

Sustainable Community-Based Natural Resources Management in sub-Saharan Africa: Perspectives on Potable Water Supply in Northwest Cameroon.

By

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THESIS

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DECLARATION 1-PLAGIARISM

I, Bikwibili Tantoh Henry declare that this thesis (data, diagrams, graphs, tables and any other information) is my own original work, except to the extent that has been acknowledged.

This thesis does not contain other persons' writings, unless specifically acknowledged as being sourced from other researchers. Where other written sources have been quoted, then: their words have been re-written and the general information attributed to them has been referenced. Where their exact words have been used, then their writings have been placed in italics and inside quotation marks, and referenced.

The thesis is being submitted for the award of the degree of Doctor of Philosophy (PhD) to the Faculty of Science, School of Geography Archaeology, and Environmental Studies (GAES) at the University of Witwatersrand, Johannesburg, South Africa. It has not previously been submitted for examination or award of degree to any other institution of learning.

DECLARATION 2-PUBLICATIONS

I, Bikwibili Tantoh Henry, declare that I personally undertook all the data collection, analysis, development and writing of the manuscripts and articles mentioned below. I wish to commend my co-author for providing useful advice and comments, as editing the manuscripts. Sections of this work have been published or submitted as manuscripts for publication to the following peer-reviewed journals:

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As the candidate's supervisor, I certify the above statement and have approved this thesis for submission. I certify that the above statement is correct:

Prof. Danny Simatele

Signature:  Date: 24th October, 2017

DEDICATION

To the memory of my father, the Late Bikwibili Andrew Njokom and brother Francis Afegnui who left this World very early.

To my mother, Agnes Ban Bikwibili for her unwavering support, love, and prayers.

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ABSTRACT

Natural Resources (NRs) across sub-Saharan Africa (SSA) have been managed from centralised systems, and this has resulted in massive marginalisation and disenfranchisement of poor rural communities. However, there is now a shift in policy interventions towards adopting pro-community approaches in resources' management. Community-Based Natural Resource Management (CBNRM) has thus, been identified as one of the ways through which Common Pool Resources *(CPRs)* could be better managed in much of SSA and other parts of the developing world. This approach to management always involves a sharing of authority and responsibility for managing resources among all interest-driven actors. Although evidence has shown that effective CBNRM and the institutions that manage them are potentially better positioned both to respond and adapt to locally specific socio-ecological conditions, and represent community interests, key questions on how to propagate the participation of the most vulnerable members of a community and the impact on Community Development (CD) remain pertinent. In this regard, policy proposals and official structures promoting it continue to show varying results across and within communities.

This study investigated the role of CBNRM in promoting the effective use and management of potable water in Northwest Cameroon. The study further examined existing challenges in managing water resources and look for an alternative operational approach for sustainable water resource management. Using both empirical and secondary data collected through the use of methods and tools inspired by Participatory Learning and Action (PLA), and rapid appraisal of existing literature, it was demonstrated that, to effectively manage rural water systems in Northwest Cameroon, there is a need to redefine the principles that underpin the management of this important resource through simplification so that ordinary citizens and other stakeholders can work together in a more coordinated manner. This collaborative approach encouraged community participation and enablement that resulted in communities networking with other stakeholders. What emerged from this situation is that involving and engaging all stakeholders throughout the initiation, execution processes facilitated transparency and encouraged the improvement of institutional capacities in decision-making at the community level. There is now an urgent need to promote efforts that address issues of community empowerment in the management of NRs.

It is argued in the study that a practical methodological framework using a System Thinking Approach (STA) will enable and enhance sustainable Community-Based Water Resource Management (CBWRM) in poor rural communities in Northwest Cameroon. This paradigm serves as a platform for collaboration through relationships with stakeholders to address issues of mutual concern and interest. This alternate approach to sustainable management is based on a more interactive top-down and bottom-up management model that focusses on power relationships among actors and the application of strategies created by them in response to particular policy choices. This is justified by the strategies and influences of the multiple stakeholders with often varied activities and interests. Furthermore, the study revealed that a resolute devolution of power, active participation and empowerment of rural communities will facilitate and invigorate a platform for capturing the views of diverse user groups and this, in turn, can bring about a community-driven development process.

The findings of this study have both theoretical and practical implications on NRM. They provided a comprehensive debate on CBWRM and how STA can offer a new dimension to the theories of stakeholder's participation in CBNRM and CD in SSA. This could be an effective and efficient management design in assisting governments and CD practitioners to resolve the water challenges rural communities in Cameroon and other developing countries.

Key words: *Community-based management, rural, participation, sustainability, Cameroon.*

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	African Development Bank
ADMADE	Administrative Management Design for Game Management Areas
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CAMWATER	Cameroon Water Utilities Corporation
°C	Degree Centigrade
CBI	Community Based Institutions
CBM	Community Based management
CBNRM	Community Based Natural Resources Management
CBO	Community Based Organisation
CBWM	Community Based Water Management
CBWRM	Community Based Water Resources Management
CBWSM	Community Based Water Supply Management
CCP	Communal Conservancy Programme
CD	Community Development
CDE	Camerounaise des Eaux
CEAC	Community Development and Action Centre
CLD	Causal Loop Diagram
CLDA	Causal Loop Diagram Analysis
CPRs	Common Pool Resources
CSOs	Civil Society Organisations
DWS	Drinking Water Supply
DCD	Departments of Community Development
DRE	Department of Rural Engineering
DO	Divisional Officer
FCFA	CFA Franc
FAO	Food and Agriculture Organisation
FEICOM	Special Council Support Fund for Mutual Assistance

GMAs	Game Management Areas
GP-DERUDEP	Grass-field Participatory and Decentralised Rural Development Project
HELVETAS	Swiss Association for International Development
IKS	Indigenous Knowledge System
LIFE	Living in a Finite Environment
LIRDP	Luangwa Integrated Resource Development Programme in Zambia
M^3	Cubic meter
MM	Millimetres
MDG's	Millennium Development Goals
MIINADER	Ministry of Agriculture and Rural Development
MINDUH	Ministry of Urban Development and Housing
MINVILLE	Ministry of Towns
MINEE	Ministry of Energy and Water Resources
MINENP	Ministry of Environment and Nature Protection
MINEPAT	Ministry of Economy, Planning and Regional Development
MINATD	Ministry of Territorial Administration and Decentralisation
MINFI	Ministry of Finance
MINTRANS	Ministry of Transport
MINFOF	Ministry of Forestry and Wildlife
MINSANTE	Ministry of Public Health
NGOs	Non-Governmental Organisation
NRs	Natural Resources
NRM	Natural Resource management
NTFPs	Non-timber Forest Products
OECD	Organisation of Economic Community Development
OM	Operation and Maintenance
pH	Proportion of Hydrogen
PAEPA-MRU	Water Supply and Sanitation Programme in Rural Areas
PEYE	Premier et Yoshim Entreprises

PLAN Cam	Plan International Cameroon
PLA	Participatory Learning and Action
RPA	Rural Participatory Appraisal
SATA	Swiss Association for Technical Assistance
SAP	Structural Adjustment Programme
SHUMAS	Strategic Humanitarian Service
SNEC	National Water Company of Cameroon
SNV	Netherlands Development Corporation
SSA	sub-Saharan Africa
STA	System Thinking Approach
US$	US Dollar
UNCED	United Nations Conference on Environment and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDP	United Nations Development Programme
VDA	Village Development Association
VDP	Village Development Project
WMCs	Water Management Committees
WRM	Water Resources Management
WRI	World Resource Institute
WUCs	Water User Committees
WWAP	World Water Assessment Programme
ZATACUDA	Zang-Tabi Cultural and Development Associa

CHAPTER ONE

1.1. Frame of reference

The deterioration of environmental systems is a dynamic process in every continent particularly, in sub-Sahara Africa (SSA) (Millennium Ecosystem Assessment, 2006). Soil depletion, deforestation, loss of biodiversity, water scarcities, floods, desertification, food insecurity and global warming, are some of the immediate ugly consequences of poor environmental and Natural Resource Management (NRM) (Amungwa, 2011). It has been argued that the relationship between humans, institutions, and Natural Resources (NRs) is impactful and dependency-oriented (Bosch, King & Herbohn, 2007). As a result, rural populations who mostly rely on the availability of NRs continue to exert significant impacts on the resources in a manner that threatens their sustainability. This state of affairs has been stimulated by; i) population growth, ii) changing consumption patterns, iii) increase in the prevalence of poverty and iv) advances in technological development (Lockie & Sonnenfeld, 2008; Binswanger-mkhize, Regt, & Spector, 2010). Given these threats, NRM has become a global concern, particularly within the context of globalisation in which the adverse effects on NRs and environmental degradation know no limits (Fonjong, 2008).

The central question in this research was to investigate the potential role of rural communities in enhancing sustainable Community Based Water Resource Management (CBWRM) in Cameroon. The more specific question this paper addresses was how to achieve sustainable water management where a series of complexities and uncertainties (uncoordinated national development policies, a weak institutional framework, a recent

history of top-down water management approaches, a tradition of paternalism among authorities, an inability of the water users to contribute to water management and watersheds that are already degraded) make it particularly difficult to do so. This research explored how different forms of governance might lead to easier water user involvement resulting into more sustainable Water Resource Management (WRM) systems.

It is a widely held view that water and fresh water, in particular, is the most important resource among other NRs and occupy a special place which cannot be replaced (Shiklomanov, 1998; Jowsey, 2012). However, despite the importance of water for the sustenance of life on the planet, humanity is polluting, diverting and depleting the earth's finite water resource at a dangerous and steadily increasing rate (Barlow, 2007). The Global Water Partnership (GWP, 2014) argues that many parts of the world are facing water shortages, while others must contend with severe water pollution and inundation. Barlow (2007), for example, observe that the abuse and displacement of water in the ground-level is equivalent of greenhouse gas emission, and likely as great a cause of climate change. Supporting this assertion, Venton (2007) emphasised that changing climates have significant impacts on water availability, as well as the quality and quantity of water that is available and accessible to meet human and environmental demands. These, it is felt the global water crisis has become a powerful symbol of the growing inequality in our world.

In the same vein, The Joint Monitoring Programme (WHO & UNICEF, 2014) reported that more than 780 million people still lack ready access to improved sources of drinking water of which 650 million people are rural dwellers with 338 million in SSA. The World Health Organisation (WHO, 2012) further estimates that more than 3.4 million people die each year from water, sanitation, and hygiene-related causes, with 99 %, occurring in the developing world. While the wealthy in city centres enjoy clean water at any time, millions

of poor rural people have access only to contaminated water from local rivers and untreated wells (Barlow, 2007). This has deepened the ecological as well as the human crisis and despite many years of development effort by governments and international support agencies to improve access to safe water supplies and sanitation services in rural areas in developing countries, many rural communities continue to be extremely marginal (Harvey & Reed, 2007). This has been aggravated by the centralised system of natural resource governance that prevails in most SSA countries (Roe, Nelson, & Sandbrook, 2009). In the context of Cameroon, Ako Ako, Shimada, Eyong, & Fantong (2010), for example, argue that the water resource is managed through a centralised approach with the Ministry of Energy and Water Resources (MINEE) responsible for coordinating and legislating water laws together with other ministerial departments and public agencies. This centralised management systems often has faulty designs, major inadequacies and corrupt practices (Agrawal & Gibson, 1999; Guy-romain et al, 2006).

Recent evidence suggests that developing countries in SSA such as; Senegal, Niger, Cameroon, Zimbabwe, Zambia, Botswana, and Madagascar, have made efforts to move from the centralised, top-down management to privatisation, liberalisation, and decentralisation, devolving power and control over resources to local communities (Borrini-Feyerabend, Kothari, & Oviedo, 2004; Cheka, 2007; Roe et al., 2009). As a result, international organisations and Community Development (CD) practitioners have recognised the need for an alternative top-down accordingly (Rechilin & Taylor, 2008). In this regard, the global quest for answers to the increasing water and environment problems, and earlier bids for facing the inefficient management of these resources particularly in developing countries have, therefore, combined to shape the route of policies around water and the environment.

It is within this framework that Community-Based Natural Resources Management (CBNRM) has been identified as one of the ways through which the plethora of devastating public action in service provision and environmental challenges could be averted. This further explains the trend towards decentralised, self-regulated, self-help and localised environmental management initiatives (Borrini-Feyeraband et al., 2004; Rihoy & Maguranyanga, 2007). This has been supported by Brosius, Tsing, & Zerner (1998), Roe et al. (2009), emphasising that CBNRM initiatives seek to promote better management outcomes with the participation of communities and resource users in decision-making activities, incorporating local institutions with customary practices, and knowledge in management, regulatory, and enforcement processes. Community well-being has thus, developed from this type of collective action at the grassroots level (Matarrita-Cascante & Brennan, 2012). Section II of Agenda 21 further, elucidates that rural communities not only have the ability to manage their resources, but understand the intricacies and hold close to indigenous management systems of resources management (UNDP, 1992).

It has been noted that community involvement in water supply in the Northwest and Southwest of Cameroon has a long history, which dates back to the late 1940s and early 1950s, and which was the main form of rural development in the 1960s in this part of the country (Chadwick, 1949; Njoh 2003; Page, 2003). It can therefore, be argued that that the past decades have seen increasingly rapid advances in the field of community participation leading to the re-emergence of Village Development Associations (VDAs) and Community Based Organisations[1] (CBOs) in rural development projects due to the economic downturn that Cameroon and many other SSA countries experienced in the late

[1]These are membership grassroots organisations such as; women's groups, farming groups, credit unions and co-operatives initiated under different influences with specific objectives but with community development as their common goal.

1980s (Fonjong & Fonchingong, 2003; Njoh, 2012). Community-Based Management (CBM) has, therefore, been given the mandate to spearhead rural CD and promote service delivery, backed by processes to support local institutions in implementing and sustaining water and sanitation ventures (Tantoh & Simatele, 2017). This approach is envisioned to address the sustainability question in rural domestic water supply projects by bringing the management closer to the people through the recognition of local institutions and the establishment of common property regimes thereby making them more active in the process of development. This study, therefore, investigated the potential role of rural communities in enhancing sustainable Community Based Water Resource Management (CBWRM) in Cameroon.

1.2. Thematic consideration

NRs are an essential component of communal livelihoods, and they serve as a source of sustenance especially in rural settings where they are mostly obtained as CPRs (Roe et al., 2009). This dependence on NRs by rural communities has created a direct relationship and deep knowledge of the resources within them. Jowsey (2012), for example, argues that water is the foundation of our global economy, even though it has not been given that privilege. This research, strived to offer a systematic understanding of the role of rural communities in promoting sustainable CBWRM in Northwest Cameroon. It has been established that Cameroon is endowed with abundant water resources, although water availability in the North-western part of the country remains a challenge because of accessibility, scarcity and inadequate management practices (Mafany & Fantong, 2006; Yongsi, 2010). Recent reports reveal that water is becoming an increasingly scarce commodity and unevenly distributed in Cameroon (Ako Ako et al., 2010). This is due to

variations in rainfall patterns, climatic changes coupled with increasing demand exceeding supply (Nyambod & Nazmul, 2010).

Recent evidence suggests that water resource in Cameroon is managed from a centralised, top-down approach by MINEE with conventional sectoral approaches in the hands of many other ministries and agencies with no clear cut mandate to service delivery (Njoh, 2003; Guy-romain et al., 2006). The Cameroon Water Utility Corporation (CAMWATER) and Camerounaise des Eaux (CDE) which replaced the National Water Company of Cameroon (SNEC) after its privatisation are the production and commercial enterprises respectively, responsible for providing potable water to urban centres where they are guaranteed higher returns (Njoh, 2003). These institutions, sadly, are unable to adequately supply drinkable water to the entire population due to regulation and legislative lapses, poor development and management of the water resource coupled with the inadequate political will and commitment (Guy-romain et al., 2006). Moreover, Cameroon's water sector is highly fragmented and underfunded with the rising amount of unaccounted water loss; from 25 % in 1990 to 40 % in 2000 (PID, 2007; Ntouda et al., 2013). This indicates ageing infrastructures and poor management strategies thwarting effective water supply.

A number of researchers have reported rural communities with growing populations are in the hands of local committees who seldom have sufficient technical and financing mechanisms for effective service delivery (Tantoh & Simatele, 2017). Also, many rural districts in Cameroon currently face water shortages and scarcity leading to water-related diseases, increasing household expenditure and the incidence of poverty (Ntouda, Sikodf, Ibrahim, & Abba, 2013). The situation has been worsened by the increasing inability of the state to effectively and adequately respond to the rural crisis thereby, stirring rural communities to initiate self-help CD projects. This was further stimulated by economic

crisis of the 1980s that Cameroon experienced combined with the Structural Adjustment Programme (SAP) in the 1990s that caused the state to abandon some of its traditional obligations vis-à-vis the provision of potable water and social security to its citizens. This fostered the growth of poverty, bringing about considerable undesirable outcomes for NR use and management at the local, regional and national levels (Menjo, 2004).

Against this backdrop, various strategies and initiatives have risen at the grassroots level to improve rural livelihood and wellbeing. The Joint Monitoring Programme (JMP, 2014), for example, highlighted that the proportion of households without access to potable water in rural areas is 50.4% and connection rates are very low with only 14.5% of the rural population with individual access to drinking water in their premises. Self-help initiatives have therefore, been advanced as a sustainable alternative strategy to improve service delivery in rural areas and propagate growth. Acknowledging that water is the centre of socio-economic development, effective management of the water resource is, therefore, imperative to achieve the Sustainable Development Goals (SDGs). Given the above observations, this study therefore, focused on the potential role that CBNRM can play in sustainable CBWRM in Northwest Cameroon.

1.3. Research aim

The overall aim of this study was to investigate the potential role of community-based natural resources management in promoting the sustainable use and management of potable water in rural Northwest Cameroon. Given, this aim, the objectives of the study were to;

1) Analyse the role of rural communities in Community-based water resource management in Northwest Cameroon.

2) Examine the complexities and existing challenges in CBWRM Northwest Cameroon.

3) Analyse and suggest an alternative methodological approach for sustainable CBWRM in Northwest Cameroon.

4) Examine sustainable approaches for CBNRM in the context of potable water resources in Northwest Cameroon.

1.4. Research questions

This research specifically addressed the following research questions;

1) In what ways is CBNRM a tool for water resource management in rural North-western Cameroon?

2) What difficulties exist in CBWRM in Northwest Cameroon?

3) What methodological approach can be used to design effective CBWRM system that supports the interaction of stakeholders' in decision-making in Northwest Cameroon?

4) How can sustainable rural water supply be achieved in the North-western part of Cameroon?

1.5. Some theoretical perspectives on CBNRM

CBNRM underscores the diverse range of forms of community involvement in NRM that have emerged across the continent during the past decades. This approach to NRM means different things to different actors in different places across SSA (Roe et al., 2009). It has been demonstrated that rural communities have been managing their NRs through customary norms and traditions which shaped their everyday forms of resource use before

colonisation (Borrini-Feyerabend et al., 2004). With the advent of colonisation, cultural institutions and customary management practices were replaced with technocratic, centralised and top-down management approaches to resources management disenfranchising rural communities from accessing and managing their NRs (Dubois, 1997; Roe et al., 2009; Amungwa, 2011; Dörre, 2015). This prejudiced approach to NRM undermined the local environmental management and livelihood strategies and entrenched state dominance resulting in the degeneration of indigenous knowledge systems with unsuitable contemporary socio-economic and environmental practices (Reid et al. 2006; Rihoy & Maguranyanga, 2007)

In this approach to natural resource governance, grassroots communities were treated as passive recipients, and service delivery suffered because the service providers were not accountable to their clients (Prager et al., 2005). This observation, as argued by Rihoy & Maguranyanga (2007) is borne out of the contention that the NRM strategy during the colonial era was an integral function of extending European administrative control into rural African landscapes which alienated the grassroots communities in accessing, using and participating in policymaking over the management of their resources. In particular, the role of grassroots communities was misrepresented because they were frequently excluded from important aspects of environmental management (Bunclark et al., 2011).

Many donors, policy makers, and development agencies following many years, from a neoliberal perspective, have started to promote community-based property, and management approaches for NRM (Armitage, 2005; Thakadu, 2005; Gruber, 2010; Stone & Nyaupane, 2014). Elsewhere, Van Koppen, Giordano, & Butterworth (2007) succinctly braces the claim that governments have failed to manage NRs effectively because the rules

in place are often in conflict with the needs and perceived rights of residents. Furthermore, national governments in developing countries have not been successful in managing and preserving CPRs that were nationalised by them (Agrawal & Gibson, 1999; Ostrom, 2008), as they continue to experience problems of inefficiencies, free-riding and illegal exploitation of NRs by both local and external populations, leading to species and resources deterioration (Berkes et al., 2004; Dörre, 2015). In situations where nation states are regarded as fragile or grassroots communities remain on the periphery of support from central government, CBNRM may be a more realistic option for encouraging and improving the locals to take leading roles in the management of their NRs (Bunclark et al., 2011; Tantoh & Simatele, 2017).

This new approach to NRM, focused on decentralisation of NRM responsibilities, with the objective of increasing public participation in view of enhancing prospects for sustainability (Maguranyanga, 2007). CBNRM has, therefore, been largely adopted in SSA as a means to combine rural development and conservation efforts (Hulme & Murphree, 1999; Roe et al., 2009). The premise underlying CBNRM reforms is that sustainable management is most likely where local users can manage and extract benefits from NRs (Ostrom, 1990, 2012). These claims are equally based on the postulations of the International Drinking Water Supply and Sanitation Decade (IDWSSD) in the 1980s and Dublin Principles on Water and Sustainable Development in the 1990s, that highlighted the importance of the shift in the way safe water services were provided emphasising approaches that deepened community participation; involving users, planners and policy-makers at all levels in the management of water and sanitation programmes (UNCED 1992). These developments around water, for example, resulted in the proliferation of community-based water supply systems in developing countries around the world with community participation and self-help management which are subject to the management

of water supply systems in many small-scale societies (Lammerink, 1998; Bunclark et al., 2011). CBNRM efforts are consequently, a response to the reality that several instances of rural resource degradation occur because centralised management regimes in African states are often, in reality, open access regimes and that devolving management responsibilities to grassroots communities is crucial (Nelson & Agrawal, 2008).

Building on this observation, Berkes & Davidson-Hunt (2010) argue that a focus on the analysis of CBNRM rests on power relationships between the stakeholders. The relationship between these different stakeholders in CBNRM is very important. Their rules and implementation and resolution of problems arising from the implementation and application are necessary to understand the management of CPRs (Gaventa, 2006). In all instances, however, CBNRM involves some degree of co-management of resources between central authorities, local government, and local communities which share rights and responsibilities through diverse institutional arrangements (Roe et al., 2009). Attention should, therefore, be dedicated to the institutional arrangements that frame and impact the interaction of all interest-driven actors. This remark, as observed by Ribot (2002) and supported by Ostrom & Nagendra (2006), is evidenced on the basis that participatory developments are related to a variety of institutional arrangements, combined with rules of allocation and use that result from the interactions between the participants. These institutional designs, however, display wide diversity, and have a mixed nature as a result of a compromise between the actors and the mechanisms of public and private regulation.

1.6. Signifiance of the study

This study sought to contribute to the growing area of research in NRM by exploring the potential role of rural communities in effective and efficient CBWRM in Northwest

Cameroon. It must be noted that the notion of CBNRM developed in response to significant environmental degradation, top-down management, and the need for measures to encourage the conservative management of water, land and biodiversity. As far as CBNRM is concerned, empirical evidence has both embodied and benefited from the lessons and underpinnings provided by different academic disciplines. However, CBNRM academia has overwhelmingly focused on forests, fauna, land, fisheries, and wildlife management (Brosius et al., 1998; Nhantumbo et al., 2003; Rihoy & Maguranyanga, 2007; Berkes & Davidson-Hunt, 2010; Hibbard & Lurie, 2012; Stone & Nyaupane, 2014 etc.,). In contrast, water resource management, particularly potable water supply at the local level lags behind. Despite salient scholastic works on water management in Cameroon (Page, 2003; Ako et al., 2010; Nyambod & Nazmul, 2010; Njoh, 2012 etc.,) hardly any studies have explored the potential role of rural communities water resources in Cameroon accordingly, proposing the STA as a possible strategy for sustainable management which is the motivation for our research. This study therefore, contributes to the current debates on CBNRM and particularly to the critical debates on CBWRM.

This research fills a gap in the literature by increasing to existing scholarship on the fundamentals that need to be adhered to by policy actors wishing to build operative collaborations between them and service beneficiaries, particularly those living in rural milieus such as those in SSA. The study generates more proof to establish why participation in the design and implementation of rural water supplies in developing countries may not achieve its intended goals if the water users are not methodically supported by their immediate public service authorities. At policy and practice level, the study uses evidence generated in a mixed-methods study design to assert the application of STA model for effective and efficient CBWRM, which certify that beneficiary communities remain active service delivery partners. In particular, the study establishes

the significant role of local government actors in encouraging and supporting the dynamisms of Water Management Committees[2] (WMCs) to efficiently achieve their service delivery obligations. By so doing, the study interrogated the reliability of approaches that appreciate the major role of communities in service delivery but which at implementation appear to be taking the same communities for granted.

Also, research on water related issues is mostly development based in the energy, agriculture and transport domain neglecting other demand-driven aspects. The centrality of water to socio-economic development faces incessant problems of provision, accessibility, management, wellbeing and poverty alleviation remain at stake. This study will provide important milestones in promoting sustainable CBWRM. This research will also be of invaluable interest to policy makers in the domain of rural development in particular and environmental management in general. It will equally be a tool for academic and CD practitioners in developing countries generally.

1.7. Description of the study area

This section provides a description of case study communities used in this research. It gives justification for the selection of the three rural districts in the North-western part of Cameroon and more importantly puts into perspective the research context (Figure 1.1). The study focuses on the role of rural communities in promoting sustainable water supply in six villages from the *Ndu, Njinikom and Mbengwi* rural districts in Northwest Cameroon

[2] Water management committees are selected members from the communities who are responsible for executing tasks such as, collection of maintenance fee; organise manual work within the community. They make major decisions concerning water management within the communities.

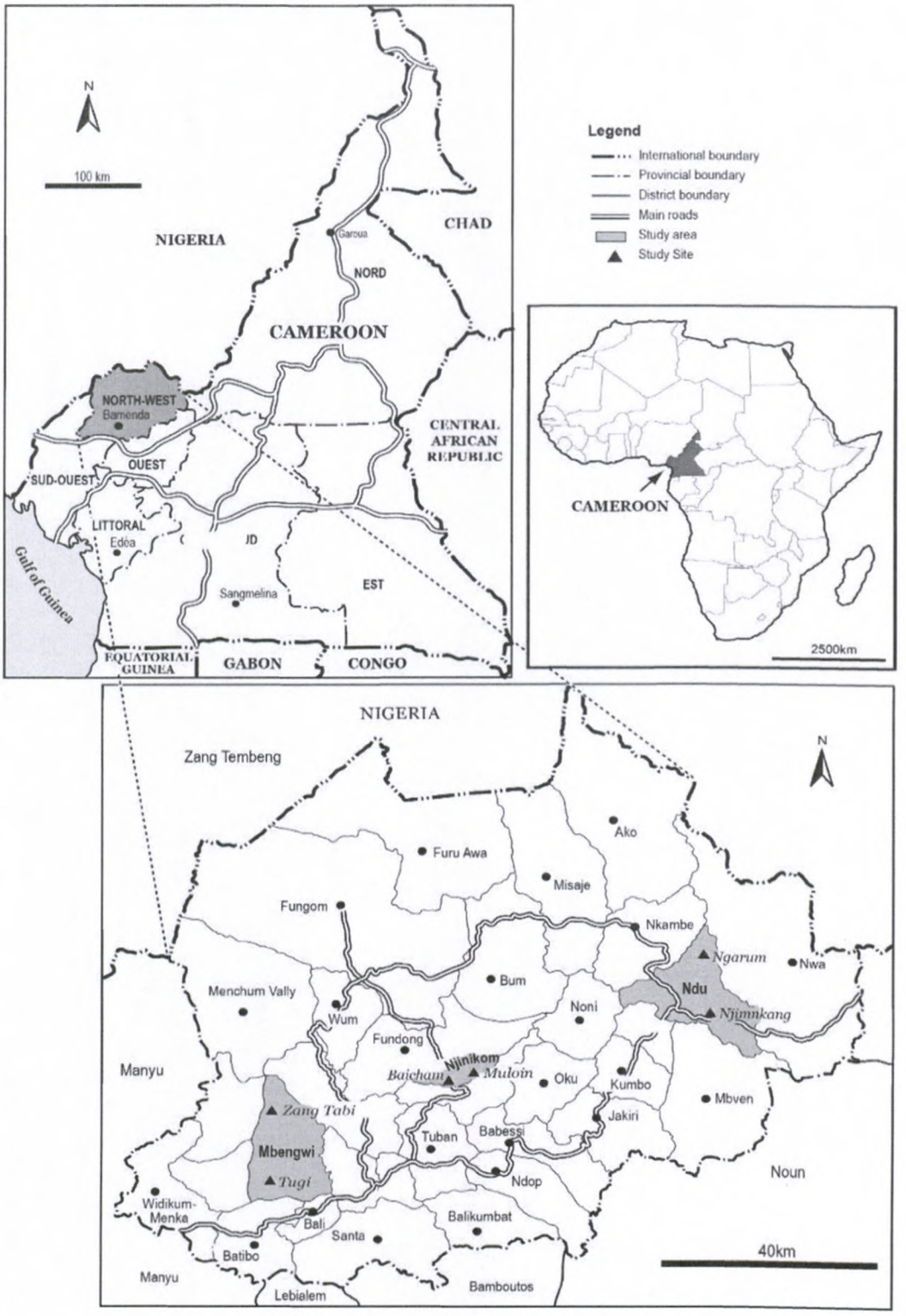


Figure 1.1: Shows study sites in Northwest Cameroon

Source: Cartography Unit (2015), School of Geography and Environmental Studies, University of Witwatersrand, South Africa.

This case study research is based in the North-western part of Cameroon, geographically located between latitudes 6° 20' and 6° 33' 3" North and between longitude 10° 30' and 10° 50' East of the Greenwich Meridian. It is found in the Western Highlands of Cameroon bordered to the Northwest by the Federal Republic of Nigeria, to the south by the West Region, to the southwest by the Southwest Region and the east by the Adamawa Region (Figure 1.1).

1. 7.1. Demographic aspects of Northwest Cameroon

The Northwest region of Cameroon is one of the most settled regions in the country with a population of 2, 410, 936 inhabitants on a surface area of 17,300 Km^2 (NIS, 2011). It has a population density of 99.12 inhabitants/ per Km^2 which is higher than the national average of 22.6 and a rural growth rate of about 1.16 % (NIS, 2011). This population is largely youthful, with over 62 % of its inhabitants aged less than 20 years, resulting in a high dependency rate particularly in the rural areas.

1. 7.2. Physical factors and the influence on water resources

The topography of Northwest Cameroon is contrasted and unevenly distributed with Mount Oku as the highest point; 3011 meters (m) above sea level, surrounded by the Mbebe and Ndop plains of about 211 m above sea level. The hilly nature of the region favours the dominance of the gravity-led water[3] supply systems in most of the rural communities. The landscape is further, characterised by volcanic mountain ranges with fertile ferralitic soils of volcanic origin with a low pH value (Neba, 1999; Kuit, 2008).

[3] This is a system where water is channelled from a watershed through springs and piped down to the villages.

This region has the tropical climate Cameroonian type with two seasons; the dry season runs from November to March and the rainy season from April to October (Molua & Lambi, 2006).

It has been demonstrated by Molua & Lambi (2006) that the main drainage basin of this region is the Western Highlands on which the region is found. This volcanic watershed, they argue is a continuation of the Cameroon volcanic line that cuts across the country almost diagonally and provides the drainage divide between the two major river systems of the entire sub-region. It must, however, be noted that the watershed, as well as the river courses, have been modified significantly due to population growth leading to land use intensification, deforestation for various purposes, overgrazing and urbanisation. The region experiences an average annual temperature of about 23°C with 2,200 millimetres (mm) of average annual rainfall that furnishes the area with abundant surface and ground water resources (Neba, 1999; Molua & Lambi, 2006). Despite the high amounts of rainfall, drinkable water is still a major challenge as demands still exceed supply.

1. 7.3. Socio-economic factors and natural resources management

On the administrative composition, the Northwest region of Cameroon is made up of seven divisions, 34 sub-divisions and 36 councils / rural districts shown in Table 1.1.

Table 1.1 Administrative set-up of the Northwest Region in Cameroon

Division	Headquarter	Sub-Divisions
Bui	**Kumbo**	Kumbo, Noni, Mbven, Jakiri, Oku, Nkum
Boyo	**Fundong**	Fundong, Belo, Bum, Njinikom
Donga-Mantung	**Nkambe**	Nkambe, Ako, Ndu, Misaje, Nwa
Menchum	**Wum**	Wum, Furu-Awa, Fungom, Menchum Valley
Mezam	**Bammenda**	Bamenda I, Bamenda II, Bamenda III, Tubah, Bali, Santa
Momo	**Mbengwi**	Mbengwi, Njikwa, Ngie, Batibo, Widikum-Menka
Ngo-Kutunjia	**Ndop**	Ndop, Balikumbat, Babessi

Source: MINATD (NIS, 2011).

The regional headquarter of the Northwest Region is Mezam with one major metropolitan city, Bamenda and several other smaller towns. A prominent feature of these communities is the high dependence on agriculture and animal husbandry as the main source of livelihood. The major food crops grown include; rice, beans, maize, potatoes, yams and cocoyam. Cash crop production is also carried out on a small scale with Arabic coffee and tea as the main products. Palm wine production and commercialisation is another activity associated with farming that supplements household income. Local craft is however, not left out with the production of various works of arts from wood, weaving, and pottery. Agricultural tools (hoes, cutlasses and spades) and grinding mills are also manufactured by small and medium size enterprises spread throughout the region.

The majority of the rural poor in Northwest Cameroon depend on NRs for their sustenance and wellbeing. NRs are considered here to involve of a broad range of materials that may be collectively or individually owned and exploited either using rudimentary or complex

means for subsistence and/or income generation (Fonjong, 2008). They include; soil, water, forest, and Non-timber Forest Products (NTFPs). It has been argued that population growth, water scarcities, and the incidence of poverty are exerting pressures on the already scarce NR in this locality coupled to the inability of the government to provide basic amenities to the rural population such as potable water, improved health facilities and social security (Ako Ako et al., 2010). It can therefore, be argued that socio-economic and environmental problems today are representative, among other things, of the significance of CBM programmes in NRM. The grassroots communities of Northwest Cameroon have as a result put their resources together through VDAs and realise CBWRM schemes to improve their standards of living to foster CD.

1.8. Methodological approach

A mixed research method (quantitative and qualitative) both relevant to practical enquiry and data collection was used to collect data. Ideological positions also formed an essential part in laying the paradigm of this study through which systematic, critical and self-critical enquiry sought to contribute to the growth of knowledge and insight in CBNRM (Bassey, 1999). This is because the philosophy of science is treated as the fundamental basis of scientific, social research which analyses research techniques from the logical viewpoint of truth and reality of the social world (Uddin & Hamiduzzaman 2009). According to Mitchell (1979), a geographer's role in NR analysis is one that seeks to understand the fundamental characteristics of NRs and processes through which they are allocated, managed and used. However, due to the mechanistic philosophical worldview of modern science caused by population growths, advances in technological development, global warming and environmental degradation, two interrelated philosophical positions; *Positivism* and *Determinism* perceive nature as a "machine" (Caldwell & Siddiqi, 1974).

This mechanistic approach determined by reductivism, mechanism and materialism continues to influence the paradigm of design in NRM (Aksoy & Bilgen, 2013). Considering the stress exerted on NRs, particularly freshwater and the consequences of climate variation and change, ecocentrists fear that man will ultimately run out of ingenuity and thrust in a catastrophe. As further recognised by O'Riordan (1976), society has two options: either to relate activities to ecological imperatives so that inputs and outputs are more or less balanced, or to develop an acceptable system of altruism to regulate our actions willingly for a wider community interest.

Building from this observation and due to the complexity of social phenomena, the philosophical position adopted in this study is the *Positivist and Interpretive Practice* that involves a subjective belief that reality exists and is socially constructed (Luckmann & Berger, 1967). This is rooted from the hermeneutic phenomenology. As an independent researcher, facts on CBWRM in rural Northwest Cameroon will be gathered and interpreted subjectively based on the positivist realist approach. The research also involves philosophical assumptions about the nature of the world (ontology), the nature of knowledge (epistemology) and social practices (values and decisions). This will be further supplemented by an investigative methodological approach observed by Douglas (1976) as a process that helps to amplify our knowledge and insight on CBWRM. In this study, conventional systems of ecological and humane imperatives to control and promote actions for sustainable management of rural water systems in Northwest Cameroon were also employed. This was facilitated by engaging the local population in regulating rural water systems as well as enabling and strengthening locally accountable institutions to make better choices through CBM initiatives for a wider community benefit.

Due to the vast nature of the region, time constraints and other logistics such as human and financial resources, a *Stratified Purposeful Sampling Approach* was used to select the study sites. The reason for this method was to select information-rich cases that illuminated the questions under study. In this regard, a total of three (3) sub-Divisions/ rural districts were purposively selected in the North-western part of Cameroon. Within these three rural districts, two (2) rural communities were selected for the study from each district using the technique of *allocation concealment*[4], and this resulted in the selection of six villages: *Tugi, Zang-Tabi, Baicham, Muloin, Njimkang, and Ngarum* (Table 1. 2).

Table 1.2: Rural districts and communities in Northwest Cameroon from which population samples were drawn.

Division	Sub-Division	Villages/ Communities
Donga-Mantung	Ndu	Njimkang, Ngarum
Boyo	Njinikom	Baicham, Muloin
Momo	Mbengwi	Tugi, Zang-Tambi

Source: Fieldwork results (2016).

Table 1.2 shows the three rural districts and six communities from which samples were drawn. These villages were selected based on the availability of the community water supply project, the age of the project, network coverage, usage and the presence of a management institution, demographic factors such as density, socio-economic and geographic characteristics such as age, gender, employment and distances to water sources. Furthermore, the region is characterised by common social and traditional attributes such as language and cultural norms as well as social structures of community leadership and NRM and utilisation. Self-reliant projects mostly initiated by VDAs play a

[4]This is a randomised process of data collection that ensures that the different groups being studied have similar characteristics and prevents researchers and participants from predicting and thus influencing upcoming group tasks. The results give a fair representation as it is unbiased.

significant role in CD with community participation as a fundamental element. The system of community governance and administration is through local Chiefs, locally known as "Fons" in the Bamenda Grassfields. Water supply and sanitation is managed through community-based systems and particularly by WMCs and Water User Committees (WUCs).

From an interpretivist viewpoint, it is imperative to understand the attitudes of the locals concerning community-based initiatives and how it shapes CD. Thus, inductive and deductive approaches were necessary for the study. At the early stages of this research, results from existing literature review motivated the conception of CBWRM and problems affecting rural water supply in Northwest Cameroon as a rather basic management issue against population growth and increasing water demands. This stage comprised of an exploratory literature which permitted us to take stock of existing empirical works related to our problem. This was to know what has been done to better understand our contribution to the subject. This was possible through books, journals, newspapers, seminar and consultancy reports, statutory and regulatory instruments from the library of the University of the Witwatersrand, University of Johannesburg, University of Pretoria all in South Africa and the Universities of Dschang and Bamenda in Cameroon with extensive use of the internet. As the study progressed and evidence accumulated, its scope was broadened, its conceptual underpinnings and research questions were refined, and the theoretical understandings and methodologies were sharpened. In the end, this study reflected a rather multifaceted investigation of CBWRM.

After that, data collection on the field emphasised on exploring and understanding participant's perceptions, views and experiences on CBM and co-governance of CPRs therein. A total of 126 structured questionnaires were administered in the six communities.

Out of these 126 questionnaires, 108 (18 per village) were directed to household users and 18 to WMCs (three per WMC). The questionnaires administered to the communities were to identify the problems faced and the views concerning the management. The questionnaires for the WMCs were meant to assess the level of management and governance, decision-making, household income, costs of production and financing, management of catchments, and difficulties encountered.

There is however a slight variation of the methodology in the different papers that form the basis for the different chapters. For example the methodology used in chapter two was for preliminary investigation which was later enhanced (e.g included a larger sample) for more detailed investigation in the other chapters.

In-depth interviews using semi-structured and open-ended interviews were used on focus groups and informed water specialists, WMCs, and other stakeholders. This approach was to permit the respondents to express their views freely. A snowball sampling technique was employed in approaching individual persons who are either working or involved in NRM initiatives. Among these include; officials from MINEE, the Ministry of Environment and Nature Protection (MINENP); the Ministry of Forestry and Wildlife (MINFOF); the Ministry of Agriculture and Rural Development (MINADER); as well as regional departments operating under these ministries in Northwest Cameroon. The mayors were also interviewed since they have an essential role in NRM within their municipalities. Relevant Non-Governmental Organisations (NGOs) working in the domain and other development organisations within the territorial limit of the study were also interviewed. Village chiefs were equally interviewed to know their role and implication in the protection of NRs. Since they are the custodians of the land, facts about customary management practices on NRM were highly solicited as it helped to put them side by side with contemporary management models. It must be noted that the aim of engaging with

different stakeholders was to assess the institutional, policy, and management structures and practices that exist in the management of water resources in Northwest Cameroon.

The data collected were analysed through descriptive statistics computer software programmes such as the Statistical Package for Social Science (SPSS) and Microsoft Excel. Normal distribution tables were employed to come out with percentages, mean medians and the modes to illustrate results. The presentation of figures and putting the work in numerical forms was done with the aid of Microsoft Word while cartographic illustrations and maps were aided by with the use of MapInfo, ArcGIS for illustrations.

This investigation was further reinforced by STA motivated by the causal feedback principles to develop policy intervention mechanisms and also to have a clear understanding to evaluate the causal relationships between public, private and local stakeholders in CBWRM in Northwest Cameroon. This was done through a Causal Loop Diagram (CLD). The STA necessitates a deliberate reconsideration of both top-down and bottom-up management methods that have played a key role in informing current management policies, practices and causal feedback relationships among the regulating variables, which enable policy interventions and which were found to be relevant for improving CBWRM in Northwest Cameroon.

1. 9. Structure of the thesis

This thesis is compiled as publication, meaning each chapter is based on the published article or is still under review (and in press). The thesis is organised into six chapters. Chapter one is the frame of reference from which the other chapters were drawn. It examines the background, context and justification of this study. It traces the events that

have led to the development of Community-Based Management (CBM) as a favourable approach towards effective water supply and management in rural communities in a sub-Saharan context. A brief description of the research problem, broad and specific research questions, the prominence of the study and the study's contribution to academia and development practice are among the key themes the chapter highlights.

Chapter two investigates the dominant development paradigms and theoretical foundations that have shaped concepts and strategies around CBNRM in a SSA context. It presents the paper that was published based on CBWRM in Northwest Cameroon. It equally reviews the role of rural communities in potable water supply and CD from a regional viewpoint.

The third chapter discusses results from the findings on the operation of CBM initiatives. It examines the complexities and uncertainties experienced in CBWRM in Northwest Cameroon. It examines in detail, the contextual dynamics at the local level which continue to influence the performance of CBM systems, but which are either unknown, overlooked or taken for granted by interest-driven actors.

Chapter presents a paper on shifting the paradigm in CBWRM in Northwest Cameroon: a Search for an alternative management approach. It focuses on the search for an alternative from the conventional top-down and bottom-up approaches in NRM which has not always been successful. The strengths, challenges and limitations of these methodologies are also examined with strategies adopted to reduce the effect of the challenges on the validity, strengths and authenticity of results. This chapter proposes a STA approach as a conceivable and sustainable method to enhance participation and improve the efficacy of

community-based water systems in Northwest Cameroon, taking into consideration the power relationships between the actors.

Chapter five examines the dynamics affecting the performance of CBM. It equally explores successful case studies of CBNRM initiatives in a developing world context and highlight practical evidence and lessons that could be adopted to improve CBWRM in Northwest Cameroon and other developing countries with the same socio-economic situation.

The sixth chapter draws together the key findings of the study and make recommendations to improve the management of rural water schemes. It similarly highlights indicators for future research in CBWRM in particular and CBNRM as a whole.

CHAPTER TWO

Community-based Water Resource Management in Northwest Cameroon: the Role of Potable Water Supply in Community Development[5].

Abstract

This paper examines the role of community-based water resource management in community development in Cameroon. Natural resources across sub-Saharan Africa (SSA) have been managed from centralised systems and this has resulted into massive marginalisation and disenfranchisement of rural communities. However, there is now a shift in policy interventions towards adopting pro-community approaches in resource management. Although this paradigm is increasingly becoming common, key questions on how to propagate the participation of the most vulnerable members of a community and the impact on community development remain pertinent. Using both secondary and empirical data collected though tools inspired by the tradition of participatory research; it is argued in the paper that community-based natural resource management (CBNRM) has the potential to imbue the full participation of local people in any development issues and changes rural societies and communities in sub-Saharan African countries. Rural Cameroon, like many other rural regions in sub-Saharan Africa faces a myriad of challenges, among which include water resource governance. This paper therefore, explores the role of CBNRM in sustainable potable water resource management. This has been explored within contemporary theoretical and development debates on natural resource management in developing countries.

Key words: *Community resources management, rural, water, participation, development, Cameroon*

[5] This chapter is based on: Tantoh, H. B., & Simatele, D. (2017). Community-based water resource management in North-west Cameroon: the role of potable water supply in community development. South African Geographical Journal, 99 (2), 166–183. http://doi.org/10.1080/03736245.2016.1208589 (Published)

2.1. Introduction

Natural Resources (NRs) remain central to rural livelihoods and they are the foundation on which national development and economic growth take place in many societies including sub-Saharan Africa (SSA) (Roe et al. 2009). A major challenge that many countries face however, is how to effectively and efficiently manage these NRs in ways that benefits those that are in close proximity to them. Part of the challenge has been the fact that access, as well as tenure to NRs is everywhere governed by power dynamics that often times contribute to the marginalisation of poor communities. In SSA countries for example, rural communities often have inadequate and sometimes insecure access to NRs (Mbaiwa, 2005). This situation owes much to a number of factors among which include prohibitive traditional and formal systems of natural resources governance mainly manifested through top-down systems of resources management, poor frameworks, land fragmentation due to fusions in legislation, and finally competition over land resources between the state and the private investors (Binns *et al* 2012; Stone & Nyaupane, 2014).

It is within this context that Community-Based Natural Resources (CBNRM) has been identified as one of the avenues for the sustainable management of Common Pool resources (CPRs) (Gruber, 2011). CBNRM as an approach espouses principles of participation of individuals, households and communities in aspects that either directly or indirectly affects their own future and that of their children. Experience with CBNRM over the last twenty (20) years have for example, demonstrated that it is a development approach and strategy that has a wide range of pathways aimed at creating opportunities for communities to tailor and own their development process (DeGeorges & Reilly, 2009). Stone and Stone (2011) observe that CBNRM is an effective approach that facilitates

linkages between biodiversity conservation and community livelihood improvement through pursuing socio-economic objectives with communities playing a key role. At a minimum therefore, CBNRM involves the transfer of authority over NRs to local communities (Borrini-Feyeraband et al., 2004; Ngwira, Kolawole, & Mbaiwa, 2013).

The transfer of authority to communities has been argued as one of the key tenets to societal transformation and effective resource management (Mutandwa & Gadzirayi, 2007; Mbiawa 2011). It is an approach that is increasingly becoming more favoured and embraced by development practitioners and policy makers. Armitage (2005), for example, observes that many policy makers, analysts and Non-Governmental Organisation (NGOs) are now embracing and encouraging CBNRM as a favoured model for better NRM and Community Development (CD). Development and conservation practitioners have further supported efforts to revive or strengthen local NRM structures in response to various socio-economic, environmental and political pressures, as well as the need for increased accountability on how CPRs are utilised or managed (Berkes et al., 2004; Gruber, 2011). Rechlin and Taylor (2008) for example, argue that Community Based Institutions (CBIs) have great potentials for the effective management of the rapidly changing local realities and needs. In the same vein, Shackelton and Campbell (2000) hold the view that Community Based Organisations[6] (CBOs) have been known to design and adopt regulations and procedures that not only define its Natural Resource Management (NRM) functions but also their accountability and responsibility towards the community members. This is because CBOs focus on building local level community management skills and

[6] These are membership grassroots organisations such as; women's groups, farming groups, credit unions and co-operatives initiated under different influences with specific objectives but with community development as their common goal.

capabilities which can, and on behalf of local people, manage NRs sustainably and in a way which promotes CD (Matarrita-Cascante & Brennan, 2012).

Despite the emphasis placed on the strengths of CBNRM as an effective resource management strategy, the debates over local community's ability to manage NRs in an inclusive and sustainable manner continue to be a matter of greater policy discussion and are a part and parcel of broader struggles over political and economic power (Roe et al., 2009). These arguments as observed by Arntzen, Halstadtro, & Halstadtro, (2003) are borne out of the contention that many CBOs suffer from a presence of weak leadership, uneven participation, corruption, lack of official recognition and inadequate income alternatives. Blaikie (2006) and citing Shackleton and Campbell's (2001) work on CBNRM from 13 African countries, argues that increased International Donor Organisation and State as well as local government's interventions in the operations of CBOs limit local people's abilities to reshape socio-economic and environmental relationships in ways which suit them.

Although CBOs and traditional systems of resource management are seen as fundamental elements in the success of CBNRM, the approach will almost always involve a sharing of authority and responsibility for managing resources among a variety of actors within and outside a community (IRDC 1998; Stone & Nyaupane, 2014). As such, one of the major challenges for CBNRM as a development approach is how to identify and establish the appropriate balance of responsibilities and interests among the various actors based on the specific social, ecological, political, and economic conditions that exist. Gorjestani (2000) for example, observed that the complexity in the operating structure of many CBNRM has in many instances made it difficult for local people, with local knowledge, to negotiate on

an equal basis with officials and actors with scientific knowledge. This is because rural communities are generally made up of multiple actors with often differing interests and needs whereby players operate as local implementers of externally introduced and developed policies (Kellert, Mehta, Ebbin, & Lichtenfield, 2000; Gorjestani 2000). As a result, the operations of many of these CBNRM have been influenced and shaped by what is offered by outsiders, who make strategic choices about which local knowledge is heard and conformable to their scientifically given environmental goals and aspirations (Stone & Nyaupane, 2014).

Despite the short comings of CBNRM, the approach has been supported by the International Development Research Centre (IDRC 1998) as one of the development strategies that is among the most effective in maintaining, adapting and building upon key elements of traditional resource management systems that have evolved under distinctive forms of social organisation (Abensperg-Traun *et al.* 2011; Ngwira et al., 2013). Although CBNRM is not a panacea in NRM and CD, it has been presented as an approach that aims to shift the power of control in issues that affect communities from outside actors to communites' themselves. This is based on the assertion that communities, when supported in their endeavours, are better placed to deal with and resolve any development challenges and issues that they may be faced with (Simatele & Etambakonga, 2015). Therefore, this paper explores the potential role that CBNRM can play in effective management of potable water resources in the North-western part of Cameroon. It is argued that CBOs and traditional systems of NRM, if encouraged, harnessed and supported appropriately, can play a pivotal role in CD and transformation.

2.2. Methodological approach

This paper is based on an extensive review of existing literature and a pilot study that was conducted between 5th January 2015 and 16th of March 2015 in Northwest Cameroon. The first stage in the search of literature comprised an extensive and intensive internet exploration using various search engines such as Google, Google Scholar, Ask.com, MSN.com, Bing, Yahoo and DuckDuckGo. Key words such as CBNRM, CBWRM, NRM and CD were entered in the search engines. An estimated total of 225 peer reviewed journal articles were generated and systematically reviewed using a five stage process. The purpose of this exercise was to limit and select only those articles that had direct relevance to the topic under investigation. This process resulted in the selection of 61 different articles and reports and they form part of the basis for the current paper.

In additional to peer reviewed journal articles, other literature were obtained through a library search of different libraries which included the libraries at the University of the Witwatersrand, the University of Johannesburg, the University of Pretoria, the University of Dschang and the University of Bamenda. A pilot survey was also conducted between the 2nd of March 2015 to the 16th March, 2015 in *Mbengwi, Njinikom and Ndu* Municipalities (see Figure 2.2). From these three municipalities, two rural communities were randomly selected giving a total of six study sites: *Tugi, Zang-Tabi, Baicham, Muloin, Njimkang, and Ngarum* respectively.

The purpose of the pilot study was to complement the secondary data and this was executed through discussions and interviews with different local and national government officials from different institutions and departments mandated with NRM and CD. Among

these include; the MINENPM; MINFOF; MINADER; MINEE; as well as regional departments operating under these ministries in Northwest Cameroon. In total seven officials from the different government ministries and six regional officials were identified and included in the study using a snowball technique.

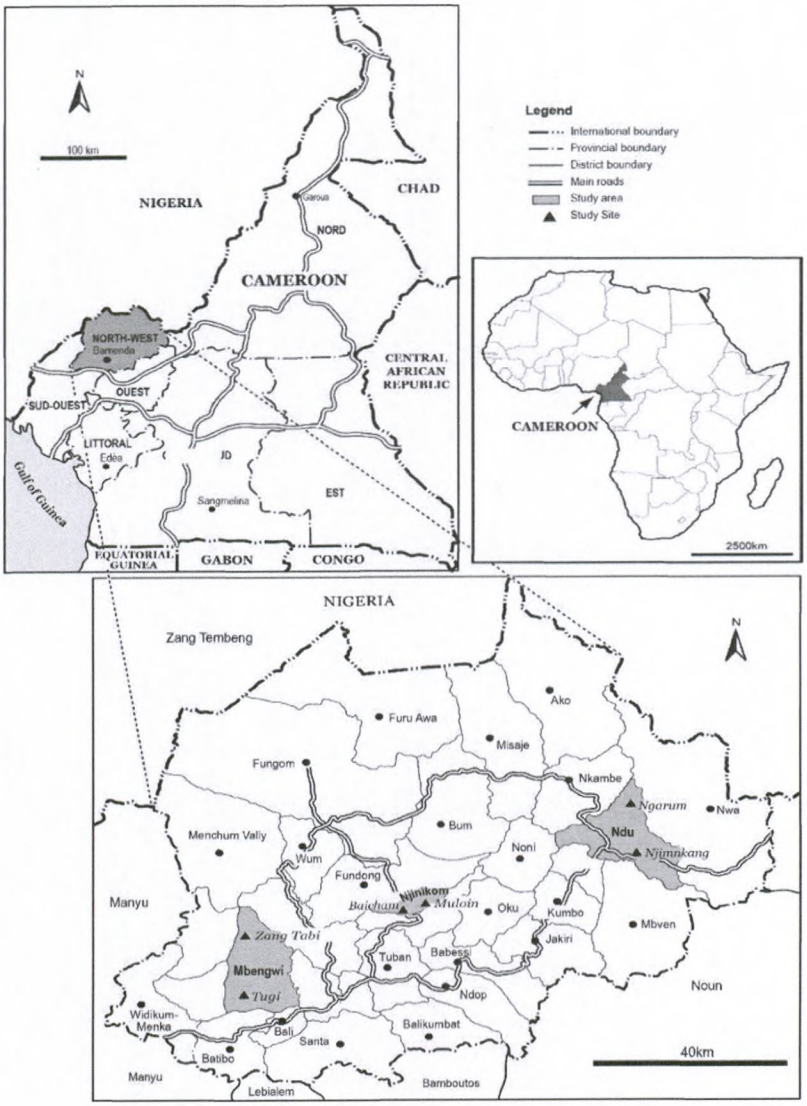


Figure 2.1: Shows the map of Cameroon and the study sites in Northwest Cameroon

Source: Cartography Unit (2015), School of Geography and Environmental Studies, University of Witwatersrand, South Africa.

The purpose of these interviews was to assess the institutional and policy frameworks that exist in the management of potable water in Cameroon and how this affects CD. Finally preliminary discussions with five community leaders identified through key informants were conducted. In additional to these discussions, informal conversations with 10 households who were randomly selected was carried out with the aim of having an idea of how the community relates to water issues and CD.

2.3. CBNRM, a sub-Saharan African (SSA) context.

Rural communities across SSA maintain significant traditional systems of collective NRM, which help facilitate sustainable livelihoods and cultures (Roe et al., 2009). These systems of resource management have been developed over long periods of time through cultural transformations (Binns & Nel 2012). However, recent changes in population growth, coupled with rapid urbanisation as well as weak local government and national institutional frameworks have resulted into increased resource use, thereby exerting massive pressures on NRs (Child & Lyma 2005). This development has in a large part contributed to increased conflicts over NR use and contemporary misunderstandings between actors of development and communities where development should be implemented.

It must be noted that CBNRM was conceived for the purpose of transferring the power of control of CPRs from a central system to communities. This assertion, as observed by Opoku-Asare *et al.* (2013) is based on the assumption that indigenous forms of governance provide a viable alternative management strategy from the traditional top-down systems, and fosters participation of the poor in the process of their own

development. From this perspective, it can be argued that any meaningful and sustainable form of development is one that involves a greater participation and collective resource management among all interested parties and stakeholders (Njoh, 2009; Lendevlo, Munyebvu & Suich, 2012). Thus, effective NRM and sustainable CD should be seen as a function of well formed partnerships between actors with the technical know-how and communities for whom development is meant (Jones 2007; Roe et al., 2009).

Blaikie (2006) is of the view that although CBNRM is in various forms and can be defined from different perspectives, it is primarily an established policy oriented strategy for grassroots development. It has the potential to influence, shape and reshape as well as extend existing policy narratives into new and innovative systems of effective resource use, while promoting equitable access to communal resources (Stone & Nyaupane, 2014). As an approach, CBNRM espouses values and norms that facilitate the participation of local people and encourages them to take ownership of their resources and development processes (Gruber, 2011; Mbaiwa, 2011). Matarrita-Cascante & Brennan (2012), for example, are of the view that communities are both the means and the end of CD and should therefore, be engaged and consulted at all stages of the development continuum (Samah & Aref 2009; Simatele & Simatele, 2014) It is through this process that communities become a strong vehicle for NRM and conservation initiatives which then lead to sustainable community development.

In the context of SSA, the importance of CBNRM as a development and resource management tool is reflected in the adoption of this strategy by a number of countries as illustrated in Table 2.1.

Table 2.1: Selected countries in which CBNRM is being used as a strategy for NRM

Region	Countries	Nature of the CBNRM of Programme
Central Africa	Cameroon	Community Outreach (sensibilisation) and Sustainable Resource Management (la gestion durable), Co-management, Community Forest/ Social Forest
	Democratic Republic of the Congo, Gabon	"Community Conservation Zone" Community Managed Protected Areas, Community Outreach (sensitisation) and Sustainable Resource Management (la gestion durable).
	Equatorial Guinea	CBNRM corridor
	Central Africa Republic	Co-management, Community Forest
West Africa	Benin, Niger, Mali, Ghana, Nigeria	Community Outreach (sensibilisation) and Sustainable Resource Management "la gestion durable" Wildlife Conservation
	Burkina Faso, Ivory Coast	Decentralised Resource Tenure and Land Management "gestion de terroir", Co-management,
East Africa	Kenya, Tanzania, Uganda, Ethiopia	Ujirani Mwena "Good Neighbourliness", Collaborative Natural Resources Management, Joint Forest Management, Co-management and Community-based, 'Community-based Conservation', Participatory Forest Management
Southern Africa	Botswana	Natural Resources Management Project-NRMP/ Community-Based Natural Resources Management CBNRM
	Mozambique	Tchuma Tchato "Our Wealth" and Chipande Chetu programs in Mozambique,
	Namibia	Communal Conservancy Programme, Living in a Finite Environment (LIFE)
	Zambia	Administrative Management Design for Game Management Areas (ADMADE)
	Zimbabwe	Communal Areas Programme for Indigenous Resources (CAMPFIRE)

Sources: Berkes (2004), Roe *et al.* (2009), Stone and Nyaupane (2014).

It has been observed by Blaikie (2006) that CBNRM is the operational version of a CPR management strategy that incorporates the adoption of indigenous knowledge in the management and distribution of the benefits from community natural resources. This is based on the assumption that in order to effectively conserve, protect and use NRs in a

more efficient manner, local knowledge of the natural environment and resources is important in the design and implementation of programmes that would contribute to environmental protection, while ensuring community wellbeing and development (Ngwira et al., 2013; Stone & Nyaupane, 2014). Despite this assumption, it is important to note that communities are themselves structured along certain norms, values and attributes which are influenced by social and power relations within a community. It is important to understand and identify the power structure and social relations within a community because they influence the nature of how CPRs and benefits are managed and distributed. Simatele & Simatele (2014) observe that those with the most power in a community usually tend to have power and influence over the governance of NRs.

Despite the above observation, the main objective for CBNRM initiatives as observed by Turner (2004) is to cultivate, promote and encourage the full participation of local people in the management of their own affairs. This view has been edified by Cheru (2002), who is of the view that, community participation in resource management entails bringing decision-making processes closer to local communities. Stone & Nyaupane (2014), observe that the participation of local communities in decision-making usually results in the achievement of several important objectives. These may include among other things; a greater sense of community commitment and involvement; the facilitation of different ethnic, religious, linguistic and economic groups to meet in a non-confrontational and legally sanctioned environment and this has potential of ensuring that challenges around resource management and benefit distribution are resolved without recourse to the violence that characterises resource management in Africa. And finally, participation of locally based community system in resource management and benefit distribution is more likely to deliver services that are needed by the community.

It is on the above assumptions and principles of empowering local communities in managing their own resources that many CBNRM initiatives are based. The backdrop to this model of resource management stems from the fact that the traditional top-down systems and state led development intervention strategies have often failed miserably to deliver and meet the demand of the general populace (Rechilin & Taylor 2008). This has prompted the argument to shift to a focus involving national governments and NGOs playing the role of facilitators in the development process (Fonchingong & Fonjong, 2003). This discourse or paradigm shift is rooted in the belief that a key precondition for achieving any successful, meaningful and efficient NRM revolution, is a result of the presence of a strong and effective 'enabling system or state' with the capacity to respond effectively to the demands of the interest groups in a community (Gruber, 2011). Building on this observation, Simatele, Binns, and Simatele (2012) argue that while the state in SSA is part of the problem in resource management, it would be a serious error to underestimate its critical role in any effective rural NRM and development strategy. Many scholars hold the view that the crucial challenge in effective NRM in many parts of rural areas in SSA is how to dismantle the 'disabling state' and replace it with 'a state or system' which is not only protector and supporter, but also enabler and liberator (Chambers, 2003; Gruber, 2011; Matarrita-Cascante & Brennan, 2012). It can therefore, be argued from this standpoint that for any NRM system to succeed, it is important that new power-sharing relationships between communities, the state and other actors are worked out and established.

Using examples of the failed CAMPFIRE in Zimbabwe, ADMADE in Zambia and LIFE in Namibia, Ngwira et al. (2013) observes that although these initiatives were and have been based on the principles of community participation in resource management, they did

not and have not embraced a complete process of decentralisation of power and resource control from the state to local communities. Thus, there was and there has been no political space that had been created and established to propagate, open up and allow local communities to establish a new relationship between themselves and the central government (See also Blaikie, 2006). As a result these initiatives did not, and have not worked out successfully, due to the lack of full participation of all the stakeholders in the management of NRs and distributions of the benefits (Samah & Aref 2009). Simatele and Binns (2008) writing in a context of urban agriculture, observes that until local communities are given the right to manage their own resources and affairs, with support from central administration, NRM will continue to stagnate and the resource base will continue to erode.

Thus, as an approach for conservation efforts as well as development process, it can be argued that CBNRM presents five important assumptions and they include: the belief that local people are better positioned to respond and adapt to locally specific socio-ecological conditions, representing local interests and preferences; that they are well-informed about the intricacies of local ecological processes and management practices than does the state or distant corporate managers; that they are better able to mobilise local resources, both human and material, through locally adapted or traditional forms of access and management; that local people are more accountable for their NRM decisions and actions given the relative importance of the NR to their livelihoods and their proximity to the people they represent; and finally that local people are capable to adopting ways and means of sustainable natural resource management (SNRM) (DeGeorges & Reilly, 2009; Mbaiwa 2011; Gruber, 2011).

In view of the above observations, it would not be an exaggeration to argue that the importance of understanding the dynamics and complexities of a locality in which CBNRM initiatives are organised and implemented is important for the success of such activities (Mutandwa & Gadzirayi, 2007; Ngwira et al., 2013). Katerere & Chikoku (2002), for example, observe that communities, if properly integrated and encouraged to participate in CD initiatives, can be effective resources for sustainable development and resource management. This is however, possible only where communities are granted the right to access, manage, determine the mode of usage, benefit fully from use, and determine the distribution of benefits (Stone & Nyaupane, 2014).

Participation, therefore, becomes an important ingredient in any CBNRM initiative. Lane (2003), for example, argues that the participation of the public in traditional modes of planning is important as it is concerned with informing the planning processes and helps legitimise and validate decisions made by all stakeholders. Lendevlo et al. (2012) argues that participation of the local people can create a platform for their empowerment and enhance their role in decision-making in CD. It must however, be noted that local participation is dependent on the capacity of the locals to self-mobilise and establish conservancies, plan and implement their programmes, and monitor and evaluate their progresses and impacts (Taye, 2008). In the same vein, increased participation of the community can result in the development of systems and mechanisms that can contribute to SNRM and development (Borrini-Feyeraband et al., 2004; Jones, 2007). Samah & Aref (2009) are of the view that people's capabilities to think about their problems and needs and to act upon them by establishing various types of community groups, conducting and sustaining group activities, pressuring and negotiating with the relevant authorities in order to solve their problems and meet their needs is part of the process by which people

come to gain control over their lives and resources. This situation as observed by Child & Dalal-Clayton (2003) is reflected in the "Second generation CBNRM programmes" implemented in the Zambian Luangwa Integrated Resource Development Project in which local people's participation imbued the operations of the CBNRM initiatives.

It must be considered however, that while community ownership and participation in development process is paramount for community transformation, it is important to note that the provision of technical and financial assistance is cardinal in the formation of effective CBNRM projects (Gruber, 2011). This has been supported by Fonchingong & Fonjong, (2003) emphasising that the combination of traditional systems and structures of governance with government management frameworks in NRM has instilled a sense of ownership and appreciation of the value of NRs, thereby, resulting in an acute shift of attitudes towards NRs. USAID (2015) similarly observes that a strong institutional programme which is well-integrated with government structures, NGOs and CBIs has the potential to motivate local people not only to be involved in resource management but to actively participate in shaping their own development process.

For all the emphasis given to CBNRM approaches within recent environment and development policy debates, results in practice have often been disappointing both from the perspectives of implementing agencies, and of certain sections of the communities concerned (Blaikie, 2006). There are sentiments that suggest that the initiatives have largely been unsuccessful to deliver the expected and theoretically predicted benefits to local communities (Stone & Stone 2013). The devolution process, for example, under which CBNRM was conceptualised, has been impacted by the nature of governance structures and power relationships among the different stakeholders with invested interests

in CBNRM projects (Shackleton & Campbell, 2000). At the same time, the successes of disseminating and implementing CBNRM has raised new challenges and dilemmas as concepts of community, territory, locality, conservation, and customary law are worked into politically varied plans and programs in disparate sites.

Even though CBNRM regimes are intended to empower local communities, the representations deployed in constituting those communities remain largely unexamined. A number of case studies for example, show that devolution has not brought about the desired outcomes (Shackelton & Campbell 2000; Steenkamp & Urh, 2000). This is the case for CAMPFIRE in Zimbabwe, Social forestry in most of SSA where the devolution process was criticised for failing to fully devolve responsibilities and management from the central government to producer communities (Mutandwa & Gadzirayi, 2007; Roe et al., 2009; Stone & Nyaupane, 2014). In the same light, the State and to some extent NGOs have continued to dominate the management of NRs and benefits that have materialised from CBNRM projects in SSA (Harvey & Reed, 2007; Amungwa, 2011). This is exemplified in Cameroon where only localised communities could benefit from forest revenue opportunities to build significant economic development from CBM in the country's NRM plan (Amungwa, 2011).

Furthermore, Jones (2007) pointed out that ADMADE in Zambia was equally ineffective as a result of inappropriate understanding of the specific context of wildlife uses and related livelihood practices within its Game Management Areas (GMAs). The inabilities to control and guide the behaviours of intervening bureaucratic and local institutions continued to be a major obstacle to the implementation of innovative conservation ideas by community members. This is also espoused by Agrawal & Gibson (1999) who are of

the view that projects mostly supported by foreign donors have exhibited designs with significant inefficiencies and those developed with time-bound external funding were more frequently not sustainable after the termination of the external support. This has been caused by the lack of monitoring and evaluation of what works and what does not work in CBNRM programmes.

It is important to note that although a number of CBNRM projects and initiatives have been developed and implemented in a number of SSA countries, they have not fully contributed significantly to rural development and sustainable livelihoods (USAID, 2007). The devolution process has not brought about the desired outcomes. This is because the state and to some extent NGOs have continued to dominate NRM in both rural and urban spaces in SSA. As such, the benefits that have materialised from such initiatives have seldom benefited the majority of the community members especially the poor (Katerere & Chikoku, 2002). Botes & van Rensburg (2000) and Njoh (2009), for example, identify barriers such as paternalistic posture of authorities, prescriptive role of the State, exaggeration of success, selective participation, and intra/inter group conflicts as being among limitations of CBNRM initiatives. Despite these observations, CBNRM as a resource management tool has played an instrumental role in rural transformation (Boudreaux, 2010). This is because CBNRM programmes that have been successful have taken into consideration the local realities and processes of the people for whom development intervention measures are meant (Roe et al., 2009; Binns & Nel, 2012).

2.4. Towards a CBWRM Strategy in North-western Cameroon.

The provision of adequate drinking water and effective management systems are an important prerequisite, not only for improved living standards, but for poverty alleviation,

especially in rural communities in Cameroon (Ntouda et al., 2013). Water is the centre of socio-economic development and access to clean water and sanitation services is critical to other aspects of sustainable development and environmental protection (United Nations Development Programme, 2004; Faurès and Santini 2008). It is argued that water is becoming an increasingly scarce commodity and unevenly distributed in Cameroon (Ntouda et al., 2013). This is due to variations in rainfall patterns, climatic changes coupled with increasing demand exceeding supply (Ako Ako et al., 2010). They further argue that water scarcity and its distribution in Cameroon has been impacted by poor management and development of water resource infrastructure, inadequate political will and government commitment in allocating sufficient water resources on a long term basis to meet the needs of its increasing population.

Furthermore, the inconsistent and detrimental policies, combined with weak sector governance systems in the last two decades, have limited the development of access to water services (Ntouda et al., 2013). The Joint Monitoring Programme for Water Supply and Sanitation (WHO & UNICEF, 2014), for example, points out that the proportion of households without access to safe drinking water supply in rural Cameroon is 50 per cent, with connection rates as low as 14 per cent, and with only 27 per cent of the rural population having access to sanitation services. This situation has led to the prevalence of water related diseases, increasing household expenditure on basic amenities and increased incidence of poverty. In spite of decades of government and donor supported investments in the water supply and sanitation sector, public utilities in Cameroon have been unable to fully meet the demand for water and sanitation (Ntouda et al., 2013). The increased inabilities by the government of Cameroon to provide, maintain, and manage water resources in an effective, equitable, and sustainable way has resulted in the majority of the

rural population having no access to sustainable water resources (Njoh, 2009; Ntouda et al., 2013). The lack of water infrastructure development and general investments in rural Cameroon have negatively affected productivity and have contributed to increased food insecurities of the majority of the rural people. If significant investments in rural spaces is promoted and encouraged, it can potentially trigger increased innovation and food production. Cheru (2002) and supported by Simatele & Simatele (2014), argue that the rate of adoption of an innovation in rural spaces is largely dependent on the availability of complementary inputs from government agents and other stakeholders.

In view of the above observation, Kubanza & Simatele (2015) are of the view that for any meaningful system of resource management to be achieved, there is need for grassroots communities and organisations to be given greater control over the management and allocation of resources and the disbursement of benefits to all. Furthermore, Simatele & Etambakonga (2015) observe that devolution of power in any system of governance is meaningless unless accompanied by a strategy to empower and strengthen rural communities to manage their own affairs.

The above arguments and observations speak to the need to seek alternative water resource management and distribution approaches in rural Cameroon which would contribute to rural transformation and development. Samah & Aref (2009), Binns & Nel. (2012), for example, argue that a focus on community based initiatives, as a promising alternative to the centralised management approach is fundamental for a comprehensive sustainable development. This is because community participation articulate and clarify the project's goals and assign responsibility for tasks and outcomes, thereby helping to foster collaboration and build consensus. It has been argued that CBM in Northwest

Cameroon trails from the setbacks that were experienced in rural communities as well as the implementation of the economic and political liberalisation in 1991 and the 1998 water law which authorised individuals and communities to take a lead in water resource management (Menjo, 2004). Thus, providing safe drinking water in rural areas has been subject to both market and government failures (Biswas 2005; Yongsi, 2010). The combination of these two processes, coupled with the low level of access to safe water in the country and the urban-rural disparities have created a space within which to rethink how water resources are managed and distributed (Ako Ako et al., 2010).

This state of affairs has left many local authorities and CBOs unable to respond to the water challenges due to weaknesses in the institutional frameworks and a lack of adequate financial resources. It is within this context that CBWRM has been identified as one of the approaches through which sustainable access and use of potable water resources and CD in rural communities of North-western Cameroon is promoted. As such, government departments mandated with water resource management and other NGOs have shifted the focus to communities as important partners in the development and effective management of potable water. Interview conversations from a pilot study in all the research sites revealed that people's everyday forms of water use are shaped by local norms and customs. Female research participants in Baicham and Muloin aged between 30 and 35 years for example stated:

> *"Our culture is shaped by the water in our rivers and streams. We respond to the sound of the water as it flows or stands stagnant. Our culture and lives cannot exist outside the limits of our water resources" (personal communication, 2015a).*

This observation reveals a close relationship between community water resource use and the norms that have been shaped by resource constraints, requiring grassroots communities to adopt a sense of responsibility in the way CPRs are accessed and used. Further discussions with community members also revealed that individuals and households within all the research sites played a crucial role in initiating, financing and management of self-reliant projects through CBOs. Of particular interest is the involvement and commitment of the youths and women who have the potential to become dynamic instruments of development within these communities. The culture of solidarity for example, has become a common feature within these rural spaces, facilitating self-help development projects. A board member of the community-based water project in Zang-Tabi, Mbengwi sub-Division, for example stated:

> *"Thanks to the devotedness and generosity of the villagers especially the youth and the women who have been so eager to work for the development of the community. With their participation, we have been able to put our resources together to establish and implement this project. With their involvement, we have been able to set up a water management committee for overseeing the water project" (personal communication 2015b).*

In view of the above discussions, it can be argued that CBOs are currently the leading agents of development in Northwest Cameroon. They are well structured along cultural and village lines, executing micro-development projects that range from the construction of water supply schemes, community health posts, and community halls. Their emergence, resurgence, organisation and success in improving the standard of living of the rural population are obvious especially when we consider the fact that similar organisations and

projects have a long history in Northwest Cameroon (Fonchingong & Fonjong, 2003). These CBOs have elected memberships that run their affairs outside the traditional councils, the Chiefs and respected members of the village who are usually consulted for guidance. The existence of separate executing bodies is basically to ensure the operation, organisation, and soliciting of funds for the realisation of projects. In addition, participating in the management of CPRs vis-a-vis CD is a corner stone of any intervention measure. As argued above, participation of local communities in issues that either directly or indirectly affect them enables the people to open up channels of dialogue among all interested stakeholders. It also affords them a platform to communicate their priorities to government decision-makers and in a way improve community-government relations. A 55 year old research participant in Njimkang village, for example, stated:

> *"We have suffered a lot from water shortages in this area. The situation is even getting bad now with all these frequent droughts that we are experiencing. I just wish that government would include us in their bid to look for solution. We were born here and have a good understanding of this area and I am sure if government mobilise these communities, we would all work together to find sustainable solutions to the current water crisis in our area" (personal communication, 2015c).*

The above sentiment highlights and re-emphasises the importance of CBOs in NRM and CD. The observation is grounded by the assumption that CBOs can be platforms to enhance participatory governance for efficient and effective management of water resources and conflict resolution (Mwaipopo et al., 2011). It can therefore, be suggested that community participation is crucial in governance and decision-making processes in CD projects especially as there is usually enthusiasm from the community to participate in

projects. This is because the adoption of projects is arrived at through consensus which must meet the aspirations of all stakeholders in the community. Examples from Zang-Tabi, Njimkang and Muloin Water Projects in Northwest Cameroon reveal that community financial contributions which are a form of participation, necessary for the realisation of water supply projects are determined by the ability of the individual to contribute. This observation, as argued by Lendevlo et al. (2012), is based on the notion that people's participation at the grassroots level is pivotal in achieving the objectives of CD and in reducing both poverty and inequality. These views are in tandem with the efforts of communities to initiate and realise their projects.

Furthermore, community participation in liaison with NGOs is an added dimension of CD in Northwest Cameroon (Fonchingong & Fonjong, 2003). For example, international NGOs like the Swiss Association for International Development (SATA-HELVETAS), Netherlands Development Corporation (SNV) and Plan International Cameroon, the Strategic Humanitarian Service (SHUMAS), Grassfield Participatory and Decentralised Rural Development Project (GP-DERUDEP) are marked as partners in self-reliant projects and CD in Cameroon. Their intervention is remarkable in the domain of pipe borne water schemes, protection of water catchments and road rehabilitation. They work in partnership with VDAs, CBOs and WMCs in designing and adopting projects, giving technical advice, digging of trenches, supplying sand, stones, laying of pipes for distribution of water to the various localities and maintenance of pipelines. The WMCs and CBOs that are an auxiliary of the VDAs are very instrumental in handling problems that relate to distribution, maintenance and collecting water dues. This situation is evident in the Ndu, Njinikom and Mbengwi municipalities in Northwest Cameroon where the involvement of community members in resource management has been aligned with formal NRM

institutions in a bid to promote sustainable resource utilisation. In addition, women were levied US1$ (500 CFA franc) and men US2$ (1000 CFA franc) for the realisation of the water systems while maintenance fees were based on the gravity of the problem in the various localities. It is through these actions, participation and contact that the community becomes more vital, more able to manage change with stronger networks, organisational ability, skills, leadership and passion. However, lasting CD relies on less tangible components of development, such as community ownership, local leadership, and action (Matarrita-Cascante & Brennan, 2012). These assertions were confirmed during a focus group discussion with six women in Njimkang, aged between 25 and 35 years who stated:

> *"Because of the long distances that we have to walk as women to get water which is even not of good quality, we have now formed a woman's community group with the aim of helping members of the community to realise the village water project. This will give us enough time to do many other things to improve our lives such as; having more time to work in our farms and setting up small businesses" (personal communication, 2015d).*

From the above statements, it would not be an exaggeration to add that in the quest to improve their standards of living, reduce inequalities and alleviate the water challenges that rural women and households face in Northwest Cameroon, community solidarity and cooperation have become important resources in the establishment of community self-help projects. These informal systems of community organisation, if properly cultivated and harnessed, could form the basis of effective and efficient structures and mechanisms for the management of potable water resources in the rural communities. A fundamental requirement for achieving a successful water resource management revolution, however, is embedded in the presence of a strong and effective 'enabling institutional and policy

framework' with the capacity to empower and respond to the needs and demands of rural populations. The key challenge for both national and local government institutions in Cameroon is how to create an innovative platform that will bring together stakeholders from different interest groups, disciplines, sectors and organisations to exchange knowledge, ideas and resources and take action to solve common problems in order to bring about a desired change in NRM. During focus group discussions with the youth, (4 boys and 3 girls) aged between 20 and 25 years from Muloin in Njinikom sub-Division, it was pointed out that:

> *"We have suffered for a long time and we can no longer sit and wait for the government to address our problems. As youths we have finally realised that we can make a difference in our communities by influencing and shaping our own development path and processes. All we need from government is space for us to determine our own development and future" (personal communication, 2015e).*

The above sentiment speaks to the argument that, if CBWRM initiatives in Northwest Cameroon are to succeed, there is need for a new power-sharing relationship to be worked out among all interested state and local actors. This common platform will provide a forum for negotiation and dialogue to encourage joint identification of issues to improve linkages between actors, empower and increase community participation in planning processes and co-design of interventions tailored to local livelihoods (Swaans et al., 2014). They also pointed out that a common platform may help address the lack of coordination and communication between stakeholders; seen, alongside power imbalances, as a key bottleneck to the process of fostering change in rural systems. The combination of these different actors is seen as a potential catalyst for addressing problems and a way of

ensuring that various groups including those traditionally marginalised can contribute to the change process.

Although CBNRM has been the flagship of NRM in Northwest Cameroon, a number of weaknesses have been identified as the major pitfalls in implementing effective community-based projects such as; mismanagement, politicisation and vested interests (Amungwa, 2011; Fonchingong & Fonjong, 2003). This is because elites in Cameroon for example constitute a strong force in CD endeavours and since the game of politics is determined by the lobbying capacity of the region, they play a central role in canvassing for resources from the central government. This is the situation of the Kumbo Water Authority in the North-western part of Cameroon for example, whereby different local interest groups and political leaders use existing CBOs as a political base to back up their actions (Page, 2003). This polarisation and return favours expected by elites have created unnecessary tension leading to the dysfunction of some VDAs. As funds become unlikely, disparate and angry voices creep in and these financial constraints has forced some VDAs to scale back on identified projects. In the same light, high levels of corruption and weak institutional frameworks within which grassroots activities could be supported has declining and negative effects on the enthusiasm of community members. Conflicts have also arisen over the mismanagement and embezzlement of funds by some leaders of CBOs leading to a crisis of confidence for members of some committees. This is an indication that CBM operations as a development model are increasingly under attack by the exigencies of a macro-political and economic environment.

There is therefore, an urgent need for an effective decentralised process that will facilitate a reversal of the current top-down paradigm of NRM to involve more participation of the

grassroots. Thus, a political space must be opened up to allow rural communities to establish new relationships among themselves, NGOs, local and national governments. Until rural populations in Northwest Cameroon are given the right to manage their own affairs and NRs, with support from government institutions and different NGOs, effective and sustainable potable water resource access and use will continue to stagnate and the resource base will continue to erode. Community-based systems of resource management and governance must be promoted and given a voice and a greater control over the allocation of resources, the disbursement of funds intended to benefit them, and the appointment and control of officials meant to serve them (Mwaipopo et al., 2011; Simatele & Etambakonga, 2015).

2. 5. Conclusion

The discussion in this paper reveals that rural communities in the North-western part of Cameroon are increasingly becoming development spaces where individuals and whole communities are dynamic actors in fashioning issues of common interest (Amungwa, 2011). As such the need to look for alternative strategies to the current development challenges such as water crisis have become a major driving factor compelling communities to unite and cooperate in their bid to find sustainable solutions to the water crisis. There is now an urgent need to promote efforts that address issues of community empowerment in the management of natural resources. It should be noted that efforts to revitalise effective NRM in the area of potable water in Northwest Cameroon will only succeed if accompanied by a radical shift in the structure of power and governance of NRs. Consequently, local people must be empowered and encouraged to participate in the

identification of problems that affect their communities as well as in the design and development of strategies to address these problems.

Although CBNRM is not a panacea for NRM and CD, it has been argued in this paper that the approach represents one of the strategies that can be used to shift the power of control in issues that affect communities from outside actors to communities' themselves. This is based on the assertion that communities, when supported in their endeavours, are strategically placed to deal with and resolve any development challenges and issues that they may be faced with (Simatele & Etambakonga, 2015). Further, contemporary experiences with CBWRM in rural Northwest Cameroon have demonstrated a wide range of development potentials and pathways, as well as opportunities which can be harnessed and tailored towards facilitating platforms for enabling the local people to meet their needs and improving the water situations in their respective locales. Thus, CBWRM, if properly integrated and aligned with the national development and planning policies can play a central role in community transformations and poverty reduction in rural areas of Cameroon.

Community-driven development has thus, confirmed its usefulness as an easy, all-on-board and results-oriented approach to contemporary modes of translating boardroom ideas into meaningful development in rural communities. This is because development that is community driven also brings the administration closer to the people, thereby making them more active contributors to the development process. There is therefore, an urgent need for the government and its development agencies to adopt systems and strategies of governance that ensure that the local people are empowered, integrated and encouraged to participate in the development of issues which either affect them directly or

indirectly. Such an approach should be the basis upon which any development intervention efforts are structured in order to achieve sustainable water resource use and development. CBWRM has therefore, been one of the most charismatic features of Cameroon's rural development.

CHAPTER THREE

Complexity and Uncertainty in Water Resource Governance in Northwest Cameroon: Reconnoitring the challenges and Potential of Community-based Water Resource Management[7].

Abstract

This paper examines the complexities and uncertainties which exist in water resource management and governance in community-based natural resource management (CBNRM) in Northwest Cameroon. Using empirical data collected through tools inspired by the tradition of participatory research with local communities in Ndu, Njinikom and Mbengwi rural districts in Northwest Cameroon, it is shown that the management of water resources is challenged by a number of factors such as uncoordinated national development policies; weak institutional framework, top-down management approaches to natural resource management, the paternalistic posture of authorities, the inability of water users to promptly and regularly contribute to the operation and maintenance of the water system, as well as the inadequate preservation of watersheds. In this paper it is argued that in contexts like rural Cameroon one of the key ways in which to improve the supply of water for human use, whilst still conserving water resources, is to make it easier for ordinary citizens (water users) to work with the other stakeholders involved in water management. Clarifying issues of jurisdiction between central and local governments is central to this process of enabling water users to be involved in the management of their own water supplies. Until the full representation and participation of ordinary citizens in policy discussions is achieved, complexity and uncertainty will overshadow the management of water resources in Northwest Cameroon.

Key words: Community-based management, sustainable, participation, rural, Cameroon

[7]This chapter is based on: Tantoh, H. B., & Simatele, D. (2017). Complexity and Uncertainty in Water Resource Governance in Northwest Cameroon: Reconnoitring the challenges and Potential of Community-based Water Resource Management (Under consideration, Land Use policy).

3.1. Introduction

The relationship between human social development and sustainable natural resource use in sub-Saharan Africa (SSA) is well documented in the literature (Potter et al., 2008; Binswanger-mkhize et al., 2010; Manzur, 2013). However, it has been observed that contemporary development processes and the need to satisfy human needs and wants have increasingly exerted enormous pressure on the natural environment, resulting in unprecedented levels of environmental devastation and destruction (Lockwood et al., 2010). Increasing population, rapid urbanisation and rising incomes, for example, have combined to result in increased demand for food and other Natural Resources (NRs) such as oil, land and water (Khanal et al., 2014).

The central question in this broad field is how to effectively manage Water Resources (WRs) in a way that meets the increasing needs of the rural population (for drinking water, sanitation, irrigation, livestock) while still conserving them in the local environment. The more specific question this paper asks is how to achieve this balance in a context where a series of issues (uncoordinated national development policies, weak institutional framework, a recent history of top-down water management approaches, a tradition of paternalism among authorities, an inability of the water users to contribute to water management and watersheds that are already degraded) make it particularly difficult to do so. Whilst this particular combination of factors may be unique to this case study, several of them are common around the world and so have wider relevance. Resolving all these issues simultaneously is unrealistic, so the paper argues that priority should be given to finding better ways to involve local water users in water management, and that clarifying the roles of national and local governance is a pre-requisite for achieving user participation. In other words the paper explores how different forms of governance might lead to easier water user involvement,

resulting in more sustainable Water Resource Management (WRM) systems. Unfortunately, changes in human behaviour and the pressure put on the NRs have coincided with significant changes in climatic conditions, further compromising the ability of the natural environment to adequately supply the ecosystem services required for human socio-economic development. Nyambod & Nazmul (2010), writing on water management and poverty alleviation, argue that climate change is projected to worsen recent and future pressures on WRs from population growth and land use, and increase the frequency and severity of droughts and floods.

It has been observed that many SSA countries are expected to experience the most devastating impacts of these changing climatic conditions due to their geographical location, low incomes, low levels of technological development, fragile institutional capability to adapt to rapid variations in the face of environmental alterations, as well as their greater dependence on climate-sensitive renewable NR sectors such as water, agriculture, and energy (Eboh, 2009). Anyadike (2009) argues that SSA countries are particularly prone to climate variability and change due to the fact that many of them are vulnerable to the increasing desertification of the continent, deteriorating run-off from river basins, impoverishment of soil fertility, reliance on subsistence agriculture, the high prevalence of HIV/AIDS and vector-borne diseases, inadequate government mechanisms and rapid population growth, factors that have the potential to compromise both economic growth and national development (see Cheru, 2002).

It is in this context that Biswas & Tortajada (2010) advocate for the development of institutional and policy frameworks through which to effectively manage and govern WRs in a bid to mitigate against the effects of climate and other environmental change, and promote

sustainable development on a local context. This state of affairs is only possible by promoting and adopting institutional and policy arrangements that are fitted to the needs of local communities and ecosystems rather than attempting to command the management of NRs with approaches developed in the developed north (Ostrom, 2007). Cheru (2002) observes that many governments in SSA have for too long lacked good governance, an essential ingredient in any form of NRM and national development. The prevailing approach to Natural Resources Management (NRM) in some African countries (such as Ivory Coast, Cameroon, Ethiopia, Madagascar, Sudan, Niger, Mali and Guinea Conakry) has often tended to be based on a centralised system, placing very little attention on the importance of private agents and rural communities (Roe et al., 2009). In Cameroon, for example, WRs have been formally managed by highly centralised national institutions and this has resulted in the exclusion of rural communities from a role in water management. However, Tantoh & Simatele (2017) note that there is now a shift in policy rhetoric towards adopting pro-community approaches in WRM in Cameroon. This development can provide a platform for learning from polycentric[8] governance approaches, which advocate multiple legitimate centres of policymaking that depend on each other. Polycentric resource governance claims to improve efficiency and sustainability and is currently practiced in some African countries such as Botswana and Kenya that are striving to improve the management of Common Pool Resources (CPRs) (McCord et al., 2016). Centralised management has raised questions on the effectiveness of top-down approaches in promoting equitable access to NRs as well as meeting the needs of the entire population especially those communities in close proximity to them (Tantoh & Simatele, 2017).

[8] Polycentric governance approach is an adaptive system of resource management that is structured with multiple centres of authority at the local, water basin, and national levels. There is usually overlapping authority among decision-making centers with formal and informal mechanisms of coordination and communication between the decision centers (McCord et al., 2016).

Despite the deficiencies in the management strategies and approaches that are employed in NRs in many SSA countries, there is now increased realisation of the importance of good governance as a bench-mark for promoting effective and sustainable modes of NRM (Musingafi & Chadamoyo, 2013). By *governance,* we imply the "interactions of different structures, processes and traditions that determine how power and responsibilities are exercised and how decisions are taken, as well as how citizens or other stakeholders have their say" (Lockwood et al., 2010:987). Governance is a more wide-ranging concept than government per se; it relates to a broad social system of governing, which includes, but is not restricted to the narrower perspective of government as the main decision-making political entity. It embraces the relationship between a society and its government. There is, now a common agreement that good governance involving the participation of all stakeholders is a pre-requisite for effective community transformation (See Lockwood et al., 2010). This calls for *good governance* defined as "an organisational system which is institutionally legitimate for its constituency, efficient in carrying out its purposes characterised by participatory tendencies, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law" (Lockwood et al., 2010: 991; OECD 2015:5). There are calls by the international community and Civil Society Organisations (CSOs), for governments to do less, and for private and community sector actors to create partnerships, with governments playing the role of facilitator in solving challenges that affect communities (Musavengane and Simatele, 2017). There is currently consensus on the need for African governments to create an enabling environment and climate in which values of fairness cooperation and accountability can be improved to address the challenges that are faced in NRM (Stone & Nyaupane, 2014). This has however, been affected by the deficiencies and inconsistencies in the implementation of real institutional reforms which would improve service delivery on the ground and empower communities to manage their

own affairs and resources. Governments across the African continent have tended to adopt the rhetoric of decentralisation and devolution, but these processes have often lacked a focus on meaningful institutional and policy changes which would facilitate the process of empowering local communities to effectively manage their NRs (Nuesiri, 2015). Cheru (2002), for example, argues that most African systems of NRM require reform and transformation in terms of the representativeness of rural populations in policymaking processes, an element that Musavengane & Simatele (2016) advances as the need for civil society engagement in a fair and transparent way, while promoting systems of partnerships[9] with local authorities, communities and the private sector. Ribot (2002) argues that such partnerships can make significant differences between well-governed and misgoverned NRs.

The shift in understanding the importance of good governance in environmental challenges which forms part of the discourse in 'wicked problems' has given rise to the concept of *new governance* (Howlett & Rayner, 2006), a term that emerged in the 1990s describing the mode of governing that shows a preference for collaborative approaches among government and nongovernment actors from the private sector and civil society. Complex and wicked problems generate obstructions that can only be overcome through the collaboration of different stakeholders (Musavengane & Simatele, 2016). It is within this context that community-based natural resource management (CBNRM) was conceived and developed to respond to the difficulties and challenges that go with the management of NRs (Nelson & Agrawal, 2008; Roe et al., 2009). In the context of this paper the term Community Water Supply Management (CWSM) has been adopted to denote that those beneficiaries who are in

[9] Understandings between interest-driven actors (public, private) with diverse goals to cooperate and advance their mutual interests (Campbell & Shackleton,2001)

close proximity to water resources (i.e. all the water in the locality) should be empowered and mandated to have access to, and control over, the development of such resources in ways that contribute to meeting their needs and promoting sustainable water supplies in their communities (Binswanger-mkhize et al., 2010). This state of affairs is possible through the facilitation of active community participation in decision making processes and the management of community projects (Hope & Rouse, 2013).

Njoh (2003) notes that community involvement in water supply in the Northwest and Southwest of Cameroon has a long history, which dates back to the late 1940s and early 1950s which involved the participation of communities in activities such as maintenance of community markets, village to farm roads, water sources, and building traditional water structures (see also Chadwick, 1949; Page, 2003). These traditional systems, as observed by Njoh (2003) and edified by Tantoh and Simatele (2017) played a key role in ensuring the sustainability in water supplies and community wellbeing. However, recent challenges in the availability and supply of water has resulted in the re-emergence of Village Development Associations (VDAs) and Community Based Organisations[10] (CBOs) with the view of identifying possible avenues through which to improve access and supply of water to rural households (Njoh, 2012). It must however, be noted that the Government of Cameroon has always been closely associated with these institutions and fostered them as agents of rural change in the past. They were mostly headed by political elites from powerful ethnic groups, even when nation-building in the 60s and through the 1980s and 90s required such VDAs to be 'non-tribal' (Mercer, Page, & Evans, 2009). However, recent evidence suggests that the deteriorations in economic growth, coupled with weaknesses within the institutional and

[10]These are membership grassroots organisations such as; women's groups, farming groups, credit unions and co-operatives initiated under different influences with specific objectives but with community development as their common goal.

policy setup as well as weak governance systems have combined to force, poor rural communities to increasingly take on the adverse impacts of the economic recession that has continued to plague the country in the face of growing inability by the State to provide economic and social services. The absence of pro-poor grass-root initiatives aimed at mobilising and organising communities to manage their own resources effectively, have further worsened the plight of the poor thereby, making it practically impossible for the rural poor to break the poverty cycle (Fonchingong & Fonjong, 2003; Carmody, 2010).

In summary therefore, it is not an exaggeration to argue that the involvement of local communities in matters that concern them is an important ingredient in the achievement of several important objectives such as community members having a greater sense of ownership of their own future and different ethnic, religious, linguistic and economic groups working towards a common community good (see Mbaiwa, 2005; Stone & Nyaupane, 2014). When communities are involved and actively participate in the initiation, development and management of their own resources for example, they become empowered and their capacities are improved to better broaden and deepen their own specific management systems of complex scenarios (Tantoh & Simatele, 2017). In view of these assertions, this paper explores the extent and potential to which CWSM initiatives in Northwest Cameroon can contribute to community transformation and sustainable development. In addition to this, the paper engages with contemporary difficulties in water resource management as well as supply and identifies possible community strategies that can be embarked on to improve the management of water resources in a sustainable and efficient way in order to improve community wellbeing.

3.2. Research methodology

This paper is based on empirical data that was collected in Northwest Cameroon between November 2015 and January 2016 through the use of methods inspired by the tradition of participatory research[11]. The research was conducted in three rural districts; *Mbengwi, Njinikom and Ndu* (Fig 3.1). These rural districts were selected based on the availability of a community water supply project, period of time that the project has been in existence with a baseline of 25 years, network coverage, usage and the presence of a management structure, as well as the representation in key decision-making positions in the project of individuals from different socio-economic groups and gender aspects. Furthermore, these communities are noted for initiating and realising rural development projects through VDAs and CBOs. The region is characterised by common cultural and traditional beliefs[12] and attributes, such as language and cultural norms, as well as social structures of community leadership and NRM and utilisation. A notable feature of these communities is the high dependence on agriculture and animal husbandry as the main source of livelihood. Self-reliant projects mostly initiated by VDAs play a significant role in Community Development (CD) with community participation as a fundamental element. The system of community governance and administration is through local chiefs, locally known as "Fons" in the Bamenda Grassfields[13]. Water supply and sanitation is managed through community based systems and particularly by Water Management Committees (WMCs) and this is administered through a gravity-led technique. This is a system where water is channelled from a watershed through springs and piped down to the villages.

[11]Participatory research is a cooperative approach that enables people to express the realities of their situation and subsequently supports them to plan and to act. It allows people the opportunity to define, describe, analyse and express their perceptions and to have their opinions taken into consideration.

[12] This refer to inherited or customary pattern of thought, action, or behaviour of the local communities

[13] The Bamenda Grassfields with Bamenda as the provincial capital illustrated in the map of Cameroon embodies most of the Northwest Province situated in the Western Highlands of Cameroon. Much of the higher altitude parts of the region are grasslands used by pastoralists, whilst the valleys at lower altitude are densely farmed or forested.

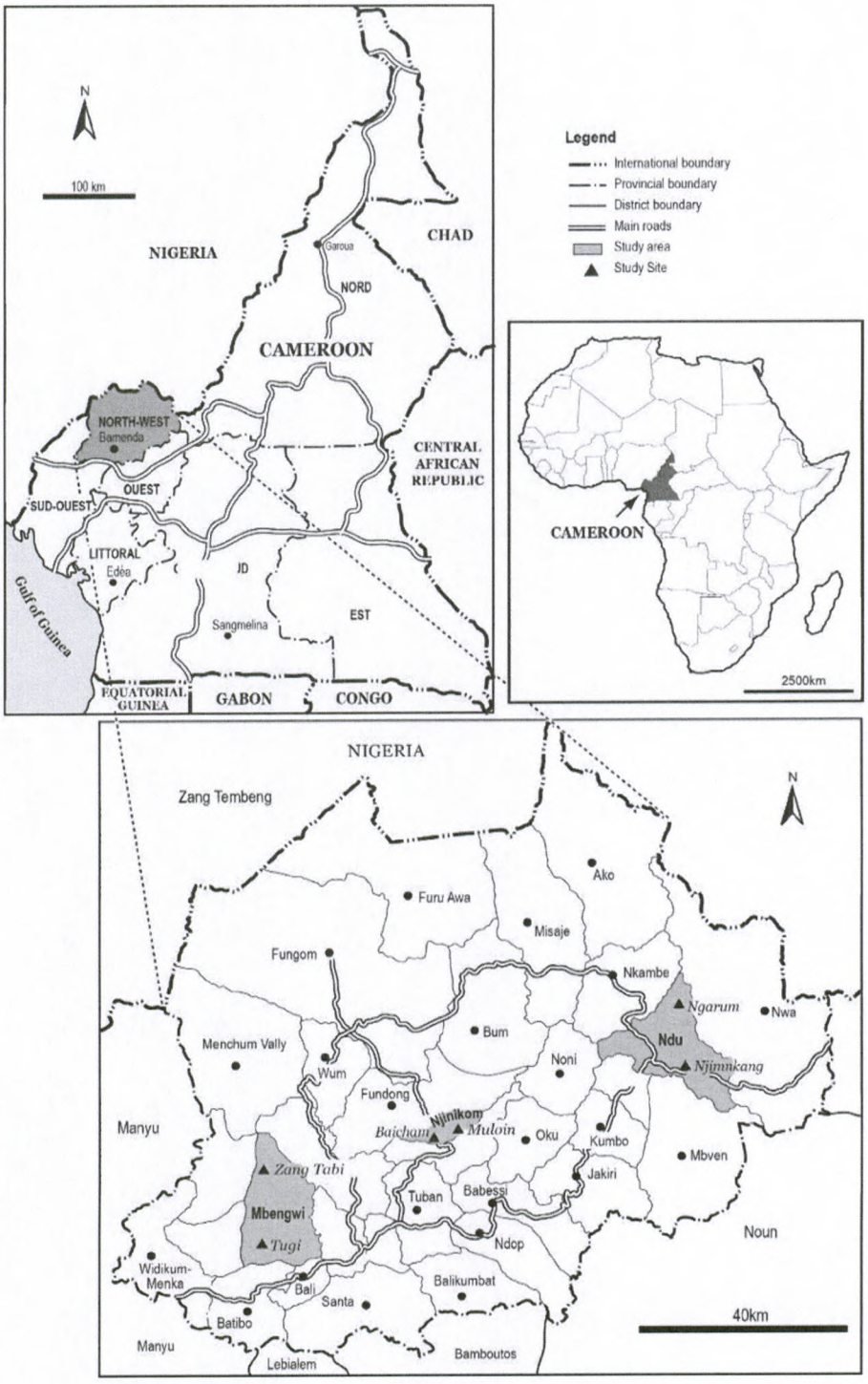


Figure 3.1: Map of Cameroon and the study sites in Northwest Cameroon

Source: Cartography Unit (2016), School of Geography and Environmental Studies, University of Witwatersrand, South Africa.

There are at least 10 villages in each of the three rural districts, so two villages were selected for the study from each district using the technique of *allocation concealment*[14], and this resulted in the selection of: *Tugi, Zang-Tabi, Baicham, Muloin, Njimkang, and Ngarum* (Figure 3). Data was collected from three main groups within the communities. They include; household heads, personnel from the WMCs, and other stakeholders with an interest in WRM (i.e., officials from various tiers and ministries, Non-Governmental Organisations (NGOs)). This was to obtain information about the various forms of participation, the role of all interest-driven actors and, the challenges faced in the realisation of the water system. A population list using the technique of *adaptive sequential method*[15] was composed and gave rise to a study population of 180 households across the six villages. A margin error of 40% was then applied to draw a study, and this resulted in the selection of 72 potential research participants. To select these participants, a logical sampling procedure was used. An interval ratio of 2.5 and rounded off to 3 was selected and applied across the study population to select the 72 research participants, with the first participants purposely selected. In addition to this, 18 questionnaires (three for each of the six villages) were designed and administered to the WMCs to assess the management practices, financing aspects, decision-making processes, and the management of the water supply and its associated watersheds[16]. To determine the level of community financial contributions towards the Operation and Maintenance (OM) of the water system in the three study sites, a questionnaire was administered, and this process yielded information on household incomes and frequency of financial contribution to WRM.

[14] This is a randomised process of data collection that ensures that the different groups being studied have similar characteristics and prevents researchers and participants from predicting and thus influencing upcoming group tasks. The results give a fair representation as it is unbiased.
[15] This is a method used to recruit a sample with a specific desired composition. It is an effective approach when we have partial/no information about the willingness to participate.
[16] A watershed is geographical unit where water is collected by the natural landscape and drains into a river, from its source to its mouth.

In-depth interviews and discussions using semi-structured and open-ended interviews were administered with focus groups and informed water specialists, CBOs, and other stakeholders. Among these include; the officials from the MINEE; the Ministry of Environment and Nature Protection (MINENP); the Ministry of Forestry and Wildlife (MINFOF); the Ministry of Agriculture and Rural Development (MINADER); as well as regional departments operating under these ministries in Northwest Cameroon. In total fifteen (15) officials from the different government ministries and five (5) regional officials were included in the study. Interview conversations with the six (6) members of CBOs were also conducted. Discussions with Five (5) community leaders were also carried out to understand the role and extent of community leaders and community members participation in WRM issues. It is imperative to note that the aim of engaging with different stakeholders was to assess the institutional, policy and management structures as well as management practices which exist in the management of potable water in Northwest Cameroon. To complement the empirical data, a review of existing literature on the governance of NRs, CBNRM, and Community-Based Water Management (CBWM) using the rapid appraisal technique[17] was conducted.

3.3. Community-based water resource management: a literature review.

The policy environment for NRM has changed dramatically in recent decades. It is argued that population growth, agricultural extension, climate variations and change and socio-economic activities have combined to put enormous pressure on NRs (Manzur, 2013; Khanal et al., 2014). Increased technological developments, globalisation and increased incomes have resulted in increased demands for NRs resulting in their over-exploitation (Blaikie, 2006; Potter et al., 2008). As a consequence, there is now a call for regional and national

[17] This is a streamlined approach to synthesizing articles that are directly related to the question under study in a timely manner.

governments both in developed and developing countries to establish institutions, formulate and implement a wide range of policy instruments and tools that can effectively contribute to the protection, conservation and sustainable management of NRs (Bartley, Andersson, Jagger, & Van Laerhoven, 2008; Roe et al., 2009). These institutional and policy arrangements could be managed and implemented through different arrangements, including governmental, private, or community conduits (Ostrom, 2007, 2012).

Most central governments in SSA countries view natural resource governance as a top-down affair with centralised approaches of environmental decision-making that place NRs under the control of state bureaucracies. This marginalises local actors who are often dependent on the same resources for their livelihoods (Agrawal & Gibson, 1999; Bartley et al., 2008). Mbaiwa (2005), for example, noted that rural communities in the Okavango Delta, Botswana often have inadequate and sometimes insecure access to NRs. Writing on the conflicts related to NRM in Cameroon, Amungwa (2011) remarked that the approach adopted by the government is highly centralised and mostly top-down without due consideration to the historical and cultural norms and values of indigenous communities. This exclusionary mode of governance has often been backed by logical narratives that signified NRs as threatened by increasing human activities, particularly those nearby (Amungwa, 2011). It was also thought that only a strong central government was capable of restricting local demands for NRs, which if unmitigated by the central powers would eventually lead to their over-exploitation and destruction (Bartley et al., 2008). Ribot et al. (2006), for example, are of the view that central governments in many countries of the developing world have tended to view the management of NRs as a top down system However, this presumption has been challenged by many who argue that centralised management systems often have faulty designs, significant inadequacies and fail to meet the needs of local communities as was the case with

Zimbabwe's Communal Areas Management Programme for Indigenous Resources (CAMFIRE) (Agrawal & Gibson, 1999; Amungwa, 2011).

Given the apparent setbacks of centralised management systems, decentralisation policy is now a highly touted response to the difficulties of natural resource governance. Consequently, considerable restructuring of the institutional arrangements governing NRM, encouraging and promoting local user groups to take leading roles in managing their NRs is on the rise (Ostrom 1990; Ribot, Agrawal, & Larson, 2006; Stone & Nyaupane, 2014). Along these lines, CBWM initiatives have been considered as an alternative approach to centralised models of NRM due to the inability of governments to effectively and efficiently manage natural resources to meet the increasing needs of local communities (Wiek & Larson, 2012). With increased recognition of the role that communities themselves can do to foster their own development, there is now a shift in the community development paradigm, from one that is entirely state driven to one that fosters principles of decentralisation[18], transferring and devolving power and control over NRM to local actors (Njoh, 2003; Borrini-Feyerabend, Kothari, & Oviedo, 2004; Cases & Ribot, 2016). Commentators of social development, for example, have advanced irrefutable arguments on the intrinsic capacity of local actors to act collectively to solve problems that affect them and scalp their own development path (Ribot, 2002; Bartley et al., 2008; Ostrom, 2012). In this regard, national and local governments are now encouraged to increasingly take on the role of facilitators and support the devolution of management and governance of NRs from central administrations to CBOs (Ribot et al., 2006). This is because local institutions have better knowledge of local needs, have access to information about their environment, and, when endowed with powers, are more likely to

[18] Decentralisation is any political act in which a central government formally cedes powers to actors and institutions at lower levels in a political-administrative and territorial hierarchy. In this sense, decentralisation is a strategy of governance to facilitate transfers of power closer to those who are most affected by the exercise of power (Ribot et al. 2006).

respond to local aspirations and are more easily held accountable by local populations (Borrini-Feyeraband et al., 2004; Njoh, 2012). Thus, a number of development experts are now defending the decentralisation reforms and encouraging CBWM as avenues through which to bring about community transformation as these processes can act as plateforms for improved efficiency, equity, and responsiveness to citizen demands and needs (Van Koppen, Giordano, & Butterworth, 2007; Bixler et al., 2015). However, Cooke & Kothary (2001) argue that development agencies tend to apply participation in a manner in which it fits into their organisational practice. Moreover, the approach tends to shift the responsibility for the consequences of project outcomes to project beneficiaries instead of practitioners. Although governments have sometimes intended to empower grassroots communities, Hans (2005) notes that it is also a strategy to divert international attention away from their lack of democracy. Furthermore, local governments have often been created without administrative authority and fiscal resources (Ribot, 2002). For instance, responsibilities in forest management were devolved to local elected councils in Uganda and Senegal, but the governments reaffirmed control by cutting territorial influence of local authorities (Ribot et al., 2006). Nuesiri (2015) further notes that the absence of political will, can overide decentralised initiatives such as was the case with community forest in Cameroon where the government using Articles 3(11) and 3(16) of the ministerial decree continued to have control over forest resources. Thus, full decision-making power and process still resides with the central government. If local people are to become better able to use, manage and conserve the NRs that their livelihoods and wellbeing depend on this mismatch must be better understood and eventually negotiated with the help of policy and development practitioners.

When WRs are managed at a local scale rules are needed to resolve disputes between different communities that were previously resolved at higher spatial scales, particularly as

ecological conditions change. Polycentric forms of governance explicitly set out to theorize such a context by establishing a system of equitable water distribution and coordination between multiple decision makers (McCord et al., 2016). This is because polycentic governance allows local groups to devise rules that respond and adapt to local conditions, making polycentric systems more resilient to ecological shocks (McCord et al., 2016). This is evident in the case of Kenya where the drive to polycentric water governance enabled the socio-ecological and institutional interactions through which responsibilities are distributed at the local, regional and national level and across multiple levels for positive outcomes (such as regulating water usage and ensuring water availability for downstream users, encourage local decision-making, and increased level coordination among water users) (McCord et al., 2016). The centrality of WRs in the livelihood and wellbeing of the inhabitants at the local level requires multifaceted governance arrangements with CBOs at the village level, municipal authorities at the district level, and government ministerial departments at the regional and national levels involving contribution from local users in diverse fashion. This is because water users have different experiences in terms of their social, political and economic attributes which also have implications on their level of access to WRs. In this regard, necessary connections for sustainable outcomes can be developed between and among these actors who have a stake in the resource at multiple scales like in the Upper Ewaso Ng'iro region in Kenya.

Although highly polycentric systems are complex and adaptive with no guarantee that they will find the combination of local rules and the national water reforms at diverse levels for any particular environment, it however, allows local groups to devise rules that respond to local environments, giving actors within the system opportunities to experiment new approaches to governance by adjusting their management strategies (McCord et al., 2016).

From this perspective, increasing attention has been conferred to Community-based Management (CBM) programmes which necessitate the involvement of all actors in decision-making for sustainable outcomes (Manzur, 2013). This approach to management as observed by Njoh (2012) and Peter & Nkambule (2012) is capable of assembling locally produced materials and labour through customary forms of access and management. One key point Page (2003) makes when discussing the Kumbo Water Authority is to think more critically about this claim and specifically whether assembling local resources (through community mobilisation) in this way is either fair (just) or generates sufficient revenues to sustain costly infrastructure over time. It is, therefore, necessary for CBM initiatives to overcome barriers to partnership and mutual aid by creating local governance structures that promote participatory decision-making as espoused in the polycentric governance approach (Musavengane & Simatele, 2016; McCord et al., 2016). This assertion, as supported by Liu et al. (2008), is based on the premise that engaging grassroots communities in policymaking processes in NRM improves trust and creates social networks which then act as an essential attribute in the day-to-day operations and lifecycle of CBWM initiatives.

A considerable amount of literature has advanced the significance of rural communities in rural water management operations (Doe & Khan, 2004; Sun et al., 2010; Njoh, 2012; Tantoh & Simatele, 2017 among others), emphasising that national and local institutions which support these grassroots initiatives, have a major responsibility, authority and control over the development of such projects. A major question that is mostly posed by policy and CD practitioners is how to organise rural communities to finance and manage local water supplies effectively (Rondinelli 1991; Bunclark et al., 2011). A classic example is the case of the Maturu-Luandeti community water supply scheme in Kenya where the local spirit of *"Harambe"* working together introduced at independence, provided the basis for a general framework for CBWM (IRC, 1997). This was facilitated by the creation of an enabling

environment *"Baraza"*, through which decisions regarding the adoption of the management options and responsibilities of the community in collaboration with public authorities and donors were made. Advocating the idea of establishing an enabling environment, Yacoob et al. (1987) identified social and symbolic rewards by village chiefs or local government leaders at village ceremonies in Sierra Leone and in other African countries as an important incentive in stimulating community participation. This is because through participation relationships are created and commitment is enhanced as is ownership and therefore sustainability of CD projects (Njoh, 2003; Lendevlo, Munyebvu, & Suich, 2012). However, Hope & Rouse (2013) hold the view that institutional risk and weak water governance are associated with rural water service delivery. These include policy design, service delivery, effective regulation and monitoring of services over time within an accountable and transparent framework that is founded on meaningful public participation.

Building on this observation, it can be argued that communities are therefore positively disposed for alternative management arrangements where the community is able to choose a desired service delivery approach. Evans & Appleton (1993) hold the view that the ability to develop efficient and pragmatic possibilities for water management, especially at local scales, involving and engaging all the stakeholders will be determined by the type of CBM design. However, Fisher & Bickel (2009) distinguished some of the widely used water management endeavours practiced in rural communities such as the demand-driven approach, community participation, co-management, collaborative management, and self/or private management (Table 3.1), an element which Borrini-Feyerabend et al. (2004) advance as a more operative and efficient management approach that has developed under distinctive ecological circumstances and with unique forms of social organisation

Table 3.1: Summary of operational terms and concepts of CBM

Terms	Definition/ Description
Demand-driven approach	This is a demand-response approach to community development promoted under the decntralised service delivery framework in which communities determine and initiate the process of service delivery. This approach refers to community-based development projects where communities have direct control over key project decisions as well as the management.
Community participation	Community participation comprises varying degrees of involvement of the local community in development projects. It may range from the contribution of cash and labour to consultation, involvement in management and decision-making.
Co-management	Co-management capitalises on multiplicity and diversity. It is usually multi-party but also a multi-level endeavour based upon a negotiated, joint decision-making approach and some degree of power-sharing, sharing of responsibilities, and distribution of benefits among all institutional actors.
Collaborative management	Collaborative management is a term that is used to describe various management techniques that promote a sense of unity and teamwork among managers, supervisors and inhabitant within a community. The idea behind this type of management is to allow all the actors to combine their resources and facilitate the realisation of community project.
Self-management	Self-management represents a promising strategy for groups of individuals grouped together to pursue common goals in promoting their welfare and interests. Members of the organisations support each other in handling related problems faced by sharing experiences and exchanging information.
Private management	This is an approach to the governance of natural resources by individuals, community groups or corporate entities for personal gain. Increased efficiency and greater responsiveness are some of the attributes of private management.
Traditional/Customary/ Indigenous Management System	These are conservative systems of natural resources built on collective environmental wisdom and ethics expressed through religious beliefs and a range of sacred and cultural practices within a community. It is sophisticated, reflecting generations of careful observations of the natural and physical environment.

Source: Njoh (2003), Borrini-Feyeraband et al. (2004), Nelson & Agrawal (2008), and Roe et al. (2009).

Although these approaches to CBWM in Table 3.1 signify diverse ideas and methods they all tend to underscore a resilient position for rural communities and CBOs in the management of NRs. Rural communities and traditional knowledge are crucial and able to adopt ways and means of managing their NRs better than those approaches that tend to be external to rural contexts (Ostrom, 1990; Fisher & Bickel, 2009). Ostrom (1990) argues that rural communities have developed relatively accurate mental models of how their biophysical

system operates, since their harvesting success efforts depend on such local knowledge and can better manage their resources (Borrini-Feyerabend et al., 2004). Grassroots communities have therefore, become pivotal institutions for sustainable development programmes in the developing world (Li 1996; Njoh, 2003). The overriding principle has been for the communities to look inwards and search for solutions to urgent development problems through the mobilisation of local resources. It is on these assumptions and principles that grassroots communities in Anglophone Cameroon[19] have been encouraged to take control in the management of their resources considering the rate at which transformations in biodiversity conservation is understood and addressed (Manzur, 2013). These, it is felt, would motivate the inhabitant in accepting leading roles in the management of their resources particularly when CBM objectives are designed and tailored to their demands.

The stream of participatory thinking has gained cache and traction in development-conservation programs and projects particularly in SSA (Fonchingong & Fonjong, 2003; Njoh, 2012). Bixler et al. (2015) hold the view that conservation programmes involving local community participation is one of the necessary prerequisites for sustainable NRM. They argue that participatory conservation plays a central role in the democratisation of decision-making authority and equitable distribution of benefits and responsibilities. Conservation theorists and development practitioners have thus advanced the importance of participatory watershed conservation, underlining that it will lead to sustainable outcomes (Binswanger-mkhize et al., 2010; Bunclark et al., 2011). It is argued that collaborative watershed management, involving all the resource users is important in controlling soil erosion and

[19] This was a British territory comprising Northwest and Southwest until independence. The British Colonial Authorities introduced formal community development practices in this part of the country and they have since retained significant political and economic autonomy which facilitated the existence numerous local associations than in the Francophone part of the country.

water conservation which will help in augmenting water storage capacity and improving local water resources by reducing the rate of runoff, and increasing the ground water recharge (de Regt, 2005; McCord et al., 2016). Studies and reviews of water supply and watershed management have for example, shown greater satisfaction with the water service and greater sustainability of the service when the community actively participate in the design and management of water systems (de Regt, 2005; Manzur, 2013). A well-known example is the Upper Ewaso Ng'iro Basin in Kenya where coordination among local and regional actors has led to increasing awareness and responsibility of actors within and outside the communally managed watershed resulting in the sustainable use of this NR (McCord et al., 2016). de Regt (2005) emphasised that conservation practices around watersheds require concerted management approaches between governments, NGOs, CBOs and local communities. This is because collaborative management will considerably improve the management of activities around the watersheds (*agriculture, forests and rangeland*) and maintain the natural vegetative cover and help control soil erosion (Bunclark et al., 2011; McCord et al., 2016). Given that watersheds usually cover multiple local jurisdictions and require knowledge from a variety of technical areas, one can argue that involving all the actors through a polycentric governance approach is critical for building capacity, devolving centralised powers to local actors thereby improving overall water management.

Many development analysts now agree that grassroots communities have developed systems and processes, if properly tapped into and encouraged can contribute to the effective management of NR use (Ostrom, 2012; Manzur, 2013; Bixler et al., 2015). Sun et al. (2010) for example, argue that various institutional procedures have now emerged and are used by grassroots communities in governing their water supplies particularly under circumstances of water shortage. Early ground-breaking works on CBWM by Rondinelli (1991), Kellert et al.

(2000), Page (2003), Njoh (2003), Van Koppen et al. (2007) and (Harvey & Reed, 2007) highlighted the strengths and abilities of CBOs and the delusions incited by development experts who believe that they were operating *de novo* instead of improving on existing local management practices. However, works by scholars such as Musingafi & Chadamoyo (2013), drawing on collective action theory have analysed the factors enhancing collective action in CBWM. An additional strand of work has directed its interest to the complexities of centralised water management systems and practices; thus advocating a transfer of management responsibilities to local users through CBOs, since they better understand local needs, and, when endowed with powers, are more likely to better respond to local aspirations (Wiek & Larson, 2012; Njoh, 2012; Tantoh & Simatele, 2017). In addition, the transfer of responsibility to local users, it is argued has increased the management and economic efficiency of resource use (Sun et al., 2010; Nuesiri, 2015; Cases & Ribot, 2016).

Increasing debates over power relationships between public, private and local communities' capacity to manage their own NRs, as observed by Campbell & Shackleton (2001) and supported by Cash et al. (2006) are a part of the bigger efforts of decentralisation over socio-economic and political power and authority in countries of the global South. Njoh (2012), for instance, observes that private companies have been very instrumental in managing water supply in Cameroon with the Cameroon Water Utilities Corporation (CAMWATER) operating in major city centres. In contrast, non-profit private organisations such as; the Swiss Association for Technical Assistance (SATA) (later, HELVETAS), the Netherlands Development Corporation (SNV) have been very active in financing rural water projects and providing technical assistance with the local population at the centre of the management in the Northwest and Southwest of Cameroon (Njoh, 2003; Tantoh & Simatele, 2017). This initiative as argued by Campbell & Shackleton (2001) is based on the premise that CBM

always involves sharing of responsibilities in managing NRs among a range of actors. Writing in the context of decentralisation Rihoy & Maguranyanga (2007), Cases & Ribot (2016) remark that the transfer of authority in NRM is a socially and politically contested issue that reveals remarkable insights about the nature of local governance and democratic practices. It is through decentralisation and institutional reforms that power and control over NRs governance can be transferred to local resource users with the hope of promoting local governance structures.

In a recent article, Peter & Nkambule (2012) question the extent to which rural communities can sustainably manage their WRs considering the extent to which external forces such as government interventions affect and influence rural processes. Campbell & Shackleton (2001), Rihoy & Maguranyanga (2007) argue that sustainable management mechanisms are those that enhance community empowerment through decentralisation with a dynamic community leadership[20] taking centre stage in order to encourage and upgrade rural water supply. Furthermore, increased involvement of local communities in the management of WRs, both today and in the future necessitates the development of effective management and governance frameworks that can positively contribute to sustainable development (OECD, 2015). This view has been repeated by the Global Water Partnership (GWP, 2014) emphasising that effective water governance and service delivery will require a combined commitment of governments and all interested actors, particularly at community levels as well as the private sector, to collaborate for sustainable outcomes. However, the responsibility of the GWP is to support countries in the sustainable management of their water resources by means of an advocacy network based on principles of integrated water resources management; stimulating partners to meet critical needs and help them match these

[20] A lack or absence of strong and good leadership will lead to poor governance

needs with available resources and supporting action at the local, national, regional, or river basin level (GWP, 2010). It would be worthwhile for policy makers to make sustainable choices about how to manage water for inclusive socio-economic growth and environmental stability (Wiek & Larson, 2012). This reflection has been supported by Musingafi & Chadamoyo (2013), underlining that effectively managing rural water supply would be possible only if water regulations are well conceived and applied so as to clarify the roles and responsibilities of all stakeholders regarding ownership, administration and management. They also argue that effective water governance requires democratic and collaborative central and local governance institutions. It is not an overstatement to argue that the organisational structure of community life and the way potable water supply governance is handled will largely determine the degree of sustainability that a community can reach.

Despite the importance and potential of CBWM and the pluses of decentralisation and polycentric governance in resolving some of the water supply and sustainability problem in rural communities, the practical implementation of water governance principles has often fallen short of expectations. Guy-romain et al. (2006), for example, argue that national water policies and services in Cameroon are at extremes in the sense that national water services are not commensurate to the water policies. For instance, the current laws have the possibility of decentralising part of the management role of the state to local entities and calls for the participatory approach in management. However, the participatory role of the community seems to be limited to access to information and providing opinions in public debates. Thus, very few actions of these different ministerial departments[21] are carried out in a concerted manner and very often there is an overlap of jurisdiction in the realisation of projects. This

[21] Such as the Ministry of Environment and Nature Protection, the Ministry of Forestry and Wildlife, and the Ministry of Agriculture and Rural Development.

could be attributed to inadequate political will and dedication in moving resources in the right direction, giving rise to a gap between policies and services. Manzur (2013) argue that inadequate resources and capacities, particularly personnel and finance, have tested the capabilities of developing countries to promote partnership between agencies and programmes that focus on diverse water-related issues and impediments. Similarly recognised is the difficulty of ensuring the investments necessary for the development of new water projects and the maintenance and management of existing ones (Bunclark, 2011). Wiek & Larson (2012) lament that the lack of a comprehensive view on water systems, participation in decision-making processes and encouraging a thorough and complete evaluation of water sustainability that recognises decrease in resources, inequality, and livelihood issues in the long-term are some of the challenges of poor water management. In spite of the challenges facing CBWM initiatives, it is still regarded as one of the effective means of service delivery for rural communities across SSA because the systems is reliable, sustainable and replicable and can stimulate a sense of ownership and can trigger community development (Evans & Appleton 1993).

3.4. CBWM in a Northwest Cameroonian context.

Socio-economic progress in any community is largely determined by the availability of reliable quantity and quality of water and the ability of these communities to harness the water resource for productive uses (Nyambod & Nazmul, 2010). A common phenomenon in Cameroon, particularly in rural communities is the complexity and uncertainty of potable water supply and the ways in which these variations are dealt with. Ako et al. (2010) note that water is a public good in Cameroon and the institutional framework is characterised by a top-down management system with MINEE as the organising body (Figure 3.2). Decisions are made by MINEE and executed by the different ministerial departments (provincial, divisional

and districts). Due to the centrality of water in socio-economic development and the transversal nature of the water resource (used for many other purposes in many other sectors), several ministerial departments and public institutions do interfere in the water sector at the regional, divisional and district levels. They include: MINADER, MINENP, Ministry of Urban Development and Housing (MINDUH), Ministry of Livestock, Fisheries and Animal Industries (MINEPIA), Ministry of Economy, Planning and Regional Development (MINEPAT), Ministry of Territorial Administration and Decentralisation (MINATD), Ministry of Finance (MINFI) and Ministry of Transport (MINTRANS) and Energy of Cameroon (ENEO) among others (Figure 3.2).

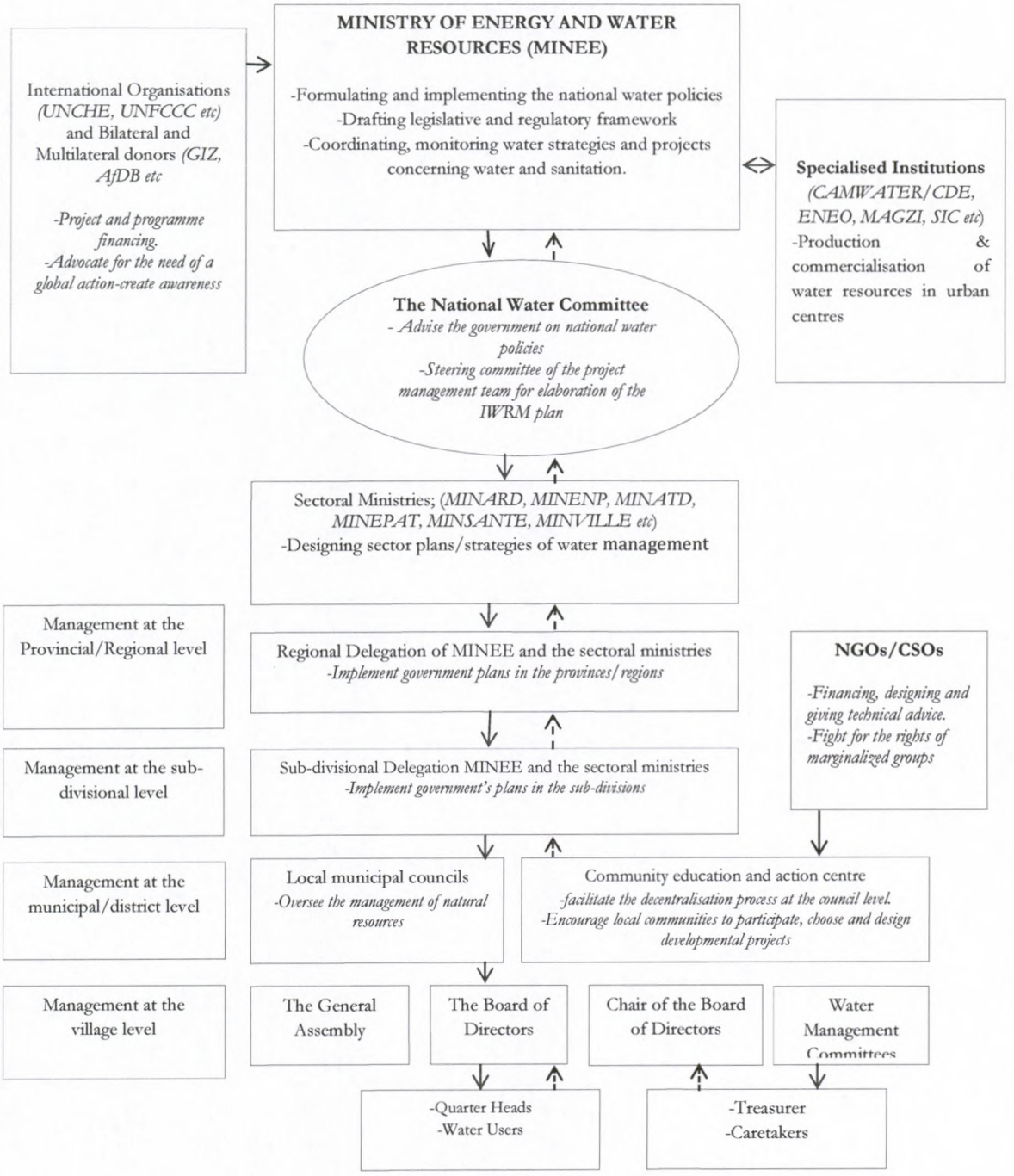


Figure 3.2: Organisational structure for managing water in Northwest Cameroon.

Source: Fieldwork results (2016).

Figure 3.2 shows that many other stakeholders including; CAMWATER and Camerounaise des Eaux (CDE), International aid organisations, NGOs, and CSOs play important roles in the mobilisation and management of the water resource. They equally perform essential

responsibilities in financing water projects and provide technical assistance in the water sector.

Building on this observation, Njoh (2003) argues that CAMWATER/CDE (which took over from the state-owned National Water Company of Cameroon (SNEC) after privatisation) is the largest commercial water supplier, but it is only responsible for providing potable water in urban centres/major cities. These private water companies focus on large urban centres where they are guaranteed higher returns on their investments. Ntouda et al. (2013) are of the opinion that these structures unfortunately are unable to meet the increasing demands of the urban population not to talk of rural communities. Ako et al. (2010) cites poor management and development of the water resources as the major problem of water management in Cameroon. The Joint Monitoring Programme for Water Supply and Sanitation (2014), for instance, noted that approximately 51% of the rural population do not have access to potable water supply and connection rates are also very low, with only 14.5% of the rural population with individual access to drinking water in their premises. Supporting this assertion, Nyambod & Nazmul (2010) argue that the water crisis in Cameroon has been caused in part by the high cost of per cubic meter (m^3) of the water resource (470 FCFA/m^3 approximately (1 US $ m^3). Furthermore, administrative complexities through centralised ministries have resulted in the marginalisation of rural communities as the government is now adopting cost-saving measures, but at the expense of rural population and spaces (Njoh, 2012). Thus, rural people are left to fend for themselves.

3.4. Policy and institutional framework guiding CBWM in Cameroon

Water management in both urban and rural areas in Cameroon is coordinated and regulated by the 1996 law on the environment (Law No. 96/12) and the 1998 law on water (No 98/005) (Guy-romain et al., 2006). These laws are extensions of colonial legislation through which the current management of NRs follows Western models with centralised management systems (Fonjong, 2008). NRM in general, in particular, WRM has since then been coordinated by the structures that took over from colonial rule, with MINEE responsible in the production and distribution of water services. With the general trends of contemporary globalisation in Africa, the government of Cameroon for example, privatised SNEC by Decree No 2005/493 and 2005/494, in 2005 to CDE to improve water supply in urban areas (AMCOW, 2010; Njoh, 2012). In the rural areas, MINEE through its Directorate of Water Supply and Hydrology (DWSH) created by Decree No 2005/087 art 7 became responsible for overseeing the management of water supply initiatives (AMCOW, 2010). This structure was reinforced by the Action Plan for the Water Supply and Sanitation Programme in Rural Areas (PAEPA-MRU), ratified in 2007 to define the role of the different actors and enhance the capacities of local groups of people and CBOs in the management of rural water supply systems. This is because the combination of the different stakeholders is seen as a potential catalyst for addressing problems in rural areas, and a way of ensuring that various groups including those traditionally marginalised from development can contribute to the change process (Fonchingong & Fonjong, 2003).

Building on the above observations and principles Chadwick (1949) as well as Tantoh & Simatele (2017) argue that rural communities, are now embracing and applying an approach that were practiced before colonisation as an effective way to advance NRM and propagate

CD in poor rural areas through decentralised governance and community empowerment. It must be noted that most CD initiatives which was practiced before colonisation in the 1940s in the Bamenda Grassfields[22] re-emerged during the period of economic recession and Structural Adjustment Programmes (SAP) that started in the late 1980s; a period typified by very restricted government spending (Fonchingong & Fonjong, 2003). Supporting this assertion Carmody (2010) emphasise that SAPs did not facilitate recovery, but rather accentuated economic decay because of theoretical flaws in the underlying neo-classical economic model which misinterpreted Africa's geographic and politico-economic context. Thus, the immediate effects of the SAP measures, designed to achieve macro-economic stability, also fuelled poverty. Fonchingong & Fonjong (2003), for example, further noted that this turning point in development led to diminished state intervention in some of its traditional obligations in vital sectors such as education, health and rural amenities which needed attention and could foster inward-looking development strategies. CBWM initiatives thus, developed as a partial response to the inability of the government to provide drinkable water to rural communities (Bunclark et al., 2011).

CBWM has thus underscored the virtue of self-reliance which emerged from the traditional method of NRM (Fonchingong & Fonjong, 2003). Both national and international NGOs and other private institutions have been involved in promoting CBWM projects in Northwest Cameroon. They include; SATA-HELVETAS, SNV, Plan International Cameroon (PLAN Cam), Special Council Support Fund For Mutual Assistance (FEICOM), PAEPA-MRU, National Community Driven Development Program (PNDP), the Strategic Humanitarian Service (SHUMAS), and Grassfield Participatory and Decentralised Rural Development

[22] Is a region of Cameroon characterised by high relief, cool temperatures, heavy rainfall and savanna vegetation

Project (GP-DERUDEP). Their intervention is notable in the domain of pipe-borne water supply and protection of watersheds. These organisations work in tandem with VDAs, CBOs, WMCs, and the Board of Directors of the community water schemes (Figure 1) in adopting, designing, and financing projects while giving technical advice. It should be noted that VDAs were mostly formed because of government's incapacity to bring basic infrastructure and social amenities to these communities. The members in these institutions are nominated by the various quarter heads in the village and are then elected during annual general meeting. However, they must have high moral standings and must have demonstrated interest in CD (Fonjong & Fonchingong, 2003). The WMCs and CBOs are auxiliaries of the VDAs and are very instrumental in handling problems that relate to distribution, maintenance and collecting water dues.

Many drinking water supply systems are practiced in Cameroon. However, the gravity-led Drinking Water Supply (DWS) system is widely practised in Northwest Cameroon because of the hilly nature of the terrain and natural springs that supply the water system. It is also practiced because the technology is locally adapted, reliable and cost effective, relative to pumping systems, as no external power is required to maintain the flow. It should be noted that the sustainability of the water schemes is directly dependent on the condition of the ecosystem and the activities carried out around the watershed. The experience of CBWM in Northwest Cameroon has for example, demonstrated the reality of various forms of decentralisation of power and authority. Interview discussions with some community members revealed that individuals, households, and elites in the research sites play a crucial role in initiating, financing and managing self-reliant projects. Emphasising the importance of community participation, the chairs of the Zang-Tabi and Njimkang WMCs highlighted:

"It is mandatory for all the villagers to contribute to the development of the community. These contributions could be in cash or in-kind. The amount of financial contributions is fixed, depending on the priorities of the community and distributed according to preference. The amount also varies between the villagers; based on their occupation and economic situation. The supply of potable water is one of those priority projects and receives a greater attention and budget" (Personal communication, 2015f).

This assertion was confirmed during focus group discussions in Baicham, Njimkang and Tugi with grass-roots communities' dominated by women who stated;

"Because of the necessity of drinkable water, long distances that we have to walk as women and (our) children to get water which is not even of good quality, we are forced to make necessary sacrifices with the aim of supporting the community to realise the village water system. This will improve our living conditions and help develop the community as a whole" (Personal communication, 2015g).

The above sentiment underlines and re-emphasises the importance of community participation in rural water supply and management. Among the various objectives and strategies of CBM, Lendevlo et al. (2012) cites people's participation at the grassroots level as being crucial in relieving poverty, reducing disparities and nurturing and building the aptitudes and capacities of the locals. The various phases of the water project for example, show the need for the inhabitants to provide potable water to the villages to foster other developmental projects amidst hurdles. In this regard, ad hoc committees were set-up to conduct feasibility studies leading to the identification of natural springs. Once they were

identified, the community was mobilised and the residents encouraged to contribute both in cash and in-kind (provision of construction materials, digging trenches, carrying of sand, stones etc.,) to maximise capital for construction costs. Despite community sensitisation and mobilisation, some villagers still do not fully participate in these activities. These communities have thus devised means to compel the inhabitants to participate such as; sanctions from the chief's palace[23] and Divisional Officer (DO), imposition of fines by WMCs/CBOs and mockery by neighbours. Considering these sanctions and the stigma that awaits defaulters, the villagers make big sacrifices (contributing financially and participating in communal work at project sites) to participate in CD projects. Doe & Khan (2004), for example, noted that the success of community water management in Ghana is due to consultation and participation by the locals in the development projects themselves.

Financial contributions have equally been identified as a dynamic feature in the success of CD and it is a matter of importance for all indigenous groups in this part of the country (Table3.2). Supporting this assertion, Njoh (2003), argue that financial contributions have a long history in CD-SATA/HELVETAS projects in the Northwest and Southwest of Cameroon (see also Mercer et al., 2009). In the 1960s, rural communities were officially expected to contribute 25-50% of the costs in CD-SATA/HELVETAS projects. Recently, rural water supply projects have been funded by FEICOM through PAEPA-MRU in partnership with NGOs and the African Development Bank (ADB). It is well-known that when communities are conscious of their needs, they find means to address them based on their resources.

[23] This is the residence of village traditional rulers in the Bamenda Grassfields of Cameroon

Table 3.2: Financial contributions towards the realisation, operation and maintenance of community water schemes.

Rural districts	Villages	Amount for project Realisation (UD$)			Monthly Contributions /household-private connection (US$)	Monthly Contributions/ households using public stand taps (US$)
		Men	Women	Youths		
Mbengwi	Tugi	3	2	<1	2	<1
	Zang-Tabi	3	2	<1	2	<1
Njinikom	Baicham	3	2	1	2	<1
	Muloin	3	2	1	2	<1
Ndu	Njimkang	4	3	1	2	<1
	Ngarum	4	3	1	2	<1

Source: Fieldwork results (2016)

As observed in Table 3.2, financial contribution is very important for the realisation and the operation of rural water schemes. This has been facilitated by the dynamism of the community in managing NRs through strong VDAs which determine the outcome of CD goals. Based on Table 3.2, the average amount contributed to realise and maintain water systems vary from one community to the other. A number of factors are taken into consideration by the WMCs before arriving at the amount to contribute including; the nature of the landscape, the distance of the watershed and tanks to the community, the cost of building materials and labour involved and the magnitude of the maintenance. Of particular interest is the involvement and commitment of youth and women who have the potential to become dynamic instruments in the success of CD initiatives (Tantoh & Simatele, 2017). Fonjong (2011) argues that women and youths have shown marked preference for working in groups to solve economic difficulties, provide infrastructure and promote community solidarity. Fonchingong & Fonjong (2003), for example, observed that the commitment of the youth and women especially in mobilising the villagers was crucial in the realisation of the Abebung community health centre in the Northwest of Cameroon. They also participated

manually in supplying sand and stones and digging trenches in the project site. This is indicative of patriarchy. Regarding Njimkang and Ngarum, women were levied 3 US$ and men 4 US$ while in Baicham, Muloin, Zang-Tabi and Tugi, women were levied 2 US$ and men 3 US$ during the execution of the water project coupled with compulsory community labour. It is through these activities, contributions, and partnership that the community becomes more dynamic to engage in communal projects.

Regarding, the Operation and Management[24] (OM) of community water systems, a small amount is required from the locals to repair and maintain broken pipes and also to motivate water caretakers. This amount is contributed per household, depending on the type of access. For instance, those with private connections contribute an equivalent of 2 US$ per month, while those using public stand taps contribute < 1US$ (Table 3.2). These payments further constitute an important source of capital for extension of projects. They are however complemented by donations from elites, municipal councils and NGOs. Bunclark (2011), for example, argues that the services of regional and sub-divisional government ministerial departments, municipal councils, and NGOs are always required for technical issues including; maintenance of sophisticated water treatment works and the monitoring of water quality. This dictates a degree of top-down management as municipal councils through the council WRM strategy is responsible for overseeing service delivery at the local level. It has therefore, been argued that the different aspects of participation elaborated in participatory planning theory play out in practice by using elements of mobilisation, collaboration, and consultation (Njoh, 2003). Community participation is thus, a central feature of all forms of CD demonstrated through contributions from community members. Despite the importance

[24] This refers to the various day to day functioning and supervising of the water system

and benefits of CBWM approaches in Northwest Cameroon, results in practice have often been unsatisfactory both from the viewpoints of executing organisations, and of some segments of the communities concerned (IRC, 1997). This is because of the failure to fully integrate rural communities, who are the local natural resource users in the management of their own resources and the top-down management on NRs by government ministerial departments (Tantoh & Simatele, 2017). In addition, projects in which the government operates and administers the water scheme are far less successful than those which treat communities as the future managers and involve them directly in the process (Page, 2003).

3.5. Barriers to sustainable CBWM in Northwest Cameroon.

Coping with the complex nature of the water resource constitutes an intrinsic element in community livelihood in Northwest Cameroon. This is because water is essential to the well-being of humankind and a basic requirement for the healthy functioning of the ecosystems (UNDP, 2004). Unfortunately, an increasing number of people still lack access to potable water, particularly in rural communities (WHO & UNICEF, 2014). As the environmental crisis deepens so too does the human crisis. This assertion, as argued by Barlow (2007) is premised on the basis that the growing water crisis has thus become a symbol of the growing inequality within countries and communities. In the same vein, the United Nations Development Programme (UNDP, 2004) argues that the growing water problems the countries and communities face is not because of shortage but management and governance. Bunclark (2011), for example, identified two types of water scarcity: physical and economic. Physical water scarcity is a condition where the available WRs are insufficient to meet the

demand from all sectors, including the environment[25]. The term economic scarcity is a social construct and occurs when there is a lack of investment or human capacity in water management to keep up with growing demand. However, UNDP (2004) reported that the water crisis that most communities and countries face today has stemmed not only from natural restrictions of water supply or the lack of financing and suitable technologies, though these are serious constraints, but rather from multifaceted failures in water management and governance structures within respective countries. In the context of Cameroon good water governance principles (accountability, transparency, equitability, inclusivity, and following the rule of law etc.,) have not been effectively implemented. Mafany & Fantong (2006), for example, argue that Cameroon has abundant water resources with annual average availability estimated at 21,000 m^3 per capita, that is three times the world's average (7,000 m^3) but water still remains a scarce commodity[26]. However, institutional weaknesses, deficiencies in the policy frameworks and coupled with deteriorations in the economy, have combined to make water provision and supply to rural communities a mammoth task (see Tantoh and Simatele, 2017). Tantoh & Simatele (2017) further argue that the roots of the water crisis in Cameroon can be traced to poverty, uncoordinated national development policies; weak institutional framework, deficiencies in water resource infrastructure and budgetary allocation, as well as inadequate technical know-how and skills characteristics that underlie most of the developing world. This assertion was confirmed during interview discussions with the delegate of CD in MINADER who stated:

[25] Environmental water demand is defined as the amount of water needed in a watercourse to sustain a healthy ecosystem (Fisher & Bickel, 2009).

[26] The cost of a meter cube (m^3) of water (without taxes) fixed by the government is: consumption less than (<), 10 m^3: 271 CFA franc - about 0.5 US$; consumption more than (>) 10 m^3: 337 CFA franc - about 0.6US$ (Page, 2003; Nyambod & Nazmul, 2010).

"Changes in policies have distanced rural communities from public authorities. Most community development projects have being contracted to private consultant companies leaving the department of community development as animators. This has strained collaboration between the department and the communities. The poor mastery of the concept of decentralisation by some state agents has also led to the poor execution and management of community-based initiatives" (personal communication, 2016h).

This declaration was confirmed by the chairs of Zang-Tabi Village Traditional Council and the WMC in Mbengwi council-Momo Division who stated;

"The village traditional council and water management committee work together with the Zang-Tabi Cultural and Development Association (ZATACUDA). It is surprising that our water system is been rehabilitated by a private company without consulting the representatives of the community. This company has no idea of the system and what we had planned to improve supplies and distribution. Despite protests and dissatisfaction of the villagers, the council which facilitated the award of the contract insisted they continue with the work" (personal communication, 2016i).

The above sentiments speak to the argument that the lack of collaboration and consultation between government departments (*Departments of Community Development - DCD) and (Department of Rural Engineering - DRE*) under MINADER and between the Council and the communities they are meant to serve is the major cause of unsustainable CBWM. For instance, the separation of the DRE from the DCD couple to the lack of teamwork between them has overlooked the duties of the DCD *(identification of projects, feasibility studies,*

mobilisation of communities, and participatory diagnosis) in preparing the communities for the execution of projects. This is because the DRE which is charged with technical issues unilaterally executes community projects when contacted by CBOs without consulting the DCD. This has resulted in the degeneration of cooperation between the communities and public authorities leading to flawed community projects. A classic example is the rehabilitation of the Zang-Tabi piped-water supply system that was contracted by the Mbengwi Council to Premier et Yoshim Entreprises (PEYE)[27] without consulting neither ZATACUDA nor the Zang-Tabi WMC. This company has little or no understanding of the context of the communities, their needs, challenges or their preferences because they did not consult them and a comprehensive feasibility study was never conducted. The community protested against rehabilitation of the project on several occasions, but the council intervened and asked the company to continue (see Annex I). After completion, which was not effective as the major tank still had leaks, coupled with a series of ruptured pipes along the water network, as low-quality materials were used to maximise profit, the community representatives were only invited to the council by the mayor and some maintenance tools handed to them by PEYE. In view of the declarations from the delegate of CD in MINADER and the Chairperson of the Zang-Tabi WMC, it can be argued that lack of synergy between public institutions governing WRs and communities has strained power and social relations between public, private and local institutions and distanced the community from public institutions. Interview discussions with the delegate of CD in the Northwest revealed that communities now execute projects without consulting public institutions because their opinion does not count as orders mostly come from above.

[27] This is a private construction company.

The lack of coordination between these services and local institutions has led to misplaced priorities. With the advent of decentralisation for example, a Community Development and Action Centre[28] (CEAC) was created in each council to facilitate the decentralisation process at the level of the rural districts. As such, the mayors are expected to work in close collaboration with personnel of CEAC and all other development actors in their rural districts. A council session is supposed to be organised by the mayors at the beginning of each year, inviting all sectoral ministerial departments and development actors to know the various projects earmarked for the communities, their areas of specialisation and competences. This is to avoid duplication of projects and to make use of the technicians and experts available. If this were to be the case PEYE, for example, would not have been awarded the contract to rehabilitate the Zang-Tabi water system. This is because there are other NGOs that are specialised in rural water provision and CD such as SHUMAS, GP-DERUDEP with experts and technicians that could have done a better job. On the contrary, mayors work with councillors who are politicians with little or no technical knowledge about CD and make proposals to suit their respective political parties. This lack of coordination between the mayors, sectoral ministerial departments, development actors and the communities for whom projects are meant leads to waste of resources and unsustainability of projects. This is contrary to participatory planning theory which according to Njoh (2003) is to be collaborative and consultative. It can therefore be argued that the municipal authorities used unorthodox measures to award the Zang-Tabi rehabilitation water project to PEYE, defying the principles of good governance which impedes the effectiveness of the water supply system. This is because the main water tank that was rehabilitated still has leaks with so many fractures along the water distribution network. A major challenge for both national

[28] A structure of the Ministry of Agriculture and Rural Development responsible for the promotion of local and community development and for the creation of synergy between the various development actors and stakeholders at the local level.

and local governments is how to collaborate with stakeholders and synergise the different departments and sectors to bring about sustainable service delivery in rural communities (Tantoh & Simatele, 2017).

The centralised management of WRs (Figure 3.2) is another disconcerting factor hindering coordination between the different water structures and agencies despite government's endeavour to decentralise the management of NRs (Nuesiri, 2015). The national water laws, policies and regulations for example, are defined by MINEE and other related ministries and applied throughout the national territory, with little consideration of the realities of the inhabitants, especially in rural communities. According to Ako et al. (2010), information on interventions carried by any sectoral ministries in a region on a project is seldom disseminated and unknown to other ministries and users of the resource. Although the concept of CBM was often directed effectively in distinct projects, it was and has again and again been lost in the process of scaling up and, ironically, interfered with by centralised administrative approaches that failed (Guy-romain et al. 2006), like the rehabilitation of the Zang-Tabi water system. This is due to ineffective communication and collaboration between the various actors. Supporting this view, Binns et al. (1997) observed that top-down management approaches often ignored and failed to appreciate the abilities, opinions, experience and aspirations of those whom the programmes are designed to assist. This state of affairs has had serious consequences on rural communities with growing populations (NIS, 2011), particularly as rural water supplies are operationalised by WMCs who rarely have sufficient technical and financing mechanisms for effective service delivery (Ntouda et al., 2013). An essential requirement for achieving efficient water resource governance, however, is rooted in the presence of a promising enabling institutional and policy framework with the ability to inspire CBOs and respond to the needs of rural communities. It can therefore, be

argued that WRM in Cameroon generally suffers from poor institutional framework and the absence of proactive policies that firmly focus on the improvement of WRs at both the national and local levels.

Tensions between local groups and other more powerful actors, including both public and private investors, also remain widespread across the rural districts and are often increasing. This is due in part to the passivity of the actors in charge of water management, the overlap of competences, inadequate financial means, the sectoral approach to solving problems related to water, unilateral top-down policies, the lack of human capacities and inadequate texts (such as the Polluters-Pay Law which lacks clarity and implementation) and structures (Guy-romain et al., 2006). Furthermore, conventional institutional principles would have us believe that most rural water management practices take place through formal bodies such as WMCs and CBOs whereas centralised control over WRs persist in the face of the widespread change in the articulation of WRM (Ako et al., 2010). They also noted for instance, that the notion of decentralisation which is supposed to facilitate the allocation of resources to local municipal councils and grassroots communities has not been supplemented by the provision of adequate financial resources and the improvement of their capacities to empower them to assume these tasks. In contrast, top-down management and an often patronising approach views communities as passive recipients and not efficient actors whose dynamism, if properly cultivated can be a vital resource for effective WRM (Manzur, 2013). Such an approach views central experts as knowledgeable; and under-estimate the contribution that local communities can make.

Evidence from the case-study shows that the paternalistic posture of authorities is another cause of unsustainable rural water systems. For example, the rehabilitation of the Zang-Tabi

rural water project was externally induced by the mayor and some elites from the community. That is why the system is not fully functioning, particularly because of the many flawed assumptions they made about local environments and needs. For instance, the WMC and the VDA intended to rehabilitate the old tank which had leaks and build a new one at a nearby spring so as to extend the network to other communities. Perhaps the most disheartening aspect of externally induced projects is the tendency for experts, bureaucrats and elites to dominate the decision-making process (Botes et al., 2000; Njoh, 2002). However, Biswas & Tortajada (2010) observed that the improvement of rural water supply schemes remains too costly for rural communities in poor countries relative to their available resources. This is certainly true in the case of rural communities in Northwest Cameroon where the villagers are unable to promptly and regularly contribute <1US$ a month for the OM of public stand taps and 2US$ for private connections (Table 3.2). The inability of the villagers to promptly and regularly contribute to the smooth functioning of the water system is due to poverty (see Table 3.3). Table 3.3 shows the average monthly income and the water collection rate of the locals in Northwest Cameroon.

Table 3.3: Monthly average income and collection rate of the locals in Northwest Cameroon.

	Monthly Income			Collection Rate	
Occupation	**Frequency**	**Monthly income (US$)**	**Percentage (%)**	**Frequency**	**Collection rate (%)**
Government employees	10	≥300	13	8	80
Retired	6	100-150	8	4	66. 7
Business	5	100-150	7	3	60
Carpenter/ Builder	8	≤100	11	4	50
Wine tapper/ Weaver/Hunters	13	≤100	18	6	46.1
Farmer	17	≤100	6	5	29
Animal husbandry	7	≤100	9	3	42.9
Others	6	≤100	8	2	33
Total	**72**		**100%**	**35**	

Source: Fieldwork results (2016).

Table 3.3 show that 26% of the villagers are engaged in seasonal agriculture with monthly revenue of ≤ 100 US$. Another 46% comprise; wine tappers, weavers hunters carpenters, builders animal husbandry and those with no stable occupation, generating an average income of ≤ 100 US$ a month. These activities are periodic and unstable, for instance, constructions are mostly done in the dry season and during such periods, carpenters and builders are sure of a steady source of income and can make necessary contributions as opposed to during the rainy season. The remaining 18% including; government employees, pensioners and small business owners with steady incomes of 100-300 US$ cannot bear the operating cost of the entire community. Furthermore, only 35 out of the 72 sampled populations, can promptly and regularly pay the monthly OM fee (Table 3.3). A higher payment proportion was however recorded from those with regular sources of income, as opposed to those with seasonal and unstable jobs (Table 3.3). This has led to poor maintenance with little or no rehabilitation of existing systems. Harvey & Reed (2007) argue that one out of every four rural water facilities are broken down or poorly functioning in rural communities in the developing world and the construction of new systems cannot even keep pace with the failure of the old ones in some countries due to poor OM (see also Hope & Rouse, 2013). It can, therefore, be argued that the combination of poor governance and the prevalence of poverty have an impact on the monthly contribution for OM which influences the functioning and sustainability of CBWM systems in Northwest Cameroon.

The views of a group of youths made of boys and girls between the ages of 18 and 25 years old from Njimkang were solicited about the management of the water system. They disclosed dissatisfaction about the inadequacy of the technical know-how of water caretakers and the lack of motivation to boost their performance. Moreover, challenges occur at the local level, when local governance institutions are not accountable to the communities and water

connections are inexplicably executed without respecting the norms (paying a connection fee and other CD dues) within the communities coupled with the malfunctioning of public stand taps.

Another important aspect that influence sustainable water supply in rural communities using the gravity-led system is a good watershed management planning.[29] It has therefore, become extremely difficult to ignore the importance of watersheds conservation in sustainable rural water supply. This is because the watersheds are the main sources of potable water to the community. Unfortunately, all the watersheds in the six villages are threatened by livestock grazing and the growth of eucalyptus trees at the perimeters of the watersheds (Table 3.4). Although the growth and exploitation of eucalyptus in the study sites is a factor of economic development and afforestation, they consume a lot of water, and are therefore unfavourable to have around the watersheds. Interview discussions with the second deputy mayor of Ndu municipality for example revealed that:

> *"The villagers depend on the environment and the natural resources for subsistence. Unfortunately, their agricultural practices are not environmentally friendly especially as they refuse to adhere to the prescription of the various ministerial departments through the municipal councils. Also, the growth of eucalyptus near water catchments though an important economic activity within the municipality has adverse effects on the water resource couple with the effects of droughts" (personal communication, 2015j).*

The above statement underscores and re-emphasises the importance of watersheds, affirming that if CBWS initiatives in Northwest Cameroon are to be sustained; there is a need for the application of law especially as the watersheds are concerned. This is because watersheds are

[29] Watershed management planning is a process that results in a plan of how to best protect and improve the water quality and other natural resources in a watershed.

the main source of water supply since the water system is gravity-fed. Moreover, the activities of the villagers around these watersheds are not regulated (Table 3.4). Thus, it needs to be protected to assure sustained water supply. However, most of the watersheds within the study area are prone to environmental degradation. Table 3.4 shows that almost all the watersheds are threatened by unfriendly environmental activities of adjacent communities, which continue to affect the quality and quantity of the water resource (see Annex J). This situation has been caused by increasing population rates (NIS, 2010) leading to the encroachment and conversion of watersheds into farmlands. This assertion, as observed by Molua & Lambi (2006) is based on the premise that the predominantly poor rural population that depend almost entirely on the natural environment for livelihood and wellbeing have far-reaching effects on the water resource and food security.

Table 3.4: Situation and the nature of water catchments within the municipalities

Rural Districts	Village	Number of watersheds	Nature of the watershed	Effects
Mbengwi	Tugi	2	- The presence of eucalyptus trees around the catchments - No delimitation of the watershed from surrounding activities *(agriculture, animal grazing)* - No land titles adjudicating the watershed a communal property	- Eucalyptus consume lots of water limiting ground water sources -Exposure to encroachment and bushfires -Unregulated practices with adverse effects on the water resource
	Zang-Tabi	2	- The presence of eucalyptus trees at catchment perimeters - No fire tracing around the watersheds -No delimitation of the watershed from surrounding activities (*agriculture, animal rearing)* - No land title	-Eucalyptus consume lots of water limiting ground water sources -Watersheds are subjected to bushfires and encroachment -Unregulated practices with adverse effects on the water resource
Njinikom	Baicham	2	-Farming is carried out around the catchments -No delimitation of the watershed demarcation from surrounding activities -No land title adjudicating the watershed a communal property	-Exposure to encroachment and bushfires -Unregulated practices with adverse effects on the water resource
	Muloin	3	-The presence of eucalyptus around catchment perimeters - No fire tracing preventing eminent bush fires from burning the watershed No delimitation of the catchment from animal rearing and farming - No land titles adjudicating the watershed a communal property	-Eucalyptus consume lots of water limiting ground water sources -Watersheds are subjected to bushfires and encroachment -Unregulated practices with adverse effects on the water resource
Ndu	Njimkang	2	-The presence of eucalyptus around the catchments - Farming is carried out around the catchments -Exposed to grazing and bushfires Partial demarcation with life fence from surrounding activities (*agriculture, animal grazing*) - Availability of fruit trees *(kolanuts, mango, pear)*	- Eucalyptus consume lots of water limiting ground water sources -Provide cover trees which protect the watershed from erosion and environmental degradation
	Ngarum	2	- The presence of eucalyptus trees at catchment perimeters - No life fence nor fire tracing protecting the watershed from cattle encroachment - No land title adjudicating the watershed a communal property	Eucalyptus consume lots of water limiting ground water sources -Watersheds are subjected to bushfires and encroachment -Unregulated practices with adverse effects on the water resource

Source: Fieldwork results (2016).

The presence of eucalyptus trees and uncontrolled afforestation on private lands, especially around watersheds is one of the main root causes and of fluxes of the water resource and in extreme cases, the drying up of rivers and streams (Table 3.4). Bouzaher et al. (2000), for example, reported that debates about the hydrological impact of eucalyptus have encouraged

the Food and Agricultural Organisation (FAO) to conclude that eucalyptus are likely to reduce water yields and that in humid tropics, young eucalyptus plantations may consume more water and regulate flow more than natural forests. In the same vein, the various human activities around watersheds are contrary to the Prime Ministerial Decree (No.2001/163/PM art 2) regulating the protection of perimeters around extraction, treatment and storage points (Guy-romain et al., 2006). This has been facilitated by the ambiguity of the legal, institutional and regulatory framework coupled to the inadequate implementation (Ako et al, 2010). Guy-romain et al. (2006), for example, note that the framework law on the "Polluter-Pays Principle," promulgated since 2000 is still fragile in its implementation because of the lack of clarity, particularly regarding the criteria and agents to conduct this activity (Guy-romain et al., 2006). It can, therefore, be argued that the type of activities carried in and around the watersheds determine the sustainability of the water resource. An essential task for national and local government institutions in Cameroon is how to dismantle the 'disabling environment' and replace it with a national and local institutional framework, which is not only protector and supporter, but also enabler and liberator of communities to realise their full potential in CBWM.

3.6. Conclusion

This paper discusses the complexities and uncertainties of water management and governance that undermine the effectiveness of CBWM models practiced in rural Northwest Cameroon. This drive is in fulfilment of the new management approach that attempts to achieve effective and sustainable water management. It is argued in this paper that the lack of synergy between public institutions governing WRs has strained power and social relations between public, private and local institutions, disengaging the community from these public institutions. The

lack of coordination between services and local institutions has further, led to misplaced priorities. Using empirical data collected through tools inspired by the tradition of participatory research it was found that CBWM in Northwest Cameroon is correspondingly challenged by uncoordinated national development policies, weak institutional frameworks, the paternalistic posture of authorities, the inability of the water users to promptly and regularly contribute to the OM of the water system and inadequate preservation of watersheds. Amid the various barriers to effective water governance in Northwest Cameroon, institutional inconsistencies and the prevalence of poverty rather than water scarcity are fundamental. This state of affairs has negatively impacted rural populations regarding meeting their livelihood requirements.

It is therefore, imperative to establish an operative institutional framework that clearly defines the roles and responsibilities of each stakeholder through a polycentric governance approach with multiple centres of authority at the local, water basin, and national levels. This will give each sector an opportunity to determine the form and manner in which WRs are used and managed. It would equally allow local groups to devise rules that respond and adapt to local conditions, making polycentric systems more resilient to ecological shocks (McCord et al., 2016). Furthermore, an effectively established framework can enable the effective management of water while enabling conservation and protection practices. This paradigm shift in management and governance will improve a more bottom-up rather than top-down approach to resources management. It is vital and urgent for effective decentralisation that will strengthen and empower local governments and facilitate a reversal of the top-down paradigm in water management initiatives to involve more participation and representation of grassroots community leaders in policymaking and NR governance. This is because grassroots communities and institutions are major beneficiaries of decentralised powers.

However, it should be noted that local governments and public authorities retain some management prerogatives, but normally one of last resort. This assertion is borne out of the contention that if CBWM initiatives in Northwest Cameroon are to succeed, there is a need for a new power-sharing relationship to be worked out among all interest-driven actors in an enabling environment through which effective water governance principles could be practiced.

CHAPTER FOUR

Shifting the Paradigm in Community-Based Water Resource Management in Northwest Cameroon: A Search for an Alternative Management Approach[30]

ABSTRACT

This paper examines conceptual and practical approaches for Community-Based Water Resource Management (CBWRM) in Northwest Cameroon. Using empirical data collected through the use of methods and tools inspired by the tradition of Participatory Learning and Action (PLA), it is argued in the paper that a lesser degree of community involvement, as well as more centralised systems of resource management, is a major cause of unsustainable water management in Northwest Cameroon. A fundamental challenge that often arises in the management of common pool resources however, is how to effectively and appropriately engage and stimulate public, private and local institutions in policymaking to address resource use conflicts and improve governance through building stronger management structures. Part of the problem in developing effective management models has been identified through the nature of approaches that inform contemporary methodologies of resource management. Many of these methods have largely been influenced by top-down systems of management that have played a major role in disenfranchising those for whom development is meant for. There is now an urgent need to rethink contemporary management approaches and develop more pragmatic models that will promote more effective and efficient systems of natural resource management to promote sustainability. It is further argued in this paper that a focus on and applying a rational System Thinking Analysis approach could potentially produce reinforcing and self-reinforcing effects to enhance rural water systems in ways that promote sustainable management in Northwest Cameroon.

Keywords: Community water management, sustainable management, system thinking, Cameroon

[30] This chapter is based on: Tantoh, H. B., & Simatele, D. (2017). Shifting the Paradigm in Community-Based Water Resource Management in Northwest Cameroon: A Search for an Alternative Management Approach (Under Review, Human Ecology)

4.1. Introduction

Community-Based Natural Resource Management (CBNRM) is but one of the strategies in the management and development agenda for most rural communities in developing countries (Lockwood et al., 2010). This approach to resources management has developed as a result of an increasing recognition of the ineffectiveness of the state to achieve sustainability and as a way to give more power and privilege to local people and communities to manage, use, dispose of, and benefit from their Natural Resources (NRs) that are essential for their livelihoods (Thakadu, 2005; Stone & Nyaupane 2014). This state of affairs in a large part contributed to changing human values and paradigm shifts in the theoretical foundations through which natural resource research and management policies and practices are established. Writing in the context of design principles for CBNRM, Cox & Arnold (2010) observe that shifts in Natural Resource Management (NRM) compel human systems to operate at multiple levels so as to deal with the challenges involved in analysing complex ecological systems. While natural systems are complex, divergent views about varied management objectives have emerged with interest-driven actors embracing different opinions and values about how management systems operate (Bosch et al., 2007). Furthermore, scientific evidence tends to reflect information about reduced scenarios in NRM, not the whole system situation which resource managers are faced with. This fragmented and conflicting picture of NRM can result in managers continually dealing with symptoms rather than the underlying causes of management problems (Bosch et al., 2007). Evely et al. (2008) emphasised that the institutional arrangements and conventional NRM practices appear to be one of the major constraints to sustainable outcomes in many countries of the global South.

It is within this context that policy and development practitioners are compelled to look for suitable, practical and holistic approaches to NRM. This assertion, as argued by Bishop et al. (2013) is based on the notion that approaches in NRM consist of intricate ecological and socio-political systems which require a shift in research and development paradigms. Building on this observations, Roe et al. (2009) note that the dominant approach in most SSA countries (Cameroon, Ivory Coast, Ethiopia, Madagascar Sudan, Niger, Mali and Guinea Conakry) to NRM has often tended to be based on a centralised management system, placing very little attention on the importance of private, grassroots participation and indigenous management systems. Tantoh & Simatele (2017), for example, observed that the water resource in Cameroon had been managed from centralised systems with MINEE as the organising body. Besides, other sectoral ministries such as; the Ministry of Urban Development and Housing (MINDUH), Ministry of Agriculture and Rural Development (MINADER) and public agencies such as Cameroon Water Utility Corporation (CAMWATER) and Camerounaise des Eaux (CDE) are involved. CAMWATER/CDE are the production and distribution companies responsible for supplying potable water only in urban centres leaving rural communities to fend for themselves. This approach of resource management as examined by Dörre (2015) has raised questions on its effectiveness in promoting equitable access to NRs as well as meeting the needs of those communities nearby. It has been reported that centrally planned NRM has had limited success in protecting sustainable ecological systems and they have exhibited designs with significant inefficiencies (Agrawal & Gibson, 1999; Amungwa, 2011). Besides, centralised management has always largely been driven by strategies that are exogenous to local communities that often promotes the agenda of external actors (Spires et al., 2014). This neglect has prevented local communities and Community-Based Institutions (CBIs) in accessing, using and managing their resources, seeing their concerns as incompatible with conservative management.

Looking through the lens provided by the works of Lockwood et al. (2010), Stone & Nyaupane (2014), there is an urgent need to promote durable and genuine grassroots communities in participating in endeavours that directly or indirectly impact their lives. CBNRM through CBIs has thus, been recognised as being a favourable alternate to the neoliberal dogma and a liberating pattern with emancipatory abilities for all-inclusive NRM (Roe et al. 2009; Dörre 2015). It is believed that CBNRM, promotes principles of decentralisation and participation of individuals, households, and communities in aspects that affects their future in one way of the other (Tantoh & Simatele, 2017). Stone & Rogerson (2011) argue that CBNRM facilitates linkages between biodiversity conservation and community livelihood improvement through pursuing socio-economic objectives with communities as major actors. This is because rural communities are capable of adopting ways and means of managing their NRs in a sustainable manner than far-off management organisations (Ostrom, 1990, 2007).

One particular advantage that grassroots communities have over central government in managing resources arises from their capacity to access exhaustive knowledge rapidly about the state of the resources, which permits them to react and therefore adapt more quickly. It is therefore, necessary to establish an institutional framework, which caters to the needs of local people at the grassroots, and to develop capacities to deal with increased responsibilities and complex issues of shared decision-making and power relationships. Mccord et al. (2016) however, noted that the institutional design of a given governance system can be more or less polycentric that seeks to liberate the ingenuity, and stimulate the creativity of local actors and political entrepreneurs. This is because polycentric systems of resources governance consider the conditions for interactive learning between local user groups and between these groups and government officials. Thus, it assesses the degree to which the governance process helps

the actors to craft and adjust their own rules over time, thereby increasing the likelihood of these rules being effective in regulating NRs (McCord et al., 2016).

In view of the fact that human efforts to govern NRs face the problem of creating rules that make sense for the particular socio-ecological and institutional context in which the resources exist, scholars and community development practitioners have recognised the need for an alternative paradigm from a centralised approach to a more collaborative and interactive means to NRM (Agrawal et al., 2014; Mccord et al., 2016). Writing in the context of participatory methods Chambers (1994) observed that *"Putting the first last"* is a driving force behind rural community's involvement in NRM as expressed in the international development literature. This is because participatory methods in resources management is a well-established feature of development practice in much of sub-Saharan Africa (SSA) (Binns et al., 1997; Fonjong & Fonchingong, 2003). These methods emerged as an alternative to mainstream approaches to development, which were top-down, linear, and often comprised Northern 'experts' telling Southern 'poor people' how to go about 'development' (Botes & van Rensburg 2000). The ability of local communities to better manage their NRs will therefore, depend on the models of interaction between public, private and local institutions (Ison et al., 1997).

Despite the importance of participatory methods of management and the role of grassroots communities in NRM, Tantoh & Simatele (2017) observe that rural communities have not always managed NRs effectively and efficiently. This assertion, as noted by Hasler (1999) is born out of the contention that rural communities and CBIs are unable to successfully accept decision-making tasks. In the same vein, the devolution of responsibilities in CBNRM has not brought about the desired results and the benefits that accumulated to the communities

(Kantere & Chikoku, 2002). This state of affairs in a large part contributed to increased conflicts and misunderstandings over NR use between actors of development and communities within which development should be effected (Amungwa, 2011). Mccord (2016), argue that the polycentric governance approach equally challenges the blueprint governance model of a one-size-fits-all. Moreover, CBIs are regularly faced with the challenge of having to anticipate the consequences of their actions to avoid unintended consequences, without comprehensive information about the systems and other stakeholders (Ostrom & Nagendra, 2006). They further remark that neither top-down management nor CBM approach represents decisive solutions for all the ills that plague NRM. This could be attributed to limited clear evaluative frameworks that guide continuous development in the way NRM initiatives could contribute to on-going improvements in resource use sustainability and the social well-being of rural communities (Bellamy et al., 2001).

It is therefore imperative to focus more on adopting a wide-ranging approach to sustainable management by building institutions that fit the socio-economic and environmental system, while policy and Community Development (CD) experts should attempt to identify the diversity in societies that may assist water managers and planners in their efforts to create better measures to improve Community Based Water Resource Management (CBWRM). This paper argues that a more practical approach that will bring all the stakeholders and systems together will enhance rural water management in Northwest Cameroon. This could be achieved by applying a rational System Thinking Approach (STA) that produces reinforcing and self-reinforcing effects to improve rural water supply. This paper also argues that CBWRM, if appropriately supported through a system approach, can play an essential role in promoting and sustaining CBWRM initiatives in Northwest Cameroon.

4.2. Contextual analysis of CBNRM approaches in SSA: a literature review

NRs have always been managed through traditional institutions in most of SSA until the advent of colonialism and the introduction of Western conservation norms (Borrini-Feyerabend et al. 2004; Roe et al., 2009). Thakadu (2005), Ostrom & Nagendra (2006) argue that local groups and communities have often developed elaborate NRM systems and practices through careful observation of local conditions, and complex processes of experimentation and adaptation to suit their socio-economic and natural settings. They have, therefore, established their identity and cultural characteristics over time by conceiving and involving strategies to cope with their environment and NRs (Borrini-Feyeraband et al., 2004). This is because rural communities are more ambitious, easily motivated and encouraged by valuable opportunities to collaborate and are best placed to make decisions about their NR use and management (Saunders, 2014). In this regard, distinctive forms of social organisations were created with grassroots communities sharing in varying degrees the socio-economic, political and cultural attributes that operate as micro-political bodies with exclusive abilities and authority in the management of their everyday resource use (Campbell & Shackleton, 2001; Borrini-Feyeraband et al., 2004).

The dawn of colonisation disregarded the indigenous NRM systems and rights and replaced them with conventional centralised management systems (Mengang, 1998; Amungwa, 2011). It was assumed that a strong central government was capable of coercing citizen's demand for resources, which if unregulated by the central influences would ultimately lead to over-exploitation and destruction of the resources (Ostrom, 1990). By the end of the last century, however, an increasing body of scientific studies challenged the centralist view of NR governance, revealing that numerous grassroots communities have successfully self-governed

their NRs through self-help and CBIs (Borrini-Feyerabend et al., 2004; Ostrom, 1990; Ostrom & Nagendra, 2006; Tantoh & Simatele, 2017). It is argued that these conventional conservation approaches introduced by the colonial powers, marginalised indigenous cultures, practices, and systems, and appropriated the responsibility for NRM from CBIs to newly created state agencies thereby dictating on the locals on how and what to do (Roe et al., 2009; Dörre, 2015). A major challenge that centralised management systems face is how to devise rules that are effective in different local circumstances, including different grassroots communities needs, norms, problems, and knowledge, as well as the traits of the resources that they use.

In a variety of NR sectors, developed and developing countries have experimented with shifting NR governance responsibilities down from centralised governments to CBIs, thus stimulating the debate about the role of local participation in NRM (Tantoh & Simatele, 2017). Recent developments in the field of environmental management have led to a renewed interest in issues of marginalisation of grassroots communities; giving the local people a chance to be involved in the management of their resources (Stone & Nyaupane, 2014). This has resulted in a shift from the classically centralised NRM towards more devolved models known very broadly as CBNRM (Gruber, 2011; Stone & Nyaupane, 2014). Supporting this assertion, Borrini-Feyeraband et al. (2004) note that CBNRM is a practical local alternative to the centralised State control of resources which was flawed with inadequacies, besides setting a platform for future decentralisation and diversification of management actions. Thakadu (2005), Tantoh & Simatele (2017) observed that CBNRM seek to promote CBIs in resource use and management, enabling and empowering local groups of people to make better decisions about their resources.

Policy and development practitioners widely promote Community-Based Management (CBM) initiatives as the way to deliver local CD and sustainability by permitting the locals and downwardly accountable, collective institutions in managing their NRs (Lockwood et al. 2010). Studies from institutional theorists including Ostrom (1990), Rondinelli (1991) and Ribot (2002) have presented increasing and incontestable proof for the inherent capacity of local actors and grassroots communities to act collectively to solve environmental problems (Roe et al., 2009; Tantoh & Simatele, 2017). Thus, moving away from centralised paradigms, towards a conceptual framework that involves local institutions and people living close to the resource base in the planning, management and decision-making will instil a spirit of ownership and ascertain sustainable management (Barrow & Murphree, 1997; Campbell & Shackleton, 2001). CBNRM has therefore, been recognised as a promising solution for the failed top-down approach to conservation and development practiced during and after colonisation (Roe et al., 2009). This claim, has been echoed by Thakadu (2005), emphasising that the emergence of CBNRM coincided with a general trend in rural development studies to include local communities in the planning and management of NRs is an attempt to promote economic growth through devolution, decentralisation and the empowerment of the communities.

The experience of CBNRM strategies in much of SSA have for example, shown that it operates largely on the decentralisation of various rights and responsibilities over lands and resources to several local authorities (Ribot, 2002; Mwaipopo et al., 2011). The recognition of an alternative way of resource governance, as observed by Katerere & Chikoku (2002) confirms that involving and engaging different forms of partnerships ranging from co-management arrangements, decentralisation of power and authority to lower tiers of government, private sector, and local communities is imperative. Community participation in

NRM has therefore, become an essential component in policy arenas informed by the discourse of sustainability, which has a clear ethical foundation in notions of responsibility, stewardship, and duty of care particularly on Common Pool Resources (CPRs) (Obeng & Agyenim, 2011). Ako et al. (2010) argue that public participation is imperative in resources management from the stance of the use of indigenous knowledge as grassroots communities can also provide an important data base, experience, and ideas towards relevant and achievable solutions to NRM problems. A well-known approach has been the decentralisation procedure, also referred to as democratic decentralisation of power to control access to resources and power to make decisions on the basis of legal status, class, gender, and ethnicity (Campbell & Shackleton, 2001; Agrawal et al., 2014). This is because policy processes that shape CBNRM are influenced by the existence of networks that seek to promote effective and participatory policy development. It is believed that the decentralisation of some management duties to local communities is crucial in enhancing CBIs to efficiently take charge in NRM (Ribot, 2002).

Decentralisation and the forms of power and authority have therefore, been associated with the development of community conservation approaches (Barrow et al., 2000). This method of NRM exhibit the ways in which partnerships with new interest-driven actors, especially in the private sector, can empower and improve the capacities of the locals giving them more self-reliant development options (Borrini-Feyerabend et al., 2004; IIED, 2009). It is believed that communities can become effective institutions for sustainable NRM, but only if they are given real ownership, that is, the right to use resources, determine the modes of usage, benefit fully from their use, determine the distribution of such benefits and define rules of access (Roe et al. 2009; Tantoh & Simatele, 2017). This is because, communities are themselves structured along certain norms, values, and attributes which are influenced by social and

power relations (Fonchingong & Fonjong, 2003). For instance, Zimbabwe's CAMPFIRE-Communal Areas Management Programme for Indigenous Resources, Project Conservancies in Namibia, and Collaborative Management in Uganda employed diverse methods to participation which relate to the authorised conditions which control access to, and ownership and use of conservation resources (Barrow & Murphree, 1997). The benefits of such participatory and devolved tendencies as opined by Gruber (2011) are shown in sharing responsibility, negotiating benefits, incorporating a range of expert knowledge, enhancing capacity for implementation and increasing trust between stakeholders (see also Galvin, 2016). However, highly devolved systems of management face problems of designing institutions and policies to empower locally elected officials to support local resource users to manage resources sustainably (Ribot, 2002). This is because not all self-organised resource governance systems will be organised democratically or relies on the input of users. Some will be dominated by a local leader or elites who only change rules for their advantage. Njoh (2002) note for example, that the Divisional Officer (DO) in the Mutengene water project in the Southwest of Cameroon is said to have taken sides with the minority native population, when it was alleged that the said population insisted on excluding the so-called strangers from project decision-making forums. It, however, limited the financial contributions towards the realisation of the project.

Although participatory management designs give voice to local people, they do not give it to everybody. Barrow and Murphree (1997), for example, noted that vociferous men might dominate discussions thereby negatively affecting those who would have contributed meaningfully in finding possible solutions to NRM issues. Lendevlo et al. (2012) observed that equal participation is challenged in societies were the roles and responsibilities of both men and women are shaped and defined by socio-cultural norms and traditions. In the case of

conservancy activities in CBNRM in Namibia, the active participation of women remains a challenge as it is traditionally a male-dominated activity. Although strategies for promoting participatory development should neither be seen as blueprints, nor as recipes, it should rather be seen as a framework of values, principles, and approaches to promote the ideals of participatory CD (Botes & van Rensburg, 2000). In the sector of devolution of management responsibilities, more recent arguments have shown that complete decentralisation has not been achieved; instead a deconcentration of responsibilities to state-related local government institutions is being implemented (Campbell & Shackleton, 2001). This is particularly evident in some communities in SSA such as Botswana were traditional Chiefs and leaders lost their power to the land management boards to allocate land as well as their developmental role to modern democratically elected village institutions such as the Village Development Associations (VDAs) (Hasler, 1999; Ngwirat et al., 2013). This, it is felt can obstruct dynamic participation of local communities in all aspects of NRM ranging from decision-making, control over resources to allocation of rights and benefits which can again jeopardise sustainability.

Given the above observations, it would not be an exaggeration to argue that it is important to understand the dynamics and complexities of a locality in which CBNRM initiatives are organised and implemented for the success of such activities (Ngwira et al., 2013). It should be noted that the likelihood of any given governance structure is likely to succeed depend on a series of context-specific factors, such as the nature of the resource to be governed; the extent to which local resource users are organised to create, monitor, and enforce the rules for resource use and management; and the degree to which actors who are subject to these local organisational arrangements interact and collaborate with other actors who are external to the community. Sayer & Campbell (2004) noted that the key question that often arises is how to

design functional systems that simultaneously benefit from the advantages of particular governance arrangement while rely on organised alternate systems that can help stabilise the imperfections. Mccord et al. (2016) argue that a polycentric approach to resource governance with many centers of decision-making which are formally independent of each other might actually improve efficiency. In contrast to centralisation and decentralisation, Mccord (2016) noted that polycentricism seeks to enable institutions of multiple scales to effectively combine local, indigenous knowledge with scientific knowledge (see also Cox & Arnold (2010). For instance, polycentric water governance initiative in Kenya enabled the socio-ecological and institutional interactions through which responsibilities are distributed at the local, regional and national level and across multiple levels for positive outcomes (Mccord et al., 2016). There is however, no guarantee that polycentric approaches will find the combination of rules at diverse levels for any particular environment they noted.

In as much as colonial and post-colonial politics set the agenda for centralist institutional control over large tracts of NRs in developing countries, Ostrom & Nagendra (2006) and Tantoh & Simatele (2017) argue that CBNRM, self-governance, and co-management have provided the standard in promoting community prerogatives in NRM. However, the complex, multidimensional and the dynamic nature of NRs show that neither government ownership nor community management represent a definite solution for all the problems that affect NRM (Ostrom & Nagendra, 2006). Given these imperfections, it is more productive for both analysts and decision makers to accept that no single structure is necessarily superior to the other. There is therefore, need to focus more on adopting and building institutions that fit the socio-ecological systems, while policy scientists should strive to recognise diversity in the institutions that may assist users in their efforts to devise better arrangements for sustainable management. In view of the fact that divergent opinions often appear because of different

management objectives and different institutions and grassroots communities hold different thoughts and values about how management systems should operate, a STA approach has been considered as the most appropriate way to successfully operationalise the concept of using and managing NRs efficiently for sustainable CD. This is because a STA approach to NRM engages, correlates the social, economic, political and natural systems and comprehend synergies between them (Noordwijk et al. 2008). A combination of actors and approaches would be seen as a potential catalyst for addressing problems within a given system, and a way of ensuring that various groups including those traditionally marginalised from NRM decisions can contribute to the change process (Ascher, 2000; Bishop et al., 2013).

Building on this observation, Varis et al. (2014) argued that external factors and actors will facilitate and promote a process of negotiation among resource users within an integrated research approach. Such negotiation will involve understanding the perspectives of every actor, examining complementarities, identifying where differences may be settled, where competence and social action can bring innovative alternatives for reconciliation, and where compromises will be necessary to move ahead (Noordwijk et al., 2008). Recognising this interdependency is fundamental in providing means to achieve ends that are continually redefined by major social concerns and adopting alternative methodological paradigms for NRM and environmental policy (Bellamy et al., 2001). Policy and development practitioners are progressively examining management challenges by employing the concept of adaptive management capacity as a critical aspect of NRM that reflects the ability to experiment and foster innovative solutions in complex socio-ecological settings through a STA approach (Berkes et al., 2004).

4.3. Methodological approach.

This paper is based on empirical evidence obtained through the use of tools inspired by the tradition of Participatory Learning and Action (PLA)[31]. The PLA has therefore, been adopted as a tool for data collection that was conducted between November 2015 and January 2016 from three rural districts; *Ndu, Njinikom and Mbengwi* in Northwest Cameroon (Figure 4.1). These rural districts were selected through a *Stratified Sampling Approach* to consider information rich cases to inform the study. From these rural districts, two villages were randomly selected giving a total of six study sites: *Njimkang, Ngarum, Baicham, Muloin, Tugi, and Zang-Tabi*. The selection of the villages was, based on the presence of a functioning rural water supply system, CBIs, VDAs, and WMCs. It should be noted that the water is distributed through a gravity-led technique[32] due the region's mountainous nature. Furthermore, these communities are well-known for initiating and realising CD projects through VDAs and CBIs. Besides, the region is characterised by common cultural and traditional attributes such as language and cultural norms as well as social structures of community leadership and NRM and utilisation.

[31] The PLA is an approach that enables local people to share their perceptions and identify, prioritise and appraise issues from their knowledge of local conditions (Chambers, 1994).
[32] This is a system where water is channelled from a watershed through springs and piped down to the villages.

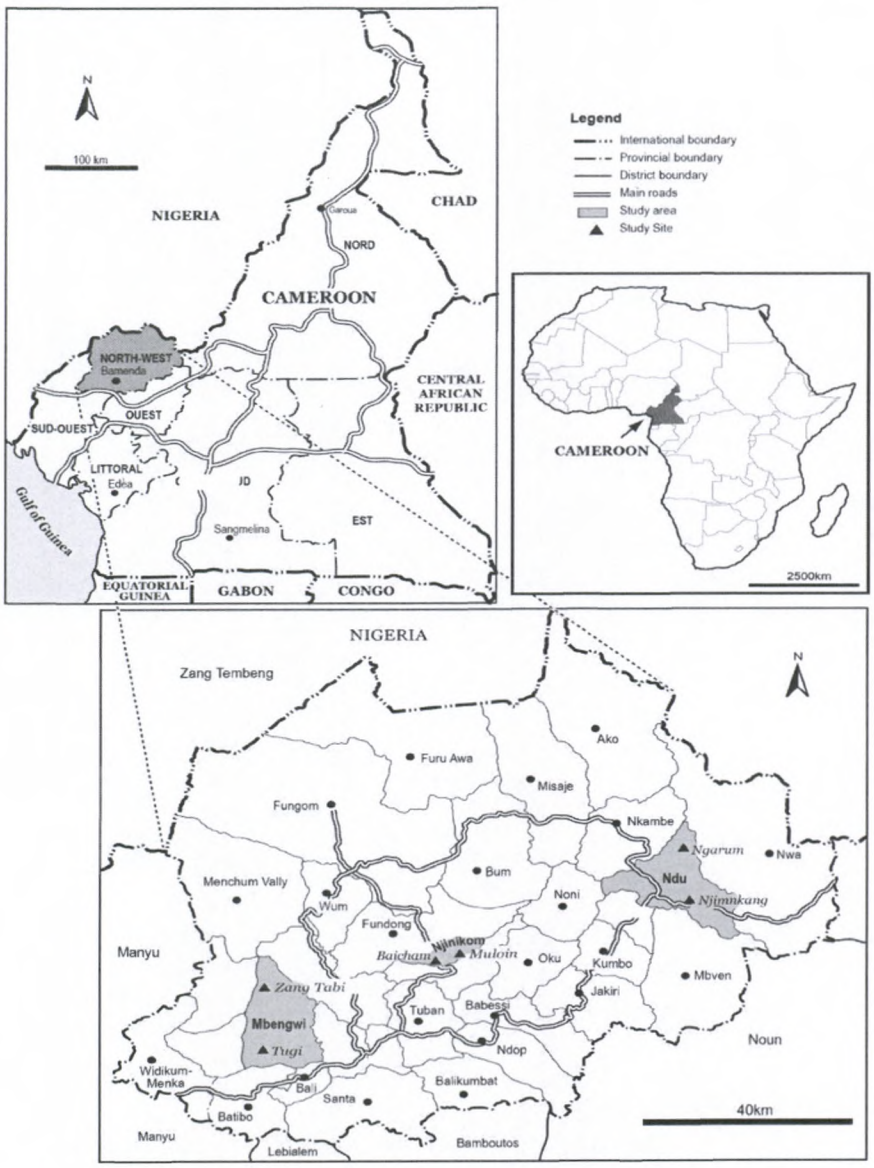


Figure 4.1: Map of Cameroon and the study sites in Northwest Cameroon

Source: Cartography Unit (2016), School of Geography and Environmental Studies, University of Witwatersrand, South Africa

A population list for the six villages was then composed using the *Adaptive Sequential Method* which gave rise to a total number of 270 potential households across the six villages having an equal chance of being selected and included in the study. After scrutiny of the population list, it was deliberately decided to employ a confidence level of 40% across the six villages to draw a study sample, and this exercise resulted in the selection of 108 participants

included in the study. Participants' ages ranged from 21 to 75; of these, 43 were males, and 65 were females. A systematic sampling procedure using an equal-probability method[33] was applied. An interval of 2.5 rounded off to three was employed to select the 108 households (18 for each community) across the six communities with the first household purposely selected and then applying the K element repeatedly across the study site.

Furthermore, interviews and informal discussions were conducted to get important data using a set of semi-structured and open-ended interviews to have a contextual background from diverse perspectives and a comprehensive understanding of the management techniques and practices used in managing rural water systems. Semi-structured interviews were equally used to conduct focus group conversations with the Water Management Committees (WMCs) and caretakers of the six villages. This was to determine their role in the management, decision-making, and their perceptions about public and private sector support towards regular and lasting water provision. Similarly, interview discussions were conducted with the local chiefs and chairs of the traditional councils identified through key informants in the various villages. These informants were identified directly during fieldwork to the communities and recommendations of previously interviewed respondents. The purpose was to understand their roles and the techniques used in NRM. The interview guidelines covered topics such as management practices and responsibilities, conflict resolutions, decision-making processes and implementation amongst others.

To complement the empirical data, a logical review of related literature on the diverse approaches to NRM was conducted, and this formed the basis of the existing literature. Using

[33] K= N/n $\frac{\text{Size of population}}{\text{Sample size}}$ Where **n** is the sample size, and **N** is the population

meta-analysis[34] as analytical framework, it was important to systematically evaluate the literature to identify factors and processes that may have contributed to the success or failure of NRM initiatives. This process included multi-database searches of online sources using various search engines, such as Scopus, Google, Google Scholar, and Ask.com. Key words such as NRM, CBNRM, and CBWRM were entered in the search engines and this yielded a total of 165 peer-reviewed journal articles. The review process was aimed at highlighting the various approaches of NRM and how new approaches can be developed for improved CBWRM practices in Northwest Cameroon. Other information was obtained through a library search from different libraries across the globe including; the universities of the Witwatersrand, Pretoria, Johannesburg in South Africa and the universities of Dschang and Bamenda in Cameroon. After initial filtration and evaluations of the literature on NRM, CBNRM and CBWRM issues, a total number of 61 peer-reviewed published research articles were comprehensively reviewed and analysed.

This investigation was further reinforced by STA motivated by the causal feedback principles to develop policy intervention mechanisms and also to have a clear understanding to evaluate the causal relationships between the stakeholders and systems in CBWRM in Northwest Cameroon. This was be done through a Causal Loop Diagram (CLD) defined by Nguyen et al. (2009) as '... a framework for seeing interrelationships rather than things, for seeing patterns of change rather than static snapshots'. The STA therefore, necessitates a deliberate reconsideration of contemporary management methods that have played a key role in informing current management policies, practices and causal feedback relationships among the regulating variables, which enable policy interventions as observed by Varis et al. (2014) and which are found to be relevant for improving CBWRM in Northwest Cameroon. Two

[34] A meta-analysis offer helpful insight into: the effectiveness of interventions, the relative impact of interventions, the strength of relationship between diverse intervention and actors (Zeynalov, Horvath, & Havranek, 2014).

main frameworks of reference were adopted in approaching the causal relationships existing in CBWRM in Cameroon. These frameworks of reference include the socio-economic and political contexts for larger inclusivity as well as to avoid variations and isolation in the cause-effect relationships observed in CBWRM.

4. 4. CBWRM in Northwest Cameroon.

History shows that rural communities in Cameroon have managed their natural environments through traditional management systems for subsistence as have local communities throughout the world for ages. It has been established that NRs such as water, land, and forests, in the village communities in Cameroon, belonged to the public and traditional leaders acted as custodians before the colonial era (Amungwa, 2011). These communities have since developed management systems of the NRs surrounding them to ensure their conservation into the future. However, colonialism replaced the indigenous management systems, cultural institutions, and practices with centralised management systems in the exploitation of NRs (Borrini-Feyerabend et al., 2004). This system of resources management, however, continued with the structures and institutions left behind by the colonial regimes which excluded rural communities in NRM (Amungwa 2011). This exclusionary tendency marginalising rural communities was intensified by the economic crisis and Structural Adjustment Programme (SAP) in the late 1980s, a period marked by limited government spending (Fonchingong & Fonjong, 2003). This stirred the development of self-help initiatives in CD ventures in Northwest of Cameroon. CBWRM thus grew as an alternative to the top-down systems of management as expressed from developing countries point to the fact that even the most competent water agencies cannot successfully realise and sustain water networks over extensive areas without involving grass-root communities (Bunclark et al., 2011). One promising strategy in the water sector involves communities mobilising and

assuming control of their water supply systems (Njoh, 2002). Binns et al. (1997) suggested that the policies of modern political regimes in developing countries required new management approaches to better understand the dynamics and needs of rural communities and improve service delivery and other development challenges. This has been supported by community leaders in the study sites. Interview conversations with community leaders' show for example show that the villagers have always managed their NRs responsibly. Below is an excerpt from chairs of WMCs regarding service provision and control in Ngarum and Muloin villages Northwest Cameroon:

> *"The villagers have been used to taking responsibilities especially in managing their natural resources using local management systems even before colonisation. During and after the colonial period, many changes took place. Hence, the water problems experienced in the communities coupled with low levels of development obliged rural communities to reconsider self-help management practices whereby the community assumes the responsibility in service provision and management" (personal communication, 2015k).*

One can deduce from the above statement that CBWRM is not a new phenomenon in Northwest Cameroon. Genuine CD initiatives through community participation had been used in NRM, construction, and maintenance of palaces, village to farm roads and markets even before independence. CBM has since then been engraved in the customs and traditions of these rural communities (Fonjong & Fonchingong (2003). In an attempt to facilitate and encourage rural communities to own their development process, the government enabled self-help programs, informal sector participation, privatisation of services, public-private partnerships to further reduce the burden on the government and increase the efficiency of

providing potable water and other social amenities to rural communities (Rondinelli, 1991; Mercer et al., 2009). CBM therefore, thrived due to the government's inability to provide adequate services to its citizens and the determination of the locals to take their destinies into their hands. This assertion was confirmed during a focus group discussion with 17 women in Zang-Tabi and seven men in Njimkang who stated:

> *"We had to realise a community water system due to the poor water conditions in the village and the sufferings that were encountered by women and children particularly in water potage exercise. Now that we have clean water, we have to make sure that it is well managed and that the necessary attention and contributions are made to the water management committees. Women should also be given a chance to be part of the decision-making and management processes" (personal communication, 2015l).*

The above remarks from community members illustrate the importance of participation and the role of women in CBM. Without the involvement of women who are known to experience water hardships most directly, it will be difficult to make significant progress in addressing water needs. It is believed that if the local population are made to participate in public decision-making processes especially on issues in Water Resource Management (WRM), it will be easier for them to realise and eventually change their practices which might have negative impacts on water resources and reinforce the ones with positive results (Tantoh & Simatele, 2017). The role of women and youths are mostly seen during the mobilisation of the villagers to participate in communal work at the project sites and financial contributions towards the realisation of the project. Unfortunately, the women and youths are not usually given the opportunity to participate in decision-making processes or occupy important positions in the WMCs and their participation is seldom needed after the realisation of the projects. It will not be illogical to argue that if women are given the opportunity to

actively participate in initiatives that are related to their traditional roles, it will facilitate the development of policies and other governance tools around NRM and benefit-sharing schemes. Some of these concerns are expressed by village chiefs from Njimkang and Ngarum who declared:

> *"The village Chief commonly called "Fon" [35]is the traditional head of the village. The chieftaincy is organised in a hierarchical order with traditional institutions that have supreme traditional mandates and enforce customary laws and is legally recognised in the country. Apart from heading and guiding the natives, the chief who is the mouth piece of the gods and the traditional council plan the management of natural resources and sanction defaulters accordingly" (personal communication, 2015m).*

Underscored in the above quotations is the significance of village authority over the management of NRs. One distinct feature of rural communities is that they are structured around strong traditional chiefdoms ruled by chiefs who are the custodians of the land. Before colonial rule, rural communities organised along clan leaders and chiefdoms managed and provided for their basic needs particularly through collective self-help efforts that combined participatory and partnership dynamics, using customary management practices (Figure 4.2). CBWRM initiatives in Northwest Cameroon are thus structured in ways that promise efficient water management.

[35] The Fon is a common name used to call traditional rulers of village chiefs in the Bamenda Grassfields of Northwest Cameroon. They are the custodian of the land and uphold the social, cultural, economic and environmental aspects of the village.

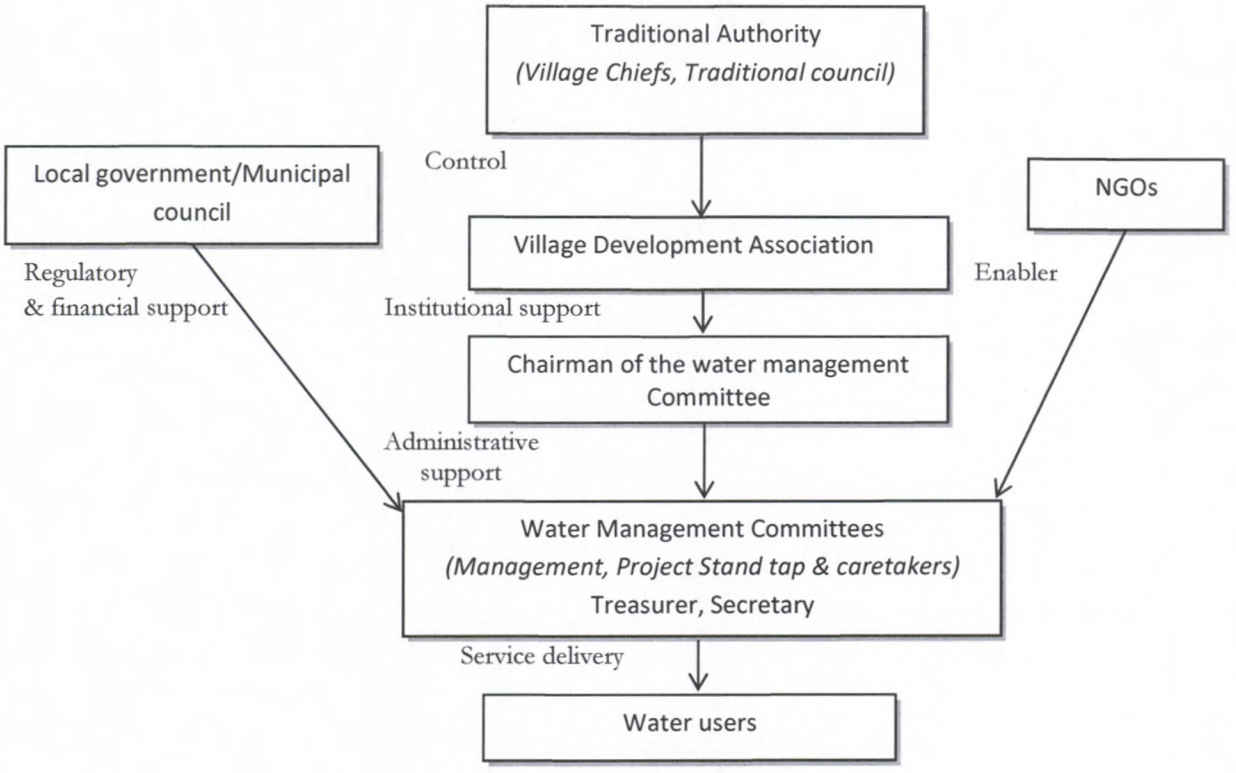


Figure 4.2: Community management model in rural Northwest Cameroon

Source: Fieldwork results (2016).

Traditional authorities (*village chiefs, traditional council*) are the highest decision-making body in the village, and they work very closely with the VDAs in shaping development projects within the communities. They oversee the WMCs (*management, project, stand tap committees, and also the treasurer and secretary*) and also provide administrative support to other CBIs. Through community participation and partnerships with local district councils and NGOs (*PLAN Cam, SHUMAS, and GP-DERUDEP),* the WMCs receive financial, regulatory and technical support while building the capacities of the water caretakers. It should also be noted that the WMCs of the different villages consist of elected and devoted members of the community and are responsible for collecting operating and maintenance fees, organise manual work and carryout necessary repairs within the water network. The

members are answerable to the chairs of the WMC who are subsidiaries of the VDAs. They equally make major decisions concerning water management within the communities. The resulting constellation and pattern of the management organisation define the power relations and performances of the WMCs which has an effect on the sustainability of the water system (Table 4.1).

Table 4.1: Performance of the various community water management committees

Rural Districts	Villages	Performance of Water User Committees			Frequency *N=108*	%	Ranking
		Management committee	*Project committee*	*Stand tap committee*			
Mbengwi	Tugi	2	2	3	12	15	3
	Zang-Tabi	2	2	2	14	17.5	2
Njinikom	Baicham	1	1	2	17	21.25	1
	Muloin	3	3	3	10	12.5	4
Ndu	Njimkang	1	1	2	17	21.25	1
	Ngarum	3	3	3	10	12.7	4
					80	100	

* 1 - Very Active, 2 – Partially active, 3 - Inactive

Source: Fieldwork results (2016).

The performances of the WMCs vary between the committees and communities which determine the effectiveness of the water system. For example, the functioning of the management and project committees were very active (1) in Baicham and Njimkang (21.25%) while the performance of the stand tap committee was partially active (2) (17.5%). This is because of the dynamic nature of the committees in the two villages resulting in sustainable outcomes in their water systems. They were also able to better mobilise, motivate, and sensitise the inhabitants of the necessity of participation in all the activities of the water system. In contrast, the performances of the WMCs were partially active (2) in Tugi and Zang-Tabi and inactive (3) in Ngarum leading to poor state of the water system (Table 4.1). It

can, therefore, be argued that if CBWRM initiatives in Northwest Cameroon are to succeed; there is need for the integration of women and active participation of all sub-management units and water users to enable and enforce management decisions.

The local district councils have equally been mandated through decentralisation to identify the potentials, opportunities and constraints of the different NRs within their districts so as to implement government's laws and policies for sustainable management. This was expressed during interview discussions with mayors from the three rural districts stressing on their remits in NRM:

> *"Faced with increasing pressures on land, high costs of living, droughts conditions, competition over natural resources have resulted in the reduction of fallow periods, intensive land use practices and environmental degradation. This has greatly affected the volume of water especially as catchments are encroached by farmers and cattle grazers. As an arm of the government at the local level, we are bound to apply government's laws and policies in protecting and conserving the environment by promoting sustainable practices" (personal communication, 2016n).*

Building on the above statement, it can be reported that rural councils determine the approach in which NRs are managed in their districts. This is because farmers and animal grazers encroach watersheds coupled with the drought periods which the community experienced. To execute governments' environmental management prerogatives, the mayors of the different rural districts apply environmental management policies and laws, especially on watersheds. This exclusionary mode of environmental governance was often backed by scientific chronicles that represented NRs as threatened by the activities of local actors in proximity to

these resources (Bixler, 2015). In particular, ecological theory scholars argued that forging a conservation approach that favoured exclusive control of NRs by state experts will better protect the environment through conservation area approaches (Bixler, 2015). This prevailing top-down approach to management defies the concept of decentralisation. It is unfortunate that the institutional failures and sectoral approaches to WRM continue to encourage top-down management approaches, disregarding the role of rural populations in NRM (Tantoh & Simatele, 2017). The poor performance of WMCs, gender bias, encroachment of watersheds and environmental degradation has deepened WRM problems in Northwest Cameroon. To improve the management of NRs and enhance CD, new relationships must emerge among national and local government agencies, CBIs, and NGOs. This is because neither top-down nor CBM represent a conclusive solution to WRM in Northwest Cameroon. Thus, an integrative bottom-up approach inspired by applying a rational STA through a causal feedback principle to develop policy intervention mechanism that produces reinforcing and self-reinforcing effects to improve CBWRM in Northwest Cameroon is necessary.

4.5. Creating of conceivable and sustainable CBWRM Standard for Northwest Cameroon

The arguments in this paper are justified by the strategies and influences of the stakeholder's in CBWRM. This is because rural communities are seen as or made up of multiple stakeholders with often differing interests and approaches to NRM (OECD, 2015). The increasing concerns of the socio-economic wellbeing of the populations are therefore, pushing rural communities to seek a balance to improve their standards of living and promote sustainability (Tantoh & Simatele, 2017). This observation, has been supported by Ascher (2000) emphasising that societies pursue interests that may correspond with neither the formal mandates of the organisation nor the preferences of those out of the organisation who

have formal and legitimate authority to set the multiple interests of the stakeholders for sustainable outcomes. These actions are however, affected by the disproportionate power relations, socio-economic and environmental conditions together with a fusion of institutional arrangements which comprise aspects of the formal and informal regulations (Fernandez-Gimenez 2008).

In an effort to improve CBWRM in Northwest Cameroon, a comprehensive STA paradigm will be used as an approach to illustrate the complex relationships and establish joint efforts to enhance effective management outcomes in an observable socio-economic and environmental context. This is because addressing the WRM challenges in Northwest Cameroon will require bold and intricate alterations to existing institutions and policies governing the water resource. This will be enabled by using the Causal Loop Diagram Analysis (CLDA) which as a tool for systems analysis illustrates the complex relationships in a visible socio-economic environment. In this regard, the causal relationships between variables, shown in Figure 4.3 are pictured by unidirectional arrows connecting the variables. In general, the (+) sign indicates that the preceding variable has an increasingly positive effect on the variable to which the arrows are connected. The (-) sign, on the contrary indicates the preceding variable has a decreasing effect on the variable to which the arrow is connected. Two or more arrows connecting two or more variables create a loop which has either a reinforcing (R) or balancing (B) effect on a given variable within the loop. The (R) in the middle of the loop that indicates the variables are reinforcing each other over time. This is because the factors of a system are not isolated and independent but are linked and might cause a growth or decline in each other as well as in other key areas of the system.

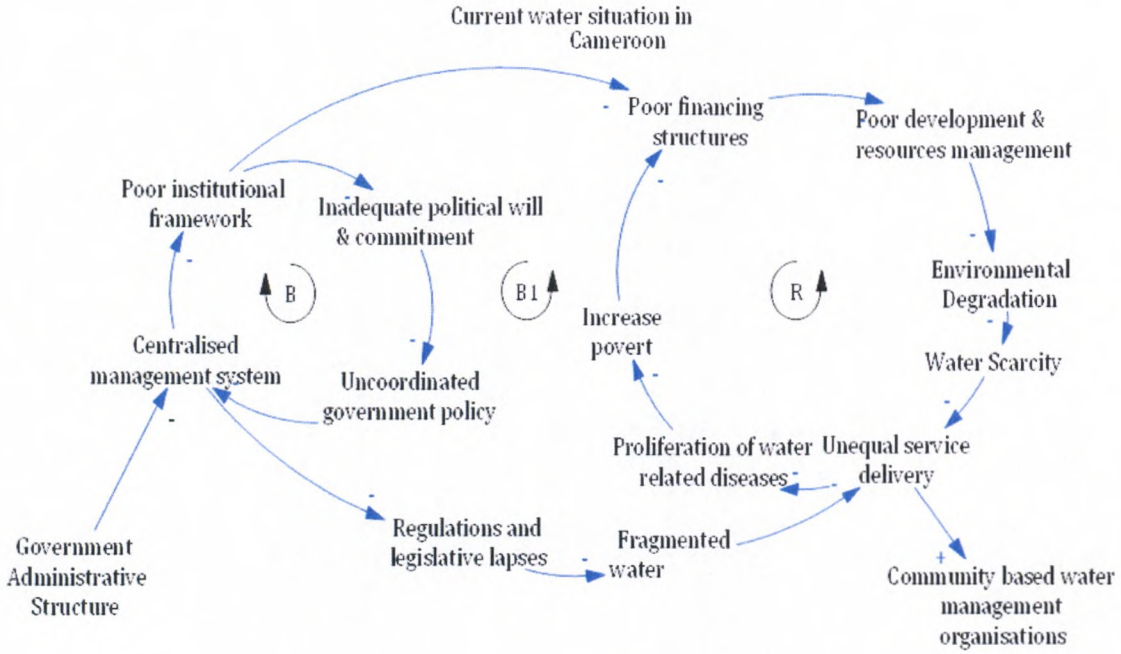


Figure 4.3: Current situation in water management in Cameroon

Source: Fieldwork results (2016).

Figure 4.3 illustrates the characteristics and relation between stakeholders of WRM in Cameroon. The centralised management of water resources in Cameroon with MINEE as the coordinating body with conventional sectoral approaches in the hands of many other ministries has resulted to poor institutional frameworks and inadequate political will and government commitment in allocating sufficient water resources on a long-term basis to meet the needs of the population (B). This is because top-down management has shown signs of lengthy decision-making processes and significant management failures (Agrawal & Gibson, 1999). The recurrent failure of centralised management strategies to accommodate local socio-cultural conditions, not the state of the resource is the major cause of its failure (Ostrom, 2007). It is evident that the inconsistent and detrimental policies, combined with weak sector governance systems, and poor financing structures have limited the development of access and use of water services (B1). This situation has led to the prevalence of water-

related diseases, increasing household expenditure on basic amenities and increased incidence of poverty (R). It is, therefore, apparent that the relationships between the key variables of the CLD in Northwest Cameroon are simple or linear. As such, trying to improve the sectors in isolation will be counterproductive and may upset the overall system and its performance. In an attempt to find new solutions to failed top-down approaches to WRM, CBM initiatives are receiving attention as potential mechanisms for improving the efficacy, and sustainability of CBWRM systems. A major question that often arises is how to share management responsibilities among the various stakeholders based on the socio-economic, political and environmental conditions together with the combination of the diverse institutional arrangements which comprise aspects of the formal and informal regulations.

According to Cullen et al. (2014), understanding the ways in which power operates, particularly within spaces determines the level of stakeholder engagement in policy processes. Figure 4.4 illustrates, the power cube framework used to analyse the interrelationship between space, place and forms of power. Gaventa (2006) outlines three dimensions of power which influence decision-making and sustainability outcomes in resource management: i) spaces which refer to the potential arenas for participation and action including closed, invited and claimed spaces; ii) forms which refers to the ways in which power manifests itself including its visible, hidden and invisible forms and iii) levels which refers to the various tiers of decision-making and authority, including the local, national and global. The framework shows that the dimensions are not stable and are constantly interrelating with interest-driven actors in policy processes, from local to global levels. These spaces as observed by Cullen et al. (2014) enable the stakeholders to articulate their needs and work together to achieve a common goal on equal terms.

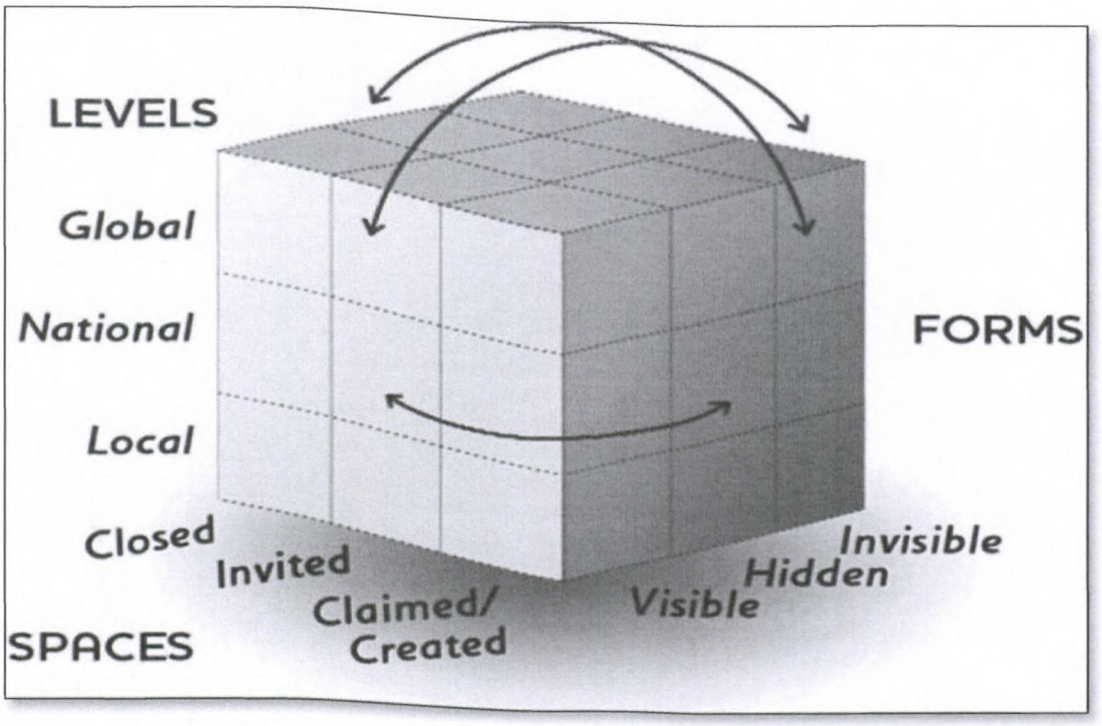


Figure 4.4: Power relations in CBWRM in Northwest Cameroon

The 'power cube': the levels, spaces, and forms of power (Gaventa, 2006).

Using the power cube (Figure 4.4) to illustrate power relations in WRM in Cameroon, we realise that the politics of participation and the part of power dynamics within participatory processes have regularly failed to achieve meaningful socio-economic change, address power imbalances and institutional realities on the ground. In a closed space scenario, for example, decisions concerning the water resource are determined at the national level by MINEE and other sectoral ministerial departments and executed at the local level without taking into consideration the socio-ecological context of local actors. This is because the power relations are unequally distributed between the stakeholder groups involved: national *(regional, divisional and sub-divisional ministerial departments and specialized institutions)* and local *(municipal/district level, traditional leadership, VDAs and WMCs and water users)*. Efforts made through CBIs to widen participation, to move from closed spaces to more "open" ones

have always faced interruptions from district councils responsible for the management of NRs at the local level. From this perspective, new spaces are, therefore, created which may be referred to as "invited" spaces. Such spaces may be regularised and more transient as argued by Gaventa (2006), through special forms of consultation. It is enabled by social movements involving natural places where people gather to debate, discuss and resist, outside of the institutionalised policy arenas. Such initiatives are mostly claimed by the less powerful actors from or against the power holders, or created more autonomously by them. This is because gaining power for one set of actors means that others must give up some power and since powerful stakeholders like the government rarely give up their power easily, it often involves conflicts and power struggles. This is exemplified in Kumbo, a town in Northwest Cameroon, where the locals forcefully expelled the National Water Corporation and retrieved a network they claimed to be rightfully community owned and began to run the system along community lines while other communities restored CBM strategies (Page, 2003).

Still at the local level, differences in power and status among the young and the elderly, men and women, or among different community units or sub-groups are classical examples of power abuse or power inequalities who affect management decisions. For example, women and youths in the study sites were not given the opportunity to assume important posts in the WMCs. They were mostly solicited when it concerns contributions, mobilisation and manual work at project sites. Such differences also manifest in accessing other NRs with the possibility of imbuing tension in the communities. Although we want to focus on the different spaces and places of power as they open up possibilities for participation, we must understand that many decision-making spaces are closed. That is, decisions are made by a set of actors behind closed doors, without any pretence of broadening the boundaries for involving other interest-driven actors which are difficult and sometimes unlikely for reaching

an accord. This is because of the power imbalances between the different actors thereby creating new institutional arrangements which might result in the exclusion of pro-poor and other marginalised groups.

Given these power imbalances, improving the current water situation would, therefore, necessitate looking beyond the existing operational frameworks that seek to examine ordinary and everyday systems, processes and structures of CBWRM and adopt approaches that examine the deep-seated social, economic, political and institutional complexity in WRM as illustrated in Figure 4.5. This alliance between the various stakeholders and institutions as argued by Cullen et al. (2014) will instil partnership on a democratic platform and facilitate exchange of knowledge about the stakes of the resource and the necessary actions to take to solve common challenges

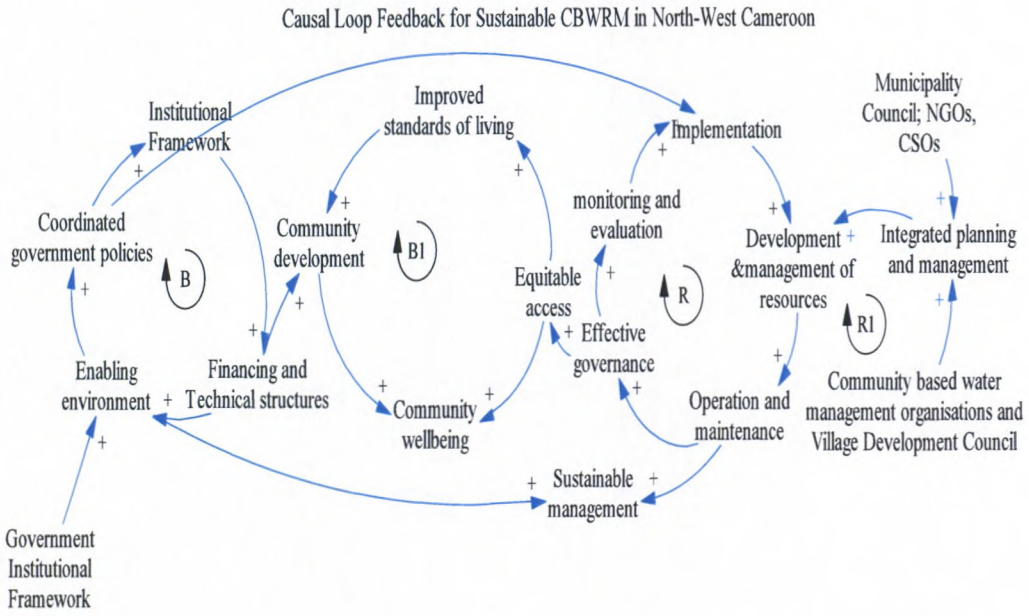


Figure 4.5: Casual Loop Feedback in Sustainable CBWRM in Northwest Cameroon.

Source: Fieldwork results (2016).

It is apparent from Figure 4.5, that there is a strong and clear causal loop relationship between the levels of coordinated policy development (B) and integrated planning and management practices (R1). From a local perspective, it is obvious that the implementation of water policies and regulations coupled with continuous monitoring and evaluation by experts (government) is paramount to sustainable management outcomes (R). Steady monitoring and evaluation should inform management practices and enable regulating authorities to assess the availability of water resources. Due to the direct and visible relationships between access to potable water and improvements in health and productivity (B1), it would be necessary for the government through MINEE and other sectoral ministerial departments, NGOs, VDAs and CBOs to partner to improve and sustain CBWRM initiatives (R1). A system approach has therefore, been developed to identify key leverage points and possible alliances to create a collaborative platform for sustainable outcomes.

As soon as a representative CLD is constructed, the appropriate intervention strategy can be devised to address the root causes and improve on the leverage points of WRM problems. This process can inform decision-makers, at various levels on how best water resources can be allocated, so they are shared appropriately. It can, therefore, be argued that for any meaningful system of NR to be achieved, there is need for grassroots communities and CBIs to be involved in all the phases of the project cycle. However, the local implementation and performance of new management regimes are highly influenced by case-specific circumstances, particularly by the engagement of interest-driven players with different levels of power whose interactions are affected by mixed and frequently conflicting institutional arrangements, and the respective socio-economic conditions (Dörre, 2015). Considering the fact that NRM regimes are being shaped and reshaped towards, creation and promotion of local resource governance, a system approach has shown to be useful as a sustainable strategy

since it takes on a holistic view and allows for interactions of the various systems and stakeholders to be discovered (Nguyen et al., 2009). It is on the above assumption and principles that a comprehensive approach involving the natural and human systems is believed to enhance sustainable CBWRM. This assertion has been supported by Law (2009), emphasising that human beings form a social network not because they only interact with other human beings but because they interact with endless other milieus and systems too which will only be possible in an enabling environment which provides a favourable ground for appropriate institutions and policies for sustainable outcomes (B).

4.6. Conclusion

CBWRM is largely perceived as being a promising alternative to the centralised, top-down neoliberal dogma and a liberating paradigm with emancipatory potential for comprehensive sustainable CD. It is believed that rural communities are capable of adopting ways and means of managing their NRs in a sustainable manner than distant management organisations. It has however, been argued that neither CBM nor the centralised, top-down NRM approach represents a conclusive solution for all the setbacks that plague CBWRM (Ostrom & Nagendra, 2006). The raison d'être of this paper is to develop a more practical methodological framework that will enable and enhance sustainable CBWRM in poor rural communities in Northwest Cameroon. The most obvious finding that emerges from this study using empirical evidence and tools inspired by the tradition of PLA is that, incorporating all the actors and diverse conventional scenarios and systems that justify the integration and collaboration amongst them are imperative for promoting sustainability.

Although co-management is crucial for CBM initiatives, the strategies, and influences of the multiple stakeholders with often varied activities and interests have different management

approaches. It is thus, necessary to focus more on adopting a comprehensive approach to sustainable WRM by building institutions that fit the socio-economic and ecological systems, while development and policy practitioners should strive to recognise diversity in societies that may assist users in their efforts to devise better arrangements for sustainable outcomes. A surrogate management approach for perceiving sustainability has, therefore, evolved from alternative ways of organising social relations. This will be feasible through a STA approach identified as an integral framework for understanding and establishing a collaborative management of the complex nature of water resources. This is because STA paradigm takes a holistic view of the socio-economic, political and environmental components that allows for interactions to be discovered. This is plausible by creating flexible combinations of the different ways of organising, perceiving and justifying social relations. Thus, a methodical framework based on a bottom-up and a more interactive model that focuses on relations among actors and the implementation strategies created by them in response to particular policy choices is vital in promoting partnership, social learning among different groups of stakeholders for sustainable results. There is, therefore, an urgent need to strengthen the capacities of the stakeholders, particularly local institutions to plan, invest wisely and manage scarce water resources in an efficient and effective manner. It is in this context that this paper proposes STA model as an operational framework for sustainable CBWRM in Northwest Cameroon.

CHAPTER FIVE

Towards a Pro-community-based Water Supply Management System in Northwest Cameroon. Practical Evidence and Lessons for Best Practices[36].

ABSTRACT

This paper examines community-based water supply management (CBWSM) in three rural districts of Northwest Cameroon as well as a review of literature focusing on some successful Community-Based Natural Resource Management (CBNRM) initiatives in sub-Saharan Africa. Using both empirical and secondary data collected through participatory research methods and a rapid appraisal of existing literature, it is argued that CBWSM has failed to achieve sustainable water supplies in Northwest Cameroon. Findings revealed that centralised control, the prevalence of poverty, passive involvement of public, private and grassroots community has continued to thwart efforts to provide sustainable water supplies within these districts. It is important to note that in any natural resource management system, power becomes a crucial factor as it determines who has and does not have access to common-pool resources. In this regard, it is argued in the paper that coordinated government policies, resolute devolution of power, active participation and empowerment of rural communities will facilitate and invigorate a platform for capturing the views of diverse user groups and this in turn can bring about a people-centred and community-driven development process. Furthermore, some aspects of best practice arising from the case studies can contribute significantly to promoting the development of effective community-based water management system in Northwest Cameroon. This has been examined within contemporary theoretical and practical discourses and approaches on CBNRM in developing countries.

Key words: Natural resource management; community participation; sustainable development; devolution; Cameroon.

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[36]Tantoh, H. B., & Simatele, D. (2016). Towards a Sustainable Community-based Water Resource Management in North-west Cameroon. Practical Evidence and lessons of Best Practices. (Under Review, International Journal of Rural Management)

5.1. Introduction

Natural resource management (NRM) regimes are being shaped and reshaped towards the promotion and creation of locally based decision-making process in resource management and governance (Stummann & Gamborg 2014). Communities are thus, increasingly being seen as important agents of change who should not only be empowered but given the power of ownership of their own development process (Matarrita-Cascante & Brennan, 2012: 301). However, a major challenge that most developing countries are facing is how to sustainably manage their NRs in ways that meets the increasing needs of their populations. Yongsi (2010), for example, argues that one of these challenges is how to access potable water which has a trigger-on effect on a number of aspects including rural livelihoods. The United Nations Development Programme (UNDP, 2004), observes that water is the center of socio-economic development and insecure access to water for consumption and productive purposes is a major constraint to poverty alleviation particularly in rural areas of SSA. It is this realisation in the importance of water for both social and national development that there is now an increased global quest to search for alternative and effective approaches for sustainable[37] Water Resource Management (WRM). Community-based Water Supply Management (CBWSM) has thus emerged as one of the strategies and approaches through which to efficiently and effectively manage the already scarce Water Resources (WRs) in order to promote sustainable resource management and development (Hill, 2009). It is on this premise that increased government

[37] A water supply or sanitation system is sustainable when it provides an effective, reliable and consistent service at a level which is desired; can be financed or co-financed by the users with limited but feasible external support and technical assistance; is being managed and used in an efficient way, without negatively affecting the environment (Ranch 2008).

and stakeholder intervention has focused more and shifted towards increased engagement of individuals, households and whole communities in the management of WRs, particularly in countries of the developing south.

The thrust towards CBWSM is borne out of contemporary theoretical and practical discourses and approaches that advocate for a more pro-community and local institution-based management system as one of the solutions to the current water crisis experienced in poorer regions of the developing world (Jaglin et al., 2011 Berryman et al., 2014). Doe & Khan (2004), for example, argue that the water difficulties experienced, particularly in rural communities in developing countries call for proactive, preventive, coordinated water management and governance strategies. The UNDP (2004), further notes that such an approach to water governance would significantly contribute to achieving water security at local, national and international levels. On the contrary however, it has been observed that the efficiency of water governance is in many places of the developing world undermined by poor management, corrupt regimes and practices, lack of appropriate institutions and infrastructure, bureaucratic inertia, insufficient capacity and shortage of investment in water infrastructure (Rogers et al., 2003). Ako et al. (2010) laments the fact that it remains widely recognised that the strategies and designs to regulate WRs are externally initiated from a top-down system of management.

This system of management heavily underpins the governance of WRs in Cameroon where the administration is coordinated from higher structures of management with ineffective structures at the lower levels (Tantoh & Simatele, 2017). With conventional and sectoral

approaches in the hands of other government ministries and public institutions', communities for whom any development interventions should be targeted at, are left without any form of representation or engagement in water related decision-making processes (Ako et al., 2010). And as such, the actions deployed at the local level by the so called water development experts are often inadequately matched to the needs of the public and rural communities (Graffy, 2006). It is against this backdrop that CBWSM is advocated as one of the favoured strategies for inclusive governance of CPRs. It has been argued by Rautanen et al. (2014), for example, that through the adoption of CBWSM strategies, communities themselves can be empowered to have access to resources that can substantially and effectively change their wellbeing and that of their respective communities. Tantoh and Simatele (2017) observe that this is possible because CBWSM is anchored on the principle of community participation in matters that affect the community as members themselves usually determine the nature of issues to be addressed and how to address them.

The overall underlying concept behind Community-Based Management (CBM) as observed by Agrawal et al. (2014) is to encourage rural communities to manage their NRs in an effective way through the transfer of some management responsibilities in policymaking. Mwaipopo et al. (2011), further observes that Community-Based Natural Resource Management (CBNRM) can be a platform to improve participatory governance and sustainable management of WRs. This is because those who have the greatest stake in the safety of their resource have the strongest drive for protective management and policymaking (Bunclark et al., 2011). Hence, experience in CBNRM over the years for

example show that rural communities desire to be involved and to participate in the management of their resources and it is important that a forum through which to achieve this is encouraged and established.

Despite the value of CBNRM initiatives, one of the major challenges that this approach to resource management faces is how power could be distributed between the different stakeholders built on existing socio-economic, political, and environmental conditions (Spires et al. 2014). Thakadu (2005) argues that the existing power relations within communities coupled with unavailability of dedicated human resources to mobilise individuals and households can in themselves be a barrier and deny sectors of the community from fully engaging and participating in these schemes. He further observes that inadequate community participation and inadequate capital and human resources devoted to CBNRM initiatives can compromise the organisation of grassroots communities. Inspite of this, CBNRM has been argued as one of the management strategies that is effective in promoting community empowerment and community-driven development process as well as building a sense of community ownership of the development process and resources management (Njoh, 2003; Ngwira et al., 2013).

In view of the above observations, the main question in this broad field is how to effectively and efficiently manage rural community-based water supply systems in a way that meets the increasing needs of the rural population. The more specific question this paper discusses is how to achieve sustainable CBWSM in a context where a chain of concerns (centralised control, the prevalence of poverty, passive involvement of public,

private and grassroots community in WRM) make it particularly difficult to do so. Although this particular combination of factors maybe unique to this case study, several of them are common around the world and so have wider relevance. The paper argues that precedence should be given to finding better ways and means to involve local water users in water management, and that clarifying the roles of national and local governments is a pre-requisite for achieving user participation. This paper discusses some aspects of best practices that can be applied to contemporary water supply initiatives in Northwest Cameroon in order to improve potable water supply and management. It has thus, been argued that CBWSM and traditional systems of NRM, if encouraged and supported appropriately by valuing the input and experiences of other successful CBM initiatives can play a fundamental role in promoting effective water supply in Northwest Cameroon.

5.2. CBNRM in a developing country context: a review of literature

CBNRM is frequently used as an approach to empower local communities to manage and own the development processes of their respective communities (Turner, 2004; Gruber, 2011). As an approach to community NRM and development, CBNRM was developed out of the dissatisfication with centralised top-down approaches to rural development and NRs conservation as well as protection (Dörre, 2015). Bartley et al. (2008) argue that central governments often view NRM and governance as a top-down management affair and as a means towards industrialised development. Given the perceived failure of these top-down policies (Agrawal & Gibson, 1999), decentralisation policy is now a highly touted response to the difficulties of NRM (Mapedza et al., 2016). As a result, national governments,

international organisations and Community Development (CD) practitioners have advocated and echoed decentralization[38] programmes as an effective alternative to centralised NRM methods (Prager et al., 2005). Supporting this assertion, the World Resources Institute (WRI, 2003) notes that sixty countries were identified by 2003, where decentralisation was an important component of NRM policies. Besides, a number of disadvantages of centralised governance as observed by Bartley et al. (2008) only conclude that decentralised governance structures are the best way of dealing with the perceived failures of centralisation. Also, scholars analyzing the decentralisation of NRM have most often focused on theories of local level institutions that facilitate cooperation among resource users (Ribot , 2002; Mapedza et al., 2016).

Governments are increasingly decentralising management and governance of NRs from central administrations to subnational levels (Roe et al., 2009). One of the few findings in the decentralisation literature with which most scholars agree is that large variation in policy outcomes exists within countries that have decentralised their governance of public goods and services (Ribot, 2002; Rihoy & Maguranyanga, 2007). In the realm of NRs, activities that have often been devolved include the granting of licenses and permits for resource use, the collection of associated fees and fines, planning of land and water use, and monitoring of user groups' compliance with environmental standards. International organisations and donor agencies have often advocated decentralisation on the impression that it would bring governance of NRs closer to those who depend on it for their livelihood

[38]Decentralisation refers to the devolution of governance from higher to lower level organizations in the governmental hierarchy, most commonly from a central government to provincial, regional, district, and sub-district levels (Bartley et al., 2008).

and generating a range of positive outcomes, including ecological sustainability and poverty alleviation (Rihoy & Maguranyanga, 2007). Although various planned and unplanned consequences of decentralisation have been argued from ecological sustainability to widespread poverty alleviation, our appraisal of the existing literature suggests that scholars of NRM should often evaluate the achievements of decentralisation efforts because of its efficacy in the improvements of the quality of NRM and equity in the distribution of benefits across different social strata as opposed to being concentrated among a select few (Bartley et al., 2008). Some well-known examples of CBNRM in SSA where decentralisation has been common include; Zimbabwe's Communal Areas Programme for Indigenous Resources (CAMPFIRE), Zambia's Administrative Management Design for Game Management (ADMADE) and the Luangwa Integrated Resource Development Programme (LIRDP), Namibia's Communal Conservancy Programme (CCP) and Living in a Finite Environment (LIFE) and Kenya's Maturu-Luandeti Community Water Scheme. It has been argued that these CBM initiatives recorded some significant achievements due to the merit of decentralisation of some management responsibilities, community participation and empowerment of grassroots communities in conservative management of NRs (Blaikie, 2006; Mazambani & Dembetembe, 2010)

Still in the decentralisation praxis, Zimbabwe's CAMPFIRE programme for example, devolved authority to established Rural District Councils while Zamibia's ADMADE's devolved authority to grassroots communities (Gujadhur, 2000). In the case of CAMPFIRE, power and authority was transferred to Community-Based Institutions (CBIs)

and locally trained observers to cleverly collect data and lucratively manage wildlife. In contrast, ADMADE's local administration was vested in traditional authorities according to custom (Frost & Bond, 2008; USAID, 2015). This different forms of devolution increased democracy and accountability by replacing the Wildlife Management Sub-authorities with the Village Area Groups and Community Resource Boards (Gujadhur, 2000). However, Ribot (2002) observes that most decentralisation efforts end up without increasing the powers of local authorities or peoples. Hasler (1999), for example, argue that higher level management over wildlife resources in the CAMPFIRE case study have been identified as one of the constraints of the devolution process. This assertion, as observed by USAID (2015) is premised on the inability of the locals to effectively assume managerial responsibilities. However, shifts in power and authority has made many to believe that grassroots communities are capable to mobilise local interest groups to manage their resources through customary management practices and are more knowledgeable about local ecological processes than does the state or far-off managers (Ostrom 1990; Gruber 2011:160). These is because when management responsibilities are transferred to grassroots communities, they feel a sense of proprietorship and they become more important, not just economically but also socially in expressing their own development need (Aref et al., 2013).

In a variety of NR sectors, developing countries (Botswana, Namibia, Zimbabwe etc.,) have experimented with shifting NR governance responsibilities down from centralised governments to local institutions, thus enlivening the debate about the role of CBM in NRM (DeGeorges & Reilly 2009). CBNRM is therefore, born out of the contention that

grassroots communities must had the authority and ability to choose over their NRs and determine the nature of development that they desire (Galvin, 2016). Roe et al. (2009) observed that the significance and potential of CBNRM initiatives in propagating a positive change in a community cannot be overemphasised especially in this ever changing global environment. As a policy intervention strategy, CBNRM has shifted the paradigm of NRM from more centralised systems which often advocated a more preservationist perspective resulting in alienating local communities, to one that puts the power of control of NRs and their use in the hands of local people (Thakadu, 2005). The overall underlying idea behind decentralisation as observed by Nelson and Agrawal (2008) in the Namibian experience for example, is to provide an enabling environment where a relatively low level of institutional corruption will reduce the probability of public authorities for retaining power over NRM. This is because devolving management and control of resources to grassroots' communities limits centralised controls of revenues from wildlife uses on community land and empowers the locals to take control of their own resources (Gujadhur, 2000). The establishment of an official framework, which caters for the needs of grassroots communities to develop their capacities to deal with increased responsibilities and power relation among all interest-driven actors, is therefore, necessary for sustainable outcomes.

In his comprehensive study of CBNRM operations, Dörre (2015) was able to show that CBNRM is basically indebted to the neo-liberal traditions of a moderated role of the state on issues regarding the management of NRs in rural communities. This approach to service delivery is broadly conceived under the wider notions of the post-welfare state which manifested itself through the neo-liberal policy recommendations to the management and

development especially of marginalised communities (Mugumya, 2013). According to Armitage (2005), CBNRM is rooted on the premise that; CBIs are capable and well positioned to answer and adjust to the needs of grassroots communities coupled with their socio-ecological conditions that match their needs. Tantoh & Simatele (2017) further observe that rural communities are knowledgeable about the complexities of traditional management practices and are able to organise local resources, through indigenous techniques of access and management. This move towards indigenous system of management has been advocated and promoted in recent debates and development discourses as a real and efficient method of NRM (Stummann & Gamborg, 2014).

The experience of NRM over the years has shown that to effectively conserve, protect and use NRs in a more efficient manner, local knowledge of the natural environment and resources is important in the design and implementation of sustainable practices (Blaikie 2006). It is believed that the inclusion of rural communities in the management of their own resources can encourage and enhance public engagement and ownership over CD projects so as to attain sustainability (Tantoh & Simatele, 2017). Besides, grassroots communities will be willing to implement protection programs as long as they are entitled to any subsequent proprietorship of resources earnings. CBNRM has therefore, become a policy goal which is well-integrated in the national legislation with the government as coordinating body in countries like Botswana, Namibia, Zambia and Zimbabwe (Gujadhur, 2000).

Recent research illustrates that successful CBNRM initiatives give a scenario were communities were mobilised, motivated, empowered and galvanised to participate in NRM

and CD (Blaikie, 2006; Nakamura, 2014). DeGeorges & Reilly (2009), for example, argue that one of the strengths of CAMPFIRE was attributed to the ability of households in producer communities to actively participate in NRM. It is believed participation of the locals in NRM provides a foundation from which grassroots communities could have the possibility to decide on issues regarding their use and management (Thakadu, 2005). However, participatory management approaches do not give voice to everyone. Barrow and Murphree (1997) observe that vocal men may dominate discussions and deprive others especially women from contributing in decision-making processes (see also Lendevlo et al., 2012). However, Turner (2004) notes that community participation for many communities within CAMPFIRE programme largely empowered the locals resulting in substantial socio-economic benefits which improved the livelihoods of the rural population and promoted development within the community (see also Lendolvo et al, 2012). Community participation as observed by Nakamura (2014) leads in the establishment of new local institutions and the strengthening and empowering of existing ones. Besides, participation leads to the designing of processes that are transparent, inclusive, accountable, democratic and reflective of people's needs and aspirations (Child, 1996; Galvin, 2016). It must be noted that the accountability of community leaders to their localities vis-à-vis their functions and rules governing their operations has been identified to be an important attribute that builds trust and reliability between the local managers and the community (Liu et al., 2008). These, it is felt, can enable and empower communities to effectively manage their own NRs for posterity.

Building on this observation, Nakamura (2014) argues that results from earlier successful studies on CBNRM including; CAMPFIRE ADMADE, LIRDP and LIFE show a strong and consistent association between community participation in resource management and decision-making processes. Through participation, collaboration and engagement is enhanced as well as the achievement of ownership and sustainability over CD projects (USAID, 2015). It is argued that when and if grassroots communities are given the opportunity to manage their resources, it will create a forum for greater community commitment and involvement thereby, facilitating all the stakeholders and other economic groups to meet in a nonviolent and legally sanctioned environment where the interest of both parties could be discussed (Turner, 2004; Tantoh & simatele, 2017). This is evident in the case of the Maturu-Luandeti community water supply scheme in Kakamega District-Kenya where the local spirit of *"Harambe"* working together introduced at independence, provided the basis for a general framework for CBWSM (IRC, 1997). Also, an enabling environment *"Baraza"* was created, making it possible for decisions regarding the adoption of the management options and responsibilities of the community in collaboration with public authorities and donors. This situation imparted a spirit of belonging and empowered rural communities to be self-reliant by initiating water supply projects to ameliorate their standard of living. Lendevlo et al. (2012) posits that when communities participate in issues that either directly or indirectly affects them, it enables them to open up channels of negotiation and compromise among all interest-driven actors.

Despite the strategies and achievements of CBNRM in the CAMPFIRE, ADMADE and LIRDP, the CCP and LIFE programs, Gujadhur (2000), argue that the statutes of CBNRM is still not complete and are poorly implemented as well as the equivocal motivation to

sustainably manage wildlife, particularly in the case of ADMADE. This has resulted in continuous poaching which is regarded as a means of survival around Game Management Areas (GMAs) where there is acute food insecurity. Moreover, the inadequate responsiveness to individual differences has led to unequal access to resources and distribution of community gains (Frost & Bond, 2008). This situation has jeopardised the obligation of inhabitants to sustainably manage their resources. Writing in the context of political ideologies, Hasler (1999) observed that the centralised system of management of most SSA countries even after independence has translated to the management of NRs and other spheres in the economy. This state of affairs have led to the persistent primacy of public institutions in charge of NRM as against "bottom-up" and a more democratic demands from grassroots communities particularly in the CAMPFIRE programme. There are however, sentiments that suggest that the devolution process under which CBNRM was conceptualised, has been impacted by the nature of governance structures and power relationships among the different stakeholders with invested interests in NRM missions. Despite the difficulties faced by these CBNRM initiatives, it should be noted that they recorded invaluable success from which lessons could be emulated and implemented in other communities of the developing world.

5.3. Methodological approach.

This paper uses both empirical and secondary data. The empirical data was collected through methods motivated by the tradition of participatory research between November 2015 and January 2016 in Northwest Cameroon. Using a lottery system in which all the names of the rural districts in Northwest Cameroon were identified and allocated a unique

number and placed in a lottery box, it was purposely decided to randomly draw three rural districts. This processes resulted in the selection of *Ndu, Njinikom and Mbengwi* (Figure 5.1). The lottery system was repeated in each of the rural districts to identify and select two villages[39] in which to draw a study sample population, and this process resulted in the selection of two villages in each of the three study sites, bringing the total to six villages. A population list for all the six villages was then composed using the adaptive sequential method and this resulted in the identification of 180 research participants. After carefully scrutinising the population list, it was purposely decided to apply a 40% error of margin to draw a study sample and this exercise resulted in the selection of 72 research participants being identified, selected and included in the study.

27. The criteria for including the villages in the lottery process were based on the presence of CBWRM initiatives and CBIs in their communities. It was important to do so to assess communities that had similar characteristics.

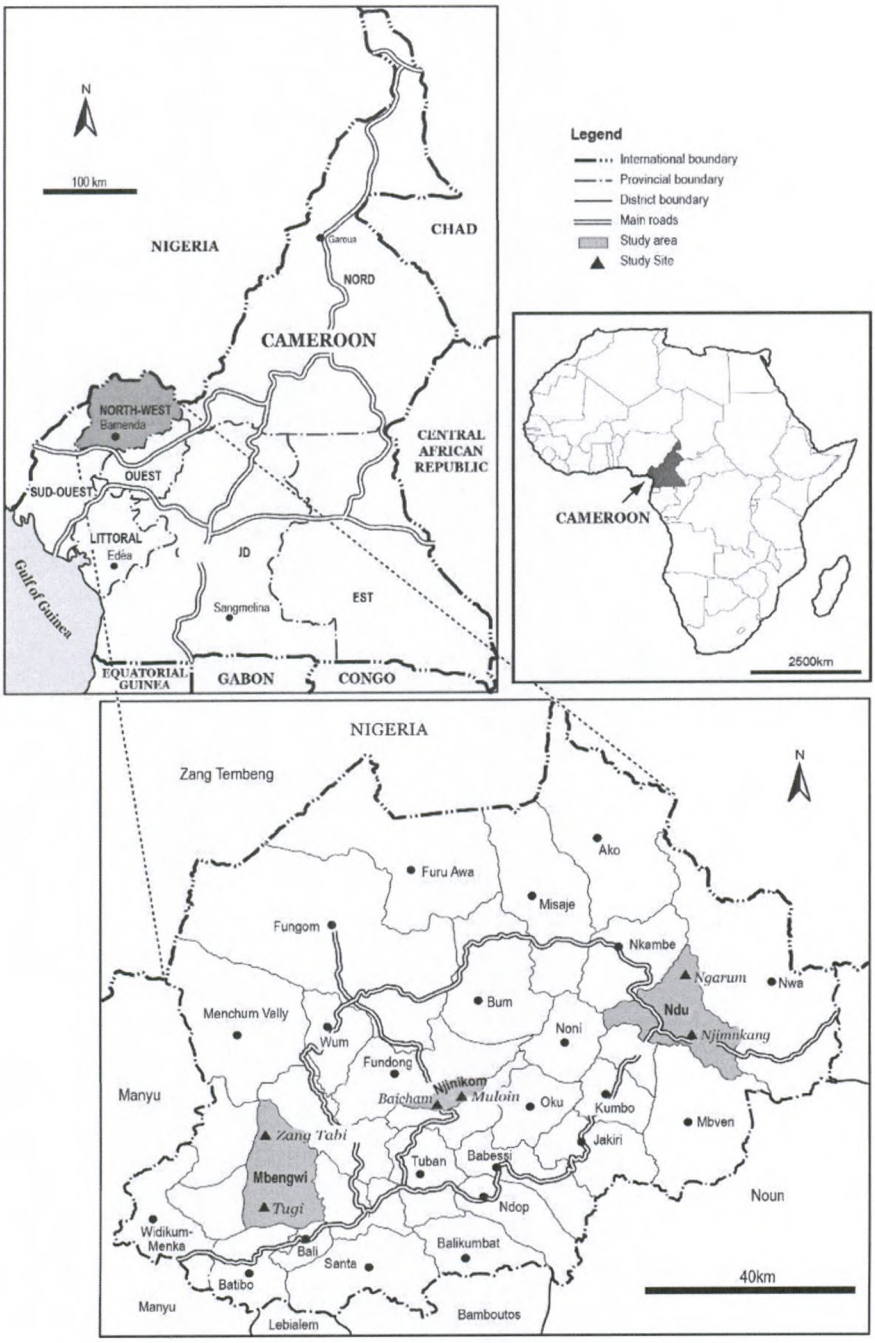


Figure 5.1: The map of Cameroon and the study sites in Northwest Cameroon.

Source: Cartography Unit (2016), School of Geography and Environmental Studies, University of Witwatersrand, South Africa.

A systematic sampling procedure using an equal-probability method[40] was then applied. Using this equation, an interval ratio of 2.5 was established and rounded off to 3 to select the research participants with the first research participant being purposely selected. It should be noted that this region is characterised by common cultural and traditional attributes such as language and cultural norms as well as social structures of community leadership and NRM and use. A prominent feature of these communities is the high dependence on agriculture and animal husbandry as the main source of livelihood. Self-reliant projects mostly initiated by Village Development Associations (VDAs) play a significant role in CD with community participation as a fundamental element. The water supply management in this locality is administered through a gravity-led technique[41]

In addition to engaging with grassroots' communities, interviews with both local municipalities and national officials mandated with WRM were conducted. These were identified and selected for inclusion in the study using a snowball technique. A total of 15 officials drawn from the departments of sub-Divisional Delegation of the Ministry of Energy and Water Resources (MINEE), Ministry of Agriculture and Rural Development (MINADER), Ministry of Environment and Nature Protection (MINENP), Municipal Councils, Non-Governmental Organisations (NGOs) and WMCs were identified and included in this study. It was important to include these officials in order to have a clear understanding of the nature of the institutional and policy frameworks governing water

[40] K= N Size of population= Where n is the sample size, and N is the population 180/72 = 2.5
n Sample size

[41] This is a method where water is directed from a watershed through springs and piped down to the villages.

supply, distribution and utilisation in Northwest Cameroon and the implications that these systems have on access to water.

Finally a rapid appraisal of existing literature using the meta-analysis approach and covering five different case studies was conducted. The five case studies include: ADMADE, CAMPFIRE, LIRDP CCP, and the Maturu-Luandeti Community Water Scheme. In addition to these, a total of 68 peer reviewed articles and text book materials were reviewed and formed part of the basis on which the current paper is based. These materials were identified through a search of different academic data bases such as Scopus, Airiti Inc, JSTOR, Lesson Planet and ORCID, all of which are multidisciplinary databases and search engines. The data was deductively coded using SPSS to measure the internal consistency and reliability of variables under considerations. The efficiency and effectiveness of the rural water supply schemes was determined by an examination of the function of regular facility maintenance and continuous service yield in community water provisions and management operations. Mugumya (2013) note that the effectiveness of CBWSM can be measured by examining the perceptions of all stakeholders in relation to how communities are involved in the everyday Operation and Maintenance (OM) of the water infrastructure, in collecting, utilising and accounting for financial resources used in relation to what is collected and the power structure of control. In the context of this paper, the effectiveness of rural water supply schemes in Northwest Cameroon was measured through the degree of community participation in all the aspects of the water system, national CD policies, devolution, and community empowerment.

5.4. An examination of contemporary CBWSM in Northwest Cameroon.

The growth of humanity has been determined by access to clean water as one of the basis upon which the health of human settlement and development depends (Ntouda et al., 2013). However, a major challenge that the government of Cameroon faces is how to provide sustainable potable water and basic sanitation particularly to its poor rural communities with increasing population. CBM initiatives have therefore, been revitalised to address the various water difficulties and enhance CD. This assertion, as observed by Chadwick (1946) is based on the premise that CBM initiatives have a very long genealogy in the Northwest Cameroon coupled to the strong social cohesion between the locals (see also Njoh, 2003; Page, 2003). Mengang (1998) opined that rural communities in Cameroon had widespread NRM systems that were opposed to centralised management of NRs with prescriptive roles from the state. This approach NRM grew from voluntary cooperative efforts that underscores the virtue of self-reliance which emerged from traditional trends of community participation and development (Chadwick, 1949; Fonchingong & Fonjong, 2003). CBM has since then been inscribed in the customs and traditions of the people as a tool for propagating growth and rural CD. However, the advent of colonisation failed to recognise this management system and altered indigenous management practices and CBIs, replacing them with technocratic and centralised state management systems in the exploitation and management of NRs. The following remarks of community members from Ndu, Njinikom and Mbengwi rural districts aged between 30 and 70 years for example illustrated their discontent with centralised management systems;

"We used to be very happy in the community especially as we had unlimited access to our natural resources. The resources were exploited in ways that would permit our grandchildren to also benefit from them. This changed when the government through centralised systems took over the management of natural resources restricting us from accessing them coupled with the unreliability of the government to provide other social amenities to the rural population in particular" (personal communication, 2015o).

It can be deduced from this remark that CBM initiatives accelerated from the bias in service delivery in Cameroon whereby public water supply for example was concentrated in cities and urban centers while rural communities where left to fend for themselves. This neglect of rural communities in service provision constrained them to stirrup the spirit of self-reliant projects. Furthermore, centralised management systems alienated the locals who have depended on their surrounding environment for sustenance for ages. This was followed by the socio-economic and environmental stratification in many SSA countries in the 1980s encouraging private natural resources-related regimes in an environment of economic liberalisation and privatisation (Esteva, 2009). Although this revolution as thought by the West was to achieve economic growth, poverty alleviation, and sustainable NRM practices, it instead impoverished and marginalised the rural population (Carmody, 2007). The government of Cameroon further abandoned most of its long-established duties such as the provision of drinkable water and other social amenities to its citizens, coercing rural communities to seek alternatives to service delivery by favoring self-help management strategies. This enhanced over exploitation of NRs by the locals and thus environmental degradation increasing the incidence of poverty within the communities. Supporting this

assertion, Seghezzo (2009), citing the resolutions of the World Commission on Environment and Development (WCED, 1987) argue on the concept of environmental sustainability in alleviating poverty, stating that underprivileged communities cannot be expected to remain in poverty to safeguard the environment.

In an attempt to look for lasting solutions to the ineffective centralised management system and the inability of central governments to provide sufficient water supply in rural communities, CBWSM was adopted as an effective, efficient, legitimate approach to WRM. This approach depends largely on community participation to provide support and facilitate the realisation and operation of CD endeavors. Community participation in rural water supply in Northwest Cameroon has therefore been crucial in CBWSM initiatives (Table 5.1).

Table 5.1: Key features of community participation in CBWRM in Northwest Cameroon

Municipality	Village	Participation & mobilization of the locals in village development projects	Devolution & empowerment	Effective CBIs, Customary Management Practices	Communication & information dissemination, sensitization & Creating awareness	Conflict resolution & enforcement processes	Observation
Mbengwi	Tugi	C	C	A	B	B	Poor performance
	Zang-Tabi	B	C	A	B	B	Fairly good performance
Njinikom	Baicham	A	B	A	A	A	Good performance
	Muloin	C	C	A	C	B	Poor performance
Ndu	Njimkang	A	B	A	A	A	Good performance
	Ngarum	C	C	A	B	B	Poor performance

*Key: A- High, B- Weak, C - Low

Source: Fieldwork results (2016).

Table 5.1 illuminates key features of CBWSM in Northwest Cameroon and their possible impact in the performance of community water operations. It must be noted that these communities have demonstrated the significance of community involvement in rural development ventures. The strength and significance of the features range however from A to C; (A) depicting high or strong influence, (B) weak influence and (C) low community influence and commitment in CBM initiatives. The most obvious effects have been reflected in the extent and vigor at which the various constituents of community participation influence the performance of CBWSM within the communities. For example, Njimkang and Baicham experienced a strong community participation and mobilisation (A) in the various aspects facilitating CD and most importantly financial contributions, participation in communal work and policymaking. This high rate of community participation is due to the effectiveness of CBIs and traditional management practices, communication and information dissemination, conflict resolution and enforcement processes which reflect in the good performance of the water systems. This is certainly not the case with the other communities leading to weak (B) and low (C) performances in their water management operations (Table 5.1). It must be noted that communities can only make significant progress in the management of their WRs if they are aptly mobilised and actively participate in all the phases of management.

Of the various forms of community participation symbolising CBWSM in Northwest Cameroon and necessary for sustainable rural water supply, compulsory participation in communal work, financial contributions and decision-making processes are central

(Table 5.2).

Table 5.2: Degree of community participation in CBWSM in Northwest Cameroon.

Municipality	Village	Financial contributions towards project realization		Financial contributions towards project maintenance)		Participation in decision making		Participation in Communal work		Total participation	Ranking
		Frequency N=26	%	Frequency N=26	%	Frequency N=26	%	Frequency N=26	%	%	-
Mbengwi	Tugi	19	14.8	14	14.3	10	15.4	20	15.9	60.4	5
	Zang-Tabi	23	18	16	16.3	11	17	21	16.7	68	3
Njinikom	Baicham	24	18.8	18	18.4	13	20	23	18.3	75.5	1
	Muloin	18	14.1	15	15.3	9	14	19	15.1	58.5	6
Ndu	Njimkang	24	18.8	19	19.4	12	18.5	21	16.7	73.4	2
	Ngarum	20	15.6	16	16.3	10	15.4	22	17.5	64.8	4
Total			**100**		**100**		**100**		**100**		

Source: Fieldwork results (2016).

These forms of involvement largely determine the success or failure of CBWSM ventures. Active participation in communal work at project sites limits the cost of construction while adequate and systematic community financial contributions not only facilitate the realisation of the water systems but also ascertain effective O M. However, the degree of participation varies from one community to the other and from one activity to another (Table 5.2). The highest participation was recorded in Baicham (75.5%) and the least in Muloin (58.5%). The disparate participation in the various activities determines the effectiveness of the system. It should also be noted that participation was high in all the communities in activities in which participation was mandatory. This is apparent in activities such as; contributions towards the realisation of the water schemes and communal work at the project sites. This is because of the sanctions that await defaulters from the District Officer (DO) and the village Chiefs. It was noticed that CBWSM initiatives were more successful in communities where the rate of

participation was generally higher and vice-versa. Active community participation has therefore, become an indispensable tool for effective CBWSM.

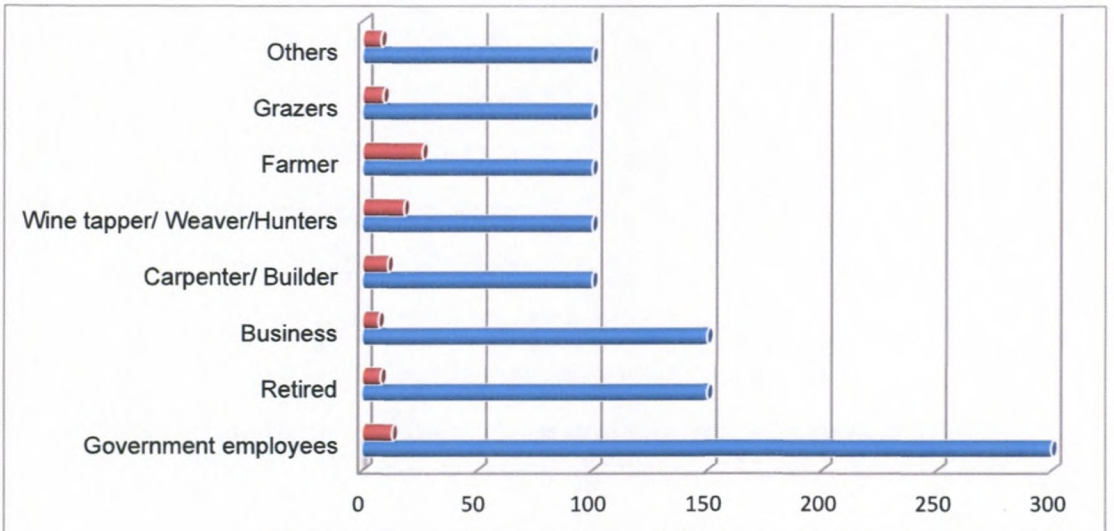
Since people's everyday forms of resource use are shaped by local norms and customs in Northwest Cameroon, the organisation of CBM initiatives rely on influential traditional chiefdoms with royal authority over NRM. These traditional authorities represent the earliest and most resilient CBNRM initiatives which is commonly known as 'Organic CBNRM' (Mawere et al., 2014). Thus, the communities are structured along certain norms, values and attributes which are influenced by social and power relations among the local actors. This is because the ability of a community to regulate, allocate, and control its resources depend primarily on whether the community has in place an authorised framework to effectively manage both people and NRs. Based on discussions with some village Chiefs in Ngarum and Njimkang in Northwest Cameroon, they stated:

> *"The villages are structured with traditional institutions; Chiefs, Kwihfor*[42]*, the Traditional Council, Village Development Association and the Quarter Heads. These institutions enforce customary laws and practices in the administration of the people and the management of the natural resources to ensure community wellbeing and development. Though the management practices have changed over time, they offer reliable, cheaper and effective methods of natural resources management and environmental protection" (personal communication, 2015p).*

31. Men's secret society in the Bamenda Grassfields with supreme powers charged with overseeing the affairs of the village.

The above discussions speak to the idea that rural communities of Northwest Cameroon are organised around powerful traditional arrangements with great authority over their subjects and their NRs. Daneel (1996), Mawere et al. (2014) observed that people in pre-colonial Africa believed their ancestors set forth regulations for governing the use of NRs and transgression of ancestral codes of behavior would result in the withdrawal of the bounty of the land. In this regard, the village Chiefs who are the mouth piece of the gods play a vital role in CBNRM and community wellbeing. This has been facilitated by the VDAs in partnership with CBIs and WUCs by designing and adopting projects for CD. This is because in a demand-driven development approach promoted under the decentralised service delivery framework, rural communities are expected to initiate the process of self-help service delivery and the success of CBM initiatives rests on the design and responsibility of the local actors.

Despite the successes experienced in CBWSM in rural Northwest Cameroon, a major challenge that often arises in these communities is the inability of these communities to systematically contribute towards the OM of the water system (Figure 5.2).



	Government employees	Retired	Business	Carpenter / Builder	Wine tapper/ Weaver/Hunters	Farmer	Grazers	Others
Percentage (%)	13	8	7	11	18	26	9	8
Monthly income (US$)	300	150	150	100	100	100	100	100

Figure 5.2: Occupation and monthly income of the villagers interviewed

Source: Fieldwork survey (2016).

Figure 5.2 shows that the majority of the villagers are poor with subsistence agriculture as the mainstay of their livelihood involving 26% of the population. Other primary activities include; wine tapping/weaving/hunting (18%), carpentering/building (11%) and animal grazing (9%) with a monthly income of less than $100. This amount is barely enough to take care of their monthly expenses let alone steadily contribute to the OM of the water system. Besides, the communities are predominantly agriculture-based and money may only be more readily available following harvests than at other times of the year. In contrast, those with higher incomes; government employees and small business operators' make-up 20% of the sampled population with monthly incomes of $300 and since this group make up

just one fifth of the population; it is difficult for them to assume the responsibilities of the entire community. The study though, indicates that discrepancies in the non-payment by a majority of households was that community members felt they sacrificed a lot during the construction phase of the water system and those who were not in the community during the realisation should be liable for the OM. This is because there are alternative water sources (*springs, brooks*) in case the WMCs decide to disconnect water supply. This may be one important reason for the dilapidation of water infrastructure and unsustainable service delivery (Figure 5.3) (also see Annex L).



Figure 3: Dilapidated Water Infrastructure in rural Northwest Cameroon

Source: Fieldwork results (2016).

The deterioration of water infrastructure (Figure 5.3) could also be attributed to inadequate funds and erratic contributions by the villagers (see Annex L). In view of this situation, investment needs within the communities are compounded by the generally low level of cost recovery, resulting in OM. This laxity lead both to deterioration of the infrastructure and

service access, and to the inability of service providers to extend services, particularly to expanding rural areas, which limit access to low-income and vulnerable groups. In communities where water supplies fail, the adverse effect on the already poor communities becomes significant. It can, therefore, be argued that a regular financial contribution is directly linked to the sustainability of rural water systems and vice-versa.

The centralised nature of WRM in Cameroon equally affects the sustainability especially in rural areas. As illustrated in Figure 5.4, the government maintains a strong hold in the management of WRs as the water laws and legislation trickle from the national, through to the local levels. This is evident by the unidirectional flow of decisions from the central government to the municipalities and to the local communities. Besides, MINEE is responsible for defining and implementing water policies, financing and monitoring of water ventures in Cameroon. Due to the centrality of the WR in socio-economic development, many other ministries and public agencies including; MINADER, MINENP, Cameroon Water Utilities Corporation (CAMWATER) and Camerounaise des Eaux (CDE) which took over from the state-owned National Water Company of Cameroon-SNEC after privatisation) NGOs and Civil Society Organisations (CSOs) are involved in WRM (Figure 5.4).

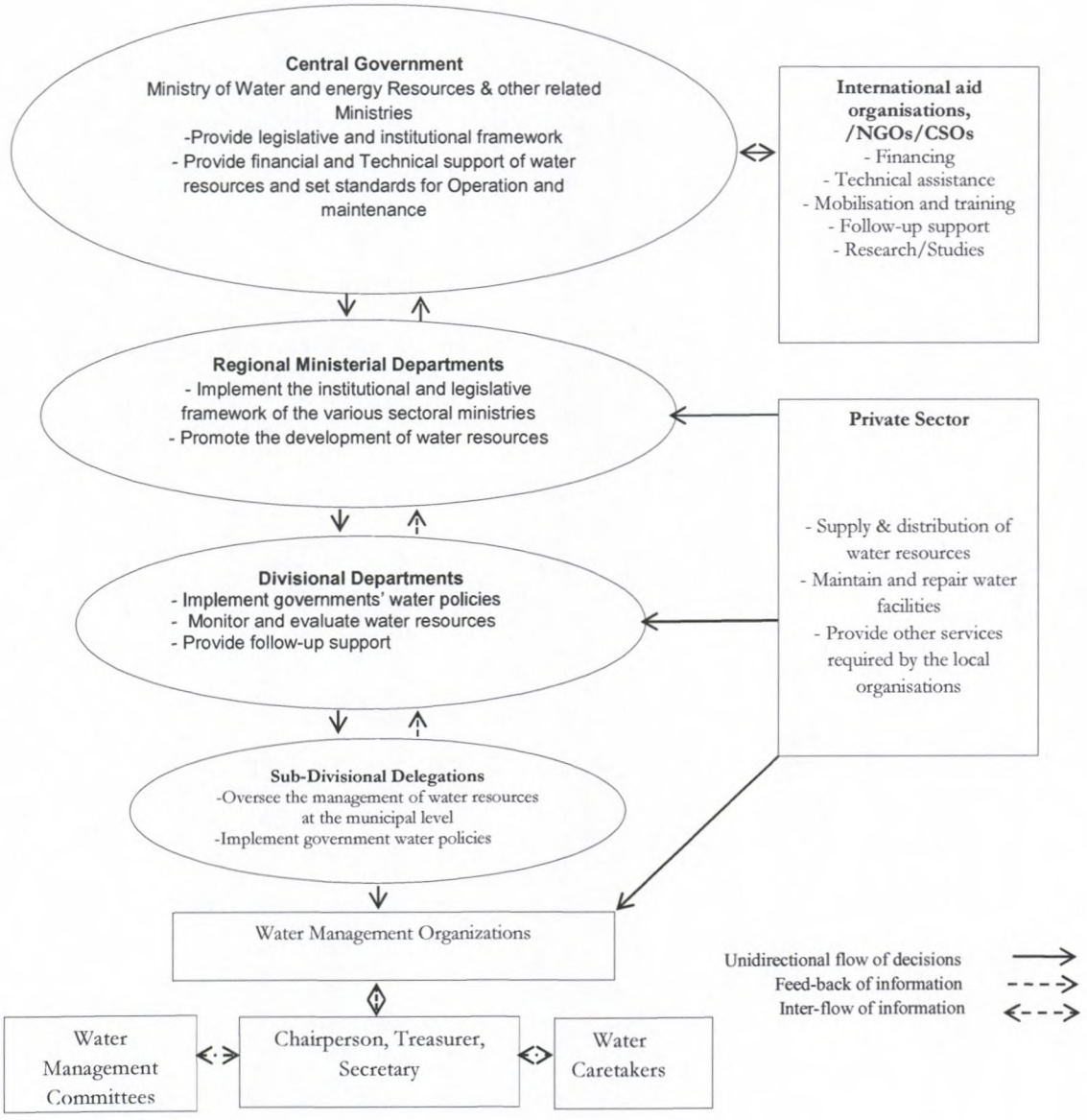


Figure 5.4: Water actors and their relationships with CBOs

Source: Fieldwork results (2016).

This system of management has often led to bureaucratic tendencies which Oorthuizen (2003) reproach, emphasizing that many disasters in NRM during the 20th century have

been caused by replacing efficient CBM systems with ineffective, corrupt and centralized governments. Attention should, therefore, be dedicated to the arrangements that frame and impact the interaction of local interest-driven actors in the bottom-up planning framework illustrated by the inter-flow of information and collaboration between water actors (Figure 5.4). It is on the above assumption and principles that rural communities have created resilient WMCs to manage rural water systems. This system of community organisation, if properly developed and harnessed, could form the basis of an effective and efficient instrument for CBWSM. Regrettably, the municipal councils which are arms of the government continue to determine the ways and means through which NRs are managed at the local level. It can, therefore, be argued that centralized management continues to prevail in the management of CPRs in Cameroon which most often undermines native laws and customs.

Evidence from the empirical data shows that inadequate community participation and engagement is another weakness in all the communities and the devolution of management responsibilities to CBIs and resource users have been mediocre. Moreover, weak institutional frameworks have aggravated the poor state of rural water systems in Northwest Cameroon. These claims were established during interview discussions with the delegate of CD in MINADER who declared that:

"The division of the service of community development into two; service of community development and service of rural engineering hinders collaboration between them. This change in policies has distanced the rural communities' from community development experts couple to the fact that community development projects are contracted by the mayors through unconventional means to private companies without consulting the community" (personal communication, 2016q).

This assertion was validated by the chairs of Zang-Tabi Village Traditional Council and the WUC in Mbengwi who stated:

"The mayor of the Mbengwi council imposes the manner in which community development projects are executed in the villages. For instance, the rehabilitation of the Zang-Tabi community water supply project was contracted to a private company without informing the Village Development Authority and other village institutions" (personal communication, 2016r).

The above opinions speak to the claim that uncoordinated national CD policies and the lack of collaboration and consultation between government departments; *Departments of Community Development (DCD) and Department of Rural Engineering (DRE*) under MINADER and between the Council and the communities is a profound basis for unsustainable CBWSM. The split-up of the Department of CD for example and lack of teamwork between them has led to unsustainable rural projects. The DCD is supposed to identify development projects in accordance with the community, conduct feasibility

studies, mobilise the community, and pilot participatory diagnosis in the community before the execution of any projects. The DRE on the other hand is supposed to carry out technical issues. Unfortunately, the DRE individually executes community projects when contacted by CBIs without consulting the DCD. This has resulted in the degeneration of cooperation between the communities and public authorities leading to failing community projects. A well-known example is the rehabilitation of the Zang-Tabi piped-water supply system that was contracted by the Mbengwi Council to Premier et Yoshim Entreprises[43] (PEYE) without consulting neither Zang-Tabi Cultural and Development Association (ZATACUDA) nor the Zang-Tabi WUC. This unilateral act has isolated rural communities from public institutions and projects are initiated without consulting CD experts leading to their ineffectiveness.

In view of the challenges facing CBWSM initiatives in Northwest Cameroon (*the prevalence of poverty and inadequate financial capacities, strong traditions, top-down management and uncoordinated national CD policies, passive participation, inadequate devolution and empowerment*), it will be worthwhile to emulate best practices from successful case studies of CBNRM to ensure effective and sustainable water supply in rural Northwest Cameroon.

5.5. Towards an effective CBWSM system in Northwest Cameroon.

Many countries and communities have a long tradition of developing and managing their everyday forms of NR use for multiple benefits. The histories of grassroots approach to management and conservation is chronicled to provide an understanding of how they

32. This is a privately-owned construction company.

developed locally and was then successfully encouraged by public actors. An investigation of the operation of CBNRM initiatives in Zimbabwe, Zambia, Namibia, and Kenya have yielded lessons that may be considered decisive for effective management with the hope that some key attributes could be applied in CBM initiatives in Northwest Cameroon and perhaps other areas across the globe. Rautanen et al. (2014) note that learning from good practices in procurement; logistics, policymaking, and management are foundations for future professional and proficient management. It is believed that the pace at which CBNRM concepts and application procedures are established, assimilated and a community accord reached are highly determined among other things by; decentralisation and devolution, active participation, the degree and nature of consultation as well as an institutional framework which can successfully be achieved only in an enabling environment. These, it is felt, are directly related to the degree to which communities will contribute to effective management as championed in the CBNRM framework.

CBNRM is likely to be most successful where there are effective decentralisation responsibilities. This transfer of authority is noticeable in policymaking processes, control of income/expenditure and profits; the transfer of ownership and property rights; and improved status amongst the individuals and organisations involved (Mapedza et al., 2016). Although decentralisation is supposed to be observed in Cameroon, it is only on paper as the transfer of power and authority in NRM particularly in rural communities is a sham. For example, the law of decentralisation which was voted by the parliament in 1996 is still to be applied. If CBWRM is to be successful in Cameroon, resourceful approaches are necessary to stimulate and activate local support so that there is greater devolution of resource privileges even in the face of existing constraints as it was the case in ADMADE and

CAMPFIRE. This is because the successful application of the general principles of decentralisation of rural communities is expected to lead to effective and equitable management and service delivery. This suggests both recognition of the rights of decentralised communities over resources in their communities, and the reorganisation of management privileges and powers by their transfer from central government to legitimate, decentralised representative communities. When management duties are effectively delegated to the locals, it will enhance the spirit of ownership and therefore effectiveness in resources management through an established framework (Njoh, 2003).

Regarding negotiating the institutional and organised barriers to effective NRM, it is important to examine the connexion between NRs and the political situation and to identify the worthlessness of trying to address NR governance concerns separate from the broader political environment (Nelson & Agrawal 2008). This emphasises the necessity of a long-term, adaptive, and flexible approach to promoting CBNRM, which must be based on the local and national political ring. It must be noted that the improvement of the capacities of CSOs and CBIs to influence the institutional arrangements governing CPRs are central to the impending progressive evolution of CBWSM (Rautanen et al., 2014). Rural communities can, therefore, become efficient institutions for effective NRM, but only if they are granted genuine possession, that is, the right to use resources, determine the modes of usage, benefit fully from their use, determine the distribution of such benefits and determine rules of access (Tantoh & Simatele, 2017). This can be possible only in an enabling environment which will provide a situation where the various stakeholders can freely decide on issues concerning them. It will not be wrong to argue that a more

democratic centralisation, participation, and empowerment of the community would guarantee the sustainability of CBWSM systems in Northwest Cameroon.

Building from the CAMPFIRE and ADMADE experiences, it is worthwhile to note that substantial progress was achieved through the improvement of institutional capacities at the community level which has gained broader based support for project activities. Frost & Bond (2008) cited some initiatives that were implemented to strengthen the operation of these projects as well as supporting and involving other relevant institutions. This includes among other things; the establishment of local governance systems, building the capacities of the locals and this resulted in increased accountability and responsiveness in conserving NRs, increase the degree of trust, conflict resolution and distribution of benefits. If such governance structures and framework are instituted in the context of Cameroon, water, and related resources will be effectively managed and issues of corruption and mismanagement would be brought under control. This is because the institutional arrangements at the community level as expressed by Rautanen et al. (2014), are the most decisive conditions for effective and efficient CBM initiatives. It can, therefore, be argued that the sustainability in rural water systems could be achieved if communities receive appropriate levels of support. This includes; financial and technical capitals in the short term as well as creating an enabling environment in the long term. The above arguments and observations, speak to the need for the development of a strong local institution that regulates behaviour in the use of Common Pool Resources (*CPRs)* as seen in the case studies.

A dynamic and compelling attribute that runs through the CBNRM programmes was greater community participation. As argued by Nakamura (2014), community participation is an exceptional and practical way to empower communities to manage their resources collectively and articulate their development needs. Hasler (1999) argues including among a greater sense of community commitment and involvement; gender mainstreaming and the facilitation of different socio-cultural groups in matters concerning them for example facilitated the success of CAMPIRE operations in Zimbabwe. This is because in resolving subjects of inequality linked to NR use and ownership, participation in decision-making and benefit-sharing are fundamental elements for sustainable development as it permits communities to overcome traditional social inhibitions. This must be associated and aligned with the institutional structures described by the "local self-governance" both when planning and when implementing individual schemes. Besides, the integration of various disciplines and indigenous knowledge, as well as cross-scale ties between local, regional, national and international actors are also important factors that will help build the capacities of the locals for sustainable management. It should, however, be noted that when communities' are supported in their endeavours, they are better placed to deal with and resolve any development challenges and issues that they may be faced with. An integrated resolutions would therefore, move from problem-solving in simple systems to problem-solving in complex adaptive systems through community involvement and these, it is felt can facilitate consultation and mobilisation as well modifying the pace and success of CBM initiatives in Northwest Cameroon.

5.6. Conclusion

This article uses the CBNRM framework to assess successful and adaptable elements in CBM initiatives and to offer lessons which could be applied in Northwest Cameroon and perhaps to other communities across the globe to facilitate sustainability. The overall underlying concept behind this approach is to provide incentives for communities to manage their resources. The investigations in this paper show that water is a global challenge especially in countries of the South. As such, the increasing need to put WRM into practice at various levels is both urgent and compelling. The fundamental contribution of this study is the growing awareness of the importance of encouraging and enhancing community participation, decentralising and devolving responsibilities, involving all stakeholders throughout the initiation, execution process and understanding and emulating best practices from successful case studies of CBNRM systems. This is because research on long-standing traditional NRM institutions shows a growing interest in understanding how performance of contemporary CBM could be achieved. This is premised on the basis that the failure by state institutions to address the problems of persistent rural poverty, accessibility to services and environmental degradation necessitate the revival, at least in modified form, traditional NRM practices. Thus, effective and efficient rural communities in Northwest Cameroon would be possible by emulating best practices from other communities, taking into consideration the historical, cultural and social-political context of the communities.

Drawing from the findings of this study, arguments of the key issues that emerge as critical for the future effectiveness of CBM have been made. These include; effective decentralisation and devolution, active participation, consultation and mutual socio-

economic aspects as well as political factors. It can, be argued therefore, that these factors are directly linked to the degree to which communities will contribute to sustainable management as advocated in the CBNRM plan. The distinctive practices of successful CBNRM case studies of CAMPFIRE, ADMADE, LIRDP, CCP, and the Maturu-Luandeti Community Water can be transcribed into a key method of intervention to improve CBWSM in Northwest Cameroon. These findings have significant implications in understanding how CBM seeks to equitably share WRs among the many different and competing uses which promote environmental protection as well as addressing the impacts of poor WRM. The present study confirms previous findings and contributes additional evidence that suggests that in order for communities to sustain their water supply, the enabling environment and the institutional framework must be operational taking into consideration socio-economic and environment conditions.

CHAPTER SIX

General Conclusion and Recommendations

6.1. Introduction

Natural resource management (NRM) remain central to rural livelihood in most the developing world, particularly in sub-Saharan Africa (SSA). This reliance on NRs by rural communities has created a direct liaison and profound understanding of the resources within them. Existing research on Community-Based Natural Resource Management (CBNRM) recognises the critical role played by Community Participation (CP) in the management of their affairs. Dungumaro and Madulu (2003) hold the view that participatory approaches show the importance of local communities consent in taking part in public decision-making processes, especially on issues that directly or indirectly affect their wellbeing. Mafany and Fantong (2006) argue for example, that Cameroon is endowed with abundant water resources, although water availability in the North-western part of the country remains a challenge because of accessibility, scarcity and inadequate management practices. In spite of the importance of CP in community-based water resource management (CBWRM) in Cameroon, CBM initiatives have not always been sustainable. This chapter draws together the key findings of the study and recommend some strategies that could improve the management of rural water schemes in Northwest Cameroon. It similarly highlights indicators for future research in CBWRM in particular and community-Based Natural Resources Management (CBNRM) as a whole.

This study investigated the potential role of CBNRM in promoting the sustainable use and management of potable water in rural Northwest Cameroon. The study further examined the complexities and uncertainties experienced in CBWRM in Northwest Cameroon. It equally explored in detail, the contextual dynamics at the community level which continue to affect the performance of CBM systems, but which are either unknown, ignored or taken for granted by interest-driven actors. The study identified practical evidences and lessons of best practices from other successful case studies in developing countries which if emulated could improve CBWRM in the North-western part of Cameroon. Finally, a comprehensive approach to sustainable management through promoting institutions that fit socio-economic and ecological systems was established, while encouraging development and policy practitioners to recognise diversity in societies that may assist users in their efforts to devise improved arrangements for sustainable management of water resources through a STA. The results presented herein make several remarkable contributions to CBNRM/CBWRM Cameroon in particular and the developing world at large.

The most outstanding finding of this study was the importance of involving rural communities in decision-making processes. The results of this study revealed that rural communities in the North-western part of Cameroon are increasingly becoming development spaces where individuals and communities are dynamic actors in fashioning issues of common interest. The growth of CBOs created a window of opportunity to implement the bottom-up approach in resource use amongst the local communities. Bottom-up approaches like the CBNRM/CBWRM initiatives encourage community participation, and this often results in communities networking with other stakeholders like

government agencies, NGOs and CSOs. Community participation and management have also been considered by the international community as an important tool to enhance public engagement and ownership as it evades the mayhem of state bureaucracy (Fonjong & Fonchingong, 2003). Community participation in Northwest Cameroon is therefore, regarded as a vital ingredient in building confidence within communities. This is also because of the normative, romantic and idealised understandings of 'communities' as being intrinsically harmonious entities and their eminent ability to establish comprehensively sustainable NRM management strategies (Dörre, 2015).

Although CBWRM initiatives enjoyed a long and successful career at the centre of international projects and programmes, the practical implementation experienced some short comings. Some reasons have been identified, including uncoordinated national development policies; weak institutional framework, deficiencies in water resource infrastructure and budgetary allocation as well as the lack of technical know-how and skills to effectively and efficiently manage rural water systems is yet another major outcome of this study. What emerged from this scenario is that the involvement of rural communities and CBIs were undermined and centralised control of NRs became the norm. State agencies considered local people as liabilities in their endeavour to protect NRs, failing to know they can turn out to be assets in state's efforts to restore mismanaged and degraded NRs and boost water supplies. Centralised control and management of resources excluded local communities from the decision-making process on NR use and management in their local areas. As a result, resource conflicts between local people and resource managers increased the failure of conventional approaches to achieve improved livelihoods and conservation. The fundamental elements identified as focal challenges to sustainable

CBWRM in Cameroon revolved around issues of jurisdiction between central and local governments. It was clear the majority were predominantly institutionally and managerially embedded, relating to organisational and socio-economic incompetence rather than technical factors. This state of affairs has not only negatively impacted rural populations regarding meeting their livelihood requirements, but has had severe implications on the general development of rural spaces as well as the wellbeing of rural populations.

This study further developed a practical STA that will enable and enhance sustainable CBWRM in poor rural communities in Northwest Cameroon. It is thought that a more democratic distribution of power is crucial for co-management in such contexts. This is justified by the strategies and influences of the multiple stakeholders with often varied activities and interests in CBWRM. Moreover, purely centralised nor decentralised NRM has not yielded sustainable results. As such, a surrogate management approach for perceiving sustainable water resources has, therefore, evolved from alternative ways of organising social relations. A system approach has thus, been recognised as an integral framework for understanding and establishing a collaborative management of the complex nature of water resources. This is because STA takes a holistic view of the environment and allows for interactions to be discovered and this is plausible by creating flexible combinations of the different ways of organising, perceiving and justifying social relations. Furthermore, a systematic study based on a more bottom-up and a more interactive model that focuses on associations among actors and the implementation plans created by them in response to particular policy choices is vital in promoting partnership, social learning among different groups of stakeholders for sustainable results (Bosch et al., 2007; Nguyen

et al ., 2009). There is, therefore, an urgent need for the government and its development agencies to adopt systems and strategies of governance that ensure that the local people are empowered, integrated and encouraged to participate in the development of issues which either affects them directly or indirectly (Tantoh & Simatele, 2017). Such an approach should be the basis upon which any development intervention efforts are structured to achieve sustainable NR use and management. CBM has, therefore, been considered as one of the most charismatic features of Cameroons rural development (Fonchingong & Fonjong, 2003).

Another fundamental contribution of this study is the growing awareness of the importance of encouraging and enhancing community participation, decentralising and devolving responsibilities, involving all stakeholders throughout the initiation, execution process and understanding and emulating best practices from successful case studies of CBNRM systems. This is because research on long-standing traditional NRM institutions shows a growing interest in understanding how the performance of contemporary CBM could be achieved. This is premised on the basis that the failure by state institutions to address the problems of persistent rural poverty, accessibility to services and environmental degradation necessitated the revival, at least in modified form, traditional NRM practices. There is now an urgent need to promote efforts that address issues of community empowerment in the management of NRs. It should be noted that efforts to revitalise effective NRM in the area of potable water in Northwest Cameroon will only succeed if accompanied by a radical shift in the structure of power and governance of NRs. Consequently, local people must be empowered and encouraged to participate in the

identification of problems that affects their communities as well as in the design and development of strategies to address these problems.

Building on these findings, it can be argued that power relations play a pivotal role in moving forward CBWRM in rural communities of Northwest Cameroon. A thoughtful distribution of power relationships between CBIs and the state in CBWRM can become a forum through which the rights, or lack thereof, of the locals to access, use, manage or own NRs to control their destinies are either established or challenged. Situating power relations in CBNRM in the broader theoretic debates of development over the past decade brings into focus a critical dynamic that is yet to receive adequate attention by experts on CBNRM. Recognising these power dynamics brings to the fore questions of governance, and locates an analysis of CBNRM as a potential vehicle for asserting such rights within the context of broader trends in CPRs in Cameroon in particular and SSA in general. To make nature a source of prosperity for poor communities call for supportive good governance conditions: policies and laws that protect the rights of the poor, coupled with responsive institutions that promote their interests. Anything short of these values, the presence of high-value resources like fresh water can be detrimental to poor communities, providing a target for exploitation by centralized structures or outside business interests and politicians. It will not be an overstatement to declare that at no time has so much been at stake, and at no time are we better able to respond to the crisis that rural communities in developing countries in particular face. This study, therefore, reinforces the belief that CBM initiatives can be a vehicle through which rural communities can effectively and efficiently use and manage their NRs and contribute to improved community wellbeing and sustainable environmental management.

6.2. Recommendations

This study was primarily about the potential role of CBNRM in promoting the sustainable use and management of potable water in rural Northwest Cameroon. The examination of CBWRM initiatives identified several important issues and questions regarding the efficacy of contemporary CBM and CD programmes as well as how various influences continually undermine conservation efforts. An essential understanding that emanated from the study was that power relationships and influence arise from various quarters and levels, and impact the policy process in varyingly direct and subtle ways. In making recommendations regarding Cameroon's future CBWRM, it is crucial that all these interlocking influences are considered. The following pro-active measures and strategies can be taken to enhance CBM initiatives to effectively and efficiently manage their CPRs.

6.2.1. Effective decentralisation an devolution of responsibilities to CBIs

The effects of decentralisation differ with regard to the degree of power transfer from the centre to lower levels of governance. The justification for decentralisation is often built around the assumption that greater participation in public decision-making is a positive good in itself or that it can improve efficiency, equity, development, and resource management (Cases & Ribot, 2016). However, this is not the case in most rural communities as this process of decentralisation is only in theory. NRs are still managed from a top-down approach through local municipal councils. It should be noted that where laws are biased against the poor and government practices disenfranchise them, the potential for better management of ecosystems to alleviate poverty is greatly diminished.

An important move is devolving management authority over ecosystems to local institutions that are more accessible to the poor. It requires, at a minimum, that local institutions whether they be official government institutions like municipal or informal institutions such as VDAs, CBOs, WMCs, user groups, cooperatives, or watershed committees are formed on democratic principles of representation, meaning that they are accountable to their low-income constituents. If sustainable NRM is to be enhanced, there is need for effective devolution and delegation of decision-making authority to rural communities for specific functions that are not under the direct control of central government ministries (see Table 6.1).

However, the devolution of authority and control over the management of NRs at the local level to local-level CBIs as suggested in the recommendation does not indicate that the state has no role to play in NRM. The State has an important facilitative role to play in CBNRM. Needless to say, a more democratic distribution of power is crucial for co-management in such contexts. This is justified by the strategies and influences of the multiple stakeholders in WRM with often varied activities, interests and modes of management. There would, therefore, be a need for a polycentric governance approach, involving CBIs with many centres of decision-making processes rather than imposing on them (see Table 6.1).

Table 6.1: Practical evidence for best practices in CBNRM which could be implimented in Cameroon to improve NRM

Regions	Countries	Practical Evidences	Strategies	Lessons learned	Possible Outcomes
Southern Africa	Zambia	Administrative Management Design for Game Management Areas (ADMADE)	Effective decentralisation	-Actual transfer of authority in resource management -Transfer of ownership rights	Enhance the spirit of ownership effectiveness in resources management
	Zimbabwe	Communal Areas Programme for Indigenous Resources (CAMPFIRE)	Community commitment and involvement; gender mainstreaming	Benefit-sharing of fundamental elements for sustainable development	-Substantial progress and improvement of institutional capacities at the community level -It permits communities to overcome traditional social inhibitions. -Facilitation of different socio-cultural groups in matters concerning them.
	Namibia	Communal Conservancy Programme, Living in a Finite Environment (LIFE)	Enabling environment	-Provide a platform for diverse stakeholders -effective resource governance	Participation, and empowerment of the community would guarantee the sustainability
	Botswana	Natural Resources Management Project-NRMP/ Community-Based Natural Resources Management (CBNRM)	Active and greater community participation	Community empowerment	Build the capacities of the locals for sustainable outcomes
East Africa	Kenya, Tanzania, Uganda, Ethiopia	Ujirani Mwena "Good Neighbourliness", Collaborative Natural Resources Management, Joint Forest Management, Co-management and Community-based, 'Community-based Conservation, Participatory Forest Management	-Greater community involvement in decision-making processes -Involving resource users throughout the initiation, execution process	-Avoid conflicts between stakeholders -Transparency and accountability - Instil a sense of proprietorship	-Instil trust between community based organisations and the local population which is essential for sustainability -effective and efficient governance -Judicious use of resources which is fundamental for sustainability -The entire community consider the resources theirs and monitor to limit overexploitation

Source: Frost & Bond (2008), Roe et al. (2009) and Stone & Nyaupane (2014).

It should be noted that the improvement of governance, devolution and decentralisation structures, processes and systems depend on whether there is an enabling and supportive framework (legislative and institutional) as well as on the social capital upon which effective and efficient CBNRM can thrive. These factors are essential in creating an

environment which enables the appropriate legal rights and status of local communities to be conferred and supported.

6.2.2. Effective empowerment

Enabling local communities and CBIs to participate in decision-making processes is crucial for sustainable outcome. This can also be facilitated through the distribution of power and status, particularly among local peoples (Table 6.1). The scales of empowerment can also tip in the other direction. Bringing rural populations and CBIs and the State on the same platform to discuss NRs governance issues can encourage the political mobilisation of local populations and such newly organised spaces could articulate common interests and a win-win situation in NRM. The structural lack of personal, technical, and financial assets has additionally weakened the local management bodies, undermined their authority and thus their power to negotiate and accomplish their intended goals within the water related negotiation and implementation of rules, as well as the resolution of conflicts, or, shortly, within the whole 'governance landscape'. In such a context, local CBOs can be heavily dependent on external support; individual resource users can see gains as they enforce their specific interests, even if they contradict the goals of the management bodies in charge. The new CBOs that gain a stature and a voice may then articulate the wider interests of rural populations, including resource rights. A significant development will only be possible when experts assist rural communities in setting-up structures for community trusts. This would give the communities a sense of empowerment in achieving a sense of standing in their negotiation with the government and of legitimacy in presenting demands for access or management rights to NRs on behalf of the community. Improving the tenure

security of the poor and their ability to exercise property rights is only one step in the legal, economic, and political empowerment of poor rural families (Prager et al., 2005).

6.2.3. Operational community building Services

There ought to be a change in CD approaches; from CD to community building. This is because effective CD model is premised upon the presence of experts helping the community identify problems and then solving them for the community. Community building entails the involvement of a wide range of participants, who develop a shared vision of what the community should be like in the future, looking at the whole and not just a few parts. Rural communities should, therefore, be encouraged to make use of CD experts in any development venture. For instance, rural communities in Northwest Cameroon should consult the regional CD offices under MINADER to facilitate conception and initiation of CD projects. The CD department must be equally equipped and a synergy between the different departments enforced and reinforced. Furthermore, the mayors of the various municipal councils should make use of the specialists at their disposal (CD-MINADER, CEAC personnel) and forget about partisan development projects to come out with sustainable projects for the common good of the public.

Special efforts to include the poor are required. These can range from reserving gender-based or income-based slots in local institutions to insure participation; arranging for special outreach and training for members of these institutions; creating rules to ensure equitable distribution of local benefits to low-income households; and conducting participatory rural appraisals or other survey methods to help local institutions catalogue and quantify community needs and the possible trade-offs for any set of management

actions (Table 6.1). Of course, this is all based on the assumption that the State has granted these local institutions some actual authority over local resources, something that is still far from common. It is unfortunately one of the most progressive and potentially manifestations of decentralisation in CBNRM initiatives. When carefully undertaken, CBM ventures can be inclusive enough to involve the poor and effective enough to generate increases in environmental income. But CBNRM is no panacea, and it is by no means always pro-poor and unless specific accommodations are made, both the power relationships and benefits associated with CBM initiatives will tend to be directed toward higher income classes. In pursuing pro-poor CBNRM, communities, governments, and NGOs must keep in mind several points: account for the costs of CBNRM, assure equity of benefit sharing, acknowledge limits of participation, provide financial and institutional support, and partner with the private sector.

6.2.4. The role of good governance

The building blocks of a pro-poor growth strategy begin with NRs. These provide the base upon which the vast majority of the poor now depend for their fragile existence, but over which they exercise limited control, and therefore cannot exercise effective stewardship over NRs. Transparent and accountable governance is critical to fostering pro-poor growth and essential to ensuring that the engine of that growth, NR wealth, is managed wisely. It should be noted that a change in governance must include reforms that give the poorest a real stake in their future. For example, the issues of land tenure, of responsibility for resources held in common, and accountability must be addressed in a way that acknowledges the role of community self-interest in managing their NRs as a long-term

asset. Included in these reforms must be a clear mandate to end corruption, which particularly oppresses the poor. In this regard, the strong attachment of government officials, the inside deals of vested interests, the paternalistic posture of elites and the exploitation of NRs for the immediate gain of a few that creates an environment where the resource rights of the poor are violated and pro-poor growth cannot flourish must be abolished.

The growth of free and uncorrupt institutions will provide a catalyst that will help resolve two inextricably linked challenges: the alleviation of poverty and the management of our natural capital to provide for future needs and promote CD. It must be noted that if the resource base is not sustainably managed for the long term and on the contrary exploited and polluted for short-term gain, it will never provide the fuel for CD to relieve poverty. Achieving these goals will not come without a price, but it is one everyone should be eager to pay, given the envisaged benefit.

6.2.5. Employing an Integrated Land Use System (ILUS) around watersheds

The classic intensification approach to increase the yield of food production, the application of pesticides and fertilizers has led to negative environmental and social consequences such as soil degradation, decline of fresh water resources, loss of biodiversity and land use conflicts. This has serious consequences on rural water supplies. Since rural water supply in the Northwest of Cameroon is through gravity and the watersheds are the main sources, an ILUS that combine different types of land uses and integrate several management goals in the same landscape for sustainable outcomes must be applied. This is

because ILUS can provide a higher level of ecosystem goods and services and is best suited to the livelihood strategies of the local populations.

Given the above suggestions, it would be important to note that improving the level of management of water resources in particular and NRs in general will greatly depend on; making governance friendlier to the poor and tackling issues of property rights, access to information and decision-making, adequate representation, institutional transparency, and fairness in sharing the costs and benefits of NRM which would improve participation and involvement of rural communities in NRM. These are all aspects of democratic governance decision-making that respects the rights and needs of those who depend on NRs. This is because; democratic governance for the poor is the door to equity and an important building block of sustainability.

6.3. Suggestion for future research

Building on the conclusion and recommendations, it seems there is a possibility for further research to be undertaken in CBNRM in the context of potable water supply in rural communities in Northwest Cameroon in particular, and the developing world in general. There is no study that has considered an Integrated Land Use System (ILUS) to develop a sustainable approach to CBWRM, particularly as river basins are concerned which is the source of water supply through gravity. Furthermore, studies on CBWRM have seldom used the STA modelling principles to come out with effective and efficient strategies to rural water supply in Cameroon and Africa at large. Studies in these directions will help improve CBWRM initiatives and environmental management.

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ANNEXES

Annexe A: Questionnaire destine to heads of household.

TITLE OF RESEARCH:

"Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: perspective on potable water supply in Northwest Cameroon"

This questionnaire aims at collecting empirical data in partial fulfillment of the requirement for a PhD Degree in Geography and Environmental Studies. It seeks to investigate the role of community-based natural resources management in promoting the sustainable use of potable water in rural Northwest Cameroon. Your responses are strictly confidential to the maximum extent allowed by the law. Your cooperation is highly appreciated.

CONFIDENTIAL

Interviewer	
Coordinator	

Information on visits

Visit							Time
Date							

Method of questionnaire completion. Mark the appropriate boxes with a tick (√).

I-IDENTIFICATION OF QUESTIONNAIRE

1) Region of origin

Northwest	1	
Southwest	2	
West	3	
Other, specify.....	4	

2) Village/Community

Sub-Division	**Village**	**Response**	√
Ndu	Njimkang	1	
	Ngar	2	
Njinikom	Baicham	3	
	Muloin	4	
Mbengwi	Tugi	5	
	Zang-Tabi	6	

II- QUESTIONNAIRE DESTINED TO HEADS OF HOUSEHOLDS.

DEMOGRAPHIC DATA

3) What is your gender?

Male	1	
Female	2	

4) What is your age Group?

-25	26-30	31-35	36-40	41-45	46-50	51-55	51-60	60+
1	2	3	4	5	6	7	8	9

5) What is your matrimonial status/regime?

Single	Married Monogamy	Married Polygamy	Living together like married partners	Widow/ Widower	Separated	Divorced
1	2	3	4	5	6	7

6) What is your level of education?

Never went to school	Primary	Secondary	High School	University	Others specify…
1	2	3	4	5	6

7) What is the size of the family?

< 4	4-6	7-9	10+
1	2	3	4

8) What is the occupation of the head of the family?

Salaried worker	Trader	Farmer	Hawker	Retired	Unemployed	Other, specify…
1	2	3	4	5	6	7

9) What is the monthly income of the household?

<50,000 (F CFA)	1	
50,000-80,000	2	
80,000-100,000	3	
100,000-130,000	4	
130,000-150,000	5	
150,000+	6	

III- SOCIO-ECONOMIC ANALYSIS OF WATER PROBLEMS

ACCESSIBILITY TO WATER RESOURCES

10) Is there a community water scheme in the community?

Yes	1	
No	2	

11) Are you a subscriber to the community water scheme?

Yes	1	
No	2	

12) If no, what other water sources are commonly used by the household? ***(You may tick more than 1***

Local gravity flow scheme	1	
Borehole	2	
Wells	3	
Springs	4	
Streams	5	
Rain water	6	
Dam/Pool/Stagnant water	7	
Others, specify.....	8	

13) What are the major reasons with coming to the water point? ***(You may tick more than 1)***

Accessibility	Availability	Others, specify.....
1	2	3

14) What are the uses of water? ***(You may tick more than 1)***

Cooking	Laundry	Drinking	Gardening	Construction	Others, specify.....
1	2	3	4	5	6

15) Which type of toilet do you have? ***(You may tick more than 1)***

Water system	Pit toilet with cemented slaps	Pit toilet with sticks	Bucket toilet	Other, specify.....
1	2	3	4	5

16) What estimated quantity of water did you use a day when there was no piped water?

1-2 Gallons (40l)	2-4 gallons	4-6 gallons	7 gallons+
1	2	3	4

17) What was the distance covered before the arrival of piped water?

200-400m	500-600m	700-900m	1000m+
1	2	3	4

18) How was the water transported?

Buckets/Gallons on the head	1	
Two wheel truck/barrow	2	
Motorcycle/Bicycle	3	
Calabashes/clay pot on head	4	
Others, specify.....	5	

19) Who is responsible for fetching water? ***(You may tick more than 1)***

The girl child	The boy child	All the children	The mother	House help	Others, specify...
1	2	3	4	5	6

20) What is the frequency of the water potage exercise?

Once a day	1	
Twice a day	2	
Once in two days	3	
Others, specify.....	4	

WATER AND SANITATION/HEALTH

21) Did you experience cases of water related diseases in the family?

Yes	1	
No	2	

22) If yes, what were the types of water related diseases experienced before the arrival of piped water and how often? ***(You may tick more than 1)***

Illnesses/Symptoms	Never	Occasionally	Often	More often
Dysentery				
Diarrhea				
Typhoid				
Filaria				
Ascaridiasis				
Schistosomiasis				
Stomach problems				
Other, specify.....				

22) Who are those easily infected and their age group? ***(You may tick more than 1)***

Children <5yrs	5-9yrs	10-14yrs	15-19yrs	20yrs+
1	2	3	4	5

23) Where did you get treatment in case of contamination? ***(You may tick more than 1)***

Government health centers	1	
Private health posts	2	
Traditional treatment	3	
Buy medicine from roadside hawkers	4	
Other, specify.....	5	

24) What was the cost of treatment?

<10,000 Franc CFA	1	
10,000-14,000 Franc CFA	2	
15,000-19,000 Franc CFA	3	
20,000 Franc CFA+	4	

25) When did you connect to the community piped water?

1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2015
1	2	3	4	5	6

26) Where is the standpipe located?

Piped water inside the	1	
Piped water inside the yard	2	
Piped water in the community stand	3	
No access	4	

27) What is the distance to the public stand tap with the arrival of piped water?

<200m	200-400m	500-800m	900m+
1	2	3	4

28) What is the cause of the long time spent?

Long cue	1	
Fighting	2	
Low flow rate	3	
Difficult access	4	
Others, precise.....	5	

29) If so, when is it usually congested?

During morning periods	1	
During the dry season	2	
Weekends	3	
Holidays and school days	4	
Traditional working days	5	
Other, Specify.....	6	

30) What estimated quantity of water do you use a day with the arrival of piped water?

<2 gallons (40 L)	1	
2-4gallons	2	
5-7 gallons	3	
8-10 gallons	4	
10 gallons+	5	

31) How is the water transported?

Buckets/Gallons on the head	1	
Two wheel truck/barrow	2	
Motorcycle/Bicycle	3	
Calabashes	4	
Clay pot	5	
Others, specify.....	6	

32) What is the frequency of the water potage exercise?

Once a day	1	
Twice a day	2	
Once in two days	3	
Others, specify.....	4	

33) At what time do you go to fetch water?

Morning before 6:00am	1	
6:00-8:00	2	
8:00-10:00	3	
Afternoon 12:00-14:00	4	
14:00-16:00	5	
Evening 14:00-16:00	6	
16:00+	7	

34) Is the water supply regularly?

Yes	1	
No	2	

35) If no, how often are there interruptions?

Every day	Once in 2 days	Twice a week	Once a week
1	2	3	4

36) Where do you get water during scarcity/interruptions?

Use stored water	1	
Streams	2	
Springs	3	
Boreholes	4	
Rain water	5	
Dam/Pool/Stagnant water	6	
Others, specify.....	7	

37) What is your yearly contribution/charge to the water scheme?

0-500 (F CFA)	600-1000 F CFA	1000 F CFA+
1	2	3

38) Are you satisfied with the amount?

Yes	No	Indifferent
1	2	3

39) If not, why?

Too much	1	
We sacrificed a lot for the project	2	
Irregular Supplies	3	
No accountability	4	
Others, specify.....	5	

40) Has your health situation change with the arrival of the piped water?

Yes	A bit	Not at all
1	2	3

41) If no, why?

Water not Clean	Feel sick after drinking	Smells	Others specify.....
1	2	3	4

42) Do you treat the water before drinking?

Yes	No	At times
1	2	3

43) If yes, how?

Filter with cloth	Boil	Allowed to settle	Others, specify.....
1	2	3	4

44) How is the water stored?

In drums	1	
In buckets	2	
In Aluminum pots	3	
In clay pots	4	
Gallons	5	
Calabashes	6	
Others, specify.....	7	

45) Any reason for storing the water in specific containers?

Keeps it fresh	1	
Well protected	2	
Gives it a good flavor	3	
Others, specify.....	4	

46) Are the storage containers covered?

Yes	1	
No	2	

IV- EVALUATION AND MANAGEMENT OF COMMUNITY WATER POINTS

47) Is there a public stand tap/water point in your neighborhood?

Yes	1	
No	2	

48) If so, which kind?

Spring	1	
Well	2	
Public stand tap	3	
Borehole	4	
Others, specify	5	

49) If not, why not?

Lack of finances	Poor organization	Others, specify.....
1	2	3

50) What is the state of your main water sources in terms of functionality?

Functional	1	
Not functional	2	
Seasonal	3	
Don't know	4	

51) Is the water point protected from animals?

Yes	1	
No	2	

52) If no, why?

Lack of finance	1	
Not fit for drinking	2	
The flow rate is slow	3	
Others, specify.....	4	

53) If yes, how is it protected?

Built to create an outlet where it flows	Fenced to keep animals away	Others, specify.....
1	2	3

54) Who instigated the idea of a community water project?

The villagers	1	
The Municipality	2	
Community Development	3	
NGOs	4	
Religious bodies	5	
Others, specify.....	7	

55) Why was it established?

Long distance covered to fetch water	1	
The prevalence of water related diseases	2	
Low levels of development in the community	3	
Interest of the local government	4	
Influence of religious bodies	5	
Influence from NGOs	6	
Others, specify.....	7	

56) Who are those involved in the water project?

The villagers	1	
Those concerned with the project	2	
Local development associations	3	
Others, specify.....	7	

57) Do you fill implicated in the management?

Yes	No	Not at all
1	2	3

58) If no, why?

Not open to everybody	1	
Managed by a particular group/class	2	
Poor sensitization	3	
Others, specify.....	4	

COMMUNITY PARTICIPATION

59) Is there a constitution/regulations concerning community water management?

Yes	1	
No	2	

60) When was the constitution/ regulations drawn?

Some time ago	1	
Recently	2	

61) Have you ever participated in the management of the water point?

Yes	1	
No	2	

62) If so, what is the nature of participation?

Financial	Material support	Manual work	Mobilizing/Sensitizing	Others specify...
1	2	3	4	5

63) If no, Why?

Never consulted/invited	Decisions are imposed	The management is not accountable	Others specify.....
1	2	3	4

64) Who manages the water point?

Management committee	1	
Development Organizations	2	
NGO's	3	
Voluntary management	4	
Others, specify.....	5	

COMMUNITY LEADERSHIP

65) What is the composition of the management committee leadership?

Elected members	Appointed	Traditional	Others, specify.....
1	2	3	4

66) Does the management committee convene meetings open to the public?

Yes	No	Sometimes
1	2	3

67) If yes, how often?

Every 2 months	Every 3 months	Once a year	Don't meet at all
1	2	3	4

68) How adequate is the community leadership record management system?

Very adequate	Adequate	Inadequate	Very inadequate
1	2	3	4

69) What do you think could be done for everyone to have access to water?

Extend the network	1	
Reduce cost of connection	2	
Install more public stand taps	3	
Exploit new water sources	4	
Other, specify.....	5	

Annex B: Questionnaires destine to the water management of commitees

TITLE OF RESEARCH:

"Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: Perspectives on Potable water supply in Northwest Cameroon"

This questionnaire aims at collecting empirical data in partial fulfillment of the requirement for a PhD Degree in Geography and Environmental Studies. It seeks to investigate the role of Community-based natural resources management in promoting the sustainable use of potable water in rural Northwest Cameroon. Your responses are strictly confidential to the maximum extent allowed by the law. Your cooperation is highly appreciated.

CONFIDENTIAL

Interviewer	
Coordinator	

Information on visits

Visit							Time
Date							

Method of questionnaire completion. Mark the appropriate boxes with a tick (√).

I-IDENTIFICATION OF QUESTIONNAIRE

1) Region of origin

Northwest	1	
Southwest	2	
West	3	
Other, specify.....	4	

2) Village/Community

Sub-Division	**Village**	
Ndu	Njimkang	
	Ngar	
Njinikom	Baicham	
	Muloin	
Mbengwi	Tugi	
	Zang-Tabi	

II-TO COMMUNITY-BASED MANAGEMENT ORGANISATIONS

A-ORGANISATION OF THE MANAGEMENT

3) Are there water management committees in the community?

Yes	1	
No	2	

4) If yes, what is the gender composition?

More males	More females	Equal males and females
1	2	3

5) Which are the management organs?

Management committee	1	
Project committee	2	
Stand tap, hygiene and sanitation committee	3	
Others, specify.....	4	

6) For how long has the water committees existed?

Less than 6 months	Between 6-12 months	Since the creation of the water scheme
1	2	3

7) How are they headed?

Elected members	Appointed members	Others, specify.....
1	2	3

8) What is your opinion about the role of the water committees?

Very active	They are inactive	Partially active	Don't know
1	2	3	4

9) What is the various management difficulties faced? ***(You may tick more than one)***

Managerial	Technical	Financial	Others, specify.....
1	2	3	4

10) Is the entire community served with pipe born water? List them if answer is no?

Yes	1	
No	2	

11) Why are the other quarters not served with piped water?

Lack of finance	1	
The situation makes it difficult (hilly, river crossing……)	2	
Others, specify……	3	

12) Do you think of extending the network?

Yes	No	Not certain
1	2	3

B-TECHNICAL ISSUES

13) What is your post in the water management committee?

Manager	Accountant	Secretary	Others, specify
1	2	3	4

14) What is your level of education?

Never went to school	Primary	Secondary	Tertiary	Others, specify……
1	2	3	4	5

15) What is your working experience as a member of water committee leadership?

Months	1-2 years	2 years +
1	2	3

16) Are there records of your water management committee?

Yes	No	Don't know
1	2	3

17) How many tanks do you have and what are their capacities?

Number	Capacity (m^3	Response	√
1-2	50	1	
2-3	100	2	
4+	100+	3	

18) Is it sufficient to store water?

Yes	1	
No	2	

19) If no, how do you conserve water for the population?

We manage with what we have	1	
When the tanks are full, water flows through waste pipes to nature	2	
Others, specify.....	3	

20) How do you carry out treatment?

This is a spring source, thus no treatment	1	
By protecting the intake points	2	
Others, specify.....	3	

21) How often do you clean the tanks?

Every three months	Every six months	Once a year
1	2	3

22) How many plumbers or caretakers are there?

-2	2+	5+
1	2	3

23) What is their means of movement?

Foot	Bicycle	Motorcycle
1	2	3

C-ACCOUNTABILITY/MONITORING

24) How many subscribers are there and the cost of subscription?

Year	Quarter	Number	Cost	
Before 1985				
1985-1995				
1995-2010				
2010-2015				

25) What are the criteria for subscription?

Distance from the main line	1	
Support project material during construction	2	
Participation in community work	3	
Payment of subscription fee	4	
All of the above	4	
Others, specify.....	5	

26) How is the revenue for servicing and maintenance generated?

Monthly Charges	Yearly levies	Metering	Others, specify.....
1	2	3	4

27) Do the subscribers respond promptly to the payment of the levies?

Yes	1	
No	2	

28) Does the levies paid by users able to cover expenses?

Yes	1	
No	2	

29) If no, which are the other sources of finance do you have?

Donors	Year	Name of organization	Amount	Response	√
contributions from users				1	
Voluntary donations				2	
Charity from local groups				3	
Government subvention				4	
Charity from foreign bodies				5	
NGO's				6	
Elites in the country				7	
Elites in the Diaspora				8	
Others, specify.....				9	

30) Are you satisfied with the level of support from the government/support agencies to ensure the provision and sustainability of water supply in the community?
In each of the agencies, tick one, 1= Very dissatisfied, 2= Not satisfied, 3= Satisfied, 4=Very satisfied

a) Government Subventions 1 ☐ 2 ☐ 3 ☐ 4 ☐
b) Local council 1 ☐ 2 ☐ 3 ☐ 4 ☐
c) NGO's 1 ☐ 2 ☐ 3 ☐ 4 ☐
d) Elites within the national territory 1 ☐ 2 ☐ 3 ☐ 4 ☐
e) Elites in the Diaspora 1 ☐ 2 ☐ 3 ☐ 4 ☐

31) How many subscribers paid or did not pay?

Year	Paid	Not Paid	Response	√
Before 1985			1	
1985-1995			2	
1995-2005			3	
2005-2010			4	
2010-2015			5	

32) What are the reasons for not paying?

The amount is too much	1	
They cannot afford	2	
Sacrificed a lot for the realization of the project	3	
Others, Specify.....	4	

33) How do you make them pay?

Water cuts	Threats of fines/penalties	Others, specify.....
1	2	3

34) How do you inform the community of water cuts and major decisions?

Through Quarter Heads	1	
Community radio announcements	2	
Churches	3	
Others, specify.....	4	

35) How often do you have meetings?

Every two Months	Every three months	Yearly
1	2	3

36) Does the community partake in the decision making?

Yes	1	
No	2	
At times	3	

37) What systems are in place to assure accountability?

Accountant	1	
Cashier	2	
Auditor	3	
Others, specify.....	4	

38) How often does the programme get evaluated?

Every three months	1	
Every six months	2	
Once a year	3	
Others, specify.....	4	

39) What happens to the results of the evaluation?

It is reported to the public during meetings	1	
It is discussed among the board members	2	
Others, specify.....	3	

D-CONFLICT RESOLUTION

40) Are there conflicts resulting from water usage or management within the community?

Yes	1	
No	2	

41) If yes, what is the nature of the conflicts?

Farmer grazer	1	
Encroachment into the catchment areas	2	
Illegal connections	3	
Diversion of water by upstream users	4	
Pollution	5	
Others, specify.....	6	

42) If yes, how do you solve the problem?

Immediate disconnections	Penalties	Others, specify.....
1	2	3

43) Who resolves the conflict within the community?

The Board of Directors members	1	
A conflict resolution committee in the water management bureau	2	
By the village traditional council	3	
Others, specify	4	

44) How long does it take for conflicts to be resolved?

1-2 week	2-4 weeks	4 weeks+
1	2	3

45) Has the community water management committee ever been trained?

Yes	1	
No	2	

46) If yes, what type of training/capacity building and by which structure?

Management of catchment areas	1	
Revenue generating activities at the catchments	2	
Accountability of water revenue	3	
Monitoring	4	
Technical issues for caretakers of the water projects		
Others, specify.....		

47) Who are the participants?

Workers of the water project	1	
Organized Groups	2	
The Board Members	3	
The entire population	4	
Others, specify.....	5	

48) How often is this carried out?

Once a year	1	
Twice a year	2	
Three times	3	
4+	4	

II-CATCHMENTS PROTECTION/ MONITORING

49) How many catchments are there in the community?

0-2	2-4	5+
1	2	3

50) Are they demarcated and with Surveyed landmark pillars and protected?

Yes	No	Others, specify
1	2	3

51) How are they protected from encroachment?

Fenced with barbed wire	Life fence	Others, specify.....
1	2	3

52) What type of plant species is used for fencing?

Fiscus	1	
Erythrina	2	
Sisal	3	
Ceasalpina	4	
Others, specify.....	5	

53) What are the measures used to control erosion in the catchments?

Permanent tree planting	1	
Permanent grass cover	2	
Grass planting	3	
Others, specify.....	4	

54) What type of plants species have been used to control erosion?

Bahama	1	
Vetiver	2	
Lemon Grass	3	
Kikuyu	4	
Others, specify.....	5	

55) Has a tree nursery been created for the Project?

Yes	1	
No	2	

56) If yes, what type of trees is nursed?

Fruit trees (Kolanut tress, mango, Pear...etc)	Water trees (Cover tress)	Plants	Other, specify.....
1	2	3	4

57) What permanent activities are carried out in the catchments to generate income?

Bee keeping	1	
Planting of Bananas	2	
Plantains	3	
Medicinal plants	4	
Others, specify.....	5	

58) How is the income or cash benefit used?

Pay care takers salaries	1	
Protect catchments	2	
Kept in Coffers	3	

59) Do you think the management is achieving its ecological aims?

Yes	No	To an extent, how?.....
1	2	3

60) What do you believe to be the most important success of the project?

Assuring reliability	1	
Accountability	2	
Extension of network	3	
Protection of catchments	4	
Others, specify	5	

61) What do you believe to be the most important factors that will guarantee sustainability?

Maintaining infrastructure	1	
Exploit new catchments	2	
Accountability	3	
Others, specify.....	4	

Annex C: Question Guide to Heads of the District Hospitals

TITLE OF RESEARCH:

Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: Perspectives on Potable Water Supply in Northwest Cameroon"

This interview guide aims at collecting empirical data in partial fulfillment of the requirement for a PhD Degree in Geography and Environmental Studies. It seeks to investigate the role of community-based natural resources management in promoting the sustainable use of potable water in rural Northwest Cameroon. Your responses are strictly confidential to the maximum extent allowed by the law. Your cooperation is highly appreciated.

QUESTION GUIDE TO HEADS OF THE DISTRICT HOSPITALS

1) What is the water situation in the community?
2) Is the water potable?
3) Which are the common water related diseases within the community?
4) What is the frequency of these diseases? (Consult hospital log books if possible)
5) What has been done to protect the population form these diseases?
6) Is there a particular period of the year when water related diseases are high and vice versa? Any explanation for that?
7) What is the role of MINSANTE in promoting sanitation and hygiene in respect to water resources in rural communities? (Sectoral approaches)
8) What are some of the difficulties encountered by MINSANTE in promoting water hygiene, sanitation in rural communities?
9) What can you tell me about water, hygiene and sanitation in the sub-division?

NB: Hospital log books will be exploited to make an inventory of the types and frequency of the water related diseases.

Annex D: Interview guide for the mayors of the sub-Divisions

TITLE OF RESEARCH:

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INTERVIEW GUIDE FOR THE MAYORS OF THE SUB-DIVISIONS

1) Which are the various natural resources within your municipality?
2) How are they managed?
3) How are they protected?
4) What is the nature of assistance given to rural communities in terms of natural resources development and management?
5) Is the assistance contrary to the indigenous systems of management?
6) How do you integrate contemporary management techniques to traditional methods?
7) How often do you organize capacity building workshops to improve the competencies of the caretakers of the various community water projects?
8) How are the river basins protected from farming, rearing and other unfriendly environmental activities?
9) What are some of the plants encouraged to be planted around the drainage basins?
10) Is there any follow up of the activities of the community water supply schemes If yes, how often?
11) How is the management plan designed for drainage basins? Are they effectively implemented? How?
12) What can you tell me concerning the management of natural resources specifically water in the advent of climate change and population growth?

Annex E: Question guide to village Chiefs or Head of Traditional Councils in the use of indigenous knowledge in natural resources management

TITLE OF RESEARCH:

"Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: Perspectives on Potable Water Supply in Northwest Cameroon"

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1) Can you tell me some of the traditional practices that your parents or grandparents told you, especially those patterning to Natural Resources Management (NRM); farming practices, water resources, hunting, and tree cutting?
2) Are these practices still common today?
3) Do you suggest they should be preserved? Why?
4) What is your understanding of what indigenous knowledge and modern knowledge are?
5) In which ways do you think indigenous knowledge and modern knowledge differ or are similar?
6) How do you think Indigenous knowledge is currently used in NRM?
7) How has the exploitation of resources (water, land, forests, hunting) changed in the community in the past 25 years?
8) How has the distance to the streams/springs change over the years?
9) What was traditionally used to store water and why? Is it still used today? Why?
10) What is limiting integration between indigenous knowledge and modern system of management?
11) What are the limitations and barriers to the use of indigenous knowledge in NRM in NW Cameroon?
12) What are the new management practices introduced in the community (water, farming, land, forest)? Who introduced it?
13) How do you think we can bring indigenous and modern knowledge together?
14) What practices do you use to protect water/soil? Are the new practices better than the old practices?
15) What are the common types of trees grown in the catchment areas? Is it what use to be there? What are their uses? Are the numbers increasing or not? Any reason for that?
16) How has it affected the water situation in the village?

17) Are there controls by the government on the use of rivers, land, forests? What are they?
18) Do you think indigenous knowledge has a contribution to modern environmental management? How?
19) What is being done to protect the environment (water, soil, forests) by the government, NGO's in your village? Do you agree with their actions?
20) Would you welcome a change in the management of the environment?
21) Are there areas prohibited from farming, and the cutting of trees?

Traditional Structures

1) Do you still have authority over the management of resources in the community?
2) What is the administrative structure of the village? Which institution is responsible managing the environment (land, water, forest)?
3) Which institution is the highest decision making body in the community?
4) What is the relationship between the village institutions and the governments and NGO's?
5) How do you see women as actors in the management of natural resources?
6) What can you tell me about natural resources management generally with stress on water resources faced with population growth and climate change?

Annex F: Question guide directed to the sub-Divisonal delegations of the Ministry of Water and Energy (MINEE) and the Ministry of Agriculture and Rural Development (MINARD)

TITLE OF RESEARCH:

"Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: Perspectives of Potable Water Supply in Northwest Cameroon"

This interview guide aims at collecting empirical data is in partial fulfillment of the requirement for a PhD Degree in Geography and Environmental Studies. It seeks to investigate the role of community-based natural resources management in promoting the sustainable use of potable water in rural Northwest Cameroon. Your responses are strictly confidential to the maximum extent allowed by the law. Your cooperation is highly appreciated

1) What is the role of the ministry MINEE/ MINARD in ensuring sustainable potable water in rural communities?
2) What is the nature of assistance given to the rural community water supply project?
3) How often do you monitor the water services in the different communities?
4) What are the contemporary management methods introduced in the communities?
5) How do you integrate the conventional contemporary management strategies with the indigenous techniques?
6) Are these techniques accepted in the rural communities?
7) What are some of the barriers of MINEE/MINARD in developing and managing water resources?
8) What is being done to address the situation?
9) What is the position of your ministerial delegation in the fight against climate change and adaptation strategies to rural communities?
10) What can you tell me concerning community water management especially as many ministries are involved through their sectoral policies?

Annex G: Question guides destined to Non-Governmental Organisations involved in water resources management

TITLE OF RESEARCH:

"Sustainable Community-based Natural Resources Management in Sub-Saharan Africa: perspectives on potable water supply in Northwest Cameroon"

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1) What are the objectives of your organisation?
2) What are some of the activities of your organization in NRM?
3) How do you operate in rural communities?
4) What can you say about traditional management systems?
5) What are some of the new management techniques introduced in the community?
6) Are these new management systems compatible with the traditional management systems? If yes, how? If no, why?
7) How do you integrate these systems?
8) How is monitoring and evaluation carried out? How often? What happens with the results?
9) What are some of the difficulties encountered in implementing new management techniques?
10) How do you deal with them?
11) What do you believe to be the most important successes of community water schemes?
12) What do you believe to be the most important factors that influenced the success or failure of community water schemes?
13) What are the current threats to community water schemes?
14) How do you think community water schemes could be improved or sustained?
15) After all what we have discussed, what can you tell me concerning community water management especially with the current climate variations and change?

Annex H: Ethics Clearance Certificate

Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Bikwibili Tanton

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER: H15/02/03**
PROJECT TITLE	Sustainable community-based natural resources management perspectives on portable water supply in NW Cameroon
INVESTIGATOR(S)	Mr H Bikwibili Tanton
SCHOOL/DEPARTMENT	GAES/
DATE CONSIDERED	20 February 2015
DECISION OF THE COMMITTEE	Approved unconditionally
EXPIRY DATE	2 March 2017
DATE 3 March 2015	**CHAIRPERSON** (Professor T Mhlanga)

cc: Supervisor : Dr D Sinate

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.

I/We fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to completion of a yearly progress report.**

Signature _____ Date ___/_____/_____

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

Annex I: Complaint about rural water supply system (Zang-Tabi)

ZANG-TABI TRADITIONAL COUNCIL
MBENGWI RURAL COUNCIL
MOMO DIVISION
14th MARCH, 2014

TO
Madam Nkenku Gladys Nangies,
Regional Engineer PAEPA-MRU
North West

SUBJECT: COMPLAINT ABOUT WATER SUPPLY SCHEME IN ZANG TABI VILLAGE

- Mindful of the complaint from the follow up committee on the above water-supply scheme.
- Mindful of the Cameroon Cooperation with the African Development Bank.
- Mindful of the brief evaluation meeting held in the Zang Tabi Fon's Palace on the 13th March 2014, between PAEPA-MRU Commission headed by Mrs. Nkenku Glagys Nangies, Regional Engineer PAEPA-MRU, North West on one hand and the Local Village Authority headed by the Fon of Zang-Tabi, Clan Head of Meta on the other.

The Fon and the people of Zang-Tabi like to extend words of gratitude to the Government of Cameroon for granting aid to the Zang-Tabi Community with the ongoing water supply through PAEPA-MRU program.

Note should be taken that the project document has not been made available to the beneficiary community

For sustainability purpose, we would wish to emphasize on the following points:-

- There is the absence of a storage tank that will facilitate future water treatment.
- In less than a month, we are already witnessing too many leakages resulting from very thin pipes.
- Many pipes are already being exposed especially where water runs down the hills.
- Two of the control chambers have already developed cracks and leakages.
- The palace which originally had 3 stand-taps now has only one public tap.
- There are only ten (10) public taps constructed (many at very wrong positions) instead of the twelve (12) as we were being informed.

We would be most grateful if the above mentioned points could be considered in order to meet the expectations of the project.

Thanks in anticipation

Sign:
Tembe Stephen
(Z.T.T. Council Chairman)

THE CHAIRMAN

Sign:
Ndang Henry
2nd Vice President
ZATACUDA

CC
- The D.O Mbengwi
- The Mayor Mbengwi
- The MP for Momo East Constituency
- The Divisional Delegate of Water and Energy
- The Fon of Zang-Tabi, Clan Head of Meta

Annex J: Pictures of water catchments and activities round in the research Sites







Annex K: The nature of water infrastructure in the study sites



Annex L: Poorly maintained and abandoned water infrastructure





