Peet and Watts (eds) 2004). Furrows are lined with cement to improve productive efficiency but this also results in increased maintenance costs. When resources are required to repair the infrastructure the committee attempts to raise them from within the community. If this fails then it seeks outside intervention. This does not necessarily mean state dependency but a realignment of emphasis of local activity and interests. The schemes are increasingly promoted by the MACO as income generation and development projects but the local communities prioritise food security. Additionally projects that claim to have included community consultation do not reap any benefits from the exercise. In some cases members are subtly coerced into consenting to projects.

The need for consensus within the community usually excludes members with divergent views who may not be as outspoken as others (Bryant and Bailey 1996; Blaikie and Brookfield 1987). The project implementers value the consensus and are often disheartened to find grassroots activity contrary to their expectations after handing over to the community. They do not seem to allow a response from the community to be integrated into the project. Community projects are dynamic in the sense that the model drawn up and handed over is adjusted to fit with the livelihoods and practices of the local population (Robbins 2004). A state of equilibrium is not necessarily essential due to the fluidity of communities. The schemes at Chonya and Sefula were perceived as relatively successful by the MACO officials and most of the farmers concur. They have some similarities especially regarding the organisation and interest of the members. The variables affecting the success or failure of a scheme are crucial at separate stages of scheme development and operation, Table 4.1.

Table 4.1 Variables in Irrigation Schemes

Stage	Variables	Comments
Scheme set up	Community consultation Community participation Community consensus Incorporating culture and custom Traditional authority legitimacy Social capital	This is a theoretical phase of all projects. Community members invest their time and efforts to ensure project implementation. The social capital illuminates the informal and formal networks within a community. High levels of capital would benefit the collective action and community participation. Local conditions must be taken into account at this stage.
Operation of scheme	State of infrastructure Organisational skills Attitude of extension workers Paying Membership fees Crop variety Witchcraft practices	This is the dynamic and critical phase of the project. Communities react to the scheme incorporating new activities alongside their old ones. They weigh the benefits of new practices.
Subsequent farming seasons	Soil fertility Land security Livelihoods	The dynamism continues as communities adjust to farming seasons and changes within their organisation and relationships.
Conversion into income generation	Intermediate technology Financial access Access to urban markets for produce Inadequate subsidies and support	This is the project implementer envisioned long term outcome from irrigation scheme. It does sometimes differ with the vision of the community members. They make this conversion if the conditions are right in their opinion.

The MACO officials usually measure the success of a scheme by its volumes of productivity, levels of activity, maintenance of infrastructure, lifespan and expansion to incorporate new members. The communities perceive success to mean continued productivity, sustainable infrastructure and strengthened relationships. The success of a scheme can be linked to the levels of social capital in the target groups, Table 4.2.

Table 4.2 Success of Irrigation schemes and Social Capital

Scheme	The MACO success measurement	The community success measurement	Levels of Social Capital
Rukuzhye	Moderate success; infrastructure not used to full capacity, community members are still dependent on outside intervention	Successful; infrastructure is available, crop variety has increased, food sufficiency has improved, no market for surplus crops	Low levels resulting from scattered locations of community members
Vuu	Unsuccessful; too much finger pointing among members, blame placed on outsiders	Unsuccessful; The MACO officials are not helpful, crop variety is minimal, no market for surplus produce	Low levels mainly resulting from allegations of witchcraft
Sefula	Successful; community members produce surplus product for sale, large number of members	Successful; community members make decisions, crop variety has increased, food sufficiency has improved, traditional land is secure	High levels mainly built on strong traditional and cultural loyalty
Chonya	Successful; community members produce surplus crops, active committee members, support from local community	Successful; community members make decisions, crop variety has increased, food sufficiency has improved	High levels built on social interactions from water sources, school committee and previous experience with dried up furrow
Ngulula	Moderate success; very few members produce surplus crops, outside intervention is occasionally required	Successful; infrastructure is available, limited market for surplus crops, increased food sufficiency	Average levels resulting from the community membership being more fluid

The social capital is not always easy to measure considering the variations in its definitions. It is one variable that is dependent on the community. However, some of the performance related variables affecting the schemes are actually determined by the policies at the central Government level. These are affected by the macro-economic situation at the national and global scale, Table 4.3.

Table 4.3 Policy effects at local level

Policy	Origin	Manifestation	Comments
Poverty alleviation	UN, Donors	Promoting income generating activities	The crops grown for income generation are not always the same as those for food security.
Participation and sustainability	International Financial Institutions (IFIs), NGOs, Donors	Criterion for project implementation Community contribution	Consensus is emphasised driving communities to accept proposals with minimum debate.
Liberalisation	IFIs, Donors	Removal of subsidies in agriculture and service provision	This removes the safety net for farmers that would be useful during years of below average harvest.
Structural Adjustment	IFIs, Donors	Removal of marketing boards Phasing out of cooperatives	Affects marketing strategies of the farmers. Produce grown cannot earn income if markets are not available.
Changes in Micro finance	Government, Donors, NGOs	Collapse of Lima bank and restrictions in lending from development banks[143]	Increases dependency on outside intervention and minimises proactivity.

The linkages between global scale policies and the effects at the local level are further discussed in a later chapter.

4.2 Commercial Agriculture

Commercial agriculture accounts for a large volume of water use. It is concentrated in the Central, Eastern and Southern Provinces. Several cash crops are grown in each province. Farmers in the Eastern and Central province are main producers of cotton and tobacco. Groundnuts are predominantly produced in the former while the latter produces maize and wheat. Farmers in the Southern Province also produce maize and tobacco and have large flocks of cattle. Some farmers in the Copperbelt and Central Provinces set up game ranches. They keep both cattle and game animals that require sources of drinking water. Most livestock owners in the Southern Province are traditional pastoralists from the Tonga and Ila tribes. They require water points for their animals and usually depend on perennial natural water bodies. The MACO is making efforts to set up multipurpose water points, following a general rule of thumb where animals move less than ten kilometres to obtain water. The pastoralists are considered commercial farmers for the purposes of this research though the focus is large scale commercial agriculture such as tea and coffee plantations.

4.2.1 The Africa Coffee Plantation

The Africa Coffee Plantation (ACP) is a few kilometres outside Mbala central, Figure 4.1. It was initially a parastatal enterprise and privatised in the late 1990s. It has two locations for coffee growing. Its headquarters are at Kateshi, in the Kasama district, Northern Province. As a parastatal the ACP was known as The Zambia Coffee Company Limited and was owned by the Zambia Industrial and Mining Corporation Limited. It was established in 1985; a modern

[143] Lima bank mainly operated in the rural areas of Zambia and provided loans for small scale farmers. The Development Bank of Zambia provides loans for small and medium businesses in Zambia. The interest rates on loans are usually too high for most local people to afford.

processing factory was commissioned in 1986. On 30 September 1995 it was practically insolvent with a negative working capital. It was failing to pay its creditors and employee salaries. The Zambia Coffee Company Limited was acquired by African Plantations Corporation LDC at a critical time for the Zambian coffee industry which had been experiencing declining growth. African Plantations Corporation LDC is a private company registered in Bermuda, which operates and manages coffee plantations in East and Central Africa[144].

The plantation in Mbala has no processing plant; the coffee beans are transported to Kateshi. The coffee plant has a life span of 15 years and requires rather large volumes of water, fertilizers and pesticides. The plantation uses its own dam formed on a diversion of the Lucheche stream. The Lucheche stream starts at Lake Chila, the main water source for Chila Water and Sewerage Company that supplies domestic water to Mbala residents[145]. The Lucheche stream is also used as a main source of water for villages located along it. The village residents use it to obtain domestic water, to wash and to practice small scale farming in the dry season. The coffee plantation is situated downstream of most villages.

Operators irrigate the plantation on a 24 hour rotation basis using a local water supply intake (pump house). They monitor the water volumes and have detectors for system blockages. The plantation uses both drip and centre pivot irrigation. The latter is a more recent system of irrigation on the plantation. The drip irrigation system has higher maintenance and operation costs, linked to labour requirements necessary for constantly checking the outlets, compared to the centre pivot. The centre pivot however, has higher capital costs than the drip system.

According to Water Board records the ACP has a bundle of water rights totalling 78850 cubic metres per day[146]. Its personnel manage the dam and the irrigation operations. Some urban centre residents of Mbala have concerns on the long term viability of Lake Chila and the Lucheche stream considering the increasing demand for raw water and the effluent being emptied into the stream. They question the quality of water in the stream after all the fertilizers and pesticides are washed into it with run off from the coffee plantation. They also worry about the encroachment on the stream by the village residents that farm along its banks. The ACP management does not perceive any threat to the water quality in the stream; most of the run off does not directly enter it. The groundwater may be affected but it is not used as a source of raw water. The Chila Water and Sewerage Company management had considered increasing the volumes of water drawn from Lake Chila to meet the increasing demands for domestic water. They believe the increased volumes of abstraction will not adversely impact other users of the stream; the volume of water in the lake is enough to meet the demand of all the water users. Most water users drawing from the same source do not seem to interact with each other.

The ACP is one of the dominant water users in Mbala. Its water use is mainly for irrigation purposes and the few residential plots on the estate. It is relatively self sufficient in its water supply. It has water rights for the amount of water it abstracts and the permission to dam the stream. The rights are granted on the basis that the activities have no adverse effect on other water users, especially those down stream. They are often automatically renewed without considering expanding villages in the area that are likely to use the same water source. The local DWA officers carry out inspections on behalf of the Water Board if payments for rights are due or increased volumes are applied for. The Water Board should settle any disputes in water allocation. Directives from the Government compel farmers to keep a minimum of 50m from the

[144] Statistics and information provided by the Zambia Privatisation Agency

[145] Chila water and Sewerage Company is the water department of Mbala Municipal Council. At the time of the filed visit the management had applied for registration as a company but this had not been granted yet.

[146] This may be an allocation for both Kateshi and Mbala.

water source to prevent encroachment by small scale farmers. They are not well known or enforced unless accidents or disasters occur. The village residents feel they are entitled to a livelihood and they see it fit to cultivate along the banks of the stream. The ACP is a commercial entity concerned with obtaining the required amount of water through the necessary channels. The threat to the water source seems to be a concern only for the elite urban residents of Mbala.

4.2.2 The Kawambwa Tea Estate

The Kawambwa Tea Estate is located 27 km from Kawambwa, on the road leading to Mporokoso in the Luapula Province, Figure 4.1. It covers a total area of 2,671 hectares; 507 hectares are cleared for tea production. Tea production began in 1964 as a Government sponsored project, which indicated that the activity was feasible in that area. Large scale production started in 1968 and the Kawambwa Tea Company Limited (KTC) was incorporated in 1974 as a wholly owned state enterprise. Like other parastatals in the late 1980s, performance at the KTC was rather poor. In 1996 it was sold to a private owner. The ownership changed hands again in 2001[147].

The KTC uses the Luena stream that flows through it as the main irrigation water source. The tea tree has a life span of about 100 years. Irrigation is conducted on a 24 hour rotation of the various estate sections using automated sprinklers that are strategically positioned in each one. It is only required during the dry months. Enough rainfall is received to water the trees in the wet months. The soils do not retain too much water hence, no need to remove water even in the years when rainfall is above average. As a safe guard furrows exist to drain excess water if the situation ever arises.

The water from Luena stream is also used to supply domestic water to the employee households within the estate, using a tower managed by the engineering and irrigation section. Domestic water is provided free of charge to all estate employees. The KTC obtains water rights from the Water Board permitting it to abstract water and impound the stream to increase the irrigation system intake capacity. Its water engineer asserts that the water users downstream are not adversely affected by the irrigation activity at the estate. It has water rights to abstract 12, 000 cubic metres per day; significantly less than the 42, 192 cubic metres that was applied for before privatisation. No official reason was given for the drop in water requirements. One possibility could be delaying plans to expand tree planting.

Talks about a possible sugar plantation in Luapula province in the Luena area are on going. The plantation, which will draw water from the same stream, has been on the national development plans for over five years. The flows in the stream are limited during the dry periods with barely enough for the KTC. The increased demand on the stream may adversely affect the estate and the irrigation capacity. The sugar plantation will potentially be located upstream of the estate. Some residents also use the stream as a source of irrigation water for their vegetable gardens that are located downstream of the estate.

The KTC appears to have a guaranteed water source at the moment, enough water for irrigation and domestic water supply for their employees. The Luena stream is perennial though volumes drop significantly during the dry season. The irrigation activity is however under threat from the potential sugar plantation that will be located upstream. The sugar plantation brings with it the potential of job creation for the local community; an incentive in Luapula, one of the poorest

[147] Statistics and information provided by the Zambia Privatisation Agency

provinces in Zambia. However, the focus on development and job creation has obscured the full consideration of the impact on other users of the Luena stream. The KTC have not been informed or consulted on these matters. Its distance from Kawambwa means it can operate with minimum interference from the Local Authority. It has no plans to charge employees for water unless this is incorporated as a cost saving measure, meaning salaries would have to be increased. The subsistence farmers using the stream have no complaints about the amount of water available to them at any particular time.

4.2.3 The Chongwe Farmers

Farmers in the Chongwe area on the outskirts of Lusaka are involved in horticulture, growing roses and vegetables for export, Figure 4.1. Most of them use boreholes and dams for irrigation. The water level in some dams and boreholes is affected by seasonal changes. Most farmers feel there should be no charge for ground water since it appears to be an unlimited resource. They however believe if competition increases and the resource is limited then charges can be introduced. Those with dams usually have a local water board that deals with conflict resolution when individuals are unrealistic about the amounts of water required to irrigate their crops. The board members are elected by the water user group members.

Commercial farming is affected by variables such as land security and private ownership, crop variety, irrigation technology and water rights allocation. The farmers usually have title to their land and also have access to financial and crop markets. The commercial farming block in Zambia lies within close proximity to the urban markets in the Copperbelt and Lusaka. The increasing economic importance of farming in Zambia has resulted in some positive policy formulation at central government level. Import tax was reduced on agricultural inputs and commercial banks encouraged to create a suitable lending environment for the farmers. Small scale farmers are also encouraged to view agriculture as a business compounding the economic value of water. The large scale commercial farmers will be affected by the proposed revision of the Water Act[148]. The current Act which dates back to 1949 does not include licensing groundwater abstraction. Groundwater is considered private because it requires investment from the user to bring it to the surface. In the proposed revised Water Act, groundwater is considered public, requiring water rights for abstraction. The revision of the Act is likely to increase the level of interaction between different water users especially those drawing from the same aquifer.

4.3 Industrial

Industrial activity in Zambia is mainly found along the initial rail line from Livingstone to the Copperbelt; a pattern of development inherited from the colonial days. In the 1970s and 1980s, the state made efforts to improve industrial activities in other parts of the country away from the rail line[149]. Transportation and logistics limited the viability of outpost factories; most were closed down soon after the liberalisation of the Zambian economy in the early 1990s. The Copperbelt mines have always been the economic and industrial heart of Zambia. They provide markets for

[148] The Water Act (1949) is being revised under the Water Resources Action Programme (WRAP). This is a donor sponsored programme looking at the economic exploitation of the Zambian water resources by developing suitable legal and institutional frameworks. The WRAP commenced in 2001 and was wound up in 2004. One of the documents includes proposals for charging for ground water abstraction.

[149] The effort was made by the Government during the second national development plans during the second republic. The plans were centred on rural development and diversification of industry to complement the mining activity. One key industry was set up in each province; bicycle assembly in Chipata, Pineapple canning in Mwinilunga, Battery manufacturing in Mansa, Car assembly in Livingstone etc.

other industries such as the beverage industry for alcoholic and non alcoholic drinks set up in close proximity. Breweries and bottling companies are large water consumers however; we focus on the use of water in the mining industry.

4.3.1 Mine Water Use

Large scale copper mines are concentrated in the Copperbelt region of Zambia, Figure 4.1. Mining, mostly underground, operations started in the late 1930s. To enable the extraction of the ore after a certain depth, groundwater needs to be pumped out. The mines invest in water pumping technology and are involved in the management of water. Some of the abstracted groundwater is used in parts of the mineral ore processing especially in parts of the process that are not sensitive to water quality and in washing and cleaning activities on the processing plants. Any excess water is discharged into nearby surface water bodies, in this particular case the Kafue River or one of its tributaries. Some mining company employees affirm the water that is discharged into the river is not checked for quality. It is assumed to be rather pure considering it comes straight from the ground. The Kafue River is also used as a source of water for the processing operations that are more sensitive to water quality.

The mines obtain water rights valid for up to 20 years permitting them to abstract water or impound streams and rivers that pass through the mining area and may interfere with mining operations. Some members of the mine management have an argument against being charged full water rights. They believe they should be charged a discounted rate as they actually put some water into the surface water bodies. The water that is discharged into the surface water bodies is of a much higher volume than the amount of water abstracted for plant operations.

Before their privatisation, which was completed in 2000, the mining companies supplied domestic water to the townships where the majority of their employees lived. They operated as parastatal conglomerates with separate divisions based in various towns. The divisions were unbundled during the privatisation exercise. They supplied domestic water at a subsidised rate. Each mine had a water treatment plant. After privatisation, the domestic water supply section was transferred to the Asset Holding Company, (AHC). The funds for the formation of the AHC were provided by the World Bank as part of a mine township project. The AHC was a transitory company with a life span of 4 years. Its project life cycle came to an end in 2004 but a year's extension was granted to give the Government extra time to workout its exit strategy[150]. It paid the mining companies for the water that was pumped to the water treatment plants. In some towns the mining activity produced more water than the AHC required for its operations. The AHC was able to sell the extra water volumes to another CU operating in that particular town. It operated as a CU and charged clients close to the cost of supplying their water[151].

Some farmers on the Copperbelt raise concerns regarding the processes used in effluent treatment and the content of the mining discharge, which also comes from accidental spillages during the processing operations. Some farmers down stream of the mines' discharge points have complained about the effects the effluents have on their livestock. The cases are settled in the courts. Cause is sometimes difficult to establish mainly because the surface water bodies are in constant flow. The commercial status of the mines means they only deal with the licensing

[150] The AHC operations were incorporated into Nkana Water and Sewerage Company (NWSC), the CU operating in Kitwe and Kalulushi. The exit strategy was announced by the Minister of Local Government and Housing in July 2005. Various options were considered for the exit strategy. NWSC was one of the best performing CUs at the time the decision was made.

[151] The World Bank provided most of the funding for the AHC and would see this as an efficient commercial operation and success story for service improvement.

authorities. They no longer provide social services to their employees which means they can concentrate on their core businesses[152]. They are usually located on the boundaries of a town and relatively far away from most residential townships. As towns expand however, the distance between the mine plants and residential townships decreases. The mines provide economic activity in the towns where they are based and have historically attracted migrants from other parts of the country. The employment seeking migrants usually set up shanty townships close to the mines. The townships usually have no piped water; the residents depend on shallow wells. The mine water pumping activity also affects other potential users of the aquifer.

The impact on other users has not been assessed given that most of them utilize surface water. Increasingly, hospitality companies opt to drill boreholes to be self sufficient in water supply and not be affected by water supply disruptions. Some households also opt to have separate water tanks for the same reason. The economic importance of the mining industry gives it strategic advantages over other water users. When the mines provided social services, they extended water pipes to new townships where migrants settled. Their privatisation has left gaps in service provision. The mining companies were parastatals and thus were able to lend their services such as skilled manpower and machinery to Local Authorities in their towns. This is no longer possible. The mining activities and other industrial uses of water promote the representation of water as an economic good. This view is legitimised by the potential economic benefits from the industrial activities.

4.4 Conclusion

The representation of water as an economic or social good is an example of the most commonly used mode of appropriation. The cases in this chapter illustrate other modes of appropriation and explore some of the underlying processes of legitimisation by various actors. The processes bear heavily on the productive logic of the various actors, which is identified in their narratives. The strategic logic which is usually more important in decision making is rarely explicitly communicated.

The economic value of water in agriculture and industry is well established. However, it cannot be detached from the social value in most operations and uses. All commercial water users in the case studies acknowledge the social value of water whether it is for their own use in the case of small scale farmers or supplying domestic water to their employees in the case of commercial farmers and industry. Commercial use of water is clearly enshrined in the water rights issued, by the Water Board, ideally after an inspection to ensure it will have no adverse impact on other users. The Water Board is however unable to perform its duties effectively due to lack of resources and its central control.

Most irrigation schemes use considerable amounts of water, at least above the minimum requirement for a water right. The relations between the MEWD and the MACO mean the schemes are effectively exempt from the legal requirement of obtaining water rights. They are also classified as development programmes and the water used is effectively seen as a social good. Scheme members are not likely to accept paying for water especially as they perceive no adverse impact on downstream users of their water source. The irrigation infrastructure provides easier access to water determined by the tenure of plots of land along the furrow or canal. The most dominant modes of appropriation in irrigation schemes are access, allocation and use. A committee is responsible for the allocation and access through the control of plot tenancy. Most

[152] This reflects the discourse of the new private owners of the mines. Their policy is to slightly increase the wages of the employees and leave them to pay for their services that are provided by separate commercial entities.

schemes are effectively self contained in their operations and only interact with the MACO officials.

Commercial farmers are also effectively self reliant. They exhibit all modes of resource appropriation in their locations. Their main concern is access to water resources for use in their farming activities. Most have title to their land with 99 years lease, which encourages them to invest in their land by putting up infrastructure for their farming activities. The large volumes of water they use require water rights but no inspections are carried out to determine exactly how much water they use. Water rights are restricted to surface water use under the Water Act (1949) that is currently being revised by the WRAP team to include groundwater. The rights can be transferred from one land owner to another. Irrigation activities, mostly by commercial farmers, account for 76% of the Zambian water use. The commercial farmers' independence also means they are rarely aware of the impact their water abstraction has on other users of the aquifers.

The high population concentration and industrial activity on the Copperbelt Province, where mines are located, puts pressure on the main water body in the Province, the Kafue River, which is used for agriculture, fishing, effluent discharge, industrial activity and natural habitat. It is the most contested water body in Zambia. The increasing demands on the water body have impacts on the quality of the water in the river. Several projects look at its water quality and dialogue involving all water users and stakeholders. They aim to ensure it is used for the benefit of all users and signify a potential of prioritising different water uses based on the economic productivity. The Kafue basin is a likely target for introducing water markets in Zambia if demand continues to increase.

The commercial entities, whether mining or farming, are formal institutions with a particular management method that differs from those applied in irrigation schemes. The schemes are dependent on the informal networks within the community. The members value their interactions with other users, which cements their access to and the use of the water resources. The commercial entities on the other hand place more value on the water rights that grant them access to the resources and ensure the transfer of the access modalities. The groundwater resources can be accessed and used without the water rights. The management methods summarised in Table 4.3 can be placed in shifting paradigms, which sometimes conflict with the local strategies being used to ensure access to water. The paradigms affect the representation and value of water resources in various locations. The increasing view of water as a scarce commodity, especially when considering the desired quality compounds the conceptualisation of water as an economic good.

Table 4.4 Management typologies and potential conflicts

Management Typology	Mode of Appropriation	Process of Legitimisation	Conflict	Cases
Commercial	Representation, Access, Transfer of access, Allocation and Use	Water rights in common law, Regulation, economic benefits	Traditional land owners	Mines, the KTC, the ACP
Community	Access and Use	Livelihood strategies, kinship, social harmony	Individuals	Rukuzhye, Chonya, Ngulula and Sefula
Committee and Individual	Access and Allocation	Beliefs	Formalisation and organisations	Lwabwe and Vuu
Committee	Representation, Allocation, Access and Use	Monetary economy, formalisation, limited national resources	Traditional livelihoods	Irrigation Schemes

The case studies also illustrate the levels of resource appropriation. At the household level an individual is usually the decision maker and appropriator. In communities the appropriator is an elected committee, a voluntary leader or a hereditary one. Some communities also interact with field officers from Local Authorities or Government agencies and NGOs who play a role in resource appropriation. In farming communities the land owner or tenant is also an appropriator. The grass root actors whose main concerns are the uses of the resource and thus mainly appropriate it through access modalities have several options including: membership to a scheme, personal investment and risk analysis, tenancy and neighbourly relations. The transfer of these modalities is critical given the fluidity of the communities. New and exiting members need to be incorporated and migration caused by various factors such as economic situations and employment seeking also deserves consideration.

5 Case Studies - Domestic

The domestic water users, the focus of this chapter, can be divided into separate groups based on their locations: rural, peri-urban and urban classifications by the MFNP and the MLGH. The methods used by the two ministries have some disparities and are currently being reviewed. For the purposes of this research the classification used by the MFNP, which is based on administrative centres in the country, will be applied. Any area outside a 20 kilometre radius from an administrative centre is considered rural. However this system results in some areas that lack the infrastructure found in others being classified urban[153].

This chapter analyses the various modes of resource appropriation in domestic water use, which is primarily concerned with access to water resources in particular quantities and qualities. The case studies examine the access modalities and their transfer revealing kinship, clientelism, payments, appointments and neighbourly relations as some of the manifestations. They explore the allocation mechanisms which are predominantly authorised by committees and water suppliers. They also examine the sources of legitimacy such as elections, appointments by traditional leaders and voluntary leadership. They reveal some potential conflicts between the models of water supply, their resulting structures and the perceptions of the local populations within the existing structures. The conflicts sometimes result in resistance to the models manifested in their instability and manipulation by local populations.

The chapter explores community managed water schemes in two villages, Chulu Ngoma and Mwansabombwe, in the Northern and Luapula Provinces respectively. The other rural case study site is Limulunga a home of the Litunga, the paramount chief of the Lozi people in the Western province. The chapter also examines water schemes managed solely by the community or in partnerships with the Commercial Utility (CU) or Local Authority in peri-urban areas drawn from Western, Northern and Lusaka Provinces. It also explores water supply managed by a Local Authority, a CU based in one district and a CU that covers an entire province in urban areas drawn from Central, Eastern and North Western Provinces respectively [154].

The selected case studies are used to accentuate the challenges faced in the domestic water sector in Zambia. Each one makes a unique contribution to the analysis of domestic water sources and water supply service provision.

[153] The disparities in infrastructure are a result of the national development plans that were undertaken in the first 20 years after independence. Provincial centres were developed with the aim of creating at least one major industry in each province. The planning was not always successful leaving some towns with dilapidated infrastructure and no envisioned supporting industries.

[154] Central and Eastern Provinces contribute significantly to the Zambian economy through agriculture. North Western province is one of the poorest provinces in Zambia but economic activity is forecast to increase after the opening of Kansanshi mine in 2004.

Figure 5.1 Main towns and surface water bodies in Zambia.

Source: http://www.afriprov.org/images/zambia.jpg (Accessed on 20/03/03)

5.1 Rural Areas

Generally a rural area is sparsely populated, has semi permanent infrastructure and no central planning unit without the administrative centre[155]. Access to basic facilities is often limited with feeder roads being the common access to markets[156]. Electrification in rural Zambia is an ongoing exercise. Most rural areas are not connected to the main grid; some use generators for their power supply. They often have hierarchical traditional leadership through a village headman who reports to a chief.

5.1.1 Chulu Ngoma

Chulu Ngoma village is on the outskirts of Mbala, Figure 5.1. It has a population of about 500 households. It was established in the early 1960s after the local chief allocated land to his subjects. The village headman, whose title is hereditary, is subordinate to the local chief and has a council of advisors that assist him in running the village affairs. The village site was considered suitable especially because it had a stream, Chulu Ngoma, which used to flood and form a seasonal lake that local people used as a water source. As the village grew most of the trees were cut down to create farming and settlement land. The population growth increased the demand on the stream. Eventually around the mid 1980s it stopped flooding. The local people began using it and hand dug wells close to it as sources of water.

Most of the village residents still use water from the hand dug wells in the porous rock that allows water to seep through. The water initially appears clear but after some months elapse it becomes cloudy signifying it is no longer suitable for domestic uses such as cooking or drinking. The village residents dig a new well when this happens. The headman mobilises male community members

[155] This classification of a rural area is used by the Ministry of Finance when determining payment of rural allowances for civil servants. It is also used by the Central Statistics Office (CSO) in Zambia. The classification was issued at a Workshop for the CSO held in 1998.

[156] A feeder road is a graded untarred road

to dig and maintain the wells. During the field visit some parts of the well sites were overgrown with grass and the community members were reportedly thinking of setting up a group to manage the sites. It would replace the ad hoc system used to dig and maintain wells.

Separate organisations drilled two boreholes in an effort to provide clean and safe drinking water to the community. They involved the residents in the selection of the borehole sites. Only one of the boreholes was in operation at the time of the field visit. According to the headman about ten households were using the borehole. Officially, the chairman of the Village Development Committee (VDC) had over 50 households on his borehole users' register. The District Water and Sanitation Health hygiene Education (DWASHE) team with financial and technical support from the Development Corporation Ireland (DCI) rehabilitated the operational borehole; replacing the hand pump with a cylinder bucket and windlass[157]. The hand pump initially installed on the borehole broke down because of improper use and overuse by the residents. During the field visit the residents complained about the size of the cylinder bucket, which they saw as very limiting. Collecting domestic water was very cumbersome. Some of the borehole users avoided using it during the rain season. The stagnant water usually tasted rusty when use was resumed.

The DWASHE team formed a water committee to manage the borehole after rehabilitating it. At the time of the field visit, the committee was no longer functional apart from the treasurer, who happened to be the wife of the VDC chairman. She still collected water fees from the users. The water committee chairman was allegedly inactive and uninterested as was the village headman. The lack of proper leadership resulted in a few other problems in the village. For instance to ease their suffering the residents opted to apply for a community water project to construct a furrow for use in small scale farming during the dry season. The headman collected monetary contributions from them to pay for the water rights for a stream, Kanyika, which passes through a neighbouring private farm. The farm existed before the village was created. According to the residents, they were sometimes accused of trespassing on the farm when they tried to obtain water from the stream. They were very hopeful the water rights would be granted to enable the diversion of part of the stream. They would construct a furrow through the village using an already mapped out a route. According to the Water Board documentation, legal provisions exist for obtaining water located on private land[158]. A clear distinction is made to separate land and water. A landlord has the right to use the water on his land but this should not exclude use by neighbouring villages or landlords. Village residents or neighbouring landlords can obtain rights of easement if they have no alternative water source.

The Chulu Ngoma residents felt development in their area was being hindered by the lack of clean and safe water in their location. They intended to construct a school and medical centre in the village but felt they would not be able to attract trained staff without clean water to use. At the time of the field visit, the residents used the services in Mbala central, which was a good one hour walk one way.

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[157] DCI was formerly known as Irish Aid. Its name has been reverted to Irish Aid as of mid 2006.

[158] The water users are eligible for easement rights which are defined in the Water Act (1948). This is the act used by the Water Board in the issuing of water rights throughout Zambia. Easement is covered under the right of abutment, right of passage and right of storage. The right of abutment means the right to occupy by means of a dam or weir the bed or banks of a public stream, whether visible or not, including lakes, swamps or marshes forming the source of such a stream or found along its course. Right of passage means the right to occupy so much land belonging to another as may be necessary for or incidental to the passage of water. Right of storage means the right to occupy land belonging to another by submerging it with water by means of a dam or weir or other works.

The above case study underscores various issues concerning water projects and the community capacity building that should accompany them. In the attempts made to provide clean and safe drinking water for the community, most community workers feel more attention is paid to the installation of infrastructure. The capabilities required to ensure its continuous operation receive less emphasis. The community workers perceive the formation of water committees as a step in the right direction and an emphasis on the need for continued community participation. The committee manages the boreholes and also provides an interface between the community and project implementers.

The support of the traditional leader is vital for project sustainability in the rural areas. The ineffective leader was compounded by a dormant water committee chairman but contrasted by the active water committee treasurer and her husband, the VDC chairman. The village headman seemed uninterested in the borehole maintenance especially that his house was located a good distance from the site. He was however actively involved in the application for the water rights, which he complained was taking too long. The residents narrated that water rights had taken more than a year to be processed and they were not aware of how far the process had gone. They staked their claim to their right to livelihood, which necessitates the construction of a furrow, and a right to development as phrased by the development organisations and Local Authority representatives that visit their area. The development projects have criterion that the village must meet such as a village constitution. The VDC chairman submitted one drawn up on request to qualify for project funds.

5.1.2 Mwansabombwe Community Managed Scheme

Mwansabombwe is a village in Luapula Province, not far from Kawambwa, Figure 5.1. It is the home of Mwata Kazembe, the chief of the Lunda people. The field visit occurred shortly after the Umutomboko ceremony. The village looked picturesque with all the houses and huts having been recently painted for the ceremony. The Umutomboko is held around harvest time and celebrates the conquest of the land by Mwata Kazembe as recorded using oral traditions. The local women bring gifts of beer and food to the chief, who pays homage to the ancestral spirits. Originally it was a dance of conquest that celebrated the investiture of a new king[159]. Mwata Kazembe has a council of advisors who assist him in running the affairs of his chiefdom.

Mwansabombwe village has two operating water systems, one provided by Kawambwa district council that the village is considered a part of and one community managed scheme. The council supply is limited to Mwata Kazembe's palace. A contractor installed the community system funded by the Zambia Social Investment Fund (ZAMSIF), operated in the MFNP. The ZAMSIF is mainly funded by multi lateral organisations, mainly the World Bank. Its funds were used to install communal taps in various parts of the village and to build a water storage and distribution centre. Before the taps were installed, residents used wells and nearby streams as water sources.

A water committee elected by the residents manages the water points. It recruits tap attendants for the communal taps. It expects the residents to pay a water user fee of K1, 000 per month. The

[159] Documented by David Gordon, department of history University of Maryland USA. The term originally is used to denote a period before the current format of the ceremony was adopted i.e. close to the time the Lunda people settled in Zambia. The exact year when the change of format occurred is not well documented.

money is used in the operation and maintenance of the scheme. The water committee members are predominantly male. The women are rarely involved in the water affairs even though they actually use water more than men, considering their domestic responsibilities. They perceive water affairs as a male dominated arena because the men are good at fixing things. They relayed these sentiments in a meeting held by the Kawambwa district council planning officers. The purpose of the meeting was to recap on some DWASHE teachings and find out why the water committee in Mwansabombwe was not performing according to expectation. Allegedly the committee was mismanaging funds and revenue collection had dropped. Most of the residents were unaware it had not been paying the electricity bills to operate the pumps at the water distribution point.

Water is supplied at the communal taps for over ten hours a day. The committee members recounted that unfortunately some households were not paying for the water. They recognised this as a contribution to the problem of paying the debt owed to the electricity supplier, the ZESCO. They planned to collect a flat fee from every household in the village. They involved the indunas (Council advisors to the chief) and the chief himself in making announcements. They also claimed some debt had been left by the contractor that installed the water points.

This case study reveals several issues faced in some rural areas with strong traditional leadership. The authority of the water committee is questioned by some residents and the chief has to be involved in sensitizing them regarding the water affairs. A directive from him is more influential than an announcement from an elected committee. His support legitimises their actions. Customs and beliefs result in water affairs being male oriented and lead to the failure to include women in decision making positions of water committees in some parts of the country. The committees start off very strong but capabilities appear not to be fully developed as the activity tapers off. Their morale is affected by the attitude of the residents who agree to pay for water when a project is suggested. Once the project teams hand over the completed project, some residents wish to free ride and not pay their user fees. Some residents criticise the DWASHE team for not checking on the operations of the committee. After the initial workshops held in the village they disappear until they receive reports of a crisis situation.

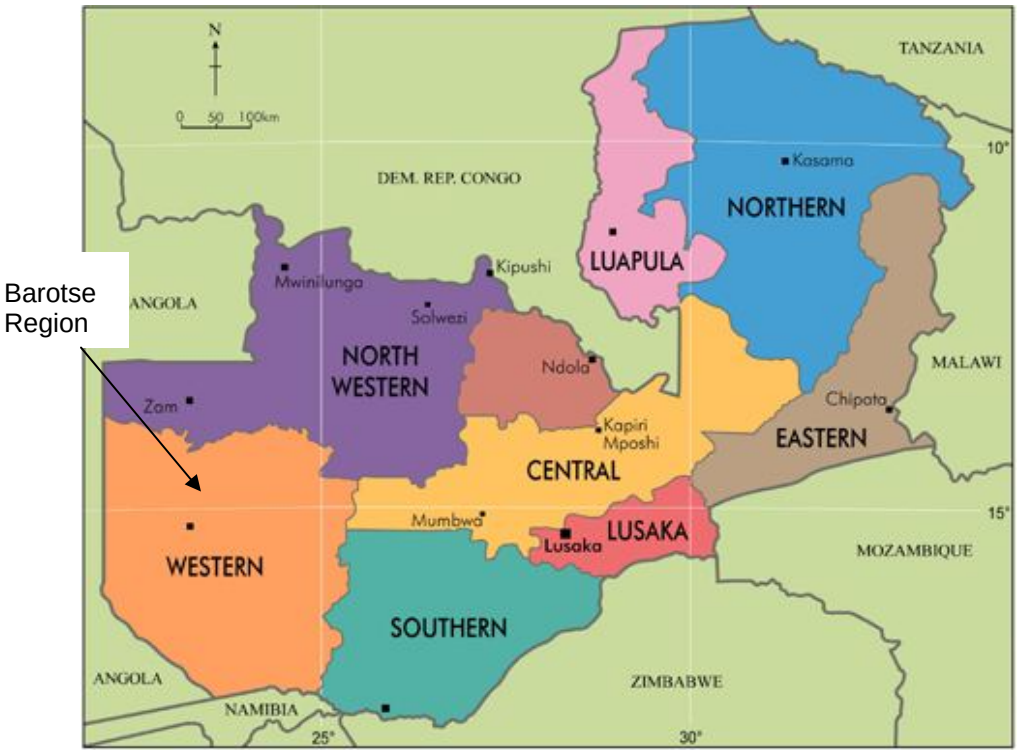

Figure 5.2 Provincial boundaries and headquarters of Zambia

Source: http://www.zambia-mining.com/province%20map.jpg (Accessed on 20/03/03)

5.1.3 Barotse Royal Establishment

The Barotse Royal Establishment, (BRE), is the custodian of natural resources like land and water in most of the Western Province, Figure 5.2. Its largest tribes are the Lozi and the Mbunda. It is headed by the paramount chief of the Lozi people, the Litunga. The Litunga is a hereditary position revolving around three families. He has a council of advisors, Indunas, who are mostly inherited from past Litungas; new ones can be appointed by the incumbent. The BRE signed a separate treaty with the BSAC and the colonial government resulting in different governing structures for their land compared to the rest of Zambia. In 1970 their land was converted to trust land like other tribal lands.

The BRE kingdom is located in the western floodplains. The Litunga has two royal palaces, one in Limulunga for the dry season and the other in Lealui for the rain season. The Limulunga palace is provided with water free of charge at the discretion of the Managing Director for Western Water and Sewerage Company (WWSC), the CU covering all seven districts in Western Province. The WWSC also supplies water to the rest of the community living near the palace. The households with taps pay a fixed monthly fee of K12, 000 for their water. Water is supplied for about eight hours a day. The taps are in effect communal taps located at a particular premises or yard. The household owner charges the neighbours a fixed monthly sum, between K1, 000 to K1, 500, to collect water. Some households have more than ten neighbours drawing from their tap. In such cases the neighbours cover the full water bill for the household.

Some households use the wells dug by community members near the Nuame harbour for their domestic water. The wells are used free of charge as an alternative water source when water

supply from the WWSC is disrupted. According to the users the water is of good quality though most households only use it for washing and cleaning. Individual taps can be installed at a household after a successful application and payment of a connection fee to the WWSC. The potential client purchases their own pipes leading to the main distribution lines. Some residents cannot afford the connection fee and the pipes. The influential community members like the Indunas are able to secure new connections more easily than other residents. One newly appointed induna that was interviewed had acquired a tap at his household after his appointment.

The Limulunga case study illustrates some community dynamics at work in acquiring new water connections and supply to neighbouring households. The untreated water from the wells can be obtained freely by all residents. Treated water is paid for either directly to the WWSC or to the household owner where the tap is located. The position of induna is considered influential and of higher status in the community. An induna should have a tap connected at his household and is in a position to obtain the connection quicker compared to other members of the community. However, the position has responsibility and prestige. Thus he feels obliged to allow his neighbours to draw water from his tap at a minimal charge. The new connection also benefits some other residents. The case study also points out the presence of a secondary water market in the community. Residents who cannot afford individual connections obtain safe and clean domestic water from their more affluent neighbours. Those living near the palace feel it should be supplied with free water by the WWSC. The Managing Director of the WWSC feels the free water is a personal and company contribution towards the upkeep of the palace.

5.2 Peri-urban Area

A peri-urban area is often located on the outskirts of an urban area. The demarcation of peri-urban boundaries varies and in some places they are so classified because of the type of infrastructure when compared to the urban centres. They encompass the shanty townships that mushroom around urban areas. The distinction between "urban" and "peri-urban" in most official documents depends on the density, types and patterns of land uses[160]. In most cases the peri-urban areas are densely populated and the residents have access to urban facilities because of their proximity.

5.2.1 Chipata Township Community Managed Scheme

Chipata Township is situated in the northern part of Lusaka, Figure 5.1. It is a growing settlement with new plots being allocated in the area. It has a population of approximately 60,000 residents (1995 local census). Like most other peri-urban areas in Lusaka, it started off as an illegal settlement. The illegality meant it was unplanned with no order in the demarcation of residential plots and other permanent structures like shops. Piped water was not supplied to the residents and no sewerage system existed. The residents dug shallow wells or drew domestic water from nearby legal townships. They dug pit latrines for sanitation purposes.

An increase in the local population resulted in a densely populated area with shallow wells for domestic water located within close proximity of pit latrines. Rubbish heaps started to mushroom around the settlement. The Local Authority is not mandated to provide services like water supply, sewerage or rubbish collection in illegal settlements. The lack of clean water, poor sanitation and public health led to an increase in water borne diseases in the settlement. In response to the

[160] In the Peri-urban Water Supply Strategy document for Northern Province (2003 – 2006), a peri-urban area is defined as: a formal or informal settlement of unplanned origin within or outside the jurisdiction of a Local Authority, with inadequate basic services, high population density and growth rates in relation to urban settlements and with a socio-economic dependence on the nearest urban set up.

public health problems the council, following a directive from the MLGH, drew up plans to upgrade the settlement and legalise it.

The central government funded the settlement upgrading using funds from the World Bank in the early 1970s. The upgrading exercise involved orderly demarcation of plots, roads grading, street lighting and water supply infrastructure installation. The Lusaka City Council (LCC) supplied water by placing communal taps at strategic locations in the settlement. The upgrading exercise took place during the era of one party rule. The ruling party, UNIP, demarcated the settlement according to administrative sections. Each section had about 25 households. This system of sections was adopted in the installation of communal taps. Each one was allocated a tap that was usually placed near the residence of the section's UNIP chairperson.

In the early 1990s, probably due to lack of bill payment and run down infrastructure, the LCC stopped supplying water to Chipata residents. The residents reverted back to using wells or neighbouring townships to collect water. The women woke up as early as 04:00 hrs in some cases, in order to fetch water for domestic use. They spent the first few hours each morning collecting water. Reports of them being raped and abused by gangs of thieves as they went to fetch water in the early morning hours were reportedly common place. The cases of water borne diseases began to increase. In 1996 some community representatives went to the Lusaka Water and Sewerage Company (LWSC) that had taken over the water supply responsibility from the LCC[161]. The representatives requested the company to restore the water supply to the community. The response from the company was negative. The LCC promised to look for some funds to implement a water project in the area.

The funds were sourced from CARE International, which was looking for a suitable area to carry out a water related project. It started with community education and sensitisation exercises. The exercises encouraged community members to bury their wells and build pit latrines in suitable places[162]. They also encouraged the community to contribute towards the project costs in terms of material and labour[163]. The contribution symbolised community support for the project. The sensitization covered project sustainability and donor expectations. The donor in this case was the UK Department for International Development (DfID).

[161] The representatives were formerly educated members of the public who had previously worked in the City Council or were retired teachers living in the community. This group was self selected because they could communicate with the management of the LWSC.

[162] The encouragement was phrased in project conditions. Community members were explicitly informed the project would not be funded unless wells were buried. The burying of the wells was packaged as a move to perpetually avoid the recurring threat of cholera. In effect residents would have no alternative water source but the taps from the project giving them a source of safe clean water, which they would pay for.

[163] Community contribution is also a condition for project funding and seen as a symbol of commitment by project implementers. The community was encouraged through public meetings chaired by community leaders who communicated the contribution as a show of commitment and ownership of the project.

The project implementation team divided Chipata into 30 zones for administrative purposes. Each zone had a representative that was a member of the Resident Development Committee (RDC)[164]. The RDC selected a water committee, from among themselves, to manage the water affairs in the community. The project also had a water board representing all the stakeholders including CARE International, the LWSC and the LCC[165]. The board recruited a manager for the scheme once the entire infrastructure was installed. The water scheme started operating in 1999.

The water committee monitors the scheme operations and recruits the tap attendants. The scheme manager recruits water treatment plant operators and security personnel. Each signed up scheme member receives a membership card and thereafter each household pays a monthly fee of K3, 000 for 140 litres per day. The community members proposed both the monthly fee and daily water allocation. They also identified locations for the taps in each zone and set the fees in a reportedly democratic and transparent method. The zones with higher populations have a higher number of water points. The taps are open for five hours in the morning and another three hours in the afternoon. The scheme manager expects the tap attendants to declare the daily revenues at the water scheme offices.

The scheme had a few teething problems such as the steady decline of the revenues from the water points and a drop in membership over the first few months. The two drops were related. The tap attendants were selling water directly at the water points at K50/ 20 litres. This works out at a minimum of K1, 500 per month for 20 litres a day. It is less economical for community members to pay K50 per 20 litres of water but some opted to do this. Evidently they argued they were not using their full 140 litres daily water allocation. Therefore they did not want to pay K3, 000 per month. They also argued that K200 per day is easier to source than K3, 000 at the beginning of each month. The tap attendants didn't declare the revenue from direct water sales at the taps. To curb the dishonest practice and provide incentives the tap attendants were allowed to sell water directly, rotated around the points and their pay related to commission as opposed to the initial fixed monthly payment. The changes reportedly improved the scheme operations.

The vulnerable families that cannot afford to pay for water are given a free daily allocation by the scheme. The scheme does not have a water supply licence from the NWASCO. It operates using the LWSC licence. It pumps ground water that is chlorinated before distribution to the residents of Chipata. Its management is not aware of other users that may be drawing from the same aquifer but has noted a drop of five centimetres in the water level since operations began. The frequent electrical power cuts from ZESCO cause annoyance for the scheme management.

The residents are generally happy with the scheme and the ability to obtain clean and safe domestic water near their homes. Some would like individual taps within their households but the current treatment, storage and distribution capacity of the scheme does not allow. Only business premises and schools have individual taps. The RDC members feel the community has been supportive and keenly participated in ensuring the success of the scheme.

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[164] The RDC members are elected on a popular vote. Most of them are retired civil servants, teachers or local business men. The RDC chairman is an influential community member who is usually a business man thus wielding both economic and political power.

[165] The stakeholders were determined by CARE International and the LCC. These two organisations were the project implementers and as such co-ordinated the whole project. The board has 5 community members and one representative from the other stakeholders.

The LCC advertise the Chipata water scheme as a successful community managed scheme. The scheme has gone through some organisational changes, which seem inevitable in any progression of an organisation. The changes are triggered by various factors, Table 5.1. The scheme management and community leaders play a crucial role in achieving positive results especially if community members know who to address their problems to and are willing to take action. The Chipata water scheme has benefited from the skills, of its manager and his team, acquired from previous employment and thus termed as externalities. It has also benefited from strong RDC community leadership, sensitisation exercises by CARE International and the availability of donor support.

Table 5.1 Organisational Changes

Level	Trigger	Action	Potential Delay	Possible Response
1st	Disease Community suffering Development	Organisation Representation Leadership	Appropriate body Project proposal	Acceptance of project Project implementation
2nd	Visit from project implementer	Community sensitisation and education	Meeting conditions	Forming committees Drawing up constitutions Collecting contributions
3rd	Handover of project	Management by community using existing model	Community influence	Incorporating community influence
4th	Drop in community involvement Drop in revenues	Stabilisation of operations	Stakeholder interference Organisational mandate	Allowing community to define success of project

The future of community managed schemes like in Chipata, which the NWASCO generally considers too small to be given separate operational licences, needs careful thought. Even though revenue collection may be efficient such schemes require further investment if they are to expand and meet the needs of a growing community and residents who are willing to pay for individual connections. The autonomy of the schemes should not be curtailed by regulation bureaucracy and stakeholder mandates. The NWASCO presents an integrated view of the water sector but the grass root activity shows disintegration. Each water user does not seem to know any other water users or interact with them especially aquifer users.

5.2.2 George Township Community Partnership

George Township is situated in the north western part of Lusaka, Figure 5.2. It is a growing peri-urban area with approximately 70,000 residents (1990 local census). It started off as an illegal settlement built on farm land. When the expatriate owner of the farm, Mr George, departed the workers allocated themselves land and invited friends and family to settle in the area. The illegal status meant lack of order in plot demarcation, structure selection and no supply of services. The residents dug shallow wells or drew water from nearby legal townships like Lilanda. They also dug pit latrines for sanitation. Like Chipata, George Township was a densely populated area with pit latrines in close proximity of shallow wells. It had visible numerous rubbish heaps. With no

water supply, sewerage or rubbish collection water borne diseases increased in the settlement until it was legalised following a local government directive. The LCC supplied domestic water based on a similar administration system to Chipata, one communal tap for a section of households.

Reportedly, the community's lack of ownership and the water supplier's lack of maintenance led to dilapidation of the infrastructure. Some of the old stand pipes are still visible in parts of George Township. Vandalism was also rampant in the community. When no more water was flowing from the taps, the residents reverted back to digging shallow wells for their water source. Often the water was neither clean nor safe and soon water borne diseases were on the increase. George Township was informally known as the cholera centre of Lusaka. In 1992 a terrible outbreak of cholera occurred in most parts of Zambia. Many lives were lost and in George Township this led to a call for improved water sources. Community leaders requested the council to improve the water supply in the settlement[166]. The council found the solution in a government to government funded program. The JICA (the Japanese government aid agency) offered assistance to set up a water supply system in the area. CARE International provided the capacity building skills for the project.

The JICA undertook the water project in partnership with the LCC and the LWSC. It carried out some feasibility studies on the type of infrastructure to install. Community leaders and the LCC field officers consulted the residents on the type of infrastructure they desired but finally a technical decision was made by the JICA. The staff from the LCC peri-urban unit and CARE International led the community sensitization and education on the benefits of the projects[167]. They communicated the expectations from the donor agency and also the expectations from the community.

The community members selected the sites for the water points. The project implementation team divided the township into zones for administrative purposes. The residents elected zone leaders, who formed an RDC. The RDC members selected a water committee that manages the water project on behalf of the community. The George Township Water project has offices where community members sign up to the scheme. The RDC directed the residents to bury their shallow wells to make the project viable and show commitment to ensuring its success. The residents decided on the cost of scheme membership and the daily water allocation for each member at a public meeting. They settled on an annual membership fee of K3, 000 and a further K3, 000 per month entitles each household to 200 litres per day. The full daily allocation is only exhausted on laundry days. Some households opt not to be members of the scheme and use the shallow wells found in the township.

The JICA handed over the water scheme to the community and the LWSC in 1998. The LWSC provides the technical support and maintains the highly technical infrastructure on behalf of the community. An attendant keeps a register of the members at a particular water point. She liaises

[166] These were not necessarily elected leaders but residents who had previously worked in the public service or with the Local Authority.

[167] Educate is a value loaded term. Its use here does not imply the imposition of ideas from the donors or the council employees. The LCC fieldworkers held demonstrations on the flow of particles from shallow wells to pit latrines and vice versa using coloured liquids. The coloured liquid was poured in a pit latrine and if the colour appeared in the well water, residents understood better the risk of water contamination. This exercise was one of the influential education materials used to convince residents to bury their wells.

with the community members on the convenient opening times and reports to a zone leader who in turn reports to the water committee. She is paid a small salary and provided with free water by the scheme management. The revenues collected at the project offices are handed over to the LWSC, which subtracts the operation costs and gives the community 10% of the remainder for a community fund.

The scheme chlorinates the groundwater, from several boreholes located at one end of the township, before distributing it to the residents. Most residents appreciate the positive changes it has brought about such as fewer diseases and also less time spent fetching water. Some would like to have individual connections in their households, especially those with flushing toilets. Individual connections are currently not possible due to the capacity of the scheme.

The George Township water scheme is also a successful community managed scheme. It differs from the Chipata scheme in that the LWSC are directly involved in its operations. The LWSC owns the operating licence, provides the technical support and has seconded a manager to it. It underwent some organisational changes to improve the operations and effectiveness. The sensitization of the community proved useful even though some members of the first committee are dissatisfied with its current management. Some of the goals set, like the possible individual connections, have not been achieved and are coupled with foreseeable challenges in providing water for new plots in the settlement.

The scheme faces several challenges. The LWSC collects the revenues from it and notes that no profits are made from the venture. Its membership numbers continue to drop, meaning some residents are resorting back to using shallow wells or refusing to pay for water. The local politicians also influence the attitude of the community especially during political campaigns (Bates 1976, 202). Some do not seem to care that their campaign speeches have adverse long term effects on community projects. They allocate new residential plots within close proximity to the boreholes increasing the dangers of polluting water sources. The tap attendants complain about the low wages they receive. Their only incentive is the free daily water allocation. George Township is also in close proximity to Matero Township where residents are infamous for the non payment of water rates. The residents of George Township are able to collect free piped water from the Matero households. The challenges and complaints lead us to question whether the community members really participate in decision making during project implementation and operation. In this case it appears they were consulted but not necessarily involved in the decision making during the project.

5.2.3 Ma-round Community Managed Scheme

Ma-round Township is a peri-urban area with a population of about 12, 000 in Mbala, Figure 5.1. It got its name from the first structures that were built in the area, which all had a round shape and thatched roof. The structures no longer exist. Before 1990, the residents received water supply from Mbala Municipal Council. Only four communal taps served the settlement. The residents had to wake up early to queue for water that was only supplied for a couple of hours each day, between 06:00 hrs and 08:00hrs. Reportedly quarrels and arguments erupted as they queued. Some resorted to using a nearby stream as a water source. They sometimes walked for an hour or more to and from the nearest source for clean and safe water. The community leaders, some of who had previously worked for the Local Authority approached the management of the water department with a request to improve water supply in the township. The Local Authority was apparently unable to restore a reliable water supply but linked them with a project financier and implementer. The Development Cooperation Ireland (DCI), now known as Irish Aid, assisted the community.

The DCI project team divided the community into 33 zones for administrative purposes. Each zone got at least one tap. The residents of each zone selected the tap location. They decided on a tariff of K1, 000 for the maintenance of the infrastructure and minor repairs they carried out. The local council undertakes major repairs and the maintenance of the pipe network and other infrastructure. This responsibility means the water revenues are submitted to the Local Authority.

After the commissioning of the taps in 1996, the residents reportedly received a high standard of service. Water was available for about 12 hours a day, 06:00 hrs to 18:00 hrs. The residents did not have to make a daily schedule around the collection of water. They could set out to their fields early in the morning and know they would be able to collect water when they returned. They were willing to pay for the water they received. The RDC was in charge of the collection of the water tariffs. Once the money was collected, it was handed over to the council who gave the RDC 20% of the revenue for minor repairs and maintenance.

At the time of the field visit the number of residents paying for water had dropped compared to 1996 figures. Some residents refused to pay for a low standard of service. Water was only available for a couple of hours a day for some parts of the settlement that were uphill. The residents downhill got water for a further hour. On some days the community had no water at all. Some residents resorted back to using the stream while others used the taps in a neighbouring township with a better standard of service. The latter were sometimes verbally abused by the owners of the households where they collected water. The RDC also had trouble collecting the 20% of the revenues from the Local Authority. The water department, which was in the process of forming a water company, planned to increase the water tariff in Ma-round. Its management hoped the standard of service would improve if it formed a CU. They also believed the Ma-round residents should pay more if they wanted an efficient service. The K1, 000 was too low compared to the cost of supplying the water.

This case study illustrates some of the power relations and dynamics between water suppliers and community groups. The RDC members in Ma-round felt cheated by the Local Authority employees and as a result were reluctant to help in the revenue collection. The service standards had also dropped compounding the non payment of water fees. Though the infrastructure in Ma-round may be operational the effective operations were still heavily dependant on the Local Authority water department. The RDC would struggle to convince the residents to pay more for a service that they consider to be unacceptable. Effective partnerships between the water supplier and the community leaders are not only essential but should also be multilateral. All parties must benefit from the partnership. The abuse suffered by some of the residents when using water points in neighbouring townships emphasises the value of water in commercialised systems. The residents value a clean and safe source of domestic water and consequently sometimes endure verbal abuse. The household owners in Location Township consider the amounts they pay for water and are unwilling to provide free water. Water to drink for a passer-by is provided free of charge, not higher volumes.

5.2.4 Harbour Communal Tap

The Mulamba harbour is on the Zambezi River in the western part of Mongu, Figure 5.1. At the time of the field visit it was busy with fishing and trading activities. The traders and fishermen mostly reside in an unplanned settlement at the harbour with make shift houses though they have permanent structures like shops. The Local Authority, prompted by the expansion of the harbour community, supplies the settlement with domestic water. It installed three taps close to the shops with a metered supply for the community members to pay the bill according to consumption. Local

Authority employees read the meters and collected a fixed amount from each household. However, only some of the users paid to use the communal facility. The non payment of the water rates by some and eventually most users resulted in a large debt owed to the water supplier. The debt rose to unmanageable levels and the supplier threatened to cut off supply.

After receiving the threat, the community formed a management committee. The process was led by community leaders who had previously lived in the urban centre of Mongu and owned businesses at the harbour. The committee oversees water and market affairs and the general relations with Mongu district council and the Barotse Royal Establishment, (BRE). Its chairman collects the revenues from all three taps that are manned by its members. Water is sold on the spot at K200 per 20 litre container. The committee members have a free water allocation. Water is supplied for a total of 12 hours a day divided between the morning and afternoon. The harbour is a busy area so afternoon supply is sometimes extended into the evening.

The tap attendants appeared unwilling to disclose the daily and monthly revenues from the taps. Incidentally, the community has managed to reduce the debt owed to the water supplier from about K900, 000 to K152, 000. They also pay their bills regularly through the committee, thus the revenue collected from the taps exceeds the monthly bill owed to the council. Additionally, the water rates charged are fairly high compared to other parts of Mongu. The current water supplier, the Western water and Sewerage Company (WWSC), is aware of the relatively higher charges and in response intends to set up water kiosks that will be managed by community members. The attendants will be paid on commission and must be acceptable to the company. The current committee has been in office for over four years. Its members believe the extra revenue from the water taps should be given to the BRE, the custodians of the entire infrastructure in the area.

The committee raises a legitimacy issue. They see their allegiance to the BRE as superior to the WWSC. In their opinion the BRE works for the benefit of the people in the area while the WWSC would be benefiting itself with any extra revenue collected from the taps. The Western Province is one of the areas with strong traditional and cultural values. Furthermore, the Harbour residents like other peri-urban areas pay relatively high rates for volumes of water though they are as classified poorer residents. Peri-urban residents in Lusaka pay K50 for 20 litres of water and the residents of Mulamba pay K200 for the same volume. The difference in cost is too high to be solely attributed to the repayment of the debt owed to the company or the larger customer base in Lusaka. The Mulamba residents seem to accept this cost especially if the extra revenue is submitted to the BRE. Their ability to clear their debts and still make some profit in water sales shows a positive aspect of a community managing their own affairs at the local level. This may not necessarily have a positive effect on the wider district level that the WWSC have to consider.

The success of a water scheme can be measured in variety of ways. The residents consider a scheme to be successful if they are able to obtain safe and treated water at an affordable price in the long term. This affects their health, livelihoods and time spent collecting water. Project implementers usually measure success using economic targets like financial stability, self funding mechanisms and the long term survival of the project. The success incorporates various factors, Table 5.2.

Table 5.2 Factors affecting success of a water scheme

Variable	Scheme	Roots	Source
Management skills	Chipata	Externalities from previous employment	Private and public enterprises
Continued community involvement	George, Chipata, Mulamba	Conditions for project implementation	NGOs and donor
Reliable water source	Ma round	Unreliable service provided by Local Authority non investment in water activities	Local Authority
Alternative water source	George, Chipata, Ma round, BRE	Traditional water sources	Individual beliefs
Sense of belonging	All	Identifying with the community, being a part of the whole	Individual beliefs
Leadership skills	Mwansabombwe, Mulamba Harbour	Authority and legitimacy of leaders	Individual beliefs
Legitimacy of scheme	BRE, Mwansabombwe	Strong traditional leaders	Culture and custom
Affordable rates	All	Willingness and ability to pay	Project implementers, NGOs and Donors
Effective tap attendance	George, Chipata	Authority and legitimacy of attendants	Individual beliefs
Flexible payment systems	George, Chipata	Ability and willingness to pay	Scheme managers
Visible benefits of scheme	All	Willingness to pay	Individual beliefs
Packaging of scheme	George, Chipata, Mwansabombwe, Ma round	Legitimacy of scheme	NGOs, Community leaders
Levels of paid up members	George, Chipata, Mwansabombwe	Economies of scale	NGOs and Donors
Social Capital	All	Sense of belonging to community and willingness to participate in projects voluntarily	Informal and formal networks in society

5.3 Urban Area

An urban area is thus classified because it has an administrative centre, a central planning unit and is more densely populated than a rural location. The infrastructure in an urban area is well developed. Residents have access to medical facilities, education facilities, roads, permanent structures, markets and transport facilities.

5.3.1 Local Authority Managed Supply

Kabwe is an urban town in central Zambia, Figure 5.1. Kabwe Municipal Council is one of the 22 Local Authorities still managing the water supply in an urban township, other towns have CUs. The Mulungushi River and groundwater are the sources of raw water. A local treatment plant has been rehabilitated a couple of times since installation in the 1950s. Before the 1990s Kabwe was a growing town with mining activity. The mines ceased operation in 1994 and the repercussions are still being felt by the residents. Kabwe is also the centre for Zambia Railways, which at the time of the field visit, was undergoing restructuring and commercialisation. The population was decreasing as families were leaving the town in search of work. The job seeking exodus results in a significant number of the Kabwe residents being retirees, recently retrenched workers, the old and orphans. The weak economic base of the town reportedly adversely affects the Council operations.

Prior to 1994, both the mines and the Council owned water distribution systems. The mines provided water to the mine townships at subsidised rates. They had the financial and human capital resources to provide the subsidised service. The Council provided water to the rest of the townships also at subsidised rates. After the closure of the mines, the Council took over the formerly mine operated water treatment and distribution system. The residents living in the former mine townships complain of a fall in the standard of service since the takeover. The number of hours when water is received from the taps has reduced to an average of eight hours a day in most townships. The Council management complains of a lack of resources to maintain the water distribution infrastructure. They see the delay in the formation of the CU as a reason for the lack of investment in the water sector in Kabwe. They find it challenging to maintain the dilapidated infrastructure; blocked, burst and leaking pipes and broken down pumps. Additionally, some investments like the boreholes sunk in Mukobeko have actually never been used because of high rates of vandalism.

The standard of water supply in Kabwe is evidently poor. The council water department appears to be autonomous but the revenues from water are still used to fund non water related activities in the council. The revenues are placed in the central council coffers which are controlled by the finance director. Revenue collection efficiencies are low and residents sometimes complain about having to pay for a service that is below acceptable standards. The council recruited the RDCs, to help collect water revenues in the peri-urban areas where the taps are few and far between and the residents dig wells for their water supply. The RDCs help the residents dig protected wells using funds raised by the community. A symbolic user fee is charged for the use of the protected wells. It is decided on by the users with the help of the RDC water and sanitation sub-committee.

Several projects have been attempted in Kabwe to improve the water supply system with limited positive results. At the time of the field visit a feasibility study on the creation of a CU had just been completed. The consultant recommended the formation of one CU covering the entire Central Province. This would mean the users in towns like Kabwe cross subsidising the users in the smaller towns like Kapiri Mposhi and Chibombo. Allegedly, the service provision is unlikely to improve in Kabwe without more investment coming in from outside the town. The residents, especially those in the peri-urban areas who say they are mostly retirees and retrenched workers, do not foresee an ability to pay for water if charged close to the true cost of supplying it. Some want piped water but are not willing to pay K3, 000 like their counterparts in Lusaka. They cite their poor economic situation, saying they can only afford K1, 000. In some areas the residents opt for protected wells that they know are cheaper to maintain. The cheaper maintenance and operation costs also imply a reduced user fee.

The Local Authority evidently faces a lot of challenges as they attempt to provide clean and safe water for the Kabwe residents. The water department management reiterates that one of the starting points would be ensuring the autonomy of the department. This would help the reinvestment into the sector using the water revenues. However, funds have been spent on the water sector in Kabwe that cannot be accounted for by results. Effective use of investment, the capacity, skills and leadership to accompany the funding allocation appear to be missing. The case study emphasises the need to balance the economic realities in some areas with the expectations of the supplier. Some residents are admittedly of low economic standing and would not be able to afford a cost of water that is close to the true cost of supplying it. As an option residents can be provided with technology cheaper than the standard taps but this would probably be unacceptable in an urban area. Cheaper technology would symbolise a drop in levels of expectation by some residents and not be welcomed by all. Some residents have dropped their expectations in response to the financial difficulties and general state of their council. A feeling of fatalism exists in some locations. The residents feel no one is addressing their needs.

Urban residents expect a high standard of service from their water supplier. However, residents have a mixed economic status including the poor. Incorporating the poor is a challenge faced by even the more established water suppliers in larger towns with a stronger economic base. Some suppliers argue that residents do not consider paying for water a priority based on the amounts paid for other utilities like electricity. They perceive the ability to pay for water as a smoke screen; most residents pay for electricity but feel they can get away with not paying for water on the premise that it is a necessity for life. Another point raised in this case study is the revenue base for Local Authorities. The government exercise that sold council houses to sitting tenants resulted in a significant reduction in council revenue. Councils are left with the option of using water revenues as the dependable source for some of their activities. A commercial entity providing water would reduce the Council revenue even further; some are now turning to bus stations and markets as their main revenue sources.

5.3.2 A District Commercial Utility

Chipata is a town in the Eastern Province of Zambia, Figure 5.2. It has a CU the Chipata Water and Sewerage Company (CWSC), which was formed in 1992 taking over water supply systems previously managed by the Local Authority. The CWSC is one of the more advanced CUs in terms of technology and operations. It has the advantage of being a pilot CU. The piloting included: setting up water kiosks in some peri-urban areas, metering of all clients, improving the billing system and rehabilitating part of the pipe network and Lutembwe dam 2. Most of the piloting was funded by the GTZ (the German Government Aid Agency). The GTZ support was still present, in the form of management consultants, at the time of the field visit to the company. The CWSC uses Lutembwe dam 1 and 2 as the sources of raw water. The dam sites are maintained by the company. Fishing activities are prohibited on the sites and maintenance involves ensuring no trees grow along the earth walls. Trees are planted on one side of the dams to ensure sustainability of the water source.

The CWSC has high coverage levels in the urban centre[168]. Some peri-urban areas are serviced using metered water kiosks, which are a method of cash payment for water using a token system. The water purchased is mainly for cooking and drinking. The CWSC monitors consumption at the kiosk using the meter and the revenue collected by the attendant. The water is subsidised, residents pay K12 per 10 litres. The subsidy is part of the rich subsidising the poor; the desired

[168] The CUs are responsible for the urban communities and not rural communities found within their districts. The rural communities fall within the jurisdiction of the Local Authority, which is the sole shareholder in the CUs. The peri-urban areas are classified as part of the urban centre for water supply purposes.

cross subsidisation in the CUs. It is also a way of giving the poor access to clean water for drinking.

Most peri-urban areas have old stand pipes that were managed by the Council and are no longer in use. These stand pipes are visible right next to the newly erected kiosks that are well spread in a couple of compounds such as Navutika and Mcini. Their locations were selected with the help of the residents. The old demarcation of wards and sections in the one party state era was also influential as is evident from the close location of the kiosks and the old stand pipes. In some of the peri-urban areas, wells still exist for the residents to use for washing and cleaning.

Metered clients of the CWSC complain of high tariffs and the company acknowledges this but adds they are justified. Tariff increases have to be approved by the NWASCO and are only possible after a three year period. The CWSC uses a step wise tariff which increases in blocks of 10 and 20 cubic metres. The relatively high tariff is justified by the improved service; almost all Chipata clients have a 24 hours metered water supply. The water meters remove the need to demarcate areas according to their affluence; a system previously applied to set a fixed monthly charge for residents of a particular area. The classification was high, medium and low cost housing based on the number and location of water points in a particular design. It was easier to use when houses were built by the Councils but as more household owners design and build their own houses, it becomes difficult to maintain. It only applies when a client is requesting a new connection. Those in historically more affluent neighbourhoods pay a higher security deposit. Some residents also complain about frequent blockages in the sewage system.

The CWSC staff explained the new billing system to the clients using education and sensitization exercises[169]. They saw the benefits of the exercises from the clients who come in making enquiries on specific parts of their bills. The penalty that exists for non payment of bills increases their collection efficiency. The responsibility of the clients has increased compared to the time when the water was supplied by the Local Authority. Each one is responsible for the water consumption in their households, the water meter and pipes at their premises leading to the main distribution line. Some clients have placed protective boxes around their meters and locking mechanisms on their outdoor taps. The latter prevent passers by and neighbours from accessing the water when the household owner is absent to authorise the use of the tap.

The CWSC is unable to access funds from financial markets reducing its ability to extend services to newly developed areas. It is affected by management challenges just like the other CUs. The management consultants from the GTZ will hopefully contribute positively to the management techniques such as accountability, which if improved would leave some room for reinvestment in the company operations. The case study shows the benefits of investment in the water sector and the financial kick start that was promised to the CUs by the Government. The kick start was meant for the restructuring of the over staffed Council water departments and rehabilitation of some dilapidated infrastructure. The CWSC seems to have gotten the kick start by default as part of the pilot CU scheme and also benefited from the sensitization of the clients. Most clients appreciate the exercises it continuously runs to help them use their water efficiently.

[169] The education and sensitization was done using local drama groups. The groups toured the various communities performing sketches related to water consumption practices, water conservation and the client's ability to control their water bill. Local radio programmes were also used to reach clients.

Customer sensitization engages the debate of improving services before increasing tariffs. According to the CWSC employees, customers were generally more willing to pay for improved services. The kiosk system used by the company has also proved to be an effective way of providing clean and safe water for the poor at prices they are able to afford. The CWSC has also seen some benefits in 100% metering. The clients are more aware of their water consumption and also able to manage their water consumption better by prioritising uses. Water conservation techniques such as washing cars from buckets rather than continuously running hosepipes and watering lawns periodically are also more widely used.

5.3.3 A Provincial Commercial Utility

Solwezi is a town in north western Zambia, Figure 5.2. Its domestic water is provided by the North Western Water and Sewerage Company, (NWWSC), which covers the whole of the North Western Province. The company head quarters are in Solwezi, the largest town in the province. It was formed and started operation in 2000 covering seven districts. Five out of the seven use a surface water source, a river or stream near the town. At the time of the field visit the NWWSC had obtained funding to drill boreholes to supplement the surface water source in Solwezi. The districts in the province are far apart presenting logistical challenges for the NWWSC, which had about 4, 177 connected clients as of 30th March 2004. Of these about 2, 693 are billed clients. Other clients had connections but may not have been receiving water because of dilapidated infrastructure or disconnections resulting from non bill payment.

The high and medium cost residential areas of the towns have individual connections while the peri-urban areas and low cost residential areas have communal taps. The communal taps are often actually located at particular households,which is not central. The household owner uses his discretion to allow the neighbours to collect water from his tap. Each household using the tap pays a monthly charge of up to K5, 000. The fixed monthly charge for water in these residential areas is K37, 000. Most household owners intend to revise the charges after a metering exercise is completed by the NWWSC. The company is aware of the secondary water market in the peri-urban areas and plans to put up kiosks, which will provide metered water supply using a pay on demand system. They would replace the communal taps, which require the collection of water revenues from several households using the tap. The key challenge in communal taps is determining which households use a particular one. The NWWSC employees suggested involving the RDC in revenue collection. However, the RDCs in Solwezi are allegedly influenced by the NGO and donor way of operation. They expect to gain financially from any project or activity in their areas.

The NWWSC inherited its infrastructure and employees from the Council's water department and the DWA. Some parts of the water distribution network need rehabilitation or a complete overhaul. This requires capital investment that the company has to source. The water supply to the low cost areas and peri-urban areas is rationed and only available for about six hours a day. The storage and water treatment capacity is limited and insufficient for 24 hours supply. The company has increased the water tariffs since it started operation. The increase was not welcomed by most of the users. Reportedly, after some educational and sensitization exercises some clients accepted that a tariff increase is necessary for an improvement in service to materialise. The client metering is an effort to increase efficiency in water use and encourage water conservation. The clients had mixed feelings about the metering exercise. Most of them expected their water bills to rise. Some households with taps that were in effect communal threatened to block their neighbours from using them, saying the K5, 000 they charge neighbours would not accumulate to the level of their bills. This may lead to an increase in the use of shallow wells in the townships or result in more households working together to secure a water point closer to their households.

The secondary water market exploited by some residents leaves the less affluent community members to use shallow wells for their water source. The factors leading to its development and the perceptions of the community are summarised in Table 5.3. It will be affected by the NWWSC's metering exercise. A positive aspect from the exercise may be some community members coming together to apply for a water point connection near their houses. Increasing the number of water points will require increased water treatment capacity but could beneficially widen the NWWSC's client base. However, the company currently limits the number of hours water can be accessed in various communities. The opening up of Kansashi mine and the expected increase in population as a result of the mining activities presents further challenges for the company. It requires investment to extend its services to expanding residential areas.

Table 5.3 Development of Secondary Water Markets and Responses

Activity	Triggers	Responses	Perceptions	Supply Target
Secondary water markets	Lack of enough water points Affordability of new connections Sale of housing to sitting tenants	Opening up point for neighbours to access Contribution towards water bill	Convenience Providing a service Sharing costs and benefits	Capturing the market
Metering	Economic efficiency Leaking Taps Unaccounted losses Consumer responsibility	Increase fees collected Limitations to volumes collected	Reorganisation of community	More water points Water kiosks to capture market Reverting to wells

Provincially operated CUs face challenges in planning, logistics and ensuring all the towns have a similar standard of service; the reporting lines and transportation need effective planning. Ensuring the same operating standards in all the towns is not always possible given the economic disparities between the towns within a province. Residents in the smaller towns expect the company to give preference for investment opportunities to those from the larger towns. The larger towns have a greater number of more affluent clients that are usually willing to pay close to the real cost of supplying their water. The provincial CUs have the advantage of being able to use cross subsidies for the smaller towns and also having a larger pool of employees to select a management team from.

5.4 Conclusion

This chapter explored the domestic water sector in Zambia using case studies from rural, peri-urban and urban areas. Evidently some issues faced in the rural areas differ significantly from those faced in the peri-urban and urban areas. Thus blanket solutions when filling in any gaps in domestic water supply should not be encouraged. However we sometimes draw more from looking at the similarities in the issues faced than paying particular attention to the differences.

The cases reveal the modalities of access to domestic water in urban, rural and peri-urban areas. In rural and some peri-urban areas access modalities include kinship, clientelism and patrimonialism, Table 5.4. These social relationships and interactions form the basis of the

strategies used in the access to domestic water. The water user is viewed mainly as an individual fitting into a community. The sense of belonging and relationships developed with other members consolidates the access modalities. In the urban and some peri-urban areas access is dependent on payment of water fees. The water user is viewed mainly as a client emphasising an economic contract between the water supplier and the water user.

Table 5.4 Typologies of Access Modalities

Modality	**Location**	**Legitimacy**	**Identity**
Clientelism	Rural areas	Investment in future needs	Indunas, Committee members
Patrimonialism	Rural areas	Maintaining family ties	Individuals
Kinship	Rural and peri-urban areas	Maintaining family ties. The tribe is a large family	Tap attendants, Committee members
Neighbour	Peri-urban areas	Maintaining social relations	Tap attendants, Committee members, Individuals
Consumerism	Urban areas	Supplier mandate	Bill payment and disconnection for non payment

The urban and peri-urban consumers have various attitudes to paying for water. Most consumers are willing to pay for treated water but not the full cost of supplying it as calculated by the water supplier. The attitudes to payment sometimes change over time and are affected by the standard of service, type of punishment for non payment, availability of alternative water sources, legitimacy of the water supplier and individual economic and social status, Table 5.5.

Table 5.5 Mechanisms Leading to Payment and Non payment of Water rates

Variable	Community	Roots	Notes
Standard of service	Low cost and medium cost urban areas, Peri-urban	Local Authorities provided a fluctuating standard of service, usually very poor. Residents accustomed to not paying for water	Fluctuating or stable
Employment status	All	Unemployed and retired residents give lack of income as reason for not paying for services	Reliable source of income
Economic standing	Peri-urban areas	Poorer households have other priorities like food and fuel for cooking	Priorities of household
Past experiences	Self built houses, Peri-urban areas	Lack of enforcement regarding disconnection allow some residents to use water free of charge	Possibility of free riding, illegal connections
Supplier	All	Commercial entities usually demand payment for water supply and other services	Local Authority or Commercial Utility
Penalty for non payment	All	If penalty is not severe then residents more likely to default	Disconnection and possibility of illegal reconnection
Alternative sources	Low cost areas, Peri-urban areas	If alternatives available residents more likely to default	Neighbours, neighbouring townships
Area	Low cost, Peri-urban	Lower expectations of service standards in these areas	Expectations and status in urban vs. peri-urban areas
Political pledges	Peri-urban areas	In areas with community water projects, politicians deceive residents by claiming the funding was a grant and not a loan so no payment is required	Inciting residents to take water as free
Personal attitudes	All	Some individuals just do not believe in paying for services	Attitude to paying for services
Type of payment	Medium cost, low cost areas, Peri-urban areas	A fixed rate of payment is usually considered affordable and subsidised	Fixed rate or metered
Type of infrastructure	Low cost areas, peri-urban areas	Communal responsibility sometimes allows for free riders	Individual or communal

The need to pay for treated water is part of the emphasis placed on the economic value of water. It is a shift from the past focus on the social values of water that were used to expand water distribution infrastructure to most residential areas. It is enshrined in the macro economic policy to liberalise the economy and the removal of subsidies by private firms and the state. This policy is a result of pressure placed on the Zambian government by the IFIs and the donor community in the

late 1980s and early 1990s. The effects of the global pressures are illustrated mainly in the urban and peri-urban case studies. A multi-scalar analysis allows a glimpse of some of the local level effects of global policies, both intended and unintended, Table 5.6.

Table 5.6 Local Impacts of Global Policies

Policy	National Effects	Community effects
Washington Consensus	Liberalisation of economy Sale of council houses Privatisation Creation of CUs National regulator	Reduced revenue for councils Removal of subsidies in service provision Metered water supply
Democracy	Multi party politics	Increased campaigning in political elections More mud slinging between politicians Inciting residents not to pay for water from community projects
Aid Conditions	Community contribution to projects Community participation Water committees	Constitutions for communities Paying for water Water Kiosks
Development	Irrigation schemes Community water projects Economic value of water	Paying for water Multi purpose water points Secondary water markets

Economic liberalisation affected the role of private firms in the Zambian water sector. Previously, mining firms and other parastatals provided water to residents in some urban and peri-urban areas at subsidised rates. Payment for water and other services was made directly to the firm by deducting the amount from an individual's salary, preventing non payment for services provided. The firms also provided skilled labour that was used by the Local Authorities to provide an acceptable standard of service to other urban residents. The privatisation of parastatals and the mining companies withdrew the private sector participation and adversely affected the standard of service provided. Policy makers encourage commercial models through the CUs that are still solely owned by the Local Authorities resulting in the same constraints blamed for poor standards of service in Local Authorities, such as no access to financial markets and lack of skilled manpower.

The Local Authorities are unable to supply water to all residents in their jurisdiction, which sometimes leads to secondary water markets. The residents, who can afford connections or have the influence to obtain them, allow their neighbours access to the taps. The tap owners view themselves as helpers and service providers even though they collect revenues from their neighbours and effectively raise all their fees for the water bill. The water suppliers consider the installation of water meters as a way of curbing the practice of secondary markets. The metering also encourages water conservation and ensures clients pay for the actual amounts they consume. The secondary water markets are easier to exploit when the tap owner pays a fixed rate.

The limitations in water supply services from the Local Authority also result in some form of community organisation and cohesion through water schemes. The communities seek out ways to address their water supply grievances. Their initial point of call is the Local Authority, which sometimes links them to project financiers after requesting project proposals. The projects have conditions that communities must meet before implementation. The conditions are set by the project financiers and implementers. Residents are directed to submit constitutions, contribute towards the project costs and form committees to manage and operate any installed infrastructure. The conditions impose formal structures in previously informal networks. The lack of long term existence of the structures once a project is handed over depicts some levels of community resistance to the processes of formalisation. These processes do not appear to build on the local frameworks previously developed and continue to support a top down and narrow approach to resource management.

The view of domestic water users as consumers in urban areas is influenced by the representation of water as an economic good. It is a mode of resource appropriation usually adopted by policy makers rooted in international discourse. It is aimed at convincing users to pay for treated water in their locations. It affects the access modalities and inevitably the use of water in various areas. The user is able to ensure access by paying for the service or finding a suitable source for their needs. The water supplier appropriates the water through their allocation mechanisms. The water schemes in peri-urban areas have limited capacity and thus restrict the daily amount available for each household. In some urban areas the limitations of capacity only affect the less affluent neighbourhoods where supply is rationed and a 24 hour supply is not guaranteed. In rural areas the quantities of water available are usually unlimited at the source but limited at the household level by the distance to the source and the labour available to collect the water.

6 Discussion

This chapter analyses the actor interactions detailed in the case studies and discusses the conclusions from the inductive approach of this research. It links the variables at the various scalar levels of analysis and concurrently examines the processes and actors that form the interfaces between them. It explores the actor influence on decision making, which continuously shifts with their perceptions, environments and influences from other actors and processes. The perceptions inform the frameworks applied in the social, political and economic aspects of development to meet individual or communal objectives. Thus the actor narratives are not neutral and deserve to be critically analysed (Long 2001, 21). The interfaces discussed in this chapter occur at several levels including the conceptual frameworks of the actors, the approaches resulting from the frameworks and their processes of application (Olivier de Sardan 2005, 155-159). The research is actor oriented recognising the role of the actor in constructing the frameworks and applying them in various locations and processes.

At the local level, actors sometimes form formal recognised and informal unrecognised groups and associations to increase their influence within an arena and to address particular needs (Ostrom 1990, 29). Those identified in the case studies such as growers associations, water committees and farmers groups affect and are affected by the existing community structures in a variety of ways. The apparently symbiotic effects translate various power relations that exist among the actors (Robbins 2004, 11). The formal groups articulate their needs and requests within hegemonic perspectives that prescribe the activity at the grass roots. The local actors appropriate the ideas and objectives of the external actors to enhance specific approaches and create opportunities for them to influence others through processes such as the tailored project proposals. Most community projects include sources for safe drinking water.

This chapter summarises the paradigm shifts in water management and explores their influence on the contemporary dominant approaches in resource management. It examines the theoretical frameworks applied by the dominant actors and the local actor responses to them. The examination includes community water projects in rural and peri-urban areas and the commercialisation of the urban water supply. The analysis is conducted at several scalar levels, which this chapter defines. The scalar levels depict entry points and target groups in intervention. Using this depiction, the chapter suggests an “appropriate” level of planning intervention based on the power relations within the four facets explored in political ecology; economy, politics, society and the environment. It examines the frameworks applied in development and the role of development agents. It depicts some of the structures of domination supported by the actors and their constructs of particular concepts in the economic, social and political fields (Jabri 1996). These structures usually shift according to individual choices, resource availability, predominant uses, predominant actors, policies and discourse; including internal and external factors. The chapter concludes with a comparison of local actor responses in the urban, peri-urban and rural areas that challenges the classification of peri-urban areas and their conceptual location as space.

6.1 Paradigm shifts in Zambia’s water management

In this section we focus on the paradigm shifts in water management in the Zambian water sector. We summarise the shifts and their impacts on local water management in various locations. We start with the colonial period followed by the one party state era and end with the liberalised economic policies in the contemporary multi party era. These eras are selected based

on their influence on the water management strategies and hence the dominant approaches to resource management.

6.1.1 The colonial paradigm

The colonial administration focused on the development of water resources in the belt where commercial farmers were located, along the initial line of rail from Livingstone to the Copperbelt (Greenwood and Howell in Tordoff 1980, 163). The farmers were predominantly settlers attracted from the southern regions below the Zambezi River (Hall 1965, 95). They required water resources for domestic purposes and to irrigate their commercial crops. The colonial government obliged them to obtain water rights for abstraction of surface waters while the ground water was classified as a private resource based on the investment necessary before its use (Water Act 1949). The approach in water management was mainly autonomous and the responsibility lay with the end user. The colonial government provided a suitable investment environment for farmers to purchase the technology to abstract water and bring it to the surface. It also had a policy of free hold on the land with the aim of creating an enabling investment environment (Tordoff (ed) 1974, 7). The opening of the mining industry in the Central and Copperbelt Provinces increased the demand and market for the commercial crops and domestic water.

The mining industry attracted workers from other parts of Zambia as well as from outside the national boundaries. The colonial government entrusted the mining firms with the responsibility of supplying domestic water to the work force it attracted (Tait 1997, 163). Thus the technical and financial capacity of the mining firms was applied in developing the infrastructure to supply domestic water in the urban centres on the Copperbelt Province and Kabwe in the Central Province. The Local Authorities in these and other urban centres also provided services that included water supply to the urban residents that were not working in the mining sector. This practice resulted in two parallel water supply networks in the urban areas of the Copperbelt. However, the mines were a parastatal company meaning the state owned 51% shares in the firm (Hamalengwa 1992, 61). As such their technical and financial resources, which were better than those of the Local Authorities, were used directly and indirectly to maintain water networks in both mining and non-mining townships. The mining companies and other parastatals provided a form of private sector participation in domestic water supply and management. However, the participation could only be legitimised in particular townships where their employees resided (Tait 1997; Tordoff (ed) 1980).

In the colonial paradigm the state developed water resources for the commercial agriculture and urban areas by providing the right investment opportunities and issuing directives for the private sector. The commercial white settler farmers and the settlers in the urban locations with mining activity were the main beneficiaries of the water resource development policies in this era. The state encouraged private property regimes through freehold lease land policies and maintained the traditional land ownership in areas outside the line of rail. Thus the vast rural areas where the indigenous populations were predominately located were ignored in the development of infrastructure for domestic and agricultural water supply.

6.1.2 The one party state paradigm

The independent state continued to use the resources from the parastatals to develop the water supply system in most urban areas. It complemented this by providing public funds to install infrastructure in some previously rural areas and subsidise the cost for the consumer in non parastatal townships. It left the rural areas to the autonomous development of water resources with limited central planning influence. The end user in rural areas sourced their own domestic water and water for other livelihood activities such as watering livestock and gardening. The separation of the rural and urban approaches in water management and supply was maintained even with the growth of the peri-urban areas. These areas were usually physically located around

the urban centres (Tait 1997, 181). The high population density in these areas and lack of sufficient water supply infrastructure and sanitation services resulted in increasing incidences of water borne diseases. The standard of water supply in peri-urban areas was officially modelled on the low cost urban areas thus communal water taps were installed using the state intervention through NGO and donor funded projects. However, if the urban model of water supply is adhered to the urban water supplier would install the infrastructure using public funds as opposed to an NGO carrying out the installation. The policy of state intervention through projects was initially aimed at rural areas that are often disadvantaged in the allocation of the allegedly limited public funds (NWP 1994)[170].

The sectors historically prioritised by the government for allocation of public funds are undoubtedly linked to the economic and social policies and the political philosophy. During the second republic, from the early 1970s to 1991, the Zambian amalgamated ideology of Humanism mixed components of socialism, capitalism and populism (Tordoff (ed) 1980, 24; Fortman de Gaay 1969, 1). It induced particular expectations from the citizens guided by its man centred approach[171]. It implied the use of Zambia's resources for the benefit of the people including the resources from the parastatals to provide subsidised services. Its socialist orientation resulted in most residents receiving these services without paying for them or at least paying far below the cost of supply. Securing a job within a parastatal usually set up a psychological contract for the employees. They expected housing and subsidised services like water and sewerage to be provided by the company or their bills for services to be paid by the employer. The parastatals that provided the services usually deducted the subsidised cost from employee salaries. The employers saw the subsidised services as a community service for the benefit of their workers and their families.

Some firms such as the China- Mulungushi Textiles in Kabwe still supply domestic water. The supply is confined to townships adjacent to the factory where most shop floor employees reside. The ZESCO also supplies domestic water to some areas where a significant number of their employees reside (NWASCO 2002). The possible demarcation of employee residential areas is a key element in legitimising the private subsidised supply of water and other services. This research demonstrates the paratastal involvement in service provision resulted in increased dependency on them as water suppliers. They were not focused on profit generation from the services provided. Furthermore their services were significantly better than those provided by the Local Authorities. Parastatals that paid the bills on behalf of their employees often used Local Authority services. Incidentally, the employee wages were kept low and the company effectively determined what percentage of the household income would be used to pay for services, removing the choice from the individual[172]. Most parastatals were able to attract and retain highly skilled employees which the Local Authorities could not achieve. Thus the organisational structure from the mining conglomerates was exploited for the benefit of the community. This private participation significantly reduced the demand on Local Authority services, which was

[170] The lack of funds is only alleged because though it is repeated by government officers, the report by Water Aid (2003) illustrates the finances may not necessarily be lacking but releasing and distributing them appears more of a bottleneck than actual availability.

[171] Man refers to mankind and not necessarily the male species. Kenneth Kaunda repeatedly spoke of the role of women as mothers of society and the role of the youth as the future of the nation.

[172] Growing up in a Zambian household where both parents worked in the mining industry, the researcher recalls her parents complaining about their low salaries and her father's payslip listing the subsidised rates paid for household services.

unlikely to be met due to numerous reasons[173]. The unemployed residents within a community viewed their employed neighbours as privileged.

In the one party state paradigm the state continued to make use of the private sector technical capabilities but also increased the areas with Local Authority managed water supply systems. It expanded the beneficiaries of the water resources development to include the indigenous populations in some rural areas and the growing peri-urban areas. It attempted to bring more land under its control by converting some of the traditional land into state land and limiting the lease hold to 99 years. It also attempted to strike a balance between communal property and private property regimes through the settlement programmes, self help schemes and commercial farming blocks.

6.1.3 The liberal economy paradigm

The Zambian government liberalised the economy soon after the multiparty elections in 1991. The process involved the privatisation of most parastatals and implementation of neoliberal fiscal monetary policies. In the liberalised economy IFIs and donor agencies encourage the private sector to participate in service provision. To legitimise participation they argue that the private sector is able to provide efficient services compared to the public sector (Taylor 2004; Marvin and Laurie 1999). The private sector participation allegedly reduces the burden on the government and frees up resources by removing subsidies to local populations. However, this forces them to pay for some services and supposedly allows more expenditure for national obligations like health, education and bilateral debt repayments. Incidentally it minimises the moral debate of providing services for the citizens or paying debts owed to international lenders.

Several options exist for the proposed private sector participation, Table 6.1. The limited participation in Zambia is through management contracts. Private firms consider the water sector investment to be long term with minimal returns and thus most are unwilling to fully commit to it[174]. Thus the use of public funds appears more feasible. The public fund investment continues for the Zambian water sector.

[173] The Local Authorities were maligned with poor service provision mainly because of inefficiencies in cash flows, poor human and capital resources, usually low employee morale, funding inconsistencies, large workforces, limited revenues etc.

[174] This sentiment was expressed during an analysis of the private sector involvement in water supply in various European countries. The analysis was presented at a workshop for European Water Management in Montpellier held from the 28th February – 3rd March 2006.

Table 6.1 Options, ownership and risk structures for public/ private partnerships

Option	Asset Ownership	Operation and Maintenance	Capital Investment	Commercial Risk
Service contract	public	private/ public	public	public
Management contract	public	private	public	public
Lease contract	public	private	public	private/ public
Concession	public	private	private	private
BOT/BOO	private / public	private	private	private

Source: European Water Management Workshop, Montpellier 28th February – 3rd March 2006

The approach for the water sector development in the liberal economy paradigm is detailed in the NWP. It lists the factors taken into account by the policy makers, their objectives and the reasoning for the separation of the urban and rural areas. Incidentally the peri-urban areas are classified as urban implying the commercial entities in the urban areas should cover the peri-urban areas. We will return to this classification and its implications in later sections. The urban sub sector approach is based on commercialisation of the previously Local authority managed and some parastatal water departments. Since the privatisation of most parastatal companies in 2000, the services provided by these firms have been merged with the Local Authorities.

The urban classification of peri-urban areas in the NWP implies adopting an urban water sector approach in these areas with a water supplier sourcing funds for installing infrastructure and operating it for the residents. However, this research depicts the peri-urban areas as part of the rural sub sector with an approach that is dependent on donor support and NGO projects. The residents submit project proposals outlining their needs. This research reveals these needs are aligned with the project financier mandates. More than 80% of the project costs are externally funded; a figure comparable to the financing of the Zambian water sector (Water Aid 2003). The community members contribute towards the project costs and operate and maintain the infrastructure after it is handed over to them (Cornwall and Brock 2005; Midgley 1986, 19). The costs of operation and maintenance are dependant on the type of technology used. This research shows rural area residents advocate for easy maintenance technology in an effort to reduce the financial requirements for the exercise. The amounts used are sourced from the water users; one way of avoiding the dependence on external resources. Major breakdowns usually require spare parts from urban areas, which can be a costly venture for most rural and peri-urban areas.

In the liberal economy paradigm the state attempts to withdraw from providing services through the Local Authorities aiming to commercialise the urban water sector supply. It encourages the private sector to participate in providing services with the objective of improving the standard. It continues to draw up separate strategies for water resource development in the rural and urban areas, clearly emphasising the former depends on NGO and donor funding while the latter depends on commercial models. The strategies imply the urban populations benefit from public funds while the rural and peri-urban populations wait for external intervention.

6.2 The dominant approaches in water management and local responses

The paradigm shifts identified earlier indicate the contemporary dominant approaches in water management that emerged from the case studies. In this section we will focus on the approaches within the liberal economy era; the community schemes in the peri-urban and rural areas and the commercialisation of the water supply in the urban areas. These approaches are guided by implicit assumptions and hypotheses of their proponents. We examine them together with the responses from the local actors in whose communities they are applied.

6.2.1 The community Schemes

The community schemes are sub divided into irrigation and domestic water to illustrate some of the variations in the intricacies influencing the local responses in community projects targeting water for livelihood and domestic water. The separation also depicts some variations between the perceptions and expectations of the rural and peri-urban area local actors. The variations are linked to the proximity of the latter to urban areas and the conceptualisation of the per-urban space, which we will return to in later sections.

6.2.1.1 Irrigation

The case studies in agriculture illustrate the MAFF and later the MACO initially proposed and set up irrigation schemes as resettlement areas for interested and willing citizens. The schemes were part of the self help and self sufficiency agricultural development policy to keep some residents in the rural areas and control the migration from rural to urban areas, while simultaneously encouraging retired urban workers to return to the rural areas (Bates 1976, 164-168). Since the 1990s the model of self help has been extended to include poverty alleviation and thus income generation for the rural residents (Schacter 2000). The schemes are also allegedly demand driven with the local users proposing the installation of infrastructure through their application for community projects to NGOs and the MACO.

6.2.1.1.1 The actors' theoretical frameworks

The various actors apply specific knowledge and theoretical frameworks (Mosse 2003, 16; Long 2001, 21). The implementers of the schemes require a consensus from the community, specify the technology installed, layout the membership of the scheme and shape the expectations of the project. This research illustrates that the applied frameworks result in specific responses from the local actors who redeploy them for their own uses. The redeployment manifests through the more popular and vocal members of society furthering their interests using the interactions with the project teams and other local actors. It often entails divergent results from those expected by the implementation teams and policy makers. It stems from the different expectations and objectives from the projects between the local actors and the project implementers that are often external actors.

6.2.1.1.1.1 The forced consensus

The project implementers' demand to prioritise needs removes some diversity in communities (Cleaver 2006; Joshi and Fawcett 2001). It calls for a united front usually serving the more dominant or vocal members like the males who focus on income generation as opposed to females who prefer food security from the irrigation schemes, depicting the gendered nature of the process. It excludes voices and choices in the hope of securing a project resulting in a false

homogenisation and self muting of members, which affects the long term sustainability of the project (Cleaver 2006). The apparent homogenisation potentially benefits disproportionately more dominant actors, such as those allegedly practicing witchcraft, and cements their influence. "The thing is there is also belief in witch craft so even if the group knows the problems are being caused by a community member they never want to point fingers so they blame everything else or everyone else but themselves. These are also issues that we have to deal with"[175]. The case studies suggest multi purpose projects that cover several representations and voices are more likely to ensure continuous support. These would beneficially have actors with albeit separate interests that are interdependent such as domestic water, irrigation water and fishing activities. They would also potentially avoid the demand for an apparent consensus. Additionally, the dominant representation and needs expressed by the group do not remain constant but change according to the project being proposed, the project implementers' mandate, environmental concerns, seasonal activities and other factors.

6.2.1.1.1.2 The selection of technology

The knowledge frameworks applied in the selection of technology cater to the competencies or speciality of the project implementer. The technology itself is embedded in the implicit choices made by the project teams (Olivier de Sardan 2005, 139; Latour 1997). Its implicit nature acknowledges that often the technology choices are only seen as non optimal after installation. Factors that may have been overlooked, such as limited long term maintenance capabilities and hence the project becoming unsustainable, are eventually revealed (Garb 2004). The selection process of the technology rarely involves the local actors indicating the power relations that imply the project teams have the knowledge and expertise to solve the problems of the local populations. Any consultation is superficial with the final decision being based on arguments of costs and models that have been used in other locations. A variety of other factors determine the decision making in community irrigation schemes (Mabry (ed) 1996, 9-14). A few NGOs working with communities attempt to use traditional technologies, which often cost less and are easier to maintain[176].

6.2.1.1.1.3 The actors' expectations

The MACO also promotes the irrigation schemes as ways of ensuring food security and poverty reduction strategies. It advises farmers who desire income to diversify their crops and grow more lucrative varieties like paprika and garlic for the urban markets. The MACO's promotion of the irrigation schemes is clearly embedded in their productive logic objectives of poverty reduction and increasing food security in rural households. However, according to the local actor narratives, food security would entail them growing staple food to be consumed in their homes as opposed to the crops for the urban market. Therefore they appear to value food self sufficiency as opposed to the food security (Winpenny 1994; Allan 2003). Some local actors, especially the women, do not consider income generating crops as a priority. Their staple food priority is often not included in the crop diversification and income generating bias of the project implementers. Hence their expected gains from the project are frequently not realised and their long term membership of the scheme not secured.

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[175] Interview with Mr Kamunga, Irrigation Officer, MACO offices, Lundazi, 4th August 2004.

[176] NGOs such as the Lutheran Worldwide foundation and aid agencies such as Irish Aid identify themselves as advocates of the use of traditional technologies using the skills of the local actors and only supplementing them with training if the actors request it.

6.2.1.1.1.4 Membership

Additionally this research illustrates that the focus on income generation moves away from the agrarian economy towards the urban market economy, which results in resistance from some local groups apart from the women. The resistance is illustrated in low activity levels in irrigation schemes and the lack of payment of the membership fees that are considered less important than maintaining the social harmony within the community. This research demonstrates users who do not pay the fee are not necessarily excluded from the scheme. Thus membership is not based on payment of fees but more on belonging to the community served by the scheme and the social relations within the community. The size of the community is often defined by the residential proximity to the infrastructure. Incidentally, in the project proposals that are checked by fieldworkers from government agencies the physical administrative boundaries and number of residents served are important; they are criteria for the awarding projects by the implementers. The numbers and boundaries are provided by the village headman or the local chief. The implementers classify the users within the boundaries as a water user group guided by the application specifications that are verified by the fieldworkers that deal with the communities. The water user group forms the overall umbrella organisation of infrastructure users. Within this umbrella the local actors form other sub groups such as farmers' groups and growers associations. The sub-groups have a more voluntary and arguably endogenous participation compared to the water user groups.

Water user groups and their formalities are models applied in other regions with irrigation infrastructure such as Asia and North Africa (Mabry (ed) 1996; Mosse 2003). The narratives of the actors in these groups infer they are not endogenous but rather a consequence of installing infrastructure in an area. The case studies illustrate that in rural areas they replace the voluntary participation previously managed by the village headman. They are mandated to make decisions on the use of the infrastructure through a committee elected by community members. The proponents of the elections consider them to be a form of participation in decision making (Mamdani 1996, 204). However, this research shows the process of election is biased towards visible, vocal and prominent members of the community. Almost every chairperson of the irrigation scheme visited owned a large farm nearby, a beer garden or a local shop, had strong links with relatives in an urban area or allegedly practiced witchcraft.

Farmer groups are also based on the use of infrastructure that is installed. However, the actor narratives infer they have voluntary membership and cater for a range of farming concerns from agricultural inputs to the marketing of harvest crops. They maintain the voluntary participation in village activities though they are not managed by the headman. Farmers apparently attend meetings and maintain their membership through their own interests and potential benefits of the groups. Incidentally, the choice of the name for the group and its choice of specific objectives provide incentives for assuming a leading role in the management of infrastructure and often replacing the water user group committee if it is not active or performing according to the expectations of the project implementers. In Ngulula the growers association took over the management of the furrow after the elected committee reportedly slackened in their duties. Groups such as farmers' groups and growers associations are usually seen as platforms for exchanging ideas and not necessarily staking claims to resources[177]. They are an interface between extension workers and the other farmers. They serve as channels for obtaining small

[177] For a project to be implemented the project implementers require the membership to reach further than a core group of farmers that form the farmers group. This is often the group interested income generation and support the objectives of the MACO promotion of irrigation schemes.

loans and demonstrating intermediate technology. They tend to influence other farmers through any visible success in farming practices; a share of best practice.

6.2.1.1.2 Forming committees

The intricacies of the water user groups and the farmers groups illustrate various forms of participation in community projects, which occurs at separate stages of implementation. In the water user groups an elected committee represents the interests of the residents and also encourages their involvement in providing labour or locally obtained materials such as sand and gravel during the installation of infrastructure. The individual decides whether to participate in the project implementation, however their decision is influenced more by the potential communal benefits from the projects as opposed to personal ones. If the community as a whole does not show commitment and support of the project it will not be implemented. Most fieldworkers that were interviewed stressed the need for the community members to show commitment to the project by attending local public meetings and contributing towards the 10% of project costs required from them. Hence the community members potentially gain more by the apparent consensus even though every individual does not agree with the project objectives (Ostrom 1990). Once the project is handed over to the community, the elected committee manages the infrastructure. Their term of office is decided by the members of the user group. However, this research shows their election is biased towards more active and vocal members of the community. Some community members that were interviewed believed the prominent members of the community were more likely to have resources to contribute towards the operations of the project after the handover. These active members are often the individuals who assent to the objectives of the project. The project implementers oversee the election procedure guided by their knowledge frameworks and hence constructs of participation.

In farmers groups the participation is based on the potential benefits of the group as assessed by an individual. Thus their membership is not primarily based on residential location but interest in the group activities. The individual interest makes them more endogenous and increases their chances of long term sustainability if the benefits are accrued. The groups are endorsed by the extension workers and the local actors appear to support them. They are however dominated by male community members and participation seems voluntary even though it is actively encouraged by the MACO extension officers who target these groups for agricultural intervention. Thus in this research participation emerges as a construct of the various actors based on their knowledge and conceptual frameworks. The extension officers and project implementation teams apply these frameworks in defining and recognising the groups hence legitimising them at the local level. However, the local actor narratives depict the biases of these constructs particularly considering the heterogeneity of the members of the water user groups.

Each heterogeneous water user group requires negotiations among the members who constitute part of the web of actors (Al-Nims 2004, 67). Their plurality of needs, representations and associations sometimes results in the exclusion of weaker voices (Peet and Watts 2004, 10; Cleaver 2006). However, these are not the only voices that are sometimes overlooked during project implementation and the decision making processes involved prior to and during it. Influential local actors such as chiefs are called upon only when uptake of a project is lower than expected by the implementers, who more often consult the village headman (Sefula Irrigation Scheme). The implementers base the consultation on theoretical and conceptual frameworks of social hierarchy and decision making in the rural area. Their assumed gate keeper, the headman, is not necessarily the recognised authority in some rural areas (Crehan 1997, 51-53). Their lack of attention to local situations results in overlooking the impact of issues like the authority of the village headman and underestimating the influence of other local actors such as the chief and

local development agents[178]. These actors are some of the forces shaping decisions and change at the local level (Long 2001, 13; Swyngedouw in Zimmerer and Bassett (ed) 2001).

6.2.1.2 Domestic water

6.2.1.2.1 The theoretical frameworks deployed by the actors

The forced consensus in community water schemes has been described in the previous sections on irrigation schemes. In domestic water schemes where the risks of using water from shallow wells are more evident the consensus often appears more long term and sustainable. They vary from the irrigation schemes that most users want to use only in times of below average rainfall when the harvest is lower than expected. Thus based on the objectives of providing clean and safe drinking water particularly in peri-urban areas as opposed to food security the domestic water schemes have more sustained interest from the community even though consensus may be forced. However, the consensus marginalises some actors who consider their wells safe and announce they have used them for many years without adverse effects. Project implementers consider these actors as dissenting voices and their support for the project is necessary for implementation. Thus they are "encouraged" to support the project for the benefits of the community as a whole. "We asked people to bury their wells if this project was to go ahead everyone needed to do this. In the end we physically went round with the RDC members to make sure the wells were buried. Some residents resisted but they understood it was necessary to show we were all in favour of the project, otherwise it would not be funded"[179]. The encouragement takes various forms such as education and sensitization to health risks associated with use of water without being sure of the quality to the physical burying of wells by project implementation teams. The forms of encouragement illustrate the power relations within the community particularly in the stages of project implementation and the associated decision making processes. The local actors participate in the projects irrespective of their beliefs.

6.2.1.2.1.1 The choice of technology

The selection of technology in domestic water projects resembles the procedure followed in irrigation projects. The decision is more biased towards technical considerations and long term mechanical durability. The technical considerations sometimes result in the installation of technology that cannot be maintained by the local actors without assistance from external actors such as urban water suppliers The George Township Community Water Project is managed and operated by the LWSC on behalf of the community. The technicians interviewed at the site confirmed the technology was too advanced for the local actors without technical skills to operate thus they had been seconded by the LWSC. They happened to be residents of George Township and appreciated the strong durable water distribution system installed by the JICA. Hence, the selection of technology supports a structure of domination that empowers the urban water supplier with local actors depending on them, effectively making the local actors more vulnerable to decisions made by the water supplier in the operation of the water scheme. We explore some of the technological choices in the domestic water supply including communal taps, mono pumps, boreholes and protected wells. Our exploration incorporates the impacts on the social relations through the local actor responses.

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[178] The local development agents are actors who position themselves at the interface between their community and development organisations such as NGOs and state agencies. They are often educated members of the community able to relate to these organisations. We will analyse their positions in later sections dealing with development frameworks and the actors applying them.

[179] Interview with Mr Mbuzi, Chipata Township water scheme manager, Chipata Township water scheme offices, September 2004.

Communal taps are not unique to community water projects, as illustrated in Figure 6.1. Parastatals and Local Authorities installed them in high density, low cost urban areas where arguably the individual connections were deemed unfeasible or costly. They based their criterion for feasibility and affordability on the affluence of the residents in these areas. Communal taps are cheaper to install and maintain compared to individual connections. Their use is determined by the residential proximity to the point and payment by each user. In community managed schemes, tap attendants monitor the users and regulate access. Each member registers with the attendant who controls the access to the taps using an installed locking mechanism; the attendant keeps the key. Thus the technology installed should allow for this locking. The attendant and the community using the tap agree on its opening hours. Officially only fully paid up members can use the taps alongside the most vulnerable groups who receive free water. The vulnerable groups are identified by the elected committee but this is not always a straightforward task. Communal taps ideally increase the interaction at community level since the residents negotiate and agree on the tap opening times. The residents also collaborate to prevent vandalism to the infrastructure in their areas. However, the collaboration makes use of already existing neighbourly relations. The case studies illustrate the neighbourliness overrides other factors like paying for water at a specified time. The tap attendant is a community member who uses her discretion to allow other residents to collect water and pay the amount when it is available for them to pay. The discretion results in several payment options. In the Chipata Township water scheme, the scheme management allowed tap attendants to sell water at the site and also bring the monthly fees at variable times, not only at the start of the month. In George Township the residents had also requested a flexible payment method; the rigid payment schedule was the most frequent complaint from all zones.

The often implemented monthly payment plan is based on an urban model where residents are more likely to have a monthly income from formal employment. In the peri-urban areas, most residents are in informal employment with variable income availability dates. Hence the predetermined payment plan results in some residents officially being excluded from the use of infrastructure. Additionally, the case studies reveal some resistance from residents manifested in the low numbers of infrastructure users in the long term. This is a potential result of clashing knowledge frameworks (Long 2001, 12-15; Robbins 2004). In both George and Chipata Townships where the local actors buried shallow wells to show support for the projects, shallow wells had been re-dug in some zones and some residents were using them. The residents revert to traditional water sources if they are available after assessing the risks as perceived by them. Risks refer to health and transaction costs of the decision[180]. According to the actor perspectives, the water used for washing clothes need not be of a high quality like drinking water. Thus the time spent collecting it is considerably less; it can be obtained from shallow wells where they exist. It is also of considerably higher volumes than drinking water making the distance factor important when determining the source, the nearer the better.

[180] Transaction costs include possible apprehension by other community members and the effect on personal relationships with other members if someone is seen as not contributing towards community project sustenance.

Figure 6.1 Communal taps in George Township, Lusaka

The DWA or NGOs usually install the mono pumps, as is illustrated in Figure 6.2. The maintenance of the pumps is a community responsibility. However, any infrastructure installed by the Government remains its property even though it is maintained by the community. The ownership characteristics are often used interchangeably for the project and the infrastructure, leading to some confusion. The users of the mono-pump usually live within its vicinity and generally agree to pay a nominal fee occasionally enforced by a committee. If the user numbers are large, the fee is only paid when costly maintenance is required. The committee asks the community for a minimal contribution towards the costs. Usually, the water from mono pumps is provided free of charge. The neighbourly relations override payment for use of infrastructure, as is the case for communal taps. The community relationships create a strong foundation for the negotiations on use and maintenance of the mono pump thus making them communally manageable. The community members also prevent vandalism and regulate access. In George compound in Ndola, Care International drilled 9 boreholes. At the time of the field visit only 4 were operational. The RDC chairman narrated that the community members living within close proximity to the operational boreholes maintained them and monitored their use especially by residents living in other parts of the compound where other boreholes had broken down. Children from within the community often play near the boreholes and report any suspected outsiders tampering with the borehole to their parents or elders in the community.

Figure 6.2 A monopump in George compound, Ndola

Boreholes are usually a main source of supply for individuals mostly living on farms and not connected to the reticulation system, see Figure 6.3. Most boreholes are financed and maintained privately, they belong to the individual. The privately owned boreholes have a high capital expenditure for the owner who restricts and regulates their use and sometimes allows outsiders use at a non-negotiable price. The NGOs and the Government finance boreholes in community water schemes where community members often hire qualified personnel to maintain them. The regulation of access for communal boreholes follows the patterns described in the mono pumps section. The community members make use of their established relationships to maintain and repair the infrastructure. Thus the sustainability of projects with mono pumps and boreholes depends on the social capital of the community.

Figure 6.3 A borehole with a windlass in Chonya village, Mungwi

Protected wells resemble mono-pumps and in some peri-urban and rural areas the names are used interchangeably, see Figure 6.4. They specifically refer to a well at least six meters deep that is lined and covered to protect the water from contamination. They are financed by NGOs, by the Government or by individuals in the community. If the well is destined to communal use, residents fund it collectively. The use of communal wells is restricted to those members who contribute towards the capital cost or maintenance. They are easier to monitor. The well is usually located in somebody's yard or an easily accessible point for the users. In Kabwe, most of the communal wells were located at the household of the individual that made the highest financial, material or labour contribution. The restricted use and location of the well prevents vandalism and ensures maintenance and repairs are carried out. The community has a high social capital based on their interactions especially for the purposes of digging the well and regulating its use.

Figure 6.4 A protected well in Shamabanse Township, Kabwe

Shallow wells are relatively cheap to dig depending on the water level in a particular area, see Figure 6.5. They are also easy to maintain. The ease of digging and maintenance makes them widespread even though they are considered unsafe in terms of health. They tap into the mobile water body that can easily be contaminated by pit latrines and refuse pits. The JICA representative interviewed narrated how his team used colouring in water ground water to demonstrate the flows between shallow wells and pit latrines to residents in George Township. Water is usually obtained here free of charge except occasionally when the owners feel they should recover some of the capital costs spent in acquiring them. The deeper ones are often perceived to provide safe drinking water and owners usually charge for their use. The communal ones are accessible to those who contribute towards their capital cost and maintenance. The regulation of access is similar to a protected well. The social capital of the community is similarly high for communal shallow wells.

Figure 6.5 A shallow well in Chililalila Township, Kabwe

Streams, whether perennial or seasonal, are used as a source of domestic water by those who are “fortunate” enough to live near them. Some residents in Ndola and Lusaka expressed this sentiment indicating a stream can provide a nearby source for water in some cases closer than a communal tap or borehole. The water from streams is free for those living nearby to use and there is no monitoring of users. The use of streams is not affected by any of the structures resulting from the shifting paradigms in water management. Their access is open but traditions and customs usually determine the activities conducted near the stream and its use. Most communities that live near them are weary of the water quality. Often the residents do not have the means for treatment and tend to drink untreated water. Streams are generally used for washing, bathing and rituals. Those that have protected water sources nearby as well as a stream, use the water from the latter mainly for washing purposes.

The membership to a community water scheme is initially determined by the residential location of the user. However, as described above their continued membership is determined by the payment of membership and user fees, both of which are specified by the community members. These regulations are set by the project implementers using their knowledge frameworks and mandates from financing organisations. The representatives from CARE International, World Vision International and Development Cooperation Ireland all indicated they guide the communities to determine a suitable level and method of payment for the water supply. Incidentally the actual use of infrastructure in a particular location, the access to water, is determined by the tap attendant if one exists and the point can be locked. The local actors at a particular water point negotiate with the attendant for tap opening times and access. In some schemes, such as the Chipata Township Community water Scheme, the attendant is given the authority and flexibility to collect water fees at various dates or charge users at the taps. The charging at the taps was a response from the scheme management to incorporate the activity at the local level that diverged from project implementer expectations. The attendant is accountable to the elected water committee, which is a sub group of the community elected RDC.

6.2.1.2.2 The water committees

The elections of community representatives, such as the RDC in the peri-urban areas, are based on a popular vote, which the domestic case studies demonstrate usually favour local business men or retired civil servants and teachers. These can be classified as elite residents. The businessmen often have the economic means to secure a position such as the chairperson. Thus the elections are not based on the skills and capabilities of an individual as expected in the model of ideal democratic elections where the candidate with the best policies and capabilities wins, but on the popularity and economic status of the candidates. In the rural case studies the water committee can be appointed by a traditional leader. Thus a committee is legitimised by their election, the recognition by the Local Authority and NGO project teams or their appointment. Incidentally the legitimacy of elected members is not guaranteed in some rural areas. It requires support from the traditional ruler, especially in areas with strong culture and traditional influence. In the Mwansabombwe and Sefula case studies both committees relied on the traditional ruler convincing the subjects about the potential benefits of a project and mobilising their support. Water committees maintain the installed infrastructure, monitor and prevent vandalism, employ and supervise tap attendants and control the revenues raised from the water points. They serve for a fixed term of office and are assisted by the rest of the RDC or the traditional ruler to ensure the community members pay their user fees. They provide an interface between the community and the project implementers.

The web of actors in peri-urban areas varies significantly from that in the rural areas. It supports a structure of domination where particular actors can thrive (Jabri 1996; Uvin 1998). The absence of the traditional ruler and the mixed customs and cultures of peri-urban residents cements the influence of actors such as businessmen and formally educated individuals. These actors are elected as RDC members. The RDCs are not endogenous groups but part of the externally constructed participation. Their proponents in the development sector legitimise them as gate keepers for their communities. The Local Authorities reportedly train them in skills required to lead, mobilize and sensitise communities. However, this training appears to be limited to the initial group of office bearers. The hand over from one group of office bearers to another seems disjointed probably due to the short term of existence for the groups. The first office bearers also evidently appropriate their roles for their benefit and that of their circle of friends and relatives. In some peri-urban areas visited the relatives of RDC members often enlisted their assistance to negotiate the use of a tap even when they have not paid their membership fees. The water sector approach in peri-urban areas is influenced both by the rural and urban models of service provision. Both community water projects and urban water suppliers are found in these areas, sometimes coexisting. According to the NWP the peri-urban areas should be serviced by the urban water suppliers, which we now focus on.

6.2.2 The urban water sector

The urban water sector approach is based on the commercialisation of the previously parastatal and Local Authority managed networks. In this section we examine the commercialisation approach and its resulting knowledge and theoretical frameworks. We also analyse some of its impacts, which are revealed in the responses from the local actors. Commercialisation as it is applied in the water sector redefines the psychological contract between the water supplier and the end user; it impacts the regulation of the water point, informs the technology installed in urban areas and also affects the payment patterns for the services[181]. It results in a particular construct of responsibility for the end user and water supplier. The water is no longer taken for granted as a God given gift that community members can freely share or receive at a subsidised rate. It is

[181] The psychological contract is often confined to relationships between an employer and an employee. It is an implicit contract based on expectations from both actors. In this research we extend its use to expectations between a service provider and the recipient or end user.

converted into a commodity that requires investment to treat, transport and distribute it to the users (Bakker 2001). It is a factor of productivity that should be conserved and used efficiently (Abu Zeid 1998). However, the sheme manangers in George and Chiptat Townships assert they sell a service to their communities and not a commodity. Their assertion is supposedly influenced by the NGO project implementation approach, which does not support the commoditisation of water. These constructs are presumably compounded by the localised competition for the resource and the poor water quality in some locations (NWP 1994).

6.2.2.1 Commercialisation

According to the actors from the MLGH, commercialisation of urban water supply, to create autonomous water departments or the CUs was inevitable considering the poor standard of service offered by the councils and the liberalisation of the Zambian economy. Most deductive study inspired large scale projects are considered inevitable without considering alternatives (Garb 2004). It is also an integral part of the water sector reforms in Zambia (NWP 1994). Incidentally this research reveals the drivers of the reform are both internal and external. They include the funding conditions from the donors and the IFIs, the lack of satisfaction with service provision and the resulting non payment of fees and rates by residents. The Government sourced inputs for the reform exercise externally, using the productive logic of increasing the percentage of the population with access to safe and clean drinking water. The water sector is also part of the public sector through local government, which the IFIs and donor agencies labelled as requiring reform in most recipient countries. Hence these reform proponents also pledged funds for the restructuring of the overstaffed water supply departments and rehabilitation of dilapidated infrastructure.

The identified causes of commercialisation and the underlying theoretical frameworks of its proponents shape the expectations of the various actors in the urban water sub sector. The regulator, the NWASCO, expects water suppliers to have a lean and skilled work force that provides a good standard of service for the end users. It expects the users to pay for the service thus making the supplies financially viable based on the client revenues. Incidentally some end users in urban and peri-urban areas considered only the Local Authority services to be of an unacceptable standard not the parastatal supply even though both were subsidised. They responded to the poor service by withholding fee payments while the users of the parastatal supply could not with hold payment as it was deducted from their salaries. Their response implies a belief that poor services should not be paid for. Some local actors interviewed expressed the will to pay for a service if the standard is acceptable. Those residing in areas previously serviced by parastatals, which are often more affluent, are accustomed to a good standard of service albeit it was subsidised. The higher rates usually form the baseline tariff for the CUs and autonomous water departments. The increased rates often meet some initial resistance but gradually the residents become convinced to pay for their services especially when threatened with disconnection of services for non payment of fees. The local actors often understand the merging of water supply systems in a town to mean a uniform standard of service closer to that provided by the parastatals with the event of commercialisation[182]. Commercialisation entails an increase in water rates and thus actors expect an improved level of service if they pay more than before. The suppliers classify them as clients with a redefined consumer contract. The promise of improved services initially instigates some support from the local actors even though the commercialisation process is mainly externally driven. However, the increased rates, the regulation of the water points, the responsibility of the local actor and the selection of technology reveal some unwelcome consequences for the local actors.

[182] Merging refers to the separate water treatment and distribution systems previously managed by the Local Authorities and the parastatals.

6.2.2.1.1 The regulation of the water points

This research illustrates the impacts of consumerism on the community interactions and communication. Commercialisation has resulted in water meters being installed in areas where residents previously paid fixed charges for water supply. As detailed in the Paradigm Shifts Chapter, metering was reserved for affluent neighbourhoods or high cost areas. Allowing a neighbour to collect water for domestic use in non metered areas had no impact on the bill of a household. The Solwezi and Chipata case studies reveal that metering and consumers paying for actual volumes of water consumed, results in stricter control of access to water taps at each household. Neighbours not paying their bills cannot use the services of the other community members. The metering also affects secondary water markets that emerge from the inability to cover all urban residential areas with individual taps or to afford them. The secondary markets are created when a household with a tap opens access to neighbouring houses at a fee. This fee contributes towards or sometimes covers the entire water bill. Some households use the revenues as an additional source of income. Metering limits the opportunities for additional income generation. Household owners with taps exert greater control on access and limit the amount of water that can be collected at any particular time. Thus metering adversely affects the neighbourly relations that promote sharing of water resources within a community.

6.2.2.1.2 The responsibility of the local actor

Actor responsibility can take various forms (Roussopoulos 1993, 103; Schacter 2000). The redefined psychological contract of the urban water end user entails a particular conceptualisation of responsibility. The regulators of the sector expect the consumer to demand a particular standard of service, which he should be willing to pay for. The NWASCO expects the responsibility of the supplier to be complemented by the consumer paying for the service. Thus actors are interdependent. The interdependency is supported through groups such as Water Watch, which are mainly found in the urban areas where domestic water supply is regulated by the NWASCO. The regulator proposed the groups as channels for consumers to present their complaints and as neighbourhood monitors of the suppliers. The water watch groups form an interface between the supplier and the community. They are a form of collective action (Ostrom 1990). Similar to other groups, they aim to represent the community demands through the collective. The members are volunteer concerned citizens, which has a bearing on their legitimacy. This research shows most urban residents prefer to direct their complaints to the customer relations officers provided by the supplier. They believe they will get a quicker response by visiting the actual company offices than by going through an intermediate actor.

In the discourse of responsibility contains some underlying perceptions (Cornwall and Brock 2005). In Zambia the end water user has increasingly shifted from a passive participating or dependant citizen to a proactive empowered consumer. This shift is supposedly accompanied by an increase in local control over the water resources but decisions on use are dependent on the supply. The supply is not usually controlled by the user or a representative of the user but by commercial entities, committees, seasons and project financiers via implementers. Thus the shift is likely to be triggered by some multi scalar factors. Those identified in this research can be summarised as follows:

Table 6.2 Triggers of shift from passive to proactive actors

Trigger	Location	Action
Health	Peri-urban, rural and remote areas	Distribution of chlorine, Project proposals or water project
Aid conditionality	Urban, peri-urban and rural areas	Formation of committees and drawing up of constitutions
Commercialisation	Urban areas	Increased pressure to pay bills demands service improvement
NGO mandates	Peri-urban and rural areas	Project proposals or water projects
Community expectations	Peri-urban and rural areas	Project proposals or water project
Economic and Social Development	Peri-urban and rural areas	Project proposals or water project
Personal experiences	Urban, peri-urban and rural areas	Informal discussion in communities which is likely to result in project proposals and formation of organisations.
Environmental concerns	Urban, peri-urban and rural areas	Informal discussions within communities likely to result in collective action

Urban areas have specific infrastructure for domestic water supply based on the technological capacity of the suppliers and regulators (NWASCO 2002). All urban locations have either a communal tap or an individual tap. Local actors in the rural areas identify the tap as the most convenient water point, it also symbolises an urban standard of water supply. They are aware it is an expensive point and concede it is limited to those who can afford to pay for such a service. However, the investment in the water distribution in urban areas makes use of public funds. The allocation of the funds determines which areas have piped water and those that don't. This research shows urban area projects are more likely to attract investment because of the considerably higher chances of cost returns when compared to rural and peri-urban areas. Incidentally cost returns were not necessarily the main driver of installing piped networks since most of the water supply in urban areas was subsidised. The urban areas that previously had white settlers had such networks installed at public expense. This bias in investment has been maintained even after independence and is compounded by the argument of higher potential for cost returns in urban areas.

6.2.2.1.3 The selection of technology

The choice of technology in the urban areas is embedded in the actor knowledge frameworks of urban living standards. These frameworks imply independence, individuality and symbolise the affluence of the location, which is linked to the willingness and ability to pay for the service and the standard of service expected. However, these symbols are affected by the capacity to operate and maintain the technology whether by the community or a water supplier. The technology installed also impacts the social organisation within a community. It possesses underlying responsibility for the end user as a community or an individual. Thus it supports a particular structure of social organisation within the communities, independence and individuality in urban areas and communal relations in peri-urban and rural areas. The local social organisation allows the modes of resource appropriation can be analysed (Trottier 1999, 160). Each point has regulations for access affected by the theoretical frameworks of the actors installing the

technology emphasising the potential benefits of analysing local access modalities and their transfer.

The individual taps are mostly found in the high and medium cost urban residential centres connected to the main reticulation system that is managed by the Local Authority or a CU. The individual connection usually restricts the use of a particular tap to the household where it is located. The occupant pays the bill and monitors the use of their tap. The supply is usually constant at the individual taps and the quality of water meets the standard set by the Zambia Bureau of Standards; it is usually supplied by trained personnel at established institutions[183]. Some residents complain of low water pressure, blocked pipes or completely dry taps. The type of water source is related to the location and the end uses, as is illustrated in Table 6.3. It is also related to technological suitability; most rural residents prefer boreholes and protected wells as these are easier to maintain and are considered dependable sources of clean water.

[183] The Bureau of Standards sets the standards for drinking water in Zambia following the WHO drinking water standards. However the monitoring of the actual drinking water quality provided by the various suppliers is done by the Ministry of Health. Random samples are collected from various points. The exercise should be routine but is emphasised during disease outbreaks. Water suppliers in urban areas monitor the daily quality of water supplied to their clients using periodic routine tests.

Table 6.3 Water supply types

Type	Location	Maintenance	Cost	Supply	Water Quality	Regulation	Potential challenges
Individual Tap	Urban Areas	Local Authority or Commercial Utility	K15,000 to K40, 000/ month	Usually constant apart from low pressure or dry taps	Treated at source	Individual responsibility Household head	Visible penalty Easier to penalise Standard of supply Penalty severance
Communal Tap	Urban and peri-urban areas	Local Authority, Commercial Utility or Community	K1,000 to K3,000/ month	Usually constant apart from low pressure or dry taps	Treated at source	Monitoring essential by community or tap attendant Household head/ RDC/ Attendant	Free riding possible Authority of fee collecto Standard of supply Penalty severance
Mono Pump	Peri-urban and Rural areas	Community	K500/ month	Usually constant apart from breakdowns	Close to drinking water standard	Monitoring done by Water Committee Attendant/ RDC	Free riders Authority of fee collecto
Borehole	Farming blocks and Rural Areas	Individual owner or Community	K1/ litre to K5/ litre	Usually constant apart from breakdowns	Close to drinking water standard	Individual or community responsibility Attendant/ RDC	Free riders Authority of fee collecto Penalty severance
Protected Well	Peri-urban and rural areas	Individual owner or Community	<K500/ month but usually Free	Usually constant	Close to drinking water standard	Individual or community responsibility Household head/ RDC	Free riders Penalty severance
Shallow Well	Peri-urban and rural areas	Individual owner or Community	<K100/ month but usually Free	Usually constant	Health hazard in rainy season	Individual or community responsibility Household head	
Stream	Peri-urban and rural areas	None	Free	Usually constant	Health hazard in rainy season	None	

6.3 The scalar levels of analysis

The scalar levels of analysis used by the various actors depict their conceptualisation of space and hence the physical and conceptual focus of their approaches in water management. The dominant actors such as the state officials, NGOs and donor agency groups often apply physical boundaries to identify their area of intervention providing quantitative figures for measuring the target populations and hence the success of the project and meeting objectives. These physical boundaries differ from the local actors' conceptualisation of space and the factors that influence their choices and decisions at the local level. In this section we examine the scalar levels of analysis applied in the dominant approaches in water management that are influenced by the identified paradigmatic shifts in resource management. We aim to contrast these with the local actors' conceptualisations of space that emerged from the research and hence illustrate some of the impacts of the conceptual variations on local water management and the responses from the local actors.

6.3.1 The influence of paradigms

6.3.1.1 The conceptual frameworks

The paradigm shifts in water management influence the conceptualisation of space by the dominant actors in resource management at particular times. During the colonial era, there was a clear distinction between commercially driven urban areas and peasant farming rural areas. The urban areas were managed by Local Authorities and the rural areas were managed according to the traditional leadership of the tribe (Mamdani 1996, 292). Thus any infrastructure development was centrally planned for urban areas and mainly autonomous for rural areas. These concepts of rural and urban area management were maintained in the paradigm of the one party state when water management and resource development was based on the technical, human and financial capacity of the state that made use of public funds. However, during this era there was less emphasis on traditional leadership and urban and peri-urban areas grew significantly. The paradigm of the liberal economy perpetuates the separation of the rural and the urban. It is allegedly constrained by the capacity of the state to provide for all its citizens. The constraint calls for participation from the community, which is defined in various ways.

In most rural area projects, the community is defined in terms of a village. It has an identifiable leader through the village headman who is supported by an advisory council. This group jointly makes decisions on behalf of the village residents with the guidance of the chief if need be. The land allocated to a village headman by the chief is traditional land devoid of deeds, thus the boundaries are often known only by the chief and the headman. These boundaries are often not fixed and depend on the number of subjects living in the village. The headman permits subjects to occupy a piece of land within the village. Thus the villages vary in size and population. The variations present challenges in applying the knowledge and theoretical frameworks of the project implementers such as minimum number of residents serviced by a particular point. A village with less than their stipulated number will be disadvantaged and sometimes the physical boundaries mean adjacent villages have two boreholes within close proximity. Thus, more residents travel long distances to reach the point for safe and clean water.

The definition of areas of intervention based on physical boundaries also implies homogenised groups within the boundaries. Thus project implementers expect almost spontaneous collective action to result from the demarcated areas. They expect the identified traditional leaders or elected committees, to mobilise and sensitise their subjects or residents to support a project. Their focus is often their conceptualisation of the social hierarchy in a particular location. However, the social influence that is maintained in the hierarchy of a group

may not necessarily coincide with the political influence, which determines the decision making (Migdal 1988, 18; Long 2001; Crehan 1997). The economic influence, which allocates resources, may also differ from the social and political influence (Olivier de Sardan 2005, 139). The environmental influence may also lie in the hands of a separate group. In the Chulu Ngoma case study the residents considered the traditional leadership to be weak and believed the village development committee and local chief was more credible to secure projects. In this research the environmental influence was rather challenging to separate from the social and political influence, particularly because most local actors felt more limited by social, economic and political factors than their natural environments.

The common objective in local actors' participation, encompassing responsibility and empowerment, is the decentralisation of decision making in resource management. Ideally it incorporates local intricacies. Supporters of decentralisation believe local actors know and understand their needs and are in a better position to ensure the benefits are more evenly distributed. Incidentally, the policy makers apply their knowledge frameworks to construct participation and responsibility as representation at the local level. The organisations such as RDCs are introduced to mobilise local actors and mediate between them and the external actors. The theoretical and knowledge frameworks applied in decentralisation require an identifiable group within each community that essentially becomes accountable for various activities at the local level. The RDCs have demonstrated the ability to manage community resources. However, the case studies reveal many members already had the capabilities and skills required to perform their duties as externalities from their previous employment. The RDC model has not been tested in locations where capabilities and skills may be lacking.

The fact that the interpretations and frameworks of project implementers are constantly evolving with the aim of improving on past practices implies the analysis in this research is only representative of the time when it was undertaken. Thus, as the management paradigms shift, the analysis of the interfaces between the existing and introduced structures and actor responses would ideally continue. The results could provide lessons to be incorporated into any planned future interventions, which would potentially increase the chances of beneficial change. Intervention is often aimed at non commercial water uses such as community projects. However, in the case studies it applies a commercial model for project sustainability resulting in conflicting frameworks and perceptions from those with the responsibility of maintaining the project and the end users. In the community water schemes visited, the financial stability and expansion to new areas is an important measure of success for the project implementers. The end users consider the continuous supply of water more important than money in the scheme account and expansion to new areas.

6.3.1.2 Power structures and multi scalar relations

The actor knowledge frameworks and conceptualisations of space for intervention and social organisation illustrate the multi scalar factors shaping the Zambian water sector. The approaches identified in this research link the global level actors such as the IFIs and international NGOs to the national actors in the state agencies and to the local level through the community water projects and policies. The links encompass the four facets of political ecology, economic, social, political and environmental issues. In the following sections we summarise the global discourse that is embedded in the dominant actor frameworks. The summary will aid the comparison of these frameworks with those of the local actors.

National policies are influenced by a variety of factors at the global level such as the decentralisation of aid and the implications it has on the strength of the state in target countries (Uvin 1998, 151-153). The actor narratives from the government agencies and contents of policy documents such as the NWP, confirm this influence. In addition, actors such as the RDCs and local NGO teams are strengthened by the decentralisation while the Government is usually weakened. The roles of local actors are realigned to fit with the international discourse and policies adopted by the donor countries regarding aid distribution.

The strategic and productive logic applied has various impacts (Trottier 1999, 160). The use of local actors may be efficient in reducing Government bureaucracy but not necessarily effective particularly when we consider the interests of the strengthened actors. Central Government is sometimes by-passed with the aim of reaching the target population more effectively and efficiently (Hulme and Edwards (eds) 1997; Eade and Literingen (eds) 2001). In the NWP the strategy formulation was dominated by the MEWD and donor agencies. The latter provided the funding for the water sector reforms. Water user groups were only represented through the ZNFU and commercial users such as the ZESCO and the copper mining companies. The economically biased policy continues to constrain the recognition of grass root resource management activity (Mosse 2003, 4). Thus ideas and strategies are imposed on the water users who usually react to incorporate their own perspectives. In the irrigation schemes and community water projects visited the membership fees were ignored by some local actors or the payment method adjusted to allow more residents to access and use the infrastructure. This incorporation of local ideas is often not welcomed but blamed for the failure of projects and policy implementation.

The global discourse on social organisations from the IFIs and international NGOs that intervene at various levels is presently focused on capacity building. The targets for capacity range from individuals and communities to institutions. The capacity building encompasses accountability to, responsibility and empowerment of the local actors. These are contributors to social development, which are included in the community projects. We analyse them further in the later sections that explore development approaches and the results of the varied definitions of capacity building. At this point we acknowledge the influence of the global discourse on issues such as community participation, local actor responsibility and accountability on project implementation at the grass roots and the knowledge frameworks applied by the dominant actors.

The Government and donor agencies consider it impossible to ensure complete representation of interests in decision making, often adversely affecting target groups. Their approved stakeholders are invited to workshops that propose and formulate policy at the national and district levels (Gould 2006). The actor narratives suggest the stakeholder selection and representation in community water projects is determined on a democratic basis involving water user groups, project implementers and financiers, community leaders and other interested groups. However, the constructed participation results in project financiers and implementers effectively making decisions, which do not directly affect them. Their knowledge frameworks dominate the decision making (Long 2001, 21). The case studies in the peri-urban areas illustrate the election of representatives' favours candidates that can relate to the actors that select the stakeholders. Additionally, the local community usually represented by elected or hereditary leaders end up drowned in formalities and bureaucracy of project implementation. They continue to depend on external intervention enshrined in policies and project financier mandates. Thus these dominant actors tend to maintain the dependency of the non participating peripheral groups, consciously or unconsciously and construct participation according to their mandates. Their selected stakeholders are likely to assent to their proposals thus the constructed participation minimises dissenting actors and excludes the majority from political influence.

Increasingly the global citizen is becoming more visible as a channel of promoting external intervention in resource management[184]. Nature and the environment have more influence as actants at the international level; presenting challenges for less industrialised countries[185]. Some advisers from multilateral international organisations and journalists in international

[184] Debates on the rain forest and its conservation to minimise the effects of climate change are constant reports in international media and research journals.

[185] The movements that dominate the debates in environmental protection are usually based in industrialised countries and pledge their determination to reach their objectives for future generations. They are often financed by residents in these countries.

media view these countries are as resource poor, focusing on economic development while ignoring the vital role of the environment and the need to conserve it (Banda 2006)[186]. Their focus is based on the assumption that social and political development will follow the economic development. This research supports the localisation of the globally determined targets and interventions in national plans for them to have a positive effect at the local level. Localisation means the long term planning at a local level, which can be financed by the IFIs or donor agencies if they refrain from imposing their ideas through conditionalities. It can occur at several levels such as those adopted in this research. Some of its results are visible at the grassroots in the daily decisions.

6.3.2 The local actor frameworks

The scalar levels of analysis selected for the purposes of this research aim to capture local actor strategies and their cooperation or competition for resources. In aid of this we aim to incorporate their conceptualisations of local space. Various organisations often use the household as a basic unit for social and economic data bases. However, households vary in size, actor domination and configuration. These variations are important when determining access to water resources particularly in rural areas. The end user, usually the female head, decides the amount of water required daily, collection methods and the water point used. In urban and peri-urban areas the household configuration is overshadowed by the economic status of the unit as a whole. The water source is fixed and the quality and quantity available is often determined by the supplier. The complexity of dealing with the household unit compounds the scaling up towards the community as a basic level with its size determined by the source of water. The number of households using a particular source constitutes the community. Its size and composition varies according to individual choices. It is heterogeneous; its members use water in a variety of ways though their needs sometimes overlap. The case studies illustrate some actors opt to belong to groups or associations with specific needs and interests.

According to the above definition of a community, it may include the groups formed for specific purposes such as farmers and water user groups. However, it only applies to users of a common water point. This clarification allows us to distinguish between endogenous groups and imposed groups. Incidentally, the process of forming groups and associations is not always traceable and is frequently taken for granted by most of the community members involved (Ostrom 1990; Edmondson (ed) 1997, 3). In Olson's economic analysis the process is rational and end goal focused. Ostrom argues for a more social focus including benefits other than economic gains[187]. This research concurs with the social focus by illustrating the dominance of the social and political aspects as drivers of the group forming process and underscoring some irrational choices according to classical theories. The farmers sharing ideas and securing irrigation infrastructure to harvest a better crop for their families or the communities securing a water project for clean and safe water supply have more social gains that do not necessarily convert into economic gains. The research identifies the triggers of the process of forming associations as visits to other communities, extension workers, drought years and the lack of food security, disease incidence and NGO projects. The resulting collective action is usually planned during informal social interactions among community members. It is a strategy to ensure access to water for a particular use which may not be achieved individually. It further creates opportunities for interaction with external organisations (Al-Nims 2004). However, it often concentrates the decision making in the hands of the representatives who directly interact and negotiate with these organisations.

[186] Resource poverty refers to human and financial resources which accompany the desire to conserve nature and the habitat of other species apart from humans.

[187] The sharing of ideas includes the use of home remedies to cure diseases that would otherwise require medical attention that some residents cannot access or afford.

6.3.3 The research revealed "appropriate" level of intervention

Applying the Political Ecology framework this research advocates for a user defined community as the "appropriate" level of decision making (Robbins 2004; Long 2001; Roussopolous 1993). According to the actors interviewed in the case studies, the user defined community is focused on the members that interact in their daily activities hence leading to their interdependence. It is often based on neighbourly relations and kinship especially due to traditional migration and settling patterns. It is the level at which the decisions have the most impact and would enable those affected to make the decisions. As a level of interaction it builds on the actors' social capital and skills that can be applied in their communal, local space. Thus it would be used beneficially as a level of intervention, potentially avoiding the forced consensus and enhancing project sustainability. Using it as the lowest level of intervention would also potentially allow up scaling of intervention to other areas within close vicinity.

6.4 The approaches to development

The reform of and the approaches in identifying and facing challenges in the Zambian water sector are embedded within the national development agenda. In this section we examine the economic, social and political aspects of development. We will analyse each aspect in relation to water management and the dominant approaches identified in the liberal economy era that are undoubtedly influenced by the colonial and one party state eras. Applying the actor oriented framework we explore the various definitions of the concepts framing the economic, social and political aspects of development in the water sector. We compare three groups of actors, the multilateral organisations, NGOs and the local ones. Their definitions of development result in different approaches and hence targets for intervention and expectations at the local level. These aspects are three facets of political ecology. Thus through this analysis we conduct an actor oriented political ecology of the Zambian water sector.

Development plays a crucial role in the distribution of financial resources to individual communities. Seers (in Ayers 1995) defines it as a means of creating the conditions for the realisation of human personality, hinging on reducing poverty, unemployment and inequality. This is an economically biased definition that aptly agrees with the MDGs that state agencies use to secure funds for water project. They incorporate urban water supply and community projects into national development plans for providing clean and safe drinking water to citizens. The projects evidently reduce incidences of water borne diseases and ease the burden of water collection on household members. However, that is the productive logic announced by the decision makers (Trottier 1999, 19). The strategic logic of the actors in the case studies exposes the maintained inequality in the economic development of the various locations. The state allocates more public funds to the urban areas to develop water supply while the rural areas depend on NGO and donor projects. This research shows that urban residents expect tap water at every household, which would presumably be a significant hurdle in peri-urban and rural areas. It requires finances, providing an argument for the productive logic such as prioritisation of limited government resources that are usually focused on the urban areas with opportunities of returns on investment. Cost returns overrule equity in resource distribution[188]. Thus the definition of development based on economics will inevitably result in a continued inequality of living conditions and external dependency of the peri-urban and rural residents. The skewed investment and dependency raise questions about the decision maker in resource allocation, the amount and timing of the allocation to particular communities and whether all citizens have an equal right to development (Manzo 2003) [189].

[188] Equity here means equal opportunity and access to the resources that are meant for the Zambian citizens irrespective of their economic status and the locations within the national borders.

[189] Development here is taken to refer to economic development that the Government allegedly strives for. However this is not necessarily the definition of development that local community members would

6.4.1 The economic aspects

The distinguishable living conditions based on publicly funded infrastructure in various parts of Zambia lead to variable starting points on the route to economic development. Our analysis of development approaches begins with the economic aspects because these often overshadow the social and political aspects. The policy formulation for the Zambian water sector provides evidence of this as does the income generation in irrigation schemes, financially sustainable community water supply and commercialisation of the urban water network. The evidence epitomises the Millennium Development poverty alleviation goals[190]. In this section we explore the implications of the poverty alleviation approach and its impacts on water management at the local level. We also analyse the dependency relationship between the local and external actors that is consciously or unconsciously maintained by the dominant approaches in water management.

6.4.1.1 Poverty alleviation

The earlier sections on community schemes illuminated some of the knowledge and theoretical frameworks applied by dominant actors. They illustrated that the actors in the IFIs impose their knowledge frameworks on the government facilitated projects through their conditionalities and mandates. The state agencies consent to these conditionalities, albeit reservedly, and identify processes and actors to operationalise the project objectives. In the apparently demand driven and community supported projects, government agencies select communities on an ad hoc basis using project proposals from the district development teams. The ZAMSIF collects the proposals and prioritises them using set criteria including the number and success of past projects, community commitment and the population to be served. Fieldworkers from line ministries that sometimes implement projects verify the information provided in the application. The ad hoc selection leaves room for clientelism in the allocation of resources (Mamdani 1996, 289). It concentrates the economic and political influence in the ZAMSIF officials receiving the applications. The fieldworkers, who verify the information in the applications, possess more social influence, which does not necessarily impact the resource allocation. The officials and fieldworkers are also accountable to separate groups. We will return to the implications of this separate accountability in a later section. The state and global actors identified in the stakeholder selection process rely on the state capacity, which is the target level of IFI intervention.

The IFIs define poverty according to its consequences such as hunger, low income, lack of access to services and lack of opportunities and choices. They make use of recipient country data bases that provide particular social and economic information. They quantify the poor according to daily expenditure such as the number of people living on less than one or two dollars per day. The quantification continues to be debated especially the incorporation of non monetary exchanges which most rural populations undertake daily.

The definitions of poverty and the resulting quantification focus the international actors on income generation and the security it allegedly brings for the local populations. Thus various projects aim to moneterise the rural communities without necessarily providing the infrastructure to support the aims and their social and political impacts on the local communities (Olivier de Sardan 2005, 139). The intervention of the international organisations is aimed at the facilitating institutions such as the state and not the local communities. The state level intervention often results in conditionalities to include various cross cutting themes in projects that are often not feasible at the local level. The state institutions consent to them and in turn impose these conditions on project implementation teams. The conditions reduce

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apply. They view it as living in better conditions for some this means having a school, clinic and other services such as water near by. For others having electricity in the home is considered development.

[190] The MDGs focus on several other issues including education and health.

the number of community proposals that are accepted for financing and also inform the ambitious applications from other communities who sometimes fail to meet the objectives.

6.4.1.1.1 The NGOs' theoretical frameworks

NGOs claim to actively seek out target communities by focusing mainly on remote areas that would not be reached by the government resources (Hulme and Edwards (eds) 1997). Their claim supports the argument that government resources are limited and also supports the structure of urban areas prioritisation for the public funds. It also ensures their continued role as actors in the water sector. Once a community is identified, the local NGO team sends proposals to external financiers. In Zambia, each NGO and donor agency appears to have a provincial stronghold based on historic relationships or its strategy and mandate, as illustrated in Figure 6.6. Some communities proactively target their project proposals to the local civil society organisations.

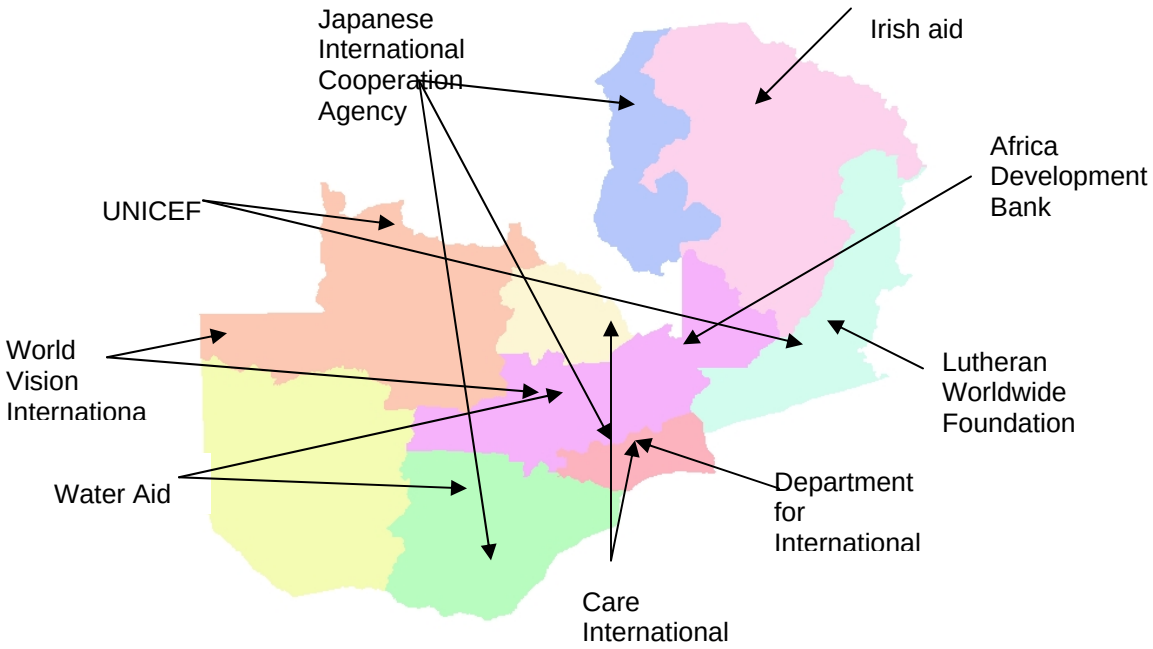

Figure 6.6 NGO and donor agency activity

NGOs such as CARE International define poverty as the product of complex social processes that affect people's dignity and security as well as their material well-being. This definition links the social and economic aspects of beneficial change. It also acknowledges the local level intricacies of poverty, thus directing intervention at the local level as opposed to institutional levels.

The local level focus of the NGOs supports their influence as local level actors in community projects. They are often implementers of the projects facilitated by the state agencies. However, their role as implementers enables them to appropriate the projects incorporating their own organisational mandates and cementing their influence in the local level decision making. It also creates space for them as actors and advocates in the water sector. They are recognised by the state agencies as community oriented actors with capacity to incorporate social aspects of development into projects.

6.4.1.1.2 The local actors' frameworks

Uvin (1998, 107) points out that when the poor discuss addressing poverty through meaningful development it includes means of production, insecurity, vulnerability, empowerment, justice, education, access to information, human dignity and equity. This address undoubtedly covers the poor in various global locations and their local concerns. The local actors in Zambia define poverty as hopelessness, over dependency on external intervention and abandonment by those in decision making positions. Most actors identify with the effects of poverty such as hunger, helplessness, dependency on handouts and lacking access to basic resources and facilities. They desire to be self reliant and have dignity. Self reliance refers to the ability to provide and take care of oneself and family. The local actors focus on their individual capacity and their potential contribution to their local space, which they identify as the community members they interact with often.

The varied definitions and targets of intervention create space for the actors at various levels of scalar analysis to appropriate the projects. Thus project activities after implementation diverge from the objectives agreed during planning. The divergence is compounded by an elusive equal footing for economic development or the right to it. Some residents are clearly favoured by the process based on their location and implicit potential project success. Success is measured in a number of ways including: project life span, return of costs, ability to duplicate and realised benefits. It is affected by the social capital possessed by the community especially in the paradigm of participation in development projects. The two way relationship between development and the targeting of projects appears to hinge on the development agents such as local NGO teams. These agents are often external actors to the community where projects are implemented. They are part of the group of actors introduced by the project application process and the dominant approaches in social and economic development.

6.4.1.2 The dependency of local actor on external actors

The income generation emphasis in poverty alleviation programmes maintains the dependency relationship between the periphery in rural areas and the core in urban areas. The dependency is maintained between the various groups of actors based on their economic status (Robbins 2004, 50; Bauzon 1992)[191]. In irrigation schemes it is maintained through the market for the produce and intervention for infrastructure installation and sometimes maintenance. In community water schemes in peri-urban areas that introduce consumer contracts it is maintained through technical dependency and capital investment from the intervention. Thus the knowledge frameworks applied in the community projects essentially support the dependency of local actors on external actors. The dependency exists in various ways such as the recurring external actor intervention, technology maintenance and the supporting structures. We examine each type of dependency in the following sections.

6.4.1.2.1 The actors in water management

The community projects and development intervention introduces various actors at the local level of water resource management. Those identified in the case studies include local and external development agents and the elected committees, which have been discussed in previous sections. In this section we focus on the role of the development agent and their positioning, which aids us in distinguishing them from development brokers (Olivier de Sardan 2005, 175). The broker for the purposes of this research is part of the organisational

[191] The dependency referred to by these authors is based on the economic development theories. However, in this research we extend this beyond pure market forces to the perspectives of technology and knowledge shaping the relationship between the local actors in the periphery, predominantly rural and peri-urban areas, and those in the urban core.

bureaucracy and is only found in government facilitated projects. This definition allows us to distinguish between the actual grass root actors and the bureaucratic actors that claim to be such. The external development agents include NGO teams and the government agency fieldworkers that act at the interfaces between project financiers and the target communities. The local ones include community leaders who can be appointed or volunteers based on their capabilities, skills, social positions or circle of influence.

The agents appear in many forms and are not always actively involved in each project (Olivier de Sardan 2005, 168). Some of their impacts in community projects are summarised in Table 6.4. Their common role is communicating ideas, which is undoubtedly influenced by their knowledge frameworks, understanding, perceptions and beliefs. Their impact is affected by their legitimacy, which is determined by past success in other projects, the organisations they represent and their ability to convince target populations of project targets and potential benefits.

Table 6.4 Impact of development agents

Project	Agent Types	Roles
Water Scheme	Local Authority fieldworkers, NGO teams, Community leaders e.g. retired professionals and business men	Needs assessment prioritisation, setting and communicating expectations
Irrigation Scheme	Extension workers, representative groups, traditional leaders	Project proposals, sourcing funds, communicating project objectives
Conservation	Agency representatives, community leaders, traditional leaders	Project proposals, sourcing funds, communicating project objectives
Commercial Utility	Water watch group	Presenting grievances, setting and communicating expectations

6.4.1.2.1.1 The logic applied by the development agent

The development agents apply both strategic and productive logic in their communication of ideas. Development brokers also apply these types of logic (Trottier 2006)[192]. The agents represent their organisations and also aim to position the project at a suitable level for the community. They attempt to position themselves in a particular construct of the project influenced by their interaction with the community and their organisations (Gould in Biershenk and Le Meur 1996). They construct a project in a way that the community will accept, citing recent experiences such as cholera outbreaks, shortage of food and limited income to encourage participation. Each agent has a job to perform in the distribution of project resources. They aim to do this effectively and ensure the continuity of the project. They attempt to incorporate aspects of equity and economic efficiency even though they may not always be adequately trained in these fields (Olivier de Sardan 2005, 169). They are influenced by the mandate of financing institutions that promote particular models and policies in the projects often implemented in urban areas. The rural and peri-urban areas have variations of the predetermined models and policies as a result of their existing structures and daily activities.

The positioning of the development agents and brokers is illustrated in Figure 6.7 depicting the separation of a broker and an agent. Sometimes the broker, as defined in this research, does not exist. In international NGOs a local team facilitates and implements the project.

[192] Trottier's definition of a broker covers both the development agent and development broker as defined in this research. However, the distinction between the two types of actors is emphasised in this research to illustrate their accountability and responsibility.

When state agencies implement projects the agent interacts and negotiates with the target group while the broker interacts and negotiates with the project financier. Thus as detailed in the section on forming committees in irrigation schemes the broker and the agent are accountable to a separate group of actors. Ideally the positioning of the agent would be more central to harmonise the accountability and decision making, see Figure 6.8. A central position ensures the agent is visible to all the actors involved in the project and their interpretations and perceptions are more potentially consistent and realistic for the target population.

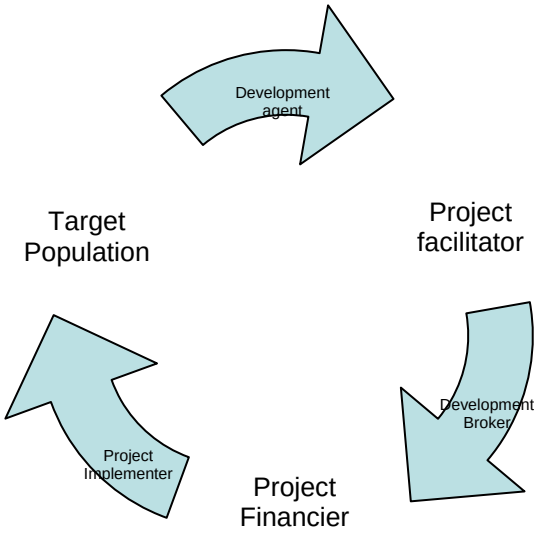

Figure 6.7 Positioning of development agents and brokers

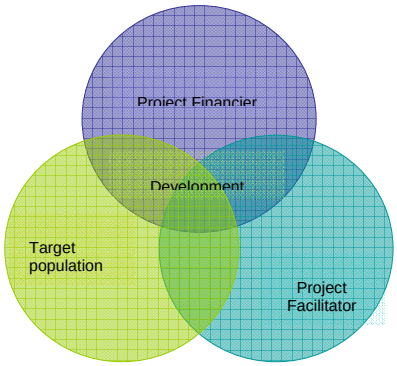

Figure 6.8 More “ideal” positioning of development agents

6.4.1.2.2 The technological biases

The infrastructure installed in community water projects maintains the local actor dependency on external intervention through the technology proposed by the project implementers (Olivier de Sardan 2005, 139-144). The implementers often determine the technology in a project based on their knowledge and theoretical frameworks discussed in an earlier section. Their decision making criterion includes technical capacity, productive efficiency and available capital. The budget is a recognised delivery constraint in most projects as any money not spent is returned to the financier. The return of unspent finances drives the determination to install the more expensive technology, which is supposedly more durable. In the domestic water projects the technology has moving mechanical parts that need maintenance and periodic replacement. The project implementers train local actors to carry out these tasks but the materials and spare parts have to be acquired from urban locations. In some cases, such as the George Township water project, the technology is deemed too advanced for the local actors to maintain and operate independently. Thus, they are dependent on the skills of employees from the commercial water supplier. The dependency supports the continuous role of commercial supplier in the local water resource management.

In irrigation schemes, the project implementers often encourage local actors to apply for cement lined canals. The water distribution usually uses gravity. However, like the mechanical parts, the lined canals also require maintenance. The fieldworkers encourage lining based on their theoretical and knowledge frameworks. They apply the productive economic argument that cement lining reduces the wastage of water through seepage. Wastage here refers to the return of water to a discharge body or to the atmosphere without it being used in the farming activity. Incidentally, the increased operations and maintenance costs usually require external intervention to raise capital for purchasing the cement, hence supporting the structure of dependency on external actors by the local actors.

6.4.1.2.3 The local economic structures

The structures supported by the project implementation, whether consciously or unconsciously, often disadvantage the local actors (Olivier de Sardan 2005, 139). The education and sensitization in the community projects supports the structures of domination by the external actors who hold particular knowledge and theoretical frameworks that implicitly appear to be superior to those held by the local actors. The irrigation projects driven by income generation grow crops for the urban markets. The actors' narratives illustrate those more inclined to food security usually opt to grow staple foods that can be used at the household level. Additionally, the farmers assert that the size of irrigation plots usually limits the crop variety. Winter maize, a lucrative crop that is a staple food in Zambia is limited to commercial farmers who have enough land to cultivate sufficient quantities. Most farmers interviewed at the irrigation schemes complained about the low prices they obtain for their efforts and produce. The prices are determined by the demand for products in the urban areas through supermarkets and street markets and not the farmers growing the crops. The power structures revealed in the economic development focused approach illustrate the potential shortfalls and a need to incorporate social and political development. We now explore some of the concepts in social development contrasting the definitions and approaches of the three groups of actors, multi lateral organisations, NGOs and the local ones.

6.4.2 The social aspects

Development includes social and political aspects, interpreting it as beneficial social change enriches a purely economic focus (Olivier de Sardan 2005, 24, 69-72; Midgley 1986). The conceptualisation of benefits will be left to the affected communities. This definition acknowledges that social and political development needs a separate effort from economic development. The case studies illustrate social and political development do not necessarily emerge from economic development. The social development aspects in the water sector are the project implementers' expected results within the objectives of the community water projects in rural and peri-urban areas and the commercialisation in the urban areas. In the community projects they are broadly termed as capacity building and empowerment of the local actors. In the urban areas they are more difficult to isolate and label. In the following sections, we examine how the various multi scalar actors define these terms, how their definition shapes the approach and the impacts of the variations in definitions and approaches on local responses to community water projects.

6.4.2.1 Capacity building and empowerment

The community water projects have ambitious targets of empowerment and capacity building. The definitions of these concepts by various organisations results in varying approaches in project implementation. They are influenced by the knowledge frameworks of the actors and their organisational mandates.

In its Capacity Building in Africa report (2005) the World Bank announces an extension of its traditional focus beyond building organizations and individual skills to strengthening institutions and demand for improved public services. It acknowledges most support for capacity building in country programs remains fragmented, designed and managed project by project. In Africa, the Bank places emphasis on public financial management, decentralization, and governance. It also acknowledges weaknesses in the needs assessment for the designed organisations and some of the skills developed prior to the report.

The multi lateral organisations such as IFIs and bilateral organisations such as donor agencies target public institutions in the capacity building intervention. The limited needs assessment and incorporation of local intricacies often result in multiple well designed institutions with ill fitting targets and objectives for the local actors.

6.4.2.1.1 The NGOs' theoretical frameworks

The UNDP defines capacity building as "the process by which individuals, organisations, institutions and societies develop abilities (individually and collectively) to perform functions, solve problems and set and achieve objectives". The UN definition often directs the knowledge frameworks of the international NGOs. In the local Zambian NGO projects, financed by the international NGOs, capacity building relates to developing skills such as book keeping, project proposal writing, basic accounting, basic mechanical maintenance, conflict resolution and leadership within a community. These skills are deemed essential by the NGOs based on their project implementation approach, the global discourse and development knowledge frameworks. A community whose members possess these skills is deemed to be empowered to seek funds for various projects and manage and maintain any infrastructure from completed projects in their location.

The approach of the NGO project capacity building focuses on a community. It aims to train an identified group, often the water committee or the RDC and equip them with these skills. In principle the skills benefit the community as a whole and not the individual. However, the mix of skills also supports particular structures of domination cemented through the conditions and prerequisites for community projects (Uvin 1998, 142-143). If these conditions and prerequisites change the skills developed by the community may no longer be required, thus the capacity built and the empowerment is dependent on the maintenance of a dependency towards external actors.

6.4.2.1.2 The local actors' frameworks

Local actors take a more personal perspective on capacity building and empowerment. In the rural areas where interdependency is more explicit than in peri-urban and urban areas, the residents share their skills based on their interactions, customs and beliefs. The village residents are also often blood relations that willingly help one another. Thus each individual possessing a skill that is beneficial for the whole community can be called upon to make use of it when the need arises. The practice of the chief or headman calling upon skilled individuals in the community supports this structure of serving the communal interests using personal skills. The capacity implied in individual skills includes daily tasks such as digging wells for drinking water, farming and community mobilisation.

6.4.2.1.3 The impacts of varied definitions and approaches

The approaches in capacity building and empowerment from the multi lateral and bilateral organisations and NGOs often support a particular structure of domination. The NGO approach arguably aims to build the bridging social capital that goes beyond the bonding capital. The former encourages interaction outside the daily associations or specifically the family and immediate neighbours that form the bonding capital (Drekker and Uslaner 2001, 179). However, the actors interacting as a result of bridging capital often perceive no real benefit from the forced community. It overlooks the individual capabilities at local level by introducing externally conceptualised needs that require particular skills. Some of these skills assist in some of the daily tasks of the community that exist before the intervention. However, they usually undermine the voluntary participation and joint responsibility for the community introducing the specific groups identified in this research, to suit the dominant actor mandates and their knowledge frameworks. They thus undermine the social capital of the community members and limit its benefits. In the rural case studies the community members living in close proximity to a water point ensure its maintenance and proper use. They arguably have more interest in ensuring the continued use of the point. They mobilise themselves to

maintain the point often overriding the water committee. The residents living further a field often refuse to pay towards maintenance costs and resort to traditional sources of water.

The undermining of the social capital leaves room for community members to mobilise it to achieve other aims apart from the project objectives. The mobilisation can be in form of resistance to projects that is shown by the slow uptake or quick significant drop in activity and interest. The resistance and lack of sustained interest result in white elephant projects that initially had some support and interest from the local actors (World Bank 1993). Thus any capacity building and empowerment envisioned by the project implementers is not sustained. The limited sustained interest in the project also alludes to the various levels of participation in decision making. Community members are sometimes coerced into accepting ambitious cross cutting projects through the sensitization and education by implementation teams and project application capacity building by fieldworkers. We now explore some of the decision making processes in the political development approaches.

6.4.3 The political aspects

The political development aspects refer to the decision making power of the local actors. Ideally this power is increased after the community projects are handed over to the local actors. We examine three specific constructs of the political processes in the dominant concepts that emerged from the research, participation, responsibility and accountability and how they shape the political mechanisms. We contrast the project implementer constructs of these concepts with that of the local actors. The analysis culminates into a framework for the decision making processes. It enables us to explore which actors gain and which ones are disadvantaged by decisions at various levels (Robbins 2004, 11; Swyngedouw in Zimmerer and Bassett 2003).

6.4.3.1 Participation

Participation as it is identified in the community projects occurs at various levels and in a variety of ways. Local actors can participate in deciding what projects are implemented in their areas. They supposedly do this through the needs assessment exercises conducted by the project implementation team[193]. The local actors can also participate in the project implementation through supplying materials and manual labour for the tasks. The participation this section explores is in decision making. The dominant actors have particular perceptions of democracy and representation (Mamdani 1996, 294). They insist on communities electing committees to manage and operate the installed infrastructure. The committee makes decisions on behalf of the community often without consultation. Their position of decision making is legitimised by the project implementers who often overlook the biases of the election process. This research illustrates the process is influenced by the popularity of the candidates and their perceived social status as opposed to their skills and capabilities.

This research also illustrates the local actors' decision making capabilities are limited by what factors they can control and those which they cannot, as illustrated in Figure 6.9. The diagram depicts the local actors' definition of community and local space. As an individual an actor can make decisions using an assessment of the factors he can control. Some factors go beyond individual decisions and into the community space. The factors outside the community domain are often controlled by the dominant actors in state agencies and NGOs that implement projects. The diagram suggests it would be more beneficial to bring more factors under the local actors' control to enable them to make decisions that affect them.

[193] The needs assessment includes participatory research tools such as pair wise ranking to assist communities in determining their priorities. The local NGO actors supplement these methods with their own competencies and projects being implemented by other NGOs in the location and surrounding areas.

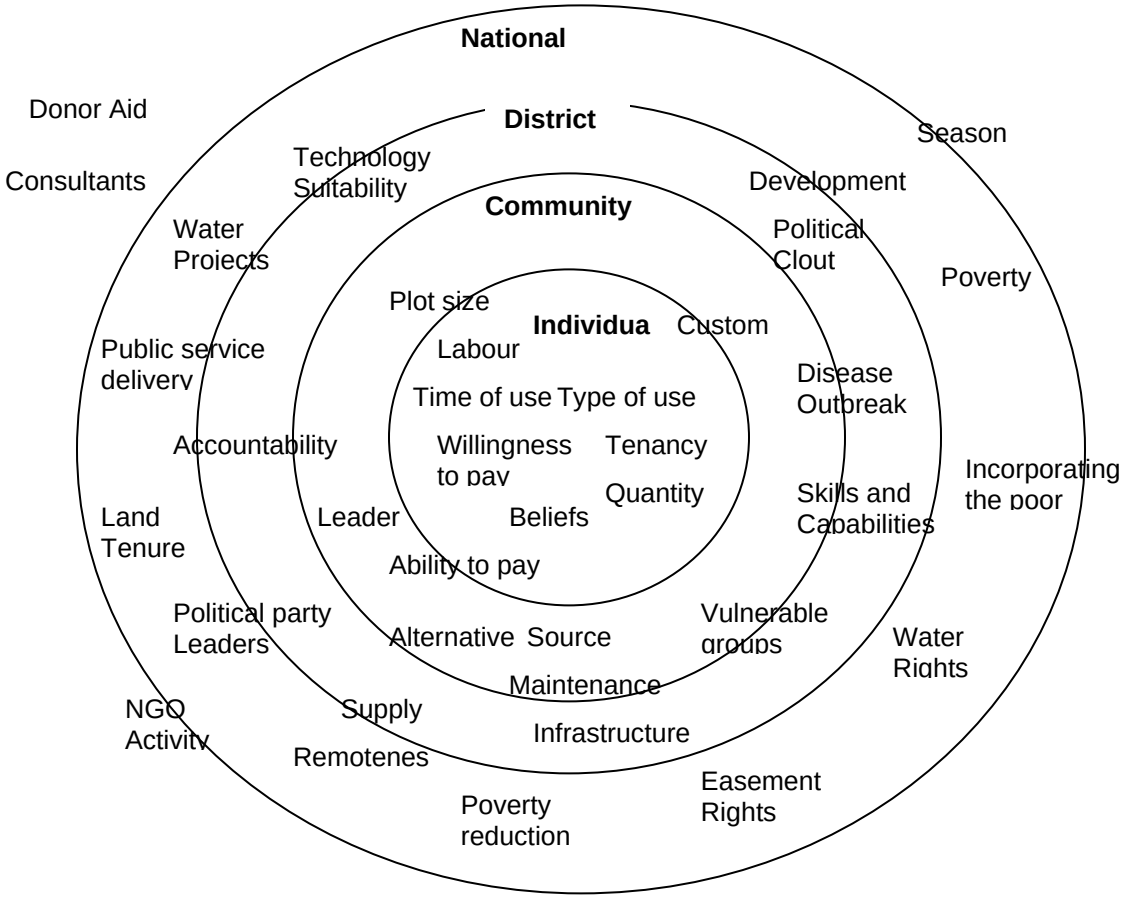

Figure 6.9 Decision making factors controlled by various actors

6.4.3.2 Responsibility

The responsibility in decision making also occurs at different levels and in a variety of ways. In the constructed participation of elected committees the committees take responsibility for decisions made. Thus if particular project objectives are not met, the committee bears this responsibility on behalf of the community. Their responsibility supports a particular structure of domination. These local actors that form the committee are likely to assent to the objectives of the projects or consider themselves to be in a position to appropriate the projects for themselves. Their responsibility also supports the populist election biases as these are the influential actors who are more likely to convince others to commit to the project.

Responsibility also occurs at the individual level, whether it is paying for services received or using infrastructure in a way that does not disadvantage other users. However, the individual responsibility, which is often attributed to actors being proactive, limits the interdependency of the actors in some areas. In peri-urban and urban areas where the less affluent communities are in close proximity to more affluent neighbourhoods, cross subsidisation is stifled. Luxury activities like the golf course that requires watering of the lawn are legitimised as priorities over other social needs in water allocation because the users pay for the water. It supports the operation of actors in isolation in the guise of responsibility and favours the more affluent community members. Additionally in all case studies with community water schemes, the amounts charged are increased and the community is apparently educated on the need to pay for services and ensure a reliable safe and clean source of domestic water. The disease prevention is part of the productive logic of the project implementers. However, this research shows the accompanying strategic logic where the responsibility for community water supply

shifts from the Local Authority to the elected RDC. Thus the state, relinquishes some of its responsibilities. Incidentally, the RDC builds on informal networks established in the day to day interaction within the community to ensure participation and project sustainability. The economic influence is not centred in the community but the project sustainability depends on the residents' social capacity. Thus the actors with the economic influence would beneficially engage those with social influence to ensure sustainability.

6.4.3.3 Accountability

The accountability of service providers is announced by the NWASCO, which expects the end user to assume the responsibility for the level of service they receive by demanding an acceptable service from the supplier. It implies grass root regulation of the water suppliers whether they are water committees or commercial entities. However, this accountability requires a level of awareness by the end user and a belief that their demands can be met by the supplier. The levels of awareness and the expectations of standard of service vary in the residential locations. The rural and peri-urban residents often seem helpless believing their needs will only be addressed after the urban residents if they rely on public funds. The residents interviewed in the Kabwe and Solwezi case studies indicated their urban counterparts are favoured in infrastructure development. The urban residents appear more visible and influential in securing public investment. They also have formal structures available to express their concerns such as customer services and media programmes.

The urban area domestic case studies show a clear formal pattern of decision making exists with the lowest level of hierarchy at the household, which is dependent on the supply from the service provider. The supplier is dependent on the water resource and treatment processes. The latter is controlled by the water company while the former is regulated by the NWASCO and the Water Board. Formalised structures exist in some rural and peri-urban areas and informal arrangements in others. In peri-urban areas with formal structures the lowest level of decision making is at the household. The access to water points is controlled by a tap attendant who is recruited by the water committee. The committee is monitored by the RDC, a Community Based Organisation (CBO) or a water board with representatives from the local water supplier in the urban area and the Local Authority. Areas with no formalised structures have no levels of hierarchy; access to resources is determined by payment if required, the proximity to the resource and quality of water in it.

At district level the formal decision making is dominated by the Local Authority and community leaders. The district usually has a DWASHE committee that reports to the District Development Committee (DDC). The DDC allocates financial resources for water infrastructure installation that are distributed by the DWASHE team. The community accesses the resources for infrastructure development through DWASHE. At national level, the formal decision making, various government departments in the MEWD and the MLGH monitor water resources within the national boundaries. The identified access determinants and information flow patterns are depicted in the diagrams below.

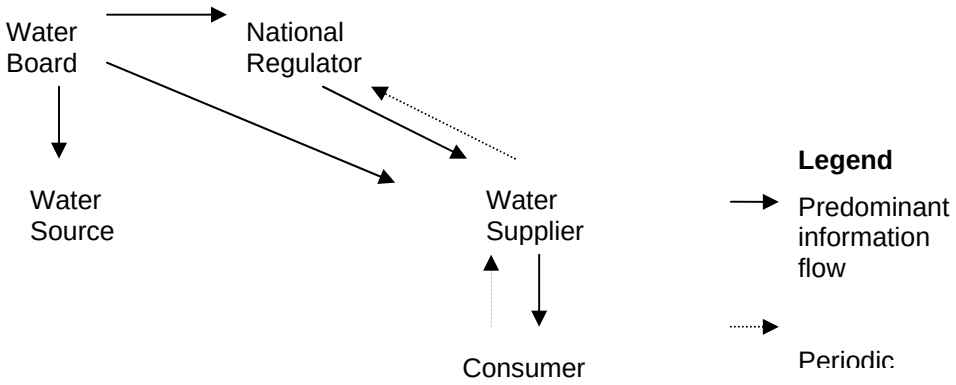

Figure 6.10 Decision making in formal Peri-urban and Urban areas

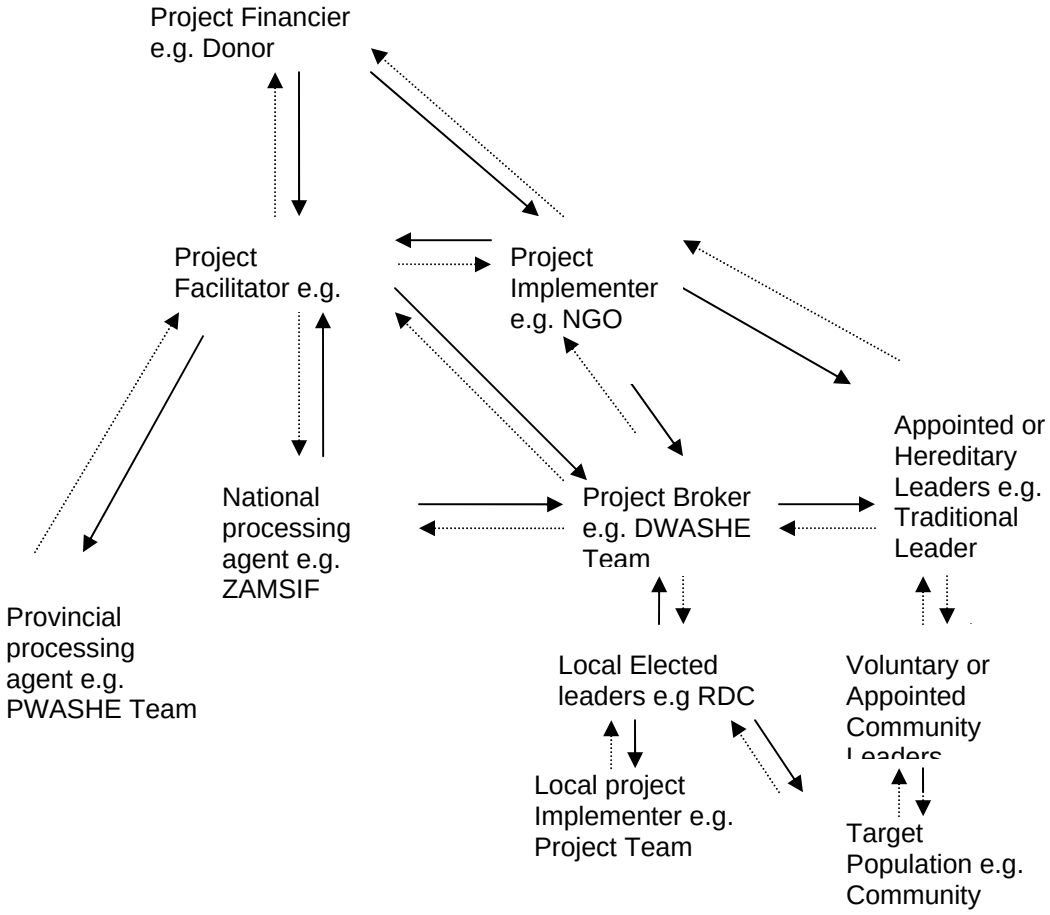

Figure 6.11 Decision making in informal peri-urban and rural areas

The above diagrams illustrate the dominant formal decision makers in the water sector. The state is a weak actor embedded in a network of other more influential actors whose legitimacy is cemented by their interactions with target populations, financial assets and supposedly superior knowledge (Migdal 1988, 15-16; Mamdani 1996, 223-224). The policy formulation appears to be dominated by the project financiers, who capitalise on their economic influence, via the facilitator. The financiers and implementation teams determine the use of the resources, particular location of and type of infrastructure to install. However, this research shows their decision depends on the information provided by the community leaders and fieldworkers who submit proposals. These groups collect and verify the information, placing them at the centre of negotiations and dominating the political influence at the local level. The

information ideally includes social indicators and the ability to pay for services, which is the economic influence of the individual. In the urban areas this is the main determinant of whether or not an end user can access domestic water supply. This research reveals a multitude of multi scalar factors impact the decision making processes, as is illustrated in Figure 6.12.

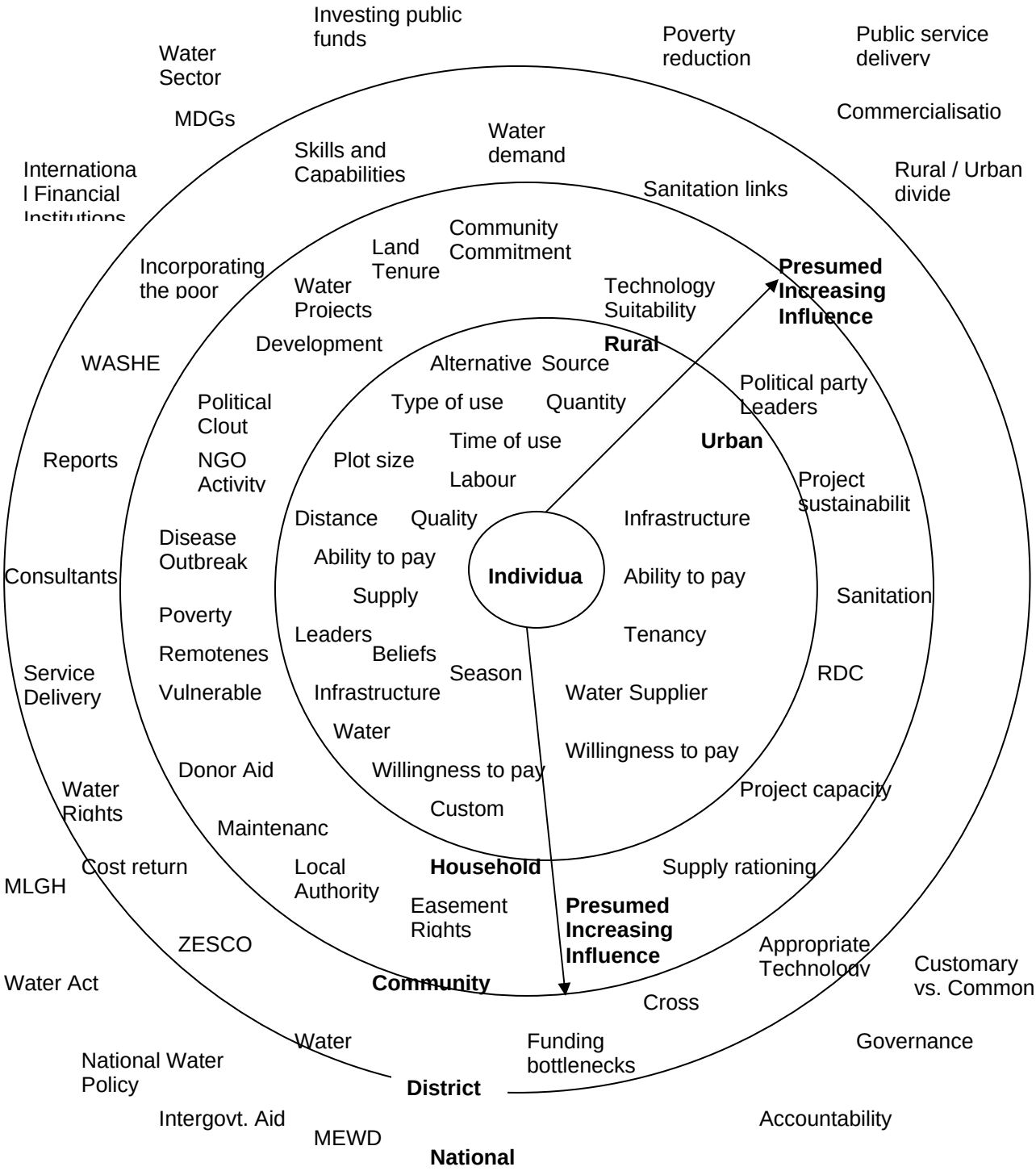

Figure 6.12 Factors to be considered in decision making

Figure 8.12 illustrates the variation of factors considered in rural and urban locations as depicted in the case studies. An individual in a rural location has more factors to consider in his decision making compared to the urban individual. In this diagram the peri-urban actor

crosses between the urban and rural sections. Belonging to a community is more important in the rural areas. However, it is optional, temporal and spatial. It is influenced by qualifications such as maintaining infrastructure, paying user fees and participation in the project (Boelens in Boelens and Davila (eds) 1998; Arce in Boelens and Davila (eds) 1998). The main factors in determining water sources at regional and national level are logistical and organisational losing the heterogeneity of communities and focusing on the common factors affecting the water sector (Mohammed and Savenije 2000; Saleth and Dinar 2000) .

6.5 The comparison of local responses - Rural vs urban

The local actor responses to changes detailed in the case studies vary according to the location. A clear distinction appears in the rural actor responses when compared to the urban actors. The peri-urban strategies are a mixture of urban and rural approaches thus the responses from the actors in peri-urban areas are influenced by the approach adopted in these locations. We will examine the location and classification of the peri-urban space in further detail. In the following sections we explore the potential causes of the varied responses in the rural and urban areas and the structures they support or intend to build on. The approaches adopted by various actors in these locations are informed by specific modes of resource appropriation that the actor decision making manifest.

6.5.1 The existing structures and modes of resource appropriation

This research distinguishes between the shift in the policy influenced representation of water as an economic good from a social and cultural good and the lack of this shift in the informal networks found in the rural and some peri-urban areas. At the national level, priority in allocation is given to those consumers who can afford to pay for the resources used and whose uses are economically beneficial as determined by the allocating authority. The ability to pay for the resources guarantees access and is also a transfer mechanism for access in urban locations. In rural and peri-urban locations where most users lack the ability to pay for treated water, the resources are represented as a social good and a human right. Thus payment is not often a manifestation of the modes of appropriation. It is superseded by manifestations such as neighbourly relations, kinship and clientelism. Collective action such as the formation of a committee to manage resources and liaise with development agents are mechanisms of ensuring access to water. Access and use are the most recognised form of resource appropriation at the grass roots level. They can be adopted by an individual as well as an elected committee or voluntary and hereditary leaders. Representation on the other hand is more open to external influence such as the media, health and hygiene education, bill payment and discourse. The individual is the focus of the urban and some peri-urban strategies while the community is the focus in the rural and some peri-urban strategies.

6.5.1.1 The communal interests

Communal interests are allegedly promoted in rural and peri-urban areas through the community water projects and the communal infrastructure installed. The projects aim to build on the social relationships developed prior to any project implementation. However, this research shows the labelling of the residents of a particular community often identified as a village falsely homogenises the residents according to their interests and interdependency. It does not promote the individual choice of association and relationships but coerces the interaction. It also continues the colonial pattern of introducing actors to positions of responsibility for the community (Mamadani 1996, 292). Its conceptualisation of local space varies from the local actors' conceptualisation.

This research also shows the introduced actors affect the interactions among the other residents (Al-Nims 2004). The introduced groups increase the number of actors and also reorganise the web of relations and interactions. Apart from the farmers groups most introduce non voluntary participation based on external mandates and conditions. They

minimise the social influence of the traditional ruler who is usually assisted by a group of appointed councillors. Voluntary participation is more likely to be based on communal benefit and serving one's community (Ostrom 1990). If volunteers are lacking, the headman appoints committee members. The representation based on elections arguably replaces the community serving with competitiveness and potential individual gain. This appears to be a spill over from the political electoral process where candidates compete for votes but seem to increasingly want to gain from their positions than serve the electorate.

6.5.1.2 The individual interests

In urban areas the commercialisation of water supply, the metering exercises and emphasis on ability to pay promotes individuality that is associated with enlightened residents. The payment for treated water according to consumption raises the level of awareness for water conservation but also restricts the ability to open a tap for neighbours to use, as was the case when fixed water rates existed. It potentially increases the amounts demanded by households with taps in some high density urban locations where individual connections are not possible due to the supplier's water treatment capacity. The increasing amounts paid may result in an increase in water users reverting to the use of shallow wells or an increase in the number of households requesting for individual connections. Additionally, clients insist on paying for a service they perceive to be acceptable, which does not include an over rationed water supply. Thus the increased paying client base desired by the CUs seems to be counter productive according to their capacities and capabilities.

6.5.2 Situating and classifying Peri-urban areas

In the Peri-urban Water Supply Strategy document for Northern Province (2003 – 2006), a peri-urban area is defined as a formal or informal settlement of unplanned origin within or outside the jurisdiction of a Local Authority, with inadequate basic services, high population density and growth rates in relation to urban settlements and with a socio-economic dependence on the nearest urban set up. This definition recognises the fact that peri-urban areas are sometimes embedded within the urban areas. The peri-urban areas appear to have a mixed approach in water management that brings together both the urban and rural approaches. The mixture is arguably caused by their physical location and their conceptualisation as a space by actors that finance, plan and facilitate intervention. Policy makers and regulators advocate for their inclusion in urban areas based on their close proximity to the urban areas and ability of the residents to pay for services. Urban water suppliers advocate for their inclusion in the rural area approaches of community projects based on their low profit potentials. According to the CU management the peri-urban areas are dependent on successful cross subsidisation by affluent urban areas that may not be sustainable. Project implementers and fieldworkers advocate for peri-urban areas be included in the rural approach based on the economic status of the residents. Incidentally some residents feel they should be included in the urban supply based on their close proximity to the urban areas and their ability to benefit from other urban services. On the other hand, some residents feel the costs of urban services are rather high for them and they would rather be incorporated in the rural approach on the condition that these services had more positive labels (Crehan 1997, Leach and Mearns 1996). The labelling of protected wells and boreholes as rural and thus primitive technology often raises questions of identity in the peri-urban areas. Residents in these areas who are either migrants from the rural areas or retirees that previously worked and lived in urban areas do not want to be labelled as primitive. Furthermore, the physical location of peri-urban areas is also not limited to the outskirts of urban centres. Some peri-urban townships are found within the urban boundaries. Thus the approach adopted in these locations would beneficially incorporate the changes in the origins of the populations residing there, their perceptions of their space and assets as community members.

7 Hydropolitical Mapping

7.1 Definitions of maps

Situational maps lay out the major human, non human, discursive and material elements in the research situation of concern and provoke analysis of relations among them[194]. Situational maps are intended to capture and discuss the messy complexities of the situation in their dense relations and permutations. They intentionally work against the usual simplification so characteristic of scientific work in particular post modern ways.

Social worlds/ arena maps lay out the collective actors and their arenas of commitment framing meso-level interpretations of the situation. Social arena maps offer meso-level interpretations of the situation, engaging collective action and its social organisation and institutional and discursive dimensions.

Positional maps examine the major positions taken (and not taken) in the discourses. Positional maps are not articulated with persons or groups but rather seek to represent the full range of positions on particular issues.

7.1.1 Use of maps in situational analysis

A major use of the maps in situational analysis is opening up the data - interrogating them in fresh ways. The maps are used as analytical tools, each contributing to the final analysis of the situation.

7.1.1.1 Uses of analysis and applicability

Situational analysis resembles needs assessment but is broader in the sense that it identifies priority problems in a complex situation and also considers the underlying dynamics with a view towards identifying potential points of intervention[195]. It also focuses on capacities and identifies not only current policies and relevant services but current and potential stakeholders as well. From the analysis, the information gathered can be used to facilitate the process of planning systematic, strategic and collaborative responses that successfully address the issues.

7.1.1.2 Principles of situational analysis

The principles of situational analysis are as follows:[196]

- Ensure a collaborative process
- Enhance capacity
- Maintain joint ownership
- Use existing networks of resources
- Target priority areas
- Build on what is known
- Take a multi-dimensional, multi sectoral approach

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[194] Clarke, A. E. 2003. Situational Analyses: Grounded theory Mapping after the Postmodern Turn. Symbolic Interaction, Volume 26, Number 4, pp 553-576

[195] Williamson, J et. Al. 2004. Conducting a Situation Analysis of Orphans and Vulnerable Children affected by HIV/AIDS - A Framework and Resource Guide. USAID (AFR/SD)

[196] Ibid

7.2 Hydropolitical Map

A situational analysis should be carried out with a purpose in mind or a main objective for the analysis. We need to identify what the findings from the analysis will be used for. In our research we are attempting to produce among other things a hydropolitical map for Zambia. The map is targeted at different water users, policy makers, project implementers in the water sector and research teams in the sector. This broad target audience may have multiple suitable maps. One solution to address the multiplicity would be to produce different maps for different users and for different scales of use. The multiple maps and scalar dimensions can be ironed out as we continue to debate the content of the hydropolitical map and desired format for the map.

The hydropolitical map being produced is for the benefit of the end user or target audience. As such it would be ideal to ask the target audience what format the map should take, how different maps will be useful, the types of maps the user would like to see and the content of the maps. This process of consultation has been started through the semi-structured interviews carried out with the end users and policy makers regarding the important actors and factors in their situations. The groups interviewed included representatives from government agencies, regulatory organisations, project groups, end users, traditional leaders, water suppliers, Non Governmental Organisations, donor agencies, consultants, companies, community based organisations and political parties. The participants were not directly asked about the contents and format of the hydropolitical map but were asked about the water access situation in their location or field of operation. The data collected in the interviews has been used to draw up the situational and positional maps that are included in this document.

The scalar issues of the map and applicability can be incorporated in different ways. We could have different maps at national level, provincial level, district level and community level. This is attractive because there are some actors that are important in a particular community and not in another. The same argument can be used for importance of different actors and factors in different districts and provinces. The individual and community detail gets diluted as we approach the national level. The use of generic terms becomes more important at national level considering the fact that there are more than 90 districts in Zambia. Temporal scales should also be considered because as the environment changes in different locations, the actors and their influence change. The evolution of actual actors and their influence is also affected by external actors like NGOs and donor agencies.

The complexity of the importance and influence of different actors at different scalar levels or the dilution of effect relates to the field or arena which is chosen for the analysis of the relationships and interaction among the different actors. A field is an open concept that is above all a configuration of objective relations between positions; a system of relationships which is independent of the populations which these relationships define[197]. An arena is a space in which real conflicts between interacting social actors occur around common stakes; it occurs within a local space[198]. The arena concept is applicable at community level given the local level focus. On the national level of analysis, the field concept is more applicable as this level incorporates various actors with different types of assets and capital that can be used to influence the interactions. Both concepts are useful at different scales in this research. The field in which the different actors interact is currently being developed[199].

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[197] Olivier de Sardan, J. 2005. *Anthropology and Development – Understanding Contemporary Social Change*. London and New York; Zed Books

[198] Ibid

[199] There are various definitions of the term field, the openness and independence from the populations of the term makes it applicable in this case

The other alternative to the scalar dilemma is to use layering of maps in the GIS fashion. So each district would have community maps that build up to the district and then each district contributes to a province. The provinces would then feed into a national data base[200]. This data base giving the different maps would help identify priority areas and intervention approaches that work. This latter alternative is a technical database that would need training for different users and may not be useful for the end user who is not a researcher, policy maker, project implementer or government official. It would also need information from all communities to create an inclusive database that would require periodic updating.

A GIS based map is not only limited to communities but can be based on a particular water body. Each water body would have to be investigated in turn to establish the different water users and interaction among the users[201]. A digitised map of the different water bodies in Zambia exists and can be used for this purpose. A digitised form of the tribal and land classification boundaries in Zambia also exists. The land and tribal map can be used to highlight areas where traditional rulers are likely to be influential and where customs and beliefs are likely to carry weight. The current land use map of Zambia is outdated. The latest version is from the 1970s. A project team is presently updating the map. The date of completion of the project is not known but is estimated to be in the next two of years[202]. A land use map would be useful in giving ideas of the different competing water uses for different water bodies.

There has also been an ongoing exercise of water point inventory in different districts. The inventory will be used to assess the extent of progress in the water sector regarding the MDGs. The inventory has included GPS data in some districts. The GPS system is being passed around the country through the provincial water engineer's office. The GPS team records whether a water point is in use or not. The water point inventory can be used to give the locations of the water point, type of water point and also the state of the water point. The data should be readily available through the new social indexes that have been introduced in Zambia.

The GIS map would also require a layer showing the population concentrations in various parts of Zambia. A version of this map is currently being sourced. This layer will help in identifying areas where competition for water resources is likely to increase. One area that has already been identified as an area of high competition is the Kafue basin. The basin covers the Kafue River and its tributaries. The Kafue basin supports the mining and industrial activity on the Copperbelt and is also used by large and small scale farmers in Central and Southern Provinces. The basin also supports a significant proportion of the Zambian population.

The hydropolitical map at the national level of analysis will show the different actors in water access, their role and possibly the capabilities and skills required to fulfil that role. Thoughts on the map continue to evolve.

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[200] The district, provincial and national units are suggested here because these are the current administrative boundaries that are used in Zambia.

[201] This map can be at catchment or sub catchment level. Sub catchment level is more attractive given the localised water competition and water shortages in the central, southern and western parts of Zambia

[202] This is an in-house project under the Ministry of Agriculture and Cooperatives

7.3 Situational Map

A situational map giving all the different human and non human actors in a situation; for our purposes access to water for different uses, representation, access modalities, transmission of these access modalities and allocation; can be quite detailed. The map not only identifies the actors but looks at the relationships between the different actors in the analysis. The exploration of relationships makes the map more complex and sometimes messy. This is one of the hindrances in the applicability of situational maps. They appear more suitable for a single case study which may look at water access in a particular community[203]. However, some communities may be similar and generic terms can be used to make the map simpler and more applicable on a wider scale. A situational map can be used by a community to identify the different actors and interaction among the different actors regarding water access for different users in the community. The map can be used to analyse and if necessary improve the water management capability in the community.

In the situational mapping of water access in Zambia, the following map was produced. The map identifies different actors in water access, both human and non human actors. It also identifies the discursive elements and potentially silent or implicated actors. The different actors, discursive elements and related issues are then used to explore the underlying factors in water access. The under lying factors come from; the responses given by the different actors, conclusions from media and written reports and the understanding of the researcher in the given situation. The underlying factors are detailed in the text that follows the map. The text explores the relationships and descriptions of different actors and discursive elements.

The map identifies the actors and the discursive elements but gives no indication of the potential influence or clout of each actor. The influence of the actor and particular role can hopefully be drawn out from the paragraphs that follow the map. It is hoped that we can then identify the various actors and the significance of the role they play in water access. The situational map is followed by the positional map using the discursive and related elements that are identified in it.

[203] This hindrance does not mean that situational maps cannot be used for multi-site research. There are linkages that can be established in multi-sited research. These linkages contribute to the richness of the research going beyond mere comparative studies. The translocal linkages should be established along with interconnections between them and other bundles of relationships that are part of the research. (Hannerz, 2003 and Marcus, 1995)

Individual Human Elements/ Actors

Users
Suppliers
Facilitators
Policy Makers
Traditional rulers
Regulators
Legislators
Political Party Chairmen

Non Human Elements/ Actors

Infrastructure
Reports
International drives
Policy documents
Development aid
Poverty Reduction Strategy Prog.
Sector reform
Customs
Law

Collective Human Elements/ Actors

Water User Groups
Resident Development Committees
Irrigation Scheme Committees
Water Scheme Committees
Rural water Committees
Donor Agencies
NGOs
Financial Institutions
Academics
Government Agencies
Consultants
Local authorities
Commercial Utilities
Companies
ZESCO

Implicated/ Silent Actors/ Actants

Poor
Low political clout
Remote residents
Vulnerable
Residents of areas with failed projects
Terminally ill residents

Discursive Constructions, Individual and/ or Collective

Vulnerable
Poor
Rural
Urban
Peri-urban
Socio-economic status

Key events in Situation

WRAP –Water Act Revision
Water Sector Reform
Department restructuring DWA
Commercialisation of water departments
Power supply shortages

Political Economic Elements

Water projects
National water policy
Valued citizens
Multiparty politics
Financial resources
Sector investment
Ability to pay

Discursive Constructions/ Non human

Concepts of development

Commercialisation

Community participation

Sustainability

Service Delivery

Water Conservation

Project Commitment and Contribution

Temporal Elements

History of service provision

History of colonisation

History of party administration

History of project support

History of project sustainability

History of civil society organisation

Land tenure

Social Cultural Symbols

Symbolism of water

Symbolism of agriculture

Traditional tribal beliefs

Water rights

Major Issues/ Debates

Willingness and ability to pay

Involvement of private sector

Public Fund investment in sector

Including the poor

Cross subsidisation

Limits of regulation

Urban/ rural divide

Maintenance

Sustainability

Skills and capabilities

Prioritisation of Uses

Water Demand Management

Sanitation link

Related issues

Public service provision

Service Expectations

MDGs

Poverty Reduction Strategy

IWRM

Donor support

Funding bottlenecks

Corruption/ Accountability

Leadership

Governance

Customary vs. Common law

Water And Sanitation Health and hygiene Education (WASHE)

7.3.1 Relationship Exploration

The following section explores the relationship between different actors and actants identified in the situational map. The relationships contribute to the understanding of the actors and actants in the given situation and also bring out some silences in the relationships between different elements.

Infrastructure

The choice of infrastructure is mainly based on a technical decision by the project leader. The project leader in this case can be an engineering firm, government department or an NGO team. The choice of infrastructure is also dependant on the availability, location and price of the infrastructure. The technical bias means that sometimes infrastructure is imposed on the community. Some infrastructure that is used in the rural areas like the India mark II pump is usually promoted through government agencies[204]. It is not clear whether the government bases its choice on technology applicability or cost effectiveness. In the urban and peri-urban areas the infrastructure is more uniform using the standard pipes and taps. The issue in the urban areas relates to the state of the infrastructure as most of it was installed before 1970. The age of the pipe network and other infrastructure compounded by the fluctuation in pressure of the water supplied has resulted in blocked pipes or burst pipes in some urban areas. Most of the infrastructure in these areas needs replacing and rehabilitating. The other challenge relating to infrastructure in urban areas is extension to newly developed areas. Water treatment capacity is limited just like the reach of water distribution infrastructure[205].

International drives

International drives provide channels of financial resources for water projects[206]. The government agencies need to find a way of internalising the drives. Internalisation of the drives means incorporate them into national plans and strategies. The drives can be used to support home grown ideas and initiatives especially in long term strategies for the water sector. The drives also promote commercialisation of the water sector and encourage community participation in community projects. The international drives also have an effect on the donor support as this is one of the entry points that can be used for donor funds[207].

Development Aid

The channelling of development aid affects the impact of the aid and the overall development and poverty reduction. Development aid is being reorganised to make it more effective. There are on going debates on whether the aid should be channelled through projects or through national budgets, incorporating the idea of supporting poverty reduction strategies[208]. Aid in the water sector is also uncoordinated though a team has been set up comprising most Donors and NGOs in the water sector[209]. The team has a task of finding ways of coordinating the aid efforts to achieve maximum impact.

Poverty reduction strategy programme

[204] Interview with DWA officials in Chipata, Eastern province

[205] Interview with Director of Chila Water in Mbala

[206] Interview with DWA official in Lusaka

[207] This is the case for meeting MDGs that are directly funded by some donor agencies

[208] Oxford Policy Management carried out a project funded by DfID looking at poverty reduction through budget support

[209] Interview with Water Aid researcher

Poverty reduction is targeted at the poor and improving the economic and living standards of Zambian citizens. The programme highlights the role of water in poverty reduction mainly through improved access to clean and safe domestic water and providing access to water for livelihoods[210]. The strategy also includes the promotion of fishing related activities especially the setting up of fish farms. The PRSP is a home grown effort towards development and is used as a channel to obtain funds for water projects.

Sector reform

The reform in the water sector was sparked by the poor level of service and the lack of investment in the water sector. The reforms were started in the early 1990s. The key objectives of the reform were set out in the National Water Policy[211]. Sector reform is supported by International Financial Institutions and other donors. The reforms include revision of the water act, separation of water supply and resource management and also creation of commercial utilities and autonomous water departments in Local Authorities[212].

Law

Legal documents have been drawn up to regulate the domestic water sector through NWASCO, control the pollution of water bodies through ECZ and control the allocation of water resources through the Water Board[213]. The Water Act is being reviewed by WRAP. Law can be used as a dispute settling instrument but becomes challenging when customary law comes into play. The debate about the use of customary and common law is on going. Customary law is used mainly in traditional land and the rural areas. Common law is used in urban centres and in state land. Officially all land and water is vested in the president but the chief must give consent on matters dealing with traditional land[214]. Land and water are inevitably linked. Budgetary laws in Zambia have been identified as part of the funding bottlenecks by Water Aid in their report produced in 2003[215].

Water User groups

Water user groups are found mainly in the rural areas and are based on particular water points or infrastructure. The groups are mainly formed around irrigation infrastructure. The groups are formed by residents using the water point. The group members elect a committee that runs and manages the water infrastructure. The elected committee draws up regulations and guidelines for the rest of the group members to follow[216]. The regulations and guidelines must be agreed on by the majority of the group members. This is a way of communities managing their own resources and sustaining the water projects in their areas. Community participation and the development of skills and capabilities to manage the resources are essential. Water is viewed as a social and economic good by user groups[217]. Informal links and cooperation are made use of in the groups especially because they are based in rural areas where customary law is more applicable.

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[210] Government of the Republic of Zambia. 2003. Poverty Reduction Strategy Programme. Lusaka: Ministry of Finance and National planning

[211] Government of the Republic of Zambia, 1994. National Water Policy. Lusaka: Ministry of Energy and Water Development

[212] Interview with DWA official in Lusaka

[213] Government of the Republic of Zambia, Water Act (1948), Water and Sanitation Act (1997), Water Pollution Control Act (1990). Lusaka: Government printers

[214] Government of the Republic of Zambia, Land Act (1995). Lusaka: Ministry Of Lands

[215] Water Aid. 2004. Getting to the true nature of the Problem: The case of financing rural water supply and sanitation in Zambia's poverty reduction strategy.

[216] Interview with Water User Group member, Sefula, Western province

[217] Interview with irrigation scheme chairman in Rukuzhye, Eastern Province

Resident Development Committees

RDCs are found in peri-urban areas and monitor the operations of water schemes in their areas through water scheme committees. RDC members are elected by community members for a fixed term of office. The RDCs are trained by the Local Authorities in leadership, accounting and dispute settlement[218]. The RDCs play a role in ensuring the willingness to pay for water by carrying out sensitization exercises and mobilising the community members to participate in community projects. RDC members see water mainly as a social good. The RDCs propose development projects in their areas and also ensure community commitment to the projects. RDCs have been used as channels of addressing poor public service delivery and project sustainability[219].

Irrigation scheme committees

Irrigation scheme committees are found in the rural areas and are formed around a completed water project that is handed over to the community. The committees are similar to water user group committees. Irrigation committee members are elected by irrigation scheme members for a fixed term of office. Effective operation of an irrigation scheme requires community participation and commitment from the scheme members[220]. The irrigation scheme committee ensure maintenance of the irrigation infrastructure, which is usually a furrow and the payment of scheme membership fees if applicable. The scheme membership is not always necessary as the schemes are mostly based in areas where customary laws are applied and communal ownership and responsibility is encouraged[221]. Irrigation scheme members view water both as a social and economic good because the water points are usually used for both irrigation and domestic purposes[222].

Water Scheme Committees

Water scheme committees are formed around a water scheme in a particular township or peri-urban area. The committee members are elected from the Resident Development Committee members for a fixed term. The water scheme committee is responsible for appointing water point attendants who regulate access to water points and collect water user fees[223]. The committee ensures maintenance of the infrastructure, sustainability of the project and a good standard of service for the residents. Committee members are trained to carry out minor repairs on the infrastructure. Water scheme committees acknowledge the importance of continued community participation and cooperation in projects. The ability and willingness to pay for water is emphasised by the committees but exceptions are made for poor and vulnerable community members.

Rural Water Committees

Rural water committees are formed when a water project is introduced in a community. The water projects are part of the poverty reduction strategy. The committee is formed around a particular water project, which may have multiple water points. The committee regulates access to the water point and is trained to maintain and carry out minor repairs on the infrastructure. The committee is expected by the community to be living in the water project area. The maintenance and repair of

[218] Interviews with RDCs in Chipata Township, Lusaka and Linda Township, Lusaka

[219] Interview with peri-urban water coordinator, Lusaka Water and Sewerage Company

[220] Interview with MACO official in Lundazi, Eastern Province

[221] Interview with Vegetable Growers Association, Ngulula, Northern Province

[222] Interview with members of Chonya Village Cooperative, Chonya, Northern Province

[223] Interviews with Water Scheme members in George Township, Lusaka and Chipata Township, Lusaka

the infrastructure requires community commitment and participation. The community members prevent vandalism and also contribute towards maintenance and repairs through the water fees[224]. Water committees also ensure the poor and vulnerable community members, who may not be able to afford the water user fee, have access to clean and safe domestic water. Rural water committees view water mainly as a social good and the rural base implies customs have an influence on the operations of the committee as do the traditional leaders[225].

Donor Agencies

Donor agencies provide funding for different government programmes and water projects. The agencies support the commercialisation of the water sector and improving the delivery of public services. Donor agencies like JICA have a strong technical focus while others like DfID have shifted their focus to governance and capacity building[226]. Donor funded projects require government contribution towards the project to show commitment to the project[227]. Most donors also encourage community participation in community projects to ensure project sustainability. Donors use international drives as entry points for their funding and may also use NGOs.

NGOs

NGOs working the water sector target remote residents, the vulnerable and poor residents. These are usually the groups that are not reached by the government resources and machinery. Most NGOs see water as a social good and encourage communities to participate in water projects in their areas. The NGOs have mandates and criterion that project areas must meet before a project commences in the area[228]. One of the criteria is community contribution towards the project costs. The NGOs target their projects in areas where populations are concentrated to ensure maximum benefit from their projects. NGOs have started placing emphasis on capacity building in communities to ensure project sustainability. NGO personnel would like to see increased investment in the water sector using public funds and increased efforts to meet the MDGs[229]. NGOs are advised to apply the WASHE concept in their projects.

Financial Institutions

International Financial Institutions support the water sector reform and provide some funding from the Water Resource Action Programme (WRAP) and water projects. WRAP has an institutional and legal framework focus in the water sector reforms[230]. International Financial Institutions encourage community participation and community contributions to projects in their areas. This is an effort to improve project sustainability and build community capacity. Financial Institutions view water mainly as an economic good and are more likely to support projects where residents show an ability to pay[231]. The institutions are also in support of the commercialisation of the water sector. International campaigns like MDGs can be used as a channel to obtain funds from International Financial Institutions. Unfortunately the drives place more emphasis on supply side water management than on governance issues in the water projects.

Academics

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[224] Interview with District Water Engineer in Mongu, Western Province

[225] Interview with village headman in Mongu, Western Province

[226] Interview with JICA water engineer and discussion with DfID member of staff

[227] Interview with WRAP publicity officer

[228] Interviews with CARE and World Vision development project staff

[229] Interview with researcher at Water Aid and CARE International staff

[230] WRAP objectives (Accessible on http://www.zambia-water.org.zm/wrap.htm)

[231] Interview with rural water sector programme coordinator

Academics sometimes play the role of consultants in the water sector reform. Academics have been part of the WRAP team and support other government programmes in various ways. Academics would like to see more investment in the water sector and support ideas of water conservation, water demand management and project sustainability[232]. Academics are also playing a role in internalising international campaigns like IWRM. They do however have a theoretical and technical bias.

Government Agencies

Government agencies are part of the water sector reform process and participated in the formulation of the National Water Policy. Government agencies view water, both as a social and economic good. The agencies are involved in promoting the view of water as an economic good through the commercialisation of the water departments in local authorities and the creation of commercial utilities. They are also involved in promoting agriculture as a business as opposed to a survival tool[233]. Personnel in the government agencies would like to see more investment in the water sector and improved service delivery. The personnel play a role in community projects and support the idea of community contribution to projects in their areas. Unfortunately some government agencies lack resources and skilled personnel to provide an efficient service to the citizens.[234]

Consultants

Consultants continue to play a role in the reforms of the water sector. The reports produced by consultants identify gaps in the water sector especially in service delivery and skills and capabilities required in the sector. Consultants support the commercialisation of the water departments and proposed the creation of commercial utilities[235]. Consultants continue to provide support to the commercial utilities especially in management roles. Consultants also propose solutions, identify problems in the water sector but are influenced by their funding organisations. Their proposals are also not always taken on board by policy makers and government ministries. Consultants are also some times used as scapegoats when projects go wrong.

Commercial Utilities

Commercial utilities have taken over the water supply and sewerage services in most urban centres. The manpower being used in the utilities, with the exception of management, was seconded from the water departments in the Local Authorities. The idea of commercial utilities was born from the National Water Policy and the need to improve water supply and sanitation service delivery. The utilities emphasise the ability to pay for services and are focused on cost return[236]. Some utilities have tried to incorporate the poor using water kiosks but most leave the poor out of their operations. The utilities are encouraged to exploit cross subsidisation by pairing larger towns with smaller towns[237]. The larger towns usually have more economic potential and a larger client base.

Local Authorities

[232] Interviews with Dr. Z Phiri (WRAP team leader) and Prof. I. Nyambe (GWP Zambia)

[233] Interviews with DWA officials, Lusaka, MACO officials, Livingstone, MACO officials, Kasama

[234] Local level positions like the District Water Engineer are vacant in some districts

[235] Discussion with GKW, consultants in the water sector usually working with GTZ

[236] Interview with Director at Southern Water and Sewerage Company, Livingstone

[237] Interview with Technical Director of North Western Water and Sewerage Company

Water departments in local authorities have historically provided domestic water for the urban and peri-urban residents. The standard of service deteriorated over the last couple of decades mainly because of subsidised water rates, poor investment in the water sector and lack of maintenance resulting from the weak financial base of the authorities[238]. Commercialisation has been introduced in all water departments under a directive from the Ministry of Local Government and Housing[239]. The move has been welcomed by the water department employees especially in towns where commercial utilities have been created. Most water departments ration the water supply to the communities because of the limited water treatment capacity. The departments also find servicing the poor a challenge and most departments lack trained and skilled man power to ensure a high standard of service. The boundaries of Local Authorities date back to the colonial days in most cases resulting in some authorities have a very poor economic potential. Local authorities in larger towns are introducing Resident Development Committees (RDCs) in peri-urban areas and townships. The RDCs help propose development projects in their areas. Another link with the community is provided through WASHE, which the Local Authorities coordinate.

Companies

Some companies like Nakambala sugar and Kaleya holdings, provide domestic water to their employees at subsidised rates[240]. The companies usually have the financial resources and trained staff to provide a high standard of service at the subsidised rate. The companies obtain water rights and licences to supply the water from the relevant authorities especially that water is used in their core company activities. This dual use of the water implies the companies view water as both a social and an economic good.

ZESCO

The national electricity supply company, ZESCO, is a water user through the hydro electric power stations and involved in water supply. Water is an economic good for ZESCO. Water suppliers mainly use power from ZESCO to drive their pumps. ZESCO has been experiencing some problems with vandals and theft of power lines and transformer oil[241]. Some parts of the country especially Lusaka, have been experiencing power cuts because of overloaded transformers. The power cuts result in water supply interruptions unless the supplier has back up generators or is not connected to the main grid. The power cuts affect the level of service provided to the end water user[242].

Poor

The poor usually include the vulnerable groups. The rural poor are dependant on NGOs and donor funded projects for their water supply. The urban poor are more dependant on cross subsidisation for affordable water supply[243]. The poor see water as a means of survival for their livelihoods and domestic use. Water is viewed more as a social good that should not be paid for as they are accustomed to using traditional water sources like hand dug wells, springs and streams[244]. In most cases the poor live outside the monetarised economy and are not able to pay for services.

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[238] Interview with Director of Water Department, Kabwe, Central Province

[239] Interview with Manager of Water Department in Lundazi, Eastern Province

[240] NWASCO. 2003. Annual Report. Lusaka: NWASCO

[241] Local media reports of vandalism on ZESCO substations

[242] Interview with Director of Water department in Mansa, Luapula Province

[243] Interview with Engineering Director, Chipata Water and Sewerage Company, Chipata, Eastern Province

[244] Interview with Village Development Committee Chairman in Chulu Ngoma, Mbala, Northern province

Remote Residents

Remote residents feel helpless unless they attract the attention of an NGO or government project in their area. The attraction is sometimes because of a disease outbreak or a visit by government or Local Authority staff. The traditional leader can also petition the government to help his people[245]. Residents living in remote areas usually depend on traditional sources of water like hand dug wells, rivers, springs and streams. In most cases the water is assumed to be of good quality especially if it appears clear. Remote residents usually have low political clout since their MPs rarely visit these remote areas. A visit is usually paid just before election time to secure votes in the areas[246].

Residents of Areas with failed projects

Residents of areas with failed projects are usually left feeling vulnerable and neglected. New water projects are difficult to secure in these areas mainly because failed projects are attributed to lack of community commitment or unwillingness to pay for services provided[247]. Skills and capabilities are usually the root of the project failure but there is less chance of these being developed in the event of a failed project. Some projects have failed in the past because of lack of ownership and lack of community participation[248]. Unfortunately with limited financial resources, areas with failed projects are placed at the bottom of the list. In some cases the areas are considered a waste of resources.

Descriptions of discursive elements

This section gives a description of the discursive elements identified in the situational map. No relationships have been explored in this section. The paragraphs contribute to the understanding of the discursive elements in the given situation.

Low political clout

Those of low political clout are silent voices that rarely get any attention unless NGOs go to their area. The citizens with low political clout are usually found in remote sparsely populated areas. The other areas, usually urban and closer to Lusaka, are prioritised when it comes to government resources. Some residents in the low politically influential areas feel they are unlikely to get any water projects in their area unless they have the ruling party as the representation in their areas[249].

Vulnerable

The vulnerable are not only difficult to identify in their places of residence but their incorporation in community projects is also challenging. The other problem is the term “vulnerable” is misused in some cases because it is seen as a term that needs to be included in community projects[250]. The definition of vulnerable varies according to the location and user of the term but amongst the most

[245] Interview with tour guide operator Mukuni Village, Livingstone

[246] Interview with World Vision project team, Kawambwa, Luapula Province

[247] Interview with Provincial Water Engineer, Copperbelt province

[248] Interview with Community Development staff, Chipata District Council, Eastern Province

[249] Interview with UNIP youth chairman, Lusaka

[250] Focus group discussion with RDC members in Natuseko, Kabwe and Chipata Township, Lusaka

important defining characteristics are age, sex, ethnicity and residence in remote locations[251]. In the Zambian water sector vulnerable groups within communities include orphans, old people, retirees and terminally ill residents. There are some areas where communities living in remote areas are considered vulnerable especially in the drought prone southern and western provinces.

Terminally ill residents

These residents have a higher demand for safe and clean domestic water but are not healthy enough to demand the resources or have access to them[252]. These residents usually have reduced immune systems and are at greater risk of catching water borne diseases.

Political Economic Elements

Water projects

The financial resources to carry out water projects are limited so priority is given to areas with higher population concentrations that will benefit more from the projects[253]. The process for selecting the areas where the projects are based does not seem coordinated or transparent.

National Water Policy (NWP)

The NWP looks at the reform of the Zambian water sector[254]. The policy attempts to bring together all the different water uses and find a way in which all uses can be included in resource management and development. The policy announces several objectives including the separation of water supply and water resource management. The reforms do not seem to moving according to plan. An in-house review of the policy has been carried out after 10 years of the document being promulgated[255].

Valued citizens

These are usually the more visible citizens found in the urban and peri-urban areas. The urban areas are the places where educated people live and also the places that have financial resources to pay for services. As such the urban areas are more likely to get investment because they are considered more able to return costs[256]. The peri-urban areas benefit from their proximity to urban centres.

Multiparty politics

The multi-party political environment which is rather immature in Zambia means the politicians from opposing parties usually end up shooting down good ideas on development and inciting citizens not to pay for water if water projects were carried out in their areas[257]. The politicians

[251] NGOs working the water sector usually use these defining characteristics of vulnerable groups.

[252] Interview with Environmental Health Technician, Mansa, Luapula Province

[253] Interview with District Water Engineer Mongu, Western Province

[254] Government of the Republic of Zambia, 1994. National Water Policy. Ministry of Energy and Water Development

[255] In house review was done under Public Service Capacity Building Project, PSCAP. The review was completed in 2004. The completed report on the findings has not been released.

[256] Water Aid. 2004. Getting to the true nature of the Problem: The case of financing rural water supply and sanitation in Zambia's poverty reduction strategy.

[257] Interview with MMD publicity secretary Kitwe, Copperbelt Province

insist the water projects are carried out using grants as opposed to loans[258]. Politicians also make empty promises like installation of water infrastructure and improvement of service delivery during election time[259].

Financial resources

Government has limited financial resources for all development and other national programmes. Water is not very high on the government priority list when compared to competing sectors like health and education[260].

Sector investment

Investment in the water sector has always been poor. The dilapidated infrastructure in the urban and peri-urban areas is evidence of this poor investment[261]. Rates of return in the water sector are also low making it more oriented to public fund investment.

Ability to pay

The ability to pay affects most water supply infrastructure and the sustainability of water projects in different areas. In some places the ability to pay is actually confused with the willingness to pay. When a water project is handed over to the community, the community is prepared to pay but after the project has been in operation for a while the willingness to pay reduces and the reality of the ability to pay kicks in[262].

Discursive Constructions/ Non human

Concepts of development

Water projects are classified under development activities in the areas where they are carried out. Citizens believe they have a right to development and the benefits that come with it[263]. The water projects also fall under the right to sustainable livelihoods[264]. The sustainable livelihood approach goes beyond domestic water. Communities also believe safe water sources are a condition to get services and trained manpower in their areas for schools, medical centres etc.

Commercialisation

Commercialisation brings improved service provision and the opportunity for internal investment in the water sector[265]. Commercialisation also implies the ability for effective management of

[258] Interview with field officer George Township, Lusaka

[259] Interview with community development officer, Matero, Lusaka

[260] Government of the Republic of Zambia. 2003. Poverty Reduction Strategy Paper and Transitional National Development Plan. Lusaka: Ministry of Finance and National Planning

[261] Coopers and Lybrand. 1988. Reorganisation Study of the Water and Sanitation Sector in Zambia – Final Report. Sponsored by GTZ, UNDP, World Bank. For Ministry of Decentralisation

[262] Interview with CBE in Linda, Lusaka and Filed officer George Township, Lusaka

[263] Interview with Village development committee Chulu Ngoma, Mbala, Northern province

[264] Interview with MACO officials, Chipata, Eastern province and Livingstone, Southern province

[265] This belief is held by some donor agencies and MLGH personnel particularly in relation to urban water supply

utilities and ability to hire skilled personnel[266]. Commercialisation also means a bottom line focus and cost return. Unless cross subsidisation can be achieved commercialisation is not pro poor.

Community participation

Communities are empowered to participate in projects and actually propose projects for their areas. This is part of a demand driven approach to community projects and development[267]. It also goes towards project sustainability, especially water projects. Community participation is not always achieved in some projects as the community ends up being consulted but not taking part in the decision making[268].

Sustainability

Sustainability is an issue in water projects carried out in rural areas and peri-urban areas. In the past some infrastructure that has been installed breaks down within the first couple of years[269]. Measures have been taken to increase sustainability of projects by community participation in projects and community contributions to projects[270].

Service Delivery

The reforms in the water sector were to help improve the level of service delivery. This was mainly in the domestic water supply. Service delivery improvement would need an overhaul of water distribution systems in some parts of the country. Another requirement would be the expansion of water treatment plants[271].

Water Conservation

The meters being installed in urban areas are a way of encouraging water conservation[272]. Metering was initiated in the more affluent neighbourhoods taking advantage of the individual connections that exist there. The metering was also a move away from fixed monthly water bills and towards paying for the actual quantities of water used. The less affluent townships usually have communal taps that are metered to account for water but control over the amounts used is a collective responsibility. The limited treatment capacity of water plants makes water conservation essential in urban areas. It also helps in keeping costs down and assisting in demand side water management.

Project Commitment and Contribution

The project contribution from the community amounts to 10 to 15% of the total project costs[273]. The contribution shows community commitment to the project and goes towards ensuring project

[266] Interview with CU personnel in Ndola, Solwezi, Livingstone, Chipata and Lusaka

[267] Interview with project team leader at CARE International and ZAMSIF personnel in Lusaka

[268] Interview with Irrigation scheme chairman, Rukuzye and Sefula water user group

[269] Interview with village headman in Chulu Ngoma, Mbala, Northern Province

[270] Focus group discussions with RDC members in Kaputula and Katondo, Kabwe, Central Province

[271] Interviews with CU and water department personnel in Kabwe, Mbala, Solwezi and Kasama

[272] Interview with CU personnel in Chipata and Solwezi

[273] Interview with project team at CARE International and ZAMSIF personnel, Lusaka

sustainability. On a national level the government also contributes 10% to donor funded projects and programmes[274].

Temporal Elements

History of service provision

Service provision in the domestic water sector has always been poor especially considering the subsidised rates paid in the past since the 1970s. The poor standard of service was recognised in the late 1980s[275]. Once the water sector reforms were started, a National Water Policy was created in 1994. The government made a commitment to improve service delivery in all urban areas.

History of colonisation

The history of colonisation has had an impact on the development of infrastructure especially in the rural areas. During the colonial years and just after independence, investment in the water sector was restricted to the urban areas. Unfortunately some of the treatment plants that were built in the 1950s were poorly maintained and the populations they were built for have been surpassed[276].

History of party administration

The sections in the one party era had a communal tap in some peri-urban areas[277]. The access to the tap was regulated by the party chairman. This was a type of autocratic rule that gave the party chairman quite a lot of powers[278]. Under the multi-party system the section party leaders have less control and there are more water points in the sections as long as the residents are able to pay.

History of project support

Donors are shifting support from direct project support towards budget support. This is in response to an ongoing debate on the most efficient way or effective way of using donor funds[279]. Donor funds were channelled through projects to prevent the redirection of funds by the government. However the system of direct project support meant some programmes and projects that were prioritised by the government would not receive funding[280]. Budget support still links to project support but government will have more control over prioritising projects.

History of project sustainability

[274] Interview with publicity officer, WRAP, Lusaka

[275] Coopers and Lybrand. 1988. Reorganisation Study of the Water and Sanitation Sector in Zambia – Final Report. Sponsored by GTZ, UNDP, World Bank. For Ministry of Decentralisation

[276] Interview with water department personnel in Kabwe and Lundazi

[277] A section was made up of 25 households and was headed by a section chairman

[278] Interview with MMD publicity officer, Kitwe and UNIP youth chairman, Lusaka

[279] Oxford Policy Management carried out a project funded by DfID looking at poverty reduction through budget support

[280] Discussion with Ministry of Finance personnel

It has been noticed that some projects do not complete their life cycle. This may be due to the ownership of the project or the acceptance of the project by the community[281]. Some communities feel projects are imposed on them and as a result do not maintain the infrastructure. Other communities feel they are entitled to water and other social goods and should not pay for them as they are the responsibility of the government[282]. Communities are now being encouraged to participate in projects and also make a contribution towards the project costs.

History of civil society organisation

Civil society in Zambia is generally weak and unorganised. As the communities get more involved in projects and propose projects for their communities civil society wakes up and begins to hold local authorities and water suppliers accountable for a good level of service provision[283]. There are also some communities where community based enterprises have been set up to manage the water supply to a community. In other communities resident development committees elect water committees to manage the water supply. In such communities the local authority has effectively been replaced as a water supplier. The media has also played a role in informing citizens especially about their rights and the organisation of civil society[284].

Land tenure

Land tenure affects the investment in water infrastructure. This is similar to tenancy in some urban and peri-urban areas. Long term land tenure and tenancy encourages investment in water supply infrastructure, maintenance of infrastructure and participation in community projects[285]. There are different classifications of land in Zambia; state land, reserve land and trust land. According to the Land Act (1995) all land is vested in the President. However when dealing with trust land or traditional land, the traditional leader in the area must be consulted and give consent to any decisions. State land can have a 99 year lease while traditional land usually has a lower tenure. The tenure for traditional land is understood to be 14 years but this is officially the right of occupancy that can be granted by a traditional leader. Traditional land usually applies customary law which varies according to the tribe. Traditional land can be converted into state land once title is given through the commissioner of lands.

Social Cultural Symbols

Representation of water

These are usually non consumptive uses of water. Water is viewed by most citizens as a social good which they are entitled to. Most citizens equate water to life itself. Even though the urban and peri-urban residents accept they should pay for treated water, there is still a general feeling that water rates should be subsidised[286]. In most rural areas there is a consensus that water should not be paid for as it is a God given gift and there is so much of it everywhere[287]. The gift

[281] Interview with project teams at CARE international and World Vision and Interviews with community development officers in Lusaka and Chipata

[282] Interview with District Officer in Mansa, Luapula province

[283] Increased civil activity in towns with CUs has been reported in local media e.g. water watch groups

[284] Radio and TV programmes have discussions on water issues

[285] Discussion with MACO officials in Lusaka and RDC members in Lusaka

[286] Interviews with general public members in Lusaka, Chipata and Kabwe

[287] Interviews with general public in Mungwi, Mongu and Livingstone

from God is a Christian view which is predominant in the rural areas and urban areas because Christianity is a wide spread religion in Zambia

Representation of agriculture

Small scale agriculture is being promoted as a business and no longer as a survival tool[288]. More irrigation schemes are being set up and broken down infrastructure is also being rehabilitated[289]. This move of changing the way people look at agriculture is part of the strategy to ensure food sufficiency in Zambia and poverty reduction.

Traditional tribal beliefs

Traditional beliefs vary according to tribes in Zambia. Some tribes have sacred springs that mere public members cannot approach[290]. Only divine members of the tribe can approach the sites. The water bodies are also seen by some tribes as cleansing places. Some sacrificial ceremonies are performed near water bodies. Some parts of the Zambezi River especially near the Victoria Falls are considered places of rest for past traditional leaders[291].

Water rights

These are obtained from the Water Board under MEWD. Water rights are issued for impounding[292] of water or use of surface waters above a minimum stipulated amount. The minimum amount is stipulated by the Water Board and is given as 500 cubic meters annually. Water rights can be issued for a period of up to 20 years[293]. The process of water rights application is being decentralised through the provincial water affairs offices. The provincial personnel will also help in monitoring activities for the board which is currently understaffed. This is pilot project which will be rolled out over a two year period based on the success of the pilot. Currently the Water Board carries out and monitors the allocation of water rights centrally from Lusaka.

Major Issues/ Debates

Willingness and Ability to Pay

The willingness to pay as compared to the ability to pay is still being debated especially in urban and peri-urban areas. The management in some commercial utilities feel residents are just not willing to pay for water as they are accustomed to getting subsidised services[294]. Other utilities like electricity which are not essentials are promptly paid for. A reason for this behaviour may be one cannot draw electricity from one's neighbour.

Involvement of Private Sector

[288] Interview with small scale farmers in Lwabwe, Kasama

[289] Interviews with MACO officials in Kasama and Chipata

[290] Interviews with village headman in Chulu Ngoma and reported by MACO officials in Kasama

[291] Interview with tour guide, Mukuni village, Livingstone

[292] Storage of water in reservoirs

[293] Interview with secretary of the Water Board, Lusaka

[294] Interview with CU personnel in Chipata, Livingstone and Ndola

Involving the private sector in water supply is an on going debate because of the level of service private companies may be able to provide and the potential investment that private companies may bring[295]. There is a counter argument of water being more of a social good and private companies not being easy to regulate.

Public Fund Investment in Sector

Public funds are more oriented to water sector investment than private funds. Water is a social good and not entirely an economic good. As such the returns from water supply provision would be lower than other commercial enterprises. The low returns would inhibit the attraction of private investment in the water sector[296].

Including the poor

The poor are expected to be a subsidised group making use of either cross subsidisation in commercial utilities or public funds for the rural areas[297]. The poor in urban and peri-urban areas sometimes end up paying accumulatively more for water than their more affluent counterparts[298]. The cost returns in water supply to the poor is not feasible.

Cross subsidisation

Cross subsidisation is still being worked out in the commercial utilities. None of them seem to have found a way of exploiting cross subsidisation. This may be because most users appear to be in the middle consumption bracket[299]. To make the most of cross subsidisation, there has to be a significant number of users in the higher consumption bracket. The higher bracket is the group that pays the actual cost of supplying their water.

Limits of regulation

Regulation in the domestic water sector is still in its infancy under NWASCO that has been in existence for just over four years. The regulator is still finding its feet in enforcing regulation in the water sector. NWASCO issues licences for water suppliers and also monitors their performance using set targets that are reviewed annually[300]. NWASCO only deals with the supply side and not the disposal side of water and sewerage. The effluent discharge is under the Environmental Council of Zambia.

Urban/ rural divide

The urban and rural divide affects the decisions made in the water sector. At the moment the divide has an adverse affect on the sector. The rural water sector is in disarray compared to the urban water sector[301]. The urban sector has historically been serviced by local authorities and

[295] Discussion with MLGH official

[296] Ibid

[297] Discussion with Rural Water Sector Project Team under MLGH

[298] Calculated costs for on the spot water payments in Mongu workout higher than rates paid by urban residents.

[299] Interviews with CU personnel in Solwezi and Livingstone

[300] Interview with NWASCO personnel, Lusaka

[301] Discussion with MLGH official

more recently the commercial utilities. The rural sector is dependent on NGOs, donor funding and government projects that are not well co-ordinated and are affected by funding bottlenecks[302].

Maintenance

The maintenance of infrastructure is an issue for water projects especially in rural and peri-urban areas. After a project is handed over to the community, trained personnel who are members of the water committee, are responsible for maintenance and repairs[303]. These residents are trained to carry out minor repairs but depend on the collection of the water user fees to raise funds for the repairs. Unfortunately if the water fees are not collected the repairs cannot be carried out effectively.

Skills and capabilities

Skills and capabilities are essential in the right mix to run water committees and manage water project infrastructure. Capabilities are not well developed in most villages and peri-urban areas[304]. This affects the sustainability of projects. The skills and capabilities are passed on by NGO staff and line ministry staff.

Prioritisation of Uses

As demand on particular water resources like the Kafue River increase there are plans to prioritise water uses to assist in the allocation of the resources[305]. Domestic water use has priority and thereafter the allocation will be based on the most efficient use of water with emphasis on economic benefits.

Water Demand Management

The supply side management has to be accompanied by demand side water management. Demand side water management encourages community water management and water conservation[306]. The latter is more engineering oriented while the demand side management is more socially oriented.

Sanitation link

The link between sanitation and water supply usually results in more emphasis being placed on water supply and not sanitation[307]. The two are inevitably linked especially when looking at health matters. All commercial utilities are water and sewerage companies yet investment is only placed

[302] Water Aid. 2004. Getting to the true nature of the Problem: The case of financing rural water supply and sanitation in Zambia's poverty reduction strategy.

[303] Interview with RDCs in Lusaka and Rural water committees in Mongu and Mbala

[304] Discussions with Community Development Officers in Mansa, Kawambwa, Mbala and Chipata

[305] Water Resources Demand document drawn up by WRAP team

[306] Nyambe I. et al. 2002. Water Demand Management in Zambia – Towards Promotion and Adoption- Final Report. South Africa Country Office: IUCN

[307] Interview with Environmental Health Technician, Mansa, Luapula province

in water supply and not improving the sewerage services[308]. In rural areas most residents use pit latrines. Pit latrines are also used in some peri-urban areas along side soak aways.

Related issues

Public service provision

Public funds are limited and generally public services in Zambia are of low standard. Water and sanitation does not always have priority for allocation of public funds especially when placed against other key sectors like health and education[309]. Investment in public services has historically been almost non existent. This is one of the reasons for commercialising the water sector.

Service Expectations

Domestic water users expect a good standard of service from water suppliers. These expectations are not always possible for the water suppliers to meet. The water suppliers have targets set by the national domestic water regulator[310]. Most commercial utilities usually fail to meet all their targets[311].

MDGs

MDGs are international targets to reduce the number of people with no access to clean and safe water. In Zambia this accounts for 36% of the population, majority of this number actually live in the rural areas[312]. The MDGs have had a positive effect on the rural water sector in Zambia even though the solutions provided are engineering focused. The strategy is to increase the number of water points in the rural areas[313]. Unfortunately as more boreholes are drilled others break down or go out of use.

Poverty Reduction Strategy

The poverty reduction strategies are home grown plans for poverty reduction. Water plays an important role in the Zambian poverty reduction strategy[314]. Water resources are to be used in agriculture promotion and fishing activities to improve livelihoods. Water also plays a role in the tourism industry, which is also getting a lot of attention[315]. The water resources will also be exploited by creating multi purpose water points in the rural areas[316]. Multi purpose water points are usually in the form of dams that can be used for fishing, recreation and to draw water for domestic use, irrigation and watering livestock.

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[308] Interview with general public members in Kapata Township, Chipata, Eastern province

[309] Government of the Republic of Zambia. 2003. Poverty Reduction Strategy Paper and Transitional National Development Plan. Lusaka: Ministry of Finance and National Planning

[310] NWASCO. 2001. Domestic Water Supply Guidelines. Lusaka: NWASCO

[311] NWASCO2002-2003. Annual Reports. Lusaka: NWASCO

[312] CSO. 2000. National Population and Housing Census. Lusaka: CSO

[313] Interview with provincial water engineers in Kasama and Mansa

[314] Government of the Republic of Zambia. 2003. Poverty Reduction Strategy Paper. Lusaka: Ministry of Finance and National Planning

[315] Visit Zambia 2005 Campaign by National tourist Board

[316] Interview with MACO official, Livingstone

IWRM is not a well spread idea in Zambia[317]. No group appears to be championing the international drive. DCI in Northern Province is applying it in some project areas and reports the idea has been welcomed by rural water users[318]. Water aid has also incorporated IWRM in some water projects in the southern province[319]. The GWP is one of the organisations promoting the idea through their local office in Zambia. The idea is to have a holistic approach to water resource management at the local level.

Donor support

Donor support has been uncoordinated in the past and the entry points for the aid seem numerous. The donor aid comes in through projects, NGOs, government budgets or directly through communities. The numerous entry points make accountability difficult[320]. A group has been set up headed by water aid to coordinate donor aid in the water sector[321].

Funding bottlenecks

Water aid reported some bottle necks in the Zambian water sector. The report showed below 13% of budget allocated funds had actually been released in 2003. The bottlenecks involve the budget process from central government and also budget proposals from provincial and district personnel[322]. There is also the chance that the money that is allocated is not actually available. Another reason may be that it is easier to get funds for water projects as compared to other development projects that seem obscure to the donors. So water may be used as a selling point to get funds which are diverted to other activities[323].

Corruption/ Accountability

Corruption and accountability go hand in hand in the Zambian water sector. There was a report from the Ministry of Finance that stated only K40 million out of K600 million released for Lusaka water projects could be accounted for. This is a figure of less than 10%. Only 2 boreholes out of a planned 30 were drilled using the funds released for this purpose[324].

Leadership

Leadership issues are highlighted and more important in rural areas where traditional leaders are involved in the selection of the water committee in their areas[325]. If a traditional leader and his council of indunas do not accept a project then even the subjects are not likely to accept the project. Leadership also plays a role in water committees that are formed once a water project is completed and handed over to the community.

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[317] Interview with DWA official, Lusaka

[318] Interview with water manager for DCI, Kasama

[319] Interview with researcher with Water Aid, Lusaka

[320] Discussion with Ministry of Finance personnel

[321] Interview with researcher with Water Aid, Lusaka

[322] Water Aid. 2004. Getting to the true nature of the Problem: The case of financing rural water supply and sanitation in Zambia's poverty reduction strategy.

[323] Discussion with Ministry of Finance personnel

[324] Speech delivered on national TV by Deputy Minister for Finance and National Planning, June 2004

[325] Interviews with general public members in Mongu, Livingstone and Mbala

Customary vs. Common law

Customary law is applicable at the local level especially in rural areas while common law is applicable on the national level and urban areas. The traditional land applies customary laws whereas the state land applies common law. Traditional land can be converted to state land through title that is consented to by the chief or traditional leader[326]. The two types of law are not always compatible and it does not help that customary law varies according to tribe.

Water and Sanitation Health and hygiene Education (WASHE)

This approach integrates water and sanitation, health, hygiene and education. The approach is championed by the health and education line ministries[327]. It is used mainly in rural areas to carry out community projects. DWASHE teams exist at district level and VWASHE teams exist at village level.

Governance

The right systems and institutions need to be in place for effective water resource management to take place. Governance encompasses most of the discursive items listed above. Governance can be defined as the traditions and institutions by which authority is exercised for the common good. This includes (i) the process by which those in authority are selected, monitored and replaced, (ii) the capacity to effectively manage resources and implement sound policies, and (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them.[328] This definition is inclined towards the concept of the state. It does however convey the general meaning of governance that covers the rules, procedures and practices affecting how powers are exercised. Governance can be explored at different levels, from the grass roots to the national levels.

7.4 Positional Map

Ideally the positional map should give the positions taken by different actors regarding different discursive elements but the position should not be directly linked or identified with any particular actor. The map should also show what silences can be picked up from the positions taken. From the silences we can highlight the issues that are being addressed and debated and the ones that are being overlooked for various reasons.

The positional map helps identify the actors that have more influence or more clout than others using the positions on the discursive elements. It is possible to point out what voices can be heard even though the voices are not ideally supposed to be identified with a particular actor. The positions taken also help assess the impact that discourse has on the decisions being made and actions found in the situation. However, the map has connotations of attempting to be objective in a rather subjective situation.

The positional maps have some draw backs in that some positions taken by actors are personal and not necessarily the same as those of an organisation or institution, which the actor operates in[329]. Unless the positions are shown to be explicitly personal, it is not easy to differentiate the two in an interview scenario. Further the actors in an organisation may have different positions, which

[326] Interview with Prof Mvunga expert in Zambian Land law

[327] Interview with DWASHE teams in Lundazi, Chipata and Mbala

[328] Governance group of World Bank Institute, part of The World Bank Group

[329] The positions may be personal to the interviewee

are influenced by their location i.e. rural or urban. The positional maps are also influenced by the researcher's personal conclusions and opinions even though this may openly be kept to a minimum. Outside influence and rhetoric is also difficult to sift through. Including all positions proves to be challenging with a large selection of interviewees, thus in some cases only common positions are given. These draw backs do not mean the tool cannot be useful but show some limitations of its use and also point towards the benefits of using more than one type of map and a team effort in the final analysis.

The positional map of Zambia's water sector depicts the positions taken by different actors on the earlier identified discursive elements and related issues. The positions come from interview data, local and international media reports, general debates and discussions, academic material and observations at sites. They are not limited to the ones summarised below. The list given is by no means exhaustive. Even though ideally each position should not be directly linked to a particular group, it was useful during the exercise to divide the different participants into groups and set up a check list to ensure the position of each group is included. The groups are given in the situational map.

Issue	Positions	Manifestation
Vulnerable	Difficult to identify in a particular community Subjective concept usually specific to location Need help in form of free services or income support Term has potential to be misused in some communities Usually refers to orphans, widows and aged	Lack of local translation for the term compounds the position that vulnerability is seen as an abstract term imported from NGO and Donor discourse. Some communities understand the term must be included in all project proposals whether the group is identified or not.
Poor	Subjective concept as definition varies Cost return not feasible Challenge to incorporate for water suppliers Should have low cost and low maintenance technology Can benefit from cross subsidisation in urban areas Usually need public funds for provision of services	Poor people can be found in any township though undoubtedly the peri-urban areas and rural areas have higher concentration than the urban areas. Job losses make it temporary in some cases. Figures show that about 75% of the Zambians live below the poverty line and about 50% in abject poverty. Target group for most NGOs.
Rural	Sparse populations which are difficult to target Lower living standards than urban areas Low cost technology used for ease of maintenance Require sustainable community managed schemes Benefit from multi-purpose water points Potential recipients of public funds Usually have alternative water points for livelihoods Likely to have strong traditional and cultural roots Historically ignored in development activities	Development in the colonial era and just after independence was concentrated in the urban centres where population density was higher. Investment is higher in the urban centres relating to the ability to pay and cost return. Rural to urban migration still continues. Majority of the migrants end up in peri-urban areas or shanty townships on the periphery of the urban centres. The peri-urban areas become densely populated even though some of them have no basic services since they are termed illegal.
Urban	Dense populations Higher living standards Large volumes of water use related to living standards	Economic activity puts the urban areas at an advantage compared to rural areas. The urban areas attract investment and residents have the ability to pay for services. The dense populations in the urban areas also have louder voices given their education and exposure to international media. Decision makers also reside in

	Ability and willingness to pay for water Economies of scale for water supply can be applied High cost technology usually demanded More market oriented than rural areas Have potential to attract investment Water tariff usually high	urban areas and thus their decisions directly affect them and their neighbours. Citizens in the urban areas have more value and potential.
Peri-urban	Dense populations related to urban centre proximity Mixed range of living standards High potential of ability to pay for services Medium cost technology Economies of scale can be applied Likely to be unwilling to pay for services Require community managed water schemes Community participation in projects is important High chance of ground water contamination from pit latrines	Peri-urban areas usually form the overspill from urban centres. The proximity to urban centres means the peri-urban areas can benefit from access to the services in urban areas. Service providers have decided to engage RDCs in collection of service fees with an incentive of contributing towards community funds. The community funds are supposed to be used for development activities proposed and supported by the community. Sanitation is usually a problem in most peri-urban areas because of the high density of populations and lack of sewage treatment systems.
Socio-economic status	Low socio-economic status should have access to public funds High socio economic status should operate on market principle Mixture of status in some peri-urban and urban areas Dependant on international classifications Indicator of ability and willingness to pay for services	Commercial utilities have been created in urban centres while rural and peri-urban water supply is dependent on NGO activity and donor aid. It is difficult to classify areas according to socio economic status as more people are migrating from one area to another and people have different attractions and reasons for living in a particular area.
Concepts of development	Access to clean and safe water essential for development and to attract trained staff for schools, hospitals etc Communities must propose development projects	Different infrastructure and resources applied in urban areas as compared to rural and peri-urban areas. Most schools and health centres in rural areas are not manned by skilled staff because of the lack of services in the areas and lack of incentives for trained

	Individual water tap as symbol of development	manpower to live and work in the outposts. Most residents prefer tap water because of the ease of collecting water from taps.
	Citizens have a right to development	
	Development gives citizens choices	
Commercialisation	Necessary for improving service delivery	CUs still find it challenging to provide services to the poor because of the focus on cost return. Employee morale is increased in CU setting and residents testify to the improved service delivery. Investment is still hindered by the fact that CUs cannot borrow money on the market because of ownership criteria.
	Attracts essential investment for water sector	
	Pro-urban water supply	
	Leaves out poor and vulnerable	
	Potential to improve accountability	
	Brings about institutional reorganisation	
	Results in increased tariffs	
Community participation	Potential for capacity building	Community management has failed in some resource poor communities. In other communities the idea has been welcomed and is doing well. The groups passing on skills and building capability feel they are making a difference even though the actual capacity may be difficult to measure.
	Form of community empowerment	
	Increases citizen responsibility	
	State passing the buck	
	Reorganises civil society	
Sustainability	Essential for resource poor state	The limited national resources, financial and human, mean that effectiveness and efficiency in the use of resources are important. The state does not have money to throw at solution finding so approaches and solutions must be well thought out to ensure maximum and lasting benefit.
	Requires community participation	
	Essential for project to have positive impact	
	Too much responsibility for some communities	
	Needs further assessment and measurement	
Service Delivery	Historically poor	One of the main reasons for water sector reform and formulation of the National Water Policy was poor service delivery. Most residents say they are willing to pay for services that they get at an acceptable standard.
	If improved increases willingness to pay	
	Better in commercial entities	
	Can be improved using various approaches	

	Government should not be involved	
Water Conservation	Essential in urban areas given the limited water treatment capacity Imposed in peri-urban and low cost urban areas Community requires sensitization regarding concept Necessary in drought prone areas Can be demand and supply driven Related to quality and quantity of water resources	Urban centres have water meters that have been installed to encourage water conservation. The peri-urban areas and some urban areas have rationed water supply. Water conservation can partly counter water shortages but water suppliers also need to focus on their high amounts of unaccounted water in the urban centres.
Project Commitment and Contribution	Addresses issues around project ownership Necessity for donor funded projects Too high for some communities Biased towards more affluent residents Amount varies according to donor or NGO	The underlying principle applied here is communities treasure projects and appreciate them more if they can see the contribution they made to the project. The contribution also shows that the community accept the project and support it giving better chances of project sustainability.
Willingness and ability to pay	Difficult to measure in some places but necessary before project or investment is undertaken Subjective concept depending on location Smoke screen for attitude of some community members Fluid concept as personal circumstances can change Usually generalised for entire communities	When water projects are suggested in communities, most members say they are willing to pay for the water and have the ability to pay. These sentiments changeover time. Residents pay for utilities like electricity but fail to pay for water. Domestic water is seen as a social good and entitlement that should be subsidised in most communities.
Involvement of private sector	Potential to provide much needed investment Water is both a social and economic good Likely to benefit more affluent areas Potential to improve service delivery Returns in water sector expected to be low Can be considered once commercialisation is complete	Private sector would be focused on cost returns unless providing a subsidised service for their employees. The social value of water has a potential to be overlooked. The low returns mean most local companies may not be able to compete leaving the water supply in the hands of international companies.

Public Fund investment in sector	Suitable for rural areas Benefits poor and less affluent areas Water not a priority in government projects Limited national resources Increases dependency on State	MLGH has a mandate to provide safe and clean drinking water for all the citizens. Human right to water is implicitly recognised. The human right to water is not explicitly cited by the Government as they are convinced they would not be able to honour their responsibility to all citizens.
Including the poor	Challenge for CUs and other water suppliers MLGH sanctioned discourse Requires low cost technology and subsidisation Necessary to meet MDGs NGOs play a crucial role Rural water supply programme must be effective	A Devolution Trust Fund has been set up by NWASCO and Kiosks have been piloted in some peri-urban areas. The kiosks offer a low cost technology and direct water sales. A team has also been formed under MLGH looking at a strategy for rural water supply.
Cross subsidisation	Consultant sanctioned discourse Difficult to exploit Smaller towns likely to benefit more Minimum numbers not ascertained Likely to benefit less affluent community members Requires significant number of high volume water users	Emphasised in consultant reports but CUs find it difficult to internalise or exploit the concept. Most large towns think the cross subsidisation will have an adverse effect on their operations. It is uneconomical to set up a CU in a small rural town and these are the towns that are usually linked with large towns to create a provincial CU.
Limits of regulation	Too many licensing bodies in water sector Only one licensed water provider for each town NWASCO teeth not tested Loss of vision by regulator	Water suppliers need licences from NWASCO, Water Board and Environmental Council of Zambia. The licences are for different aspects of the water supply and sewage treatment. Targets are set for the suppliers but the targets are rather flexible.
Urban/ rural divide	Widening gap especially in service delivery Rural water supply in need of new strategy Urban focus for investment because of cost return	Disparities in organisation of the water sector and problem solving leave the rural water sector in disarray. There are also some towns that are classified as rural but have the facilities of an urban centre and vice versa.

	Debated classification of rural area	
Maintenance	Related to ownership of project and infrastructure Essential for all projects and requires resources Requires increased community participation Increases citizen responsibility Government failing its citizens Related to project sustainability	Disparities in project life cycles in different parts of the country. The projects are usually in rural and peri-urban areas where community participation in projects is encouraged and sustainability is important. In urban areas maintenance of infrastructure is mainly the responsibility of the water supplier.
Skills and capabilities	Lacking in most CUs especially at management level Usually apparent but not real i.e. not long term Difficult to measure in some organisations Essential for community managed schemes Implementers play key role in passing on skills	Disparities in performance of water committees and CUs. The secondment of all former council employees to CUs has an adverse effect on performance and service delivery in urban centres. Management has been changed several times in some CUs.
Prioritisation of Uses	Domestic water is a primary use Enhances allocative efficiency Applicable to water bodies with high competition User pays principle	To be included in WRAP recommendations especially for Kafue basin. The Kafue basin has the highest demand for water resources in Zambia and industrial activity has impact on water quality in the river.
Water Demand Management	Encourages community participation Complements supply driven solutions Encourages water conservation Pre-emptive approach	Documents are available on research carried out on demand management but the concept does not seem to have been internalised by the water suppliers and the end users. The metering exercise in the urban centres and sensitization exercises do contribute to demand management.
Sanitation link	Water supply closely linked to sanitation Sanitation is usually forgotten because of water focus Related to public health Emphasised in peri-urban areas due to high density	More resources allocated to water than sanitation even though the link between water and sanitation is highlighted in all projects and studies. The link also encourages an integrated approach to water management. Most residents design and build their own soak ways and pit latrines. An improved ventilated pit latrine has been piloted in some areas

	Space is required to minimise contamination chances	
	Soak ways and pit latrines must be well designed	
Poverty Reduction Strategy	Home grown initiative to retarget donor aid for maximum impact	Documents available but programme differs from activity on the ground. The difference between the plans and action is usually blamed on the funding mechanisms that are available for the projects under poverty reduction and the support given to the activities by the donors. Even though government sets its priorities, the financiers may not agree.
	Prioritisation of projects according to local ideas	
	Donors still have control on fund allocation	
	Places health and education above water sector	
	Potential to improve coordination of donor aid	
IWRM	International discourse	Only at pilot stage though GWP is looking at internalisation. This is an international campaign which has potential to improve water management in Zambia especially that Zambia has a considerable amount of shared water resources.
	Lack of funds to ensure implementation	
	Low uptake	
	Piloted in Northern province by DCI and in Southern Province by Water Aid	
	Potential for holistic resource management	
Donor support	Uncoordinated	Current international debate to reorganise aid and make it more effective. A team has been set up in Zambia involving most stakeholders in the water sector. the team includes water Aid, DANNIDA, DfID and other donor organisations working along side government ministries relating to water i.e. MLGH and MEWD. Competition exists among donor organisations regarding visibility and projects supported.
	Too many conditions	
	Conditions sometimes unfeasible	
	Conditions affect project implementation	
	Numerous entry points that affect accountability	
	Debate to refocus and coordinate	
	Competition for particular areas and sectors	
Funding bottlenecks	Budget procedure related	Erratic release of project funds by relevant ministry i.e. MLGH or Ministry of Finance. Accountability is an issue for most projects especially given the numerous entry points for donor funds. Some times the funds that are allocated for projects are not actually available or are diverted for causes considered more of a priority.
	Adversely affect project implementation	
	Relate to availability of resources	
	One direction of information flow	

	No feedback to bottom tiers of administration	
	Funds difficult to trace because of numerous entry points	
Corruption/ Accountability	Poor accountability for released funds and water revenues Related to billing systems in CUs Related to erratic funding release by MoF and MLGH Contract bidding process not transparent Some water projects have no positive impact	Departmental and media reports usually show lack of accountability for project funds. The lack of transparency in project bidding processes also leaves room for corruption especially in government projects. In some towns like Kabwe, funds released for improving the water supply have had no visible impact.
Leadership	Essential for effective organisations Traditional rulers must be consulted and involved in community projects Hereditary leaders have different attitudes Training to improve skills can be provided Legitimacy and authority varies according to location	Traditional leaders are entry points for most NGO projects. The fact that some leaders are hereditary makes it difficult to remove them if the community chooses. The authority and legitimacy of traditional leaders is sometimes overlooked by project implementers.
Governance	Institutional reorganisation by WRAP Time consuming exercise Less attractive than engineering solutions Essential for maximum project impact Responsibility of project implementers	Championed by donor agencies and NGOs. Most government agencies do not have the capacity to address governance issues in projects. This aspect is usually left to NGOs like CARE International. The NGOs do some times work with line ministry staff at community level.
Customary vs. Common law	Customary law applicable for traditional lands Chief is consulted but president is custodian of land Common law more applicable in urban areas Coded customary law differs from customs Common law applied in times of dispute	There are differing local perspectives on authority and legitimacy of traditional rulers as compared to elected officials. The authority and legitimacy debate is prominent in the rural areas where traditional leaders command more respect.
Water And Sanitation Health and hygiene	Integrated approach from different sectors Encourages dialogue	Dominant at district level but not provincial level. The WASHE concept started off as an international campaign. Initial funding for

Education (WASHE)	Common entry point for projects Encourages community participation Effective at district level and not provincial level Accessible for most communities	the approach was provided by NORAD. The concept is applied in most districts especially by the health sector and community development office of the local authority.
MDGs	Entry point for donor funds Clear milestones Easy to represent in figures Not achievable at current pace of action Supply driven solutions Targets the poor, vulnerable and rural areas	Supported by donors and international financial institutions. There is a current debate in Zambia regarding the ability to meet MDGs given the current course of action. Most stakeholders feel the targets are unachievable without drastic changes to the pace and actions being taken.
Service Expectations	High level of service expected in urban areas where water rates are considered high Low expectations in areas catered for by local authorities Service should be improved before tariff increase Need investment to improve services Improved service does not guarantee willingness to pay	Greater awareness and expressions of demand in urban areas especially that there are visible channels to address concerns in most areas. Concerns from the community are more difficult to address in rural areas unless through the channel of traditional leaders or the DWASHE teams.

7.4.1 Silences

The positions taken on different discursive elements reveal some of the silences in the Zambian water sector. Some issues are dealt with by different government agencies or project groups e.g. the strategy for the rural water sector. However, some issues are not addressed by the responsible bodies or organisations. These overlooked or ignored issues are some the silences within the sector. A variety of reasons exist for not addressing issues such as the lack of human and capital resources or the attitude of those responsible for addressing them. In some cases the government agencies do not employ qualified staff; the staff lacks the capabilities to address particular issues like governance. Some project teams or agencies are not effective in carrying out their duties and overlook issues that they consider unimportant. Morale is generally low in government agencies mainly because of the low rates of pay. Additionally, in some extreme cases the project implementers or facilitators are not bothered to address a particular issue especially if it does not affect them directly. One example of the extreme case is the issue of project contribution, which eliminates some communities from qualifying for water projects in their areas of residence. The actors setting the criterion for qualifying for projects do not reside in the project areas. Therefore the consequences of an area not qualifying for a water project have no effect on these decision makers.

Silences can be drawn out from both the situational map and the positional map. The paragraphs that follow the situational map are the outcome of a relationship exploration among the different actors and actants. The exploration process identifies some relationships that may be hidden. The hidden relationships are in some cases accidental silences that different actors are not aware of. Positional mapping is more likely to reveal the deliberate silences that are not being addressed mainly because of lack of resources or knowledge to address these issues. It is more oriented to deliberate silences because it gives positions that are taken by different actors. Sometimes the deliberate silences are known, not necessarily to the responsible actor or the decision makers, they are just not being addressed.

Silences caused by lack of resources i.e. both human and financial resources include:

- Illegal settlements are not being entitled to service provision
- Access to clean and safe water being essential for development
- Citizens having a right to development
- Commercialisation leaving out poor and vulnerable
- Imposed water conservation in peri-urban areas and low cost areas
- Project commitment and contribution being too high for some communities
- Project commitment and contribution being biased towards more affluent residents
- Challenge for CUs and other water suppliers to include the poor
- Cross subsidisation requiring a significant number of high volume water users
- Skills and capabilities usually being apparent but not real i.e. not long term
- Sanitation usually being forgotten because of water focus
- Donors still having control on fund allocation
- Competition of donor support for particular areas and sectors
- Contract bidding process not being transparent
- Some water projects having no positive impact
- MDGs not being achievable at current pace of action
- Improved service delivery not guaranteeing willingness to pay

Silences resulting from overlooking of issues include:

- Peri-urban having a mixed range of living standards
- Development giving citizens choices
- Improving service delivery using various approaches
- Community participation increasing citizen responsibility
- Sustainability of projects being too much responsibility for some communities

- Willingness to pay and ability to pay being a fluid concept as personal circumstances can change
- Lack of funds to ensure implementation of IWRM
- Donor support conditions sometimes adversely affect project implementation
- Erratic release of funds by Ministry of Finance and Ministry of Local Government and Housing
- Hereditary leaders having different attitudes
- Governance issues being less attractive than engineering solutions

7.5 Social World Mapping

Social worlds/ arena maps lay out the collective actors and their arenas of commitment framing meso-level interpretations of the situation. They offer meso-level interpretations of the situation, engaging collective action and its social organisation and institutional and discursive dimensions[330]. The interpretations may be personal to individual actors but influenced by the situation and negotiations they are involved in. The actors situate themselves in the arenas through their interpretations. The resultant maps are based on an identified arena, which may emerge from the raw results or be pre selected for the analysis. Allowing the arenas to emerge from the data presents some challenges in dealing with the separate stages of results. A messy step of the mapping process may result from the initial analysis, requiring the use of composite concepts for manageable further analysis and potential visual representation. This critical point of analysis is influenced by the interpretations of the researcher.

In this research the social world maps are based on the raw results collected during field visits. The social world mapping process can have a bottom up, top down or mixed approach. In the Zambian case study the selected approach started with the analysis of interview material from the sites visited.

7.5.1 Raw material

All the semi-structured interviews were accompanied by notes and recorded in some cases[331]. The notes included key phrases and words used by the interviewee. They provided a guideline for the transcribing processes. All interviews were conducted by the researcher, expediting the transcribing process from the notes[332]. The interviews were mostly transcribed on the day of the interview while the event and information was still fresh in the researcher's mind. The semi-structured interviews allowed flexibility to seek clarification on particular issues raised and to follow the thought process of the interviewee. The interviewees were voluntary participants in the research representing themselves as individual water users or organisations in the Zambian water sector[333].

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[330] Clarke, A. E. 2003. Situational Analyses: Grounded theory Mapping after the Postmodern Turn. Symbolic Interaction, Volume 26, Number 4, pp 553-576

[331] Recording all the interviews would be ideal and attempts should be made to ensure this is done where possible. Alternatively thorough note taking and clarification would suffice.

[332] If the interviewer and the transcribers are separate individuals the interviews would need to be recorded.

[333] Voluntary means they participated willingly even though in some organisations an individual was requested or assigned by the approached authority in the organisation.

The interview transcripts were analysed in several stages both individually and in a team[334]. In the initial stage the researcher read through the transcript to recall the interview contents[335]. The second read over registered the sayables and thinkables in the situation[336]. The sayables and thinkables revealed the various individual and collective representations of the actors. They contain some of the key phrases and words recorded in the interview notes[337]. The researcher coded the emerging details according to modes of resource appropriation: representation, access modalities, use and allocation. Representation was further sub divided into representation of: self, water user, and water. This breakdown of analysis was initially used in the South African case study[338]. The modes of resource appropriation were broken down according to the questions below:

Section 1

7.5.2 Site Level Analysis

[334] A team effort in the initial analysis stages keeps it on track and potentially ensures the it is focused from the start. The team decides on the objectives of the analysis and the questions used to interrogate the data

[335] This research had field work extending over several months. Thus the analysis was conducted several months after some of the interviews were transcribed.

[336] The situation refers to the space in which the actor is operating. It is dependent on the actor and their commitments, perceptions and interpretations. The research team decided to focus on the sayables and thinkables as perspectives of the actors

[337] Verbatim is possible in some cases while in others the researcher interpreted the material from the interview using the points of reference of the interviewee and recurring phrases and concepts throughout the interview.

[338] The research strategy varied slightly for the South African and Zambian case study. In the former the team conducting the interviews used the modes of resource appropriation as guidelines in the interview process. In the Zambian case the interviews were conducted without specific reference to the modes of appropriation.

Representation of self

Unable to provide service
Manager
Well expert
Global discourse
Propose projects
Seek funding
Link between LA and residents
Build protected wells
Resource poor
Address community complaints
Community leader
Community representative
Community sensitizer
Health worker
Retiree
No income source
Fortunate recipient
Verify community claims
Raw water supplier
End user
Self reliant
Recycle ground water
Bring policy to grass roots
Commercial entity
Water supplier
Routine monitor of supply
Community officer
Communicator
Community policy advisor
Frustrated by end users
Provide service
Provide poor with safe water source
Drill water points
Rehabilitate and re-equip old points
Focused on cost returns
Transformer of employee attitudes
Improve services
Develop and manage water resources
Install infrastructure
Allocate water rights
Technical support for Water Board
Project implementer
Help communities prioritise needs
Ensure project sustainability
Develop skills in community
Project facilitator
Unsatisfied with service
Water collector
Non bill payer
Prioritise projects and applications
Submit plans for financing
Partner
Beneficiary
Observe and experience changes in supply
Disgruntled community member
Consulted by committee
Headman
Collect revenues
Repair infrastructure
Monitor use of infrastructure
Sample water quality
Provide information on flows
Stakeholder
Share resources among districts
Ensure project implementation
Encourage community projects
Protect traditional water sources
Advise communities on uncontaminated water resources
Distribute chlorine
Government officer
Facilitator of planning process
Set standards for access
Provide technical advice for communities
Expansionist
Burdened with dilapidated infrastructure
Cash strapped

Educate communities
Ensure WASHE concept in projects
Set up committees in communities
Action oriented
Value people
Provide for neighbourhood in dry months
Christian based organisation
Supplement government limited efforts
Ensure domestic quantities are collected
Coordinate programmes
Provide software for projects
Capacity building
Paying client
Helping neighbours
No choice of safe source
Ensure revenue collection
Surface and ground water monitor
Capacity to handle large projects
Bureaucrat
Implement strategic plan
Encourage farmers to use water resources
Ensure stakeholder involvement
Collect revenue
Aid poverty alleviation
Provide African village experience for tourists
Village guide
Influenced by tourist behaviour
Introducing non tolerance
Spare parts supplier

Representation of user

Deprived communities
Lacking resources and facilities
Female
Child
People without access to enough boreholes
Privileged clients
Kiosk client
Enlightened
Subordinate partners
Backyard gardeners
Illegal livestock owners
Aware of health risks
Willing to pay for satisfactory service
Vulnerable
Aged
Orphans
Short term tenants
Retirees
Domestic
Neighbours
Urban residents
Peri-urban residents
High cost residents
Medium cost residents
Low cost residents
Low density residents
High density residents
Commercial farmers
Peasant farmers
Animals
Employees
Non payers
Exploiting political influence
Dependant on government subsidy
Participants
Passive users
Resist paying for services
Consumer
Need educating
Accustomed to subsidised services
Use more than billed amount
Manual labourers
Unemployed
Disadvantaged poor
Fishermen
Livestock owners

Government institutions
Rural residents
Punishable if allowing neighbours free access on fixed supply
Contributors to projects
Involved in various project stages
Not caring for infrastructure
Need educating on technology use
Provide own solutions
Beneficiaries
Downstream
Cooperative members
Institutions
Commercial
Partners
No trust in council
Queue for resources
Receive bad service
Destructive and ignorant
Selfish
Select crops
Settle disputes
Encroach on source
Bridge constructors
Responsive
Believe in free supply
Expensive to cater for
Sense of responsibility
Rarely reap benefits of projects
Expectations not met
Active
Claim not to receive supply
Suffer effects of non funding
Poor people waiting indefinitely for help
Maintain infrastructure
Feel water rates are high
Contribute towards water bill
Immune to impurities
Illegal connectors
Contribute to local traditional authority
Posses varying perceptions of development
Foreign investors
Hunters
Uncontrolled wildlife
Women
Skin diseased
Tourists
Young sport loving tourists
Not accepting of true cost of supply

Scalar

Project
Township
Household
Neighbourhood
District
Household shifting
Community subgroups
Periphery
Town expanding
Operational plant
Farm
Treatment plant
Town
Community
Irrigation scheme
Network distribution
Province
Village
Point users
Urban centre
Sub district
Compound
Health catchment
Section
Coffee estate
Rural area
Rural health centres

Downhill residents
Neglected remote rural areas
Zone
Area
Peri-urban areas
Scheme
Tourist centre
Catchment

Representation of water

Safe domestic supply
Basic needs
Sustainable livelihoods
Protected sources
Consumer good
Resource needing protection
Must be affordable
Dry taps
Low pressure
Erratic supply
Chlorinated
Unsure quality
Treated at source
Open access
Reliable source
Occasionally in short supply
Rarely tested
By product from mining
Commodity
Dirty sources
Generates income
Increases productivity
Needs conservation
Low available volumes
Meets calculated requirements
Intersector demand driven
Meets drinking water standards
Low rates of return on investment
High cost in supply
Supply driven
Ensure future supply
Rationed supply
Enough supply
Local sacred sites
Disrupted supply
Commercialisations brings no improvement
Limited intake point
Large quantities available naturally
Requires protected collection points
Limited collection points
Component of ADP
Lack of it hinders development
Threatened source
Bad smell and taste after rains
Integrated with health
It is life
Capital intensive
Linked to sanitation
Supplement using well water
Not treated at source
Not a priority for central government
Cost recovery in urban centres
Quality not bad
Secure source
Bad yields
Easy cost recovery
Component of WASHE
Cleaner from ground sources
Cleaner from natural spring
Poor quality during rainy season
High water table
Saline in some locations
Requires management
Common good
High iron content
Development tool
Controlled
Productivity tool

Drought
Heavy and intensive rains
Sporting sites
Scared areas
High evapotranspiration
Large storage required

Drivers of Change

Environmental policy
Commercialisation
Space at household
Prioritisation of pit latrine
Distance to safe source
Duration of tenancy
Funds
Cost
Funding cycles
Local election of representatives
Life cycle of latrines
Funding opportunities
Hand over from office bearers
Feedback to communities
Water pressure in taps
Council funding sources
Human behaviour
House ownership
Seasons
Supplier behaviour
Household size
Housing classification
Service standards
Pilot project status
Political term of office
Affordability
Palatability of water
Concessions
Topography of area
RDC involvement
Community involvement
MDGs and local targets
Local level support from International organisations
Unbundling of flats
Clients paying for services
Reducing leakages
Reducing vandalism
Organisation of CUs
Management of CUs
Rehabilitating infrastructure
Droughts
Metering supply
CU financial kick start
Crop diversity
Routine maintenance
External market for produce
Improved water management
Inter-group negotiations
Traditional land ownership
Economics
Witchcraft beliefs
Capacity for treatment of water
Increased storage capacity of water
Tariffs
Accountability of tap attendants
Government institutions paying bills
Electricity costs
Removal of subsidies
Partnership with donor agencies
Financially viable schemes
Changing mindset of employees
Tariff increasing after improving services
CU access to financial markets
Handover between MLGH and MEWD
Capacity building in LA and CUs
IWRM
Alternative fuel sources
Land management skills
Effective traditional leaders
Institutions paying bills

Ability to draw water from neighbour
MOU from council
New developments and constructions
Costs of projects
Proximity of alternative source
Council accountability
User behaviour
Water rights
Chief's verification and authorization
Reducing pollution
Power supply
National standards
NWP
Community sensitization
Water act revision
Increased tourism
Donor conditionalities
Different working cultures and approaches
Influence of local politicians
WRAP
Strong institutions
International waters and related agreements
Supply of spare parts
Ease of maintenance
Cholera prone areas
Transit town status
Accountability of decision makers
Limited government resources
Communities monitoring projects
Local inferiority complex
Dependants and transport for water collection
Depth of well
Communication
Timely responses
Release of budgeted funds
Ownership of infrastructure
Soil type
Accessibility to remote areas
Politicized water points
Disaster periods and areas
Availability of ground water
Opening of new mine
Legality of compound
Influence of previous tenant or land owner
Extension of services
Contractors
Corruption
Skilled manpower
Employee behaviour
Increased revenues
Improved billing system
Intermediate technology
Settling bad debts
Overgrazing on dam walls
Moneterized economy

Water Use

Health campaigns
Domestic
Securing community projects
Protest for unsatisfactory service
Applying developed skills
Reaping benefits of personal investment
Neighbourhood harmony
Raising community funds
Abstraction
Discharge bodies
Cleaning
Irrigation
Safety in mining
Flood prevention
Development tool
Election campaigns
Exhibiting political power
Financing community activities
Sustaining operations
Promoting irrigation

Service to clients
Income generation
Ensure sustainability
Improving service delivery
Justifying payment for services
Department projects
Funding channel
Implementing international drives
Interaction between users
Dialogue between users
Drinking
Satisfying community needs
Daily life
Improving lives
Removing deficiencies
Bettering communities
Transferring responsibility to citizens
Free service
Building local capacity
Empowering communities to manage resources
Exploiting agricultural potential
Increasing yield
Improving drainage
Meeting organisational objectives
Growing profitable crops
Misrepresentation of needs
Fishing
Livestock
Sacrificial cooking
Rain making
Resting place for traditional leaders
Meeting targets

Access to decision making power

Prioritise projects
Recognition by donors
Recognition by LA
Elected by community
Committee responsibility
Role at interface
Communal well
Metered
Donor funds
Community mobilisation
Organisational power
Statistics
Reticulation
Neighbour
Water fee payment
Locking mechanism on tap
Township supply
Collecting revenues
Collecting fees
Licence
Mining firm
Political ruling party
Government mandate
Ability to disconnect services
Tokens
Limiting volumes
Knowledge
Experience
Organisational mandate
Data collected
Direct link with councillors
Inventory of water points
Company management
Verification of data
Allocation of funds
Payment for connection
Door to door sensitization
Links with funding organisations
Listing potential beneficiaries
Postgraduate qualifications
Self reliance
Capital
Standardization
Office held

Self belief
Links with grass roots
Providing acceptable standard of service
Monitoring consumption
Diplomacy and negotiations
Full cost recovery
Exposure to other locations with expertise
Water user group
Tourist village
Influential traditional leader
Appointed by chief
Cleansing practices
Guidelines in dam building

Technology

Tankers
Manhole covers
Africare pumps
Lakes
Hand dug wells
Shallow wells
Protected wells
Communal taps
Protected wells
Monopumps
Individual taps
Piping
VIP latrines
Pit latrines
Flushing toilets
Valves
Mains
Mine water works
Boreholes
Booster pumps
Pumps
Water treatment plants
Dam
Meter
Kiosks
Pipe network
Customer database
Transport
Stream
Gate valve
Canal
Engines
Low lift pumps
Screens
Sedimentation tank
Filter
Contact tank
Clear water tank
Chlorinator
Rising mains
Treadle pump
Submersive pump
Standpipes
Soak aways
India mark II pump
India mark III pump
Natural spring
River
Weir
Siphon
Scoop holes
Rings
Windlass
Hosepipes
Rig
Furrow
Storage tanks
Parallel pipes
Rapid sand filters
Burnt bricks
Cement
Apron
Bucket
Seasonal stream

Drip irrigation
Centre pivot
Collection chamber
Hydrological gauges
Hand pump
Galvanised pipes
Steel pipes
Water tower
Filters
Reservoir
Elevated tank
Asbestos pipes
Hard plastic pipes
Sprinklers
Hydrant
Points
Raw water harvesting
Conversion system
Multi-purpose points
Mud drilling
Gravel packs
Lagoon
Consolain pump
Blair pump
Jetted wells
Dambo

National level

Representation of self

Coordinator
Facilitator
Director
Advisor
Bridge or link
Technocrat
Install infrastructure
Capacity builder
Trainer
Advocate
Advisor for Ministry
Coordinate donor activity
Filling gaps
Sensitize communities
Demonstrate technology
Monitor water quality
Disinfect water sources
Provide water infrastructure
Encourage community
Exploit economic potential of resources
Advice and assist farmers
Generate electric power
Regulate domestic water
Monitor operations of CUs
Monitor water quality in natural bodies
Test drinking water quality
Set standards for drinking water
Government partner
Implement water sector initiatives
Bring government, private sector and civil sector together
Conduct needs assessment
Encourage council to legalise settlements
Supplement government efforts in service provision and extension
Control water pollution
Allocate licences for effluent discharge into water ways
Educate communities
Christian organisation
Empower people and give them knowledge
Control abstraction and impounding of water
Issue water rights
Government project
Establish a comprehensive legal and institutional framework for use,

management and development of water resources

Champion IWRM campaign

Representation of user

Small scale farmers

Dependants

Lacking qualified manpower

Lacking resources

Donor dependant

Irrigation farmers

Domestic users

Consumers

Beneficiaries

Stakeholders

Poor

Contributors to project

Propose projects

Rural residents

Peri-urban residents

Participants

Suffers of pollicised environments

Non payers

Subjects to be taught and educated

Specific responsibility as users

Maintain infrastructure

Aim to please donor

Influential community members

Legal settlement residents

Discharge effluent into water ways

Relocated residents

Willing to do something about their situation

Primary users

Secondary users

Tertiary users

Partners

Commercial utilities

Water suppliers

Scalar

User group

Project

National

Provincial

Community

Multi scalar

Periphery

Central government

Village

Discourse

Settlement

Water ways

Zone

Catchment

River basin

Drinking water supply sub sector

Representation of water

Production tool

Need

Public good

Commodity

Demand driven

Safe sources

Component f community projects

Integrated with health or education

Livelihoods

Daily living necessity

Service

Quality requires monitoring

Need to ensure sustainability

Economic development tool

Needs conservation

Unsure of exact quantity and quality

Drivers of change

User behaviour

Available resources
Expansion of irrigation
Political will
Availability of funds
Classification of resources
Project proposals
Potential benefit from projects
Education
Demonstration
Prioritisation of projects
Funding structure
Project guidelines
Counterpart funding
Political systems
Subsidisation
Seasons
Disease outbreaks
Local water quality
Needs assessment
Community initiative
MDGs
Human capacity
Commercialisation
Variation of tariffs
Sustainability
Community ownership
Conversion from service focus to cost recovery
Revival of Water Resources Master plan
Financial stability of CUs
Institutionalisation of drives
Determination from national leadership
Engagement of various actors
Charges for water
Distance to safe water sources
Amended water act
Legalising settlements
Beneficiaries managing resources
Community incentives
Donor conditionalities

Water use

Providing livelihoods
Subject matter
Tool for testing approaches
Technical expertise
Improving standards of living
Poverty alleviation
Capacity building
Spreading best practice
Dialogue tool
Policy direction
Political power and control
Community harmony
Protest tool
Financing party activities
Preventing diseases
Force initiative
Fulfil responsibility
Implement policy
Advocacy
Public relations
Meeting community needs
Fulfilling organisational role
Service provision

Access to decision making

Information
Directives
Planning
Qualifications
Prior research or study
Government partnership
Technical cooperation
Finance
Data
Negotiation with line Ministries
Expertise in capacity building

Donor preference
Advocate of state centrality
Predetermined criteria
HIPC funds
Ministry responsibility
Policy
Needs assessment
Sourcing funds
Parliamentary act
Statutory law
Supporting NWP
Participatory appraisal
Training

Technology
Dams
Pipes
Drip irrigation
Pumps
Canals
Meters
Water points
Treatment plants
Boreholes
Windmills
Tanks
Solar pumps
Submerssive pumps
Taps
Pit latrines
Chlorine
Stands

Section 2

7.5.3 Composite Concepts for Site Level Social Worlds

Representation of self
Technocrat
Community worker
Expert
Bureaucrat
Resourceful
Broker
Implementer
Facilitator
Supplier
Manager
Employment
Recipient
Commercial
Client
Leader

Representation of user
Gender
Poverty
Social status
Legality of location or use
Density of residence
Commercial activity
Dependency levels
Payment methods and patterns
Institutional classification
Capacity possessed
Physical location
Organisational structure
Membership or affiliations
Activity or use
Expectations
Beliefs
Tenancy
Influence

Consumption levels
Benefits accrued
Cost of service
Health

Scalar
Physical boundaries
Interface
No boundaries
Abstract boundaries
Discourse boundaries
Mandate boundaries

Representation of water
Supply quantity
Supply quality
Volumes required
Use
Value
Availability
Treatment
Standards
Integrated
Seasons
Source
Control
Accessibility
Reliability
Scientific process

Participation
Ownership
Local politics and elections
Topography
Organisational structure
Attitudes of users
Attitudes within organisation
Seasons
Commercial model
Access to markets
Maintenance
Beliefs and customs
Expectations
Standards
Institutional
Accountability
Awareness
Availability of water resources
Economic activity
Legal
Tenancy (house and land)
Supply
Household (size and location)
Leadership
Productivity
Costs
Donor conditions and behaviour
Alternative sources
Power supply
Harmonising approaches
Diseases and health
Transport

Drivers of Change
Policy
Discourse
Negotiations
Availability of funds
Technology
Skills

Water Use
Health
Domestic
Projects
Relationships
Skills

Safety
Income generating
Meeting needs
Livelihoods
Fishing
Customs and traditions
Empowerment
Service
Productivity
Livestock
Protest tool
Influence
Operations
Meeting objectives

Access to decision making power
Recognition
Election
Office responsibility
Relationship
Technology
Expertise

Funds (control)
Information held
Tradition and custom
Legal
Appointment
Membership
Influence
Payment
Self reliance
Standardization

Technology
Natural water bodies
Transport
Industrial and domestic supply
Treatment
Irrigation
Sanitation
Storage
Billing
Monitoring levels and quality

Section 3

7.5.4 Composite Concepts Deconstruction

Representation of Self

Technocrat
Civil servant
Project team
Repairs
Expansion
Machinery
Skills

Community worker
Leaders
Representatoives
Sensitizer

Health worker
Policy implementer
Advisor
Service provider
Helper
Encourage
Set up committees
Educate
Coordinate
Build capacity

Expert

Well construction experience
Well rehabilitation experience
Developing community skills
Monitor use
Experience
Qualification
Recognition
Benchmark data
Trend analysis

Bureaucrat
Verify information
Monitor
Community relations
Allocation of rights
Planner
Share resources
Civil servant
Promote concepts

Resourceful
Links
Potential influence
Prioritising
Ceremonial figurehead
Posses information
Past record
Planner
Action potential
Recognised leader

Broker
Discourse
Assist government
Assist communities
Aid poverty alleviation
Seek funding

Gender
Sex
Age
Traditional role
Allocated role
Household role

Poverty
Deprivation
Assets

Implementer
Propose projects
Hands on involvement
Middlemen
Strategic planners

Supplier
Adequate service
Inadequate service
Helper
Raw source
Treated source
Seasonal
Asset base limitations

Manager
Employee base
Services
Resources

Employment
Income
Level
Status

Recipient
Satisfaction
Fortune

Representation of user
Resource accessibility
Disadvantaged
Ignored
Attention give
Assistance required

Social status
Previledges
Available infrastructure
Employment
Use
Role in household
Payment
Active
Passive
Choices available

Commercial
Supplier
Client
Discourse endorsed
Asset base (funds)

Leader
Company
Community
Appointed
Hereditary
Elected
Voluntary

Recognition
Self
Discourse
Donor (Financier)
Community (target group)
Government (Facilitator)
Implementer

Vulnerability
Housing location

Legality of location or use
Public health
Connections (supplier determined)
Housing (Local authority)

Residence

Urban

Peri-urban

Rural

Cost of housing

Density

Commercial activity

Water use

Classification

Dependency levels

Government subsidy

Service subsidy

Source

Type

Payment methods and patterns

Willingness

Affordability

Institutional classification

Existence

Type

Capacity possessed

Knowledge

Capabilities

Partnership

Education

Technology

Responsibility

Contribution (potential)

Honesty

Finances

Physical location

Neighbourhood

Rural

In relation to natural resources

In relation to other users

Organisational structure

Employment

Skill level

Membership or affiliations

Cooperative

Community

Neighbourhood

Activity or use

Scale of use

Type of use

Participation

Passive

Contribution

Responsibility

Partnership

Project

Livelihood

Expectations

Service

Responsibility

Being met

Development view

Responsibility to meet them

Beliefs

Reputation of supplier

Personal behaviour

Customs

Traditions

Tenancy

Length

Nature

Influence

Political

Community

Consumption levels

Volumes

Supplier estimates

Supplier estimates

Benefits accrued

Target groups

Uneven capture

Cost of service

Health

Diseases

Immunity

Scalar

Physical boundaries

Township

Household

District

Treatment plant

Private land

Province

Zone

No boundaries

Periphery

Tourist area

Abstract boundaries

Village

Urban area
Compound
Scheme

Discourse boundaries

Supply quantity
Pressure
Disruption
Erratic
Rationing
Sufficient
Shortages

Supply quality
Trust
Taste
Comparative
Impurities

Volumes required
Storage

Use
Domestic
Basic needs
Livelihoods
Life
Essence
Development
Productivity
Sport
Tradition/ Custom

Value
Consumer good
Affordability

Policy
Environmental
Catchment
Vulnerable
Urban poor
Remote areas

ROI
Commodity
Supply cost
Sacred
Commercial
Development
Priority
Common good

Availability
Volumes
Natural
Yields
Water table

Treatment
Chlorination
Point
Testing
Scale

Standards
Calculated requirements
Drinking water

Integrated
Demand driven
Health
Area Development Programme
Sanitation

Drivers of Change
Housing
Project

Mandate boundaries
Projects
Organisation

Representation of water

Seasons
After effects of rains – taste and quality
Droughts
Rainfall intensity

Source
Protection
Sustainability
Intake
Potential threats
Long term security
Quality

Control
Conservation
Management
Allocation

Accessibility
Access
Collection points

Reliability
Source

Scientific process
Evapotransipiration rates

Health
Donor

Organisation

Discourse

MDGs

IWRM

International agreements

Negotiations

Internalisation

Inter group

Funds

Availability

Costs

Cycles

Opportunities

Sources

Pledges

Limitations

Budget release

Increasing revenues

Technology

Life cycle

Spare parts

Intermediate

Skills

Land management

Man power

Participation

Involvement

Community

Ownership

Monitoring projects

Infrastructure

Local politics

Elections

Office handover

Length of office

Local influence

Politicized points

Campaigns

Topography

Area

Organisational structure

Supplier

Commercial utility

Ministry roles

Attitudes

Individuals

Values

Willingness to pay

Organisations

Behaviour change

Users

Inferiority

Priorities

Open access

Employees

Seasons

Droughts

Rainfall

Cycle

Commercial model

Commercialisation of sector

Pilot projects

Consumer pays

Cost returns

Financial viability

Efficient billing

Cancelling debts

Markets

Access

Availability

Financial

Products

Maintenance

Leakages

Vandalism

Rehabilitation

Routine

Ease

Type

Responsibility

Timing

Beliefs and customs

Witchcraft

Expectations

Feedback

Service levels

Appropriate tariffs

Responses (timing)

Standards

Services

Regulator

Expectations

Institutional

Organisational management

Resource management

Capacity building

MOU

Strength

Corruption

Accountability

Revenue collectors

Local council

Decision makers

Targets

Office bearers

Awareness

Sensitization

Availability of water resources

Distance

Permission

Depth of water table

Ground water quality

Economic activity

Concessions

National scale

Local businesses

New developments (construction)

Tourism

Mining

Services

Monetorization

Legal

Acts

Compounds

Contractors

Health

Campaigns

Neighbourhood

Public

Tenancy (house and land)

Duration

Ownership

Traditional land

Influence of tenant

Supply

Pressure

Palatability

Metering

Treatment capacity

Household (size and location)

Size

Dependats

Internal hierarchy

Affordability

Income sources

Priorities

Leadership

Elected

Hereditary

Voluntary

Appointed

Productivity

Crop diversity

Soil type

Inputs

Land management

Power supply

Domestic

Chores

Drinking

Costs

Electricity

Subsidies

Projects

Donor conditions and behaviour

Partnerships

Conditions

Approaches

Models

Alternative sources

Fuel

Water

Payment

Power supply

Harmonising approaches

Development

Implementation

Diseases and health

Natural disasters

Endemic

Prone

Transport

Remote areas

Routes

Transit towns

Water Use

Projects

Sustainability

Department responsibility

Community implementation
Localisation

Relationships
Harmony
Dialogue
User

Skills
Developed
Application
Practice
Use

Safety
Mining
Flood

Income
Community
Generation
Justification
Channels

Meeting needs
Community

Recognition
Donors
Local authority
Organisation
Community

Election
Community

Office responsibility
Committee

Individual
Daily
Deficiencies
Representation

Livelihoods
Improvement

Fishing

Customs and traditions
Sacrifice
Rain making
Resting place

Empowerment
Responsibility
Capacity
Community

Service
Clients
Delivery
Costs
Charges

Productivity

Access to decision making power

Revenue collection
Organisation
Company
Mandate

Relationship

Technology
Reticulation
Locks
Disconnection of service

Irrigation
Development
Promotion
Potential
Yields

Livestock

Protest tool
Unsatisfactory service

Influence
Personal investment
Campaigns
Exhibition

Operations
Abstraction
Discharge
Sustainability

Meeting objectives
Organisational
Mandates
Targets

Expertise
Practical
Knowledge
Experience
Inferred
Exposure
Qualification

Funds (control)
Donors

Allocation
Capital

Information held
Relationship building
Statistics
Access
Data
Inventories
Links

Tradition and custom
Leader influence
Cleansing

Legal
Licence
Acts
Companies

Natural water bodies
Lakes
Streams
Springs
Rivers
Seasonal streams
Lagoons
Dambos

Transport
Vehicles
Pumps

Industrial and domestic supply
Pumps
Wells
Taps
Pipes

Appointment
Traditional
Political
Government

Membership
Community
Township
User group
Voluntary
Hereditary
Boundaries
Participation
Payment
Acceptance

Influence
Mobilisation

Technology
Boreholes
Meters
Valves
Distribution
Collection
Control
Monitoring
Protection

Treatment
Plants
Pumps
Screens
Filters
Tanks
Mains
Chambers
Towers

Political
Local authority
Sensitization

Payment
Fees
Collection
Tokens
Connection

Self reliance
Belief
Capability
Resources

Standardization
Guidelines
National

Irrigation
Canals
Pumps
Weirs
Siphons
Furrows
Buckets
Drip
Pivot
Sprinklers

Sanitation
Manhole covers
Latrines
Soak aways
Toilets

Storage
Dam

Tanks

Reservoir

Billing

Database

Monitoring levels and quality

Gauge

7.5.5 Social World Mapping Steps

The following sections detail the steps of analysis to create social world maps. They document the sources of raw materials and their methods of collections. They elaborate on the analysis steps and thought processes. They conclude with thoughts on visual versions of the maps and the multi scalar approach followed in this research.

In this research the social world maps are based on the raw results collected during field visits. The social world mapping process can have a bottom up, top down or mixed approach. In the Zambian case study the selected approach started with the analysis of interview material from the sites visited.

7.5.5.1 Raw material

All the semi-structured interviews were accompanied by notes and recorded in some cases[339]. All interviews were conducted by the researcher, expediting the transcribing process from the notes[340]. The modes of resource appropriation were broken down according to the questions below:

Representation of self

How does the actor represent himself in relation to water resources?

Representation of water user

How does the actor represent the water users they interact or relate with?

Scale

What scalar level do they think at?

Representation of water

How does the actor represent water resources?

Drivers of change

What factors does the actor perceive as important to cause changes at various scalar levels, whether they react or initiate them?

Water use

How does the actor use water resources to play their role or achieve their purpose?

Access to decision making

What are the key relations that empower the actor in decision making?

Technology

What technology does the actor identify or work with?

[339] Recording all the interviews would be ideal and attempts should be made to ensure this is done where possible. Alternatively thorough note taking and clarification would suffice.

[340] If the interviewer and the transcribers are separate individuals the interviews would need to be recorded.

The questions aid the collection of the same type of information from each interview and the comparison of the Zambian and South African cases using the same base line questions. The analysis at this stage produces a rather messy starting point version for the map. The composite concepts form the 3rd stage of analysis.

7.5.5.2 Composite concepts

A desired effect of the mapping process is to produce a set of results that can be represented visually. Composite concepts within the modes of appropriation are used to synthesise the emerging interpretations and refine the maps. They emerge from the sayables and thinkables and question the relationship to the modes of appropriation. The analytical step poses a set of questions that are illustrated below.

Representation of self

What reference points do the actors use to define their role?

Representation of water user

What terminology is used to identify the end user of the water resources?

Scale

What boundaries exist on the scale of thought?

Representation of water

What aspect of water resources does the actor identify or deal with?

Drivers of change

What are the issues that drive the changes based on?

Water use

What is the product or end use of the water resources?

Access to decision making

What channels and mechanisms are used to access and establish the decision making power?

Technology

What purpose does the technology used serve?

The composite concepts of the translations of the modes of resource appropriation point to specific arenas[341]. The translations existing within them deserve further analysis by deconstruction, the 4th step of analysis.

7.5.5.3 Deconstruction of composite concepts

The composite concepts can be deconstructed to reveal a layer of actor interactions and influences. Some of these translations may not have initially been expressed by the actors, which

[341] The translations are individual modes of resource appropriation which can be grouped according to the classifications of: representation, access modalities, transfer of access modalities, allocation and use.

emphasises the value added by the analysis. Deconstruction is another analytical step that is dependent on the researcher's interpretations and understanding. It is done with a purpose in mind. In this research the purpose is to identify the emerging actors and how they shape the situation of analysis.

The deconstruction returns to the sayables and thinkables. Each composite concept is interrogated using the sayables and thinkables that it emerged from to produce a set of components. The analysis can be phrased as a question for each composite concept referring to the modes of resource appropriation. The questions are detailed below.

Representation of self

What is the actor's specific role in the arena?

Representation of water user

What are the actor's reference points and terms in this arena?

Scale

What are the actors identified scales in this area?

Representation of water

What aspects are identified or referred to by the actors in this arena?

Drivers of change

What features of the drivers are identified by the actors in this arena?

Water use

What are the actors identified locations and manifestations in this arena?

Access to decision making

What aspects determine the decision making in this arena?

Technology

What types of technology are identified by the actors in this arena?

The actors identified in the situational analysis can be located in the component maps to show their areas of influence and their signification. The level of influence is not necessarily shown in these maps. Further analysis is required to compare the dominant views and perceptions with the grass root maps.

7.5.5.4 Visualisation

Thoughts on the actual visual maps are still evolving. So far the components of each composite concept can be mapped to show the actor based areas of influence and basis of legitimacy. However, the actors include the targets for the influence, which were not separated during the analysis. This conflict is raised by the researcher's perception of what the map should show. If the objective is obtaining a measure of the influence particular actors have on others in the situation, then the groups should be separated during analysis. If it's to show the dominant perceptions from all grass root actors then separation is not necessary. The site interviewees include representatives of actors at the national level. The representatives consider themselves as part of the grass root actors and distinguish themselves from the national actors mostly based in Lusaka.

They also consider themselves to be in a privileged position and possess knowledge from target groups and national actors. With this in mind several ideas emerge.

Option 1a: Using each representation of self that was identified within step 3, we return to the sayables and thinkables and bring out the other modes of resource appropriation. It is important to have the list of which sayables and thinkables constituted the composite concepts within each mode. The results at each stage are based on actors who create an ideal starting point for the map. The identities of the actors are blinded during the analysis i.e. no reference is made to a particular one. This depiction allows us to extrapolate the potential influence of each composite group of actors. However the foreseeable challenge here is the fact that some actors belong to several composite groups[342].

Option 1b: For each access to decision making power composite concept, we position the actors to reveal the type of influence and the actors involved at various scales. Once again we need to return to the sayables to extract the thought of scale for each actor.

Option 1c and 1d: Repeat process of analysis using the representation of the user and representation of water composite concepts. Scale is unlikely to be important in option 1c but is useful in option 1d.

All options are two dimensional maps representing the interpreted influence and its potential scale of impact. The multi dimensional map can probably be created using the two dimensional maps and holding the scale constant. A process of elimination can be used to determine which maps add value.

Option 2: Using each composite concept in the modes of appropriation, place the identified actors in each component. Some components reveal the actors which should make the process easier. This option removes the concerns on actor locations and prevents generalisation to include all possibilities. However, each composite concept produces a separate level of information. Composite concept maps may be created using these layers.

7.5.5.5 Multi scalar approach

The steps of analysis were repeated for the national level. The actors were identified and interview raw results analysed. The analysis produced a separate set of composite concepts that can be interrogated using the site level analysis and international discourse. The international discourse provides a separate scale of analysis that primarily uses secondary sources. The levels included so far illustrate the multi scalar level of analysis followed throughout the project. The interrogation of the various maps allows us to illustrate some of the impact of official discourse at the grass roots and contrasts that may be occurring between the various levels.

[342] An organisation like an NGO is made up of separate teams including projects, finance, communications etc. The project teams can also be subdivided into various sections such as water and sanitation. Some teams can be classified as bureaucrats, others as community workers and others as technocrats.

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