



DETERMINANTS OF EQUITABLE SHARING OF WATER RESOURCES IN KENYA: A CASE OF LAKE NAIVASHA BASIN

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Abstract

In most developing countries, the benefits that people obtain from water resources are known to be a major contributor to local and national economic development. In Lake Naivasha Basin, weak enforcement by the majority of government institutions who have inadequate resources, political will, commitment and the required seriousness to undertake effective enforcement of natural resources policies, laws and regulations. Lack of access to information regarding actual and state use of natural resources for example water abstraction estimates from research documents although varied provide only useful information. Most of these are held by different institution in formats that is not readily accessible to the majority of the stakeholder. This has curtailed informed decision making process and caused conflicts among researchers and resource users. Due to inequitable sharing of water resources, conflicts have emerged among the users which have several potential adverse impacts on natural resources use and management within the Lake Naivasha basin. The purpose of this study was to establish the determinants of equitable sharing of water resources in Kenya. The target population of the study was 371 staff of WARMA in Lake Naivasha Basin. The study used 188 as the sample size with the use of stratified sampling technique. The primary data was collected through the use of questionnaires whereas the secondary data was obtained from published documents such as journals, periodicals, magazines and reports to supplement the primary data. A pilot study was conducted for data collection instruments. The data was analyzed with help of SPSS version 21 and Excel. The study adopted regression and correlation analysis at 5% level of significance to determine strength and direction of the relationship of the variables under study. The regression analysis showed that leadership had the strongest positive (Pearson correlation coefficient =.678) influence on effective equitable sharing of water resources. In addition, institutional capacity, community participation and government policy were positively correlated to equitable sharing of water resources management with Pearson correlation coefficient of .599, .606 and .506 with p-values of .009, .009<0.05, .007<0.05 and .010<0.05 respectively. The study established that leadership was the most significant factor. The study recommends for similar studies to be undertaken in other areas in Kenya for generalization of the findings of this study.

Key Words: Equitable Sharing, Water Resources in Kenya, Institutional Capacity, Government Policy, Leadership, Community Participation

INTRODUCTION

This chapter aims at providing sufficient information for better understanding of the study. It examines the global context and then narrows down to the issues that the study will address.

Background of the study

According to Kenya's flagship 'Vision 2030', aspirations for well-being and prosperity are intrinsically linked to sustainable and equitable poverty alleviation, premised not only on economic growth, but on environmental protection, with increasing recognition of the role of environmental services in supporting livelihoods (Kenya Vision 2030, 2012). Kenya is classified as a chronically water scarce country with a freshwater endowment of only 647m³ per capita. This per capita is expected to decline if the resource base continues to diminish (GoK, 2003).

A number of reasons have been advanced for the diminish of water in Kenya and these include the increase in population, increased use of woody plants and trees as fuel wood for cooking, water resources degradation, vulnerability to rainfall variability, droughts and endemic flood that occur frequently. Before the year 2002 there was a single water body doing both resource management and water services provision. The institutional arrangement was based on administrative boundaries. (Gitobu & Julia, 2001).

The development of Integrated Water Resource Management (IWRM) was recommended in the final statement of the ministers at the International Conference on Water and the Environment in 1992 (the Dublin principles). This concept aims to promote changes in practices which are considered fundamental to improved water resources management. In its definition, IWRM principles that act as a framework are: Social equity: ensuring

equal access for all users (particularly marginalised and poorer user groups) to an adequate quantity and quality of water necessary to sustain human well being. Economic efficiency: bringing the greatest benefit to the greatest number of users possible with the available financial and water resources. Ecological sustainability: requiring that aquatic ecosystems are acknowledged as users and that adequate allocation is made to sustain their natural functioning.

Benefit sharing approaches are increasingly being advanced as a means of addressing problems related to the governance of social-ecological systems in developing countries. These approaches seek to address fundamental issues around the complex interactions between nature and society. They can be considered as part of the growing trend to promote the notion of ecosystem services, broadly defined by the Millennium Ecosystem Assessment as the benefits of nature to society (MEA 2005). This trend is viewed as a way of exposing and highlighting the values of ecosystems to humans (Constanza et al. 1997, Boyd & Banzhaf 2007, Wallace 2007, Daily et al. 2009, Norgaard 2010). While the trend has at times been criticized as an attempt to commodify nature (McCauley 2006), the services provided by ecosystems are socioeconomically and culturally valuable and lead to a range of benefits that support human well-being.

Global Perspective of Equitable Sharing of Water Resources

According to the United Nations Environmental Program (UNEP), one third of the world's population lives in countries where there is moderate to high water stress. More than a third of the world's population lives in river basins that experience severe water shortages for at least one month each year (Hoekstra & Mekonnen, 2012). Currently, more than one billion people lack access to clean drinking water and sanitation. More than

3.4 million people die each year from water, sanitation, and hygiene-related causes. Nearly all deaths, 99 percent, occur in the developing world. (WHO, 2008). The need for clean, accessible drinking water along with the demands of a growing world population will place more burdens on our natural resources. Additionally, developing countries are increasing their consumptive uses. Water security continues to be an unrelenting issue.

In most developing countries, the benefits that people obtain from ecosystem services, such as food, potable water, fiber, and flood regulation, are known to be a major contributor to local and national economic development. In sub-Saharan Africa, for example, ecosystem services are considered to be probably of greater importance to human well-being than anywhere else (Convention on Biological Diversity 2000). This is largely attributed to the relatively huge proportion of poor rural people whose livelihoods depend directly and heavily on ecosystem services. As such, the sharing of benefits derived from ecosystem services in developing countries is usually considered in contexts in which the majority of the people face the most serious and immediate risks from loss of those benefits (Díaz et al. 2006).

Local Perspective of Equitable Sharing of Water resources

Kenya is one of the countries classified by the United Nations as chronically "water scarce." (World Bank 2004). A country is water scarce if its annual water supply is less than 1,000 cubic meters, the global standard benchmark for a country to be considered as adequately supplied with water. Kenya's per capita water supply is less than 647 cubic meters (UNESCO 2006). The growing human population, nearly 50% of who live below the absolute poverty line, puts increasing pressure on natural resources including freshwater ((UN-WATER/WWAP/2006/12 2006).

The Water Act 2002 focused on the decentralization of water services and separating water policy formulation from regulation and services provision. Additionally, the 2002 National Water Policy defined the government's role as regulatory and delegated water service provision to the private sector, municipalities and communities. In spite of this decentralization and separation, the roles of the different actors (e.g., communities, non-governmental organizations, and private sector) involved in the water sector (users, managers, suppliers, conservationists) remain a challenge to the realization of the goal of Kenya's water policy because they are ambiguous and often conflicting (World bank 2014).

Lake Naivasha Basin

In Lake Naivasha Basin, Weak enforcement by the majority of government institutions who have inadequate resources, political will, commitment and the required seriousness to undertake effective enforcement of natural resources policies, laws and regulations. Lack of access to information regarding actual and state use of natural resources for example water abstraction estimates from research documents although varied provide only useful information. Most of these are held by different institution in formats that is not readily accessible to the majority of the stakeholder. This has curtailed informed decision making process and caused conflicts among researchers and resource users (Lake Naivasha Basin Integrated Management Plan 2012-2022).

Conflicts have several potential adverse impacts on natural resources use and management within the Lake Naivasha basin. Potential impacts include; ineffective decision making processes, poor implementation of EIA and Environmental Audit procedures, ineffective inventory of all natural resources within the basin, lack of integrated planning and management, ineffective

communication and sharing of information, ineffective enforcement and compliance, inadequate technical capacity among stakeholders, ineffective resource mobilization and sharing of available resources, poor local, national and international linkages. (Lake Naivasha Basin Integrated Management Plan 2012-2022).

Statement of the problem

In rural sub-Saharan Africa (SSA), rates of accessing and having equitable sharing of water resources are among the lowest worldwide (Joint Monitoring Programme report, 2012). In Kenya, Lake Naivasha basin has experienced; growth in population, human settlement, intensive commercial farming, tourism and geothermal production which have put intense pressure on natural resources in the watershed and this threatens the area's integrity and especially the water resources (Wambui, 2014). Increased demand for scarce water resources has led to the excessive abstraction of surface and ground water resources, depletion of forestry resources, pollution of water bodies and siltation of the lake (Mireri, 2005). Water from the rivers and the lake provide a wide range of opportunities for various activities in the area, which in turn have produced a conflict of interests between different stakeholders (upper catchment, farmers and urban people). This has created pressure on the lake and river water level and its quality (Alfarra, 2004). Demand of water for domestic use, agriculture, and industry continues to increase rapidly due to increasing population levels and immigration in the basin thus the need and concern for more efficient water use (Wambui, 2014).

According to Alfarra (2004) observes that the main problem in the area is not the shortage of water but the management of the resource between multiple users and uses. It is apparent that equitable sharing of water resources in the basin has not been attained and there is lack of proper institutions and

organization in management (Harper, 2004). The upper catchment population is highly significant in that it is indirectly responsible for maintaining the inflow into the rivers, the lake, and the aquifers (Harper, 2004). They utilize water for domestic and livestock, as well as for farming and sediments and agrochemicals from the upper basin end up in the lake. Whatever soil, woodland, and land management activities the upper catchment dwellers do, it will eventually affect the system's hydrology and quality (Wambui, 20014).

Despite the foregoing, there is a dearth of research on determinants influencing equitable sharing of water resources in the Kenyan context. As such it is important for stakeholders to know why there is inequitable sharing of water resources especially in Lake Naivasha basin. This study therefore, seeks to establish the determinants influencing equitable sharing of water resources in Lake Naivasha basin. However, to come up with the influence, the researcher seek to examine; the influence of monitoring and evaluation; how government policy contributes to equitable sharing of water resources; whether institutional capacity assist in equitable sharing of water resources; the influence of community participation on equitable sharing of water resources and seeks suggestions on equitable sharing of water resources that can help stakeholders to avoid conflicts in the basin.

Objectives

General objective

The purpose of the study was to establish the determinants of equitable sharing of water resources in Kenya.

Specific objective

The specific objectives of the study were to:

- i. Establish how community participation influences equitable sharing of water resources in Kenya.
- ii. Examine the how institutional capacity affect equitable sharing of water resources in Kenya.
- iii. Determine how government policy affect equitable sharing of water resources in Kenya.
- iv. Explore how leadership affects equitable sharing of water resources in Kenya.

Research questions

The study was guided by the following research questions:

- i. What is the influence of community participation on equitable sharing of water resources in Kenya?
- ii. How does institutional capacity affect equitable sharing of water resources in Kenya?
- iii. Does government policy influence equitable sharing of water resources in Kenya?
- iv. How does leadership affect equitable sharing of water resources in Kenya?

LITERATURE REVIEW

Introduction

This chapter reviews relevant literature on determinants of equitable sharing of water resources. The chapter develops theoretical review, conceptual framework, empirical review that will be used in the study in regard to each variable in the study.

Theoretical Review

A Theory is a set of statements or principles devised to explain a group of facts or phenomena especially one that has been repeatedly tested or is widely accepted and can be used to make predictions about natural phenomena (Popper, 1963). A theoretical framework provides the researcher the lens to view the world. The theoretical framework

relates to the philosophical basis on which the research takes place and forms the link between the theoretical aspects and practical components of the problem under investigation. In this study the theoretical framework consists of theories and models related to the present study. It is in this framework where the research problem under study evolved. The theoretical framework, thus discusses resource dependence theory, social conflict theory, expectancy theory, resource based theory, Equity Theory and stakeholder theory.

Resource Based Theory

Penrose is credited with establishing the foundations of resource-based view as a theory (Roos & Roos, 1997).Barney (1991) states that a firm is a collection of physical capital resources, human capital resources and organizational resources. The core premise of the resource-based view is that organizational resources and capabilities can vary significantly across firms, and that these differences can be stable (Hijzen, Görg & Hine, 2005). The theory focuses on the idea of costly-to-copy attributes of the firm as sources of business returns and the means to achieve superior performance and competitive advantage (Conner, 1991).

Chandler (1990) indicates that organizational capabilities emanates from lower management, middle and top management. He further states that if these organization capabilities were carefully synchronized and assimilated it could achieve the economies of scale and scope needed to compete in national and international markets (Chandler, 1990).A firm can gain competitive advantage when its resources and capabilities are used properly.

Barney (1986) states that, “sustainable competitive advantage is derived from resources that are valuable, rare, imperfectly imitable (due to path-dependence, causal ambiguity, and social complexity), and no substitutable” (Barney, 1986).A resource-based view of the firm accepts that

attributes related to past experiences, organizational culture and competences are critical for the success of the firm (Hamel & Prahalad, 1996). The above theory relates to institutional capacity on equitable sharing of water resources

Agency Theory

Institutional capacity can be well explained by the agency theory. Agency theory asserts that a key activity for boards is monitoring management on behalf of shareholders and that effective monitoring can improve firm performance by reducing agency costs (Amy & Thomas, 2003). Boyd (1990) states that the monitoring function of boards is also referred to as the control role (Boyd, 1990). According to Amy & Thomas (2003), the institutions mandated to take care of the organization function refers directly to the responsibility of directors to monitor managers on behalf of shareholders. The theoretical underpinning of the board's monitoring function is derived from agency theory, which describes the potential for conflicts of interest that arise from the separation of ownership and control in organizations. In agency theory terms, the owners are principals and the managers are agents and there is an agency loss which is the extent to which returns to the residual claimants, the owners, fall below what they would be if the principals, the owners, exercised direct control of the corporation (Jensen and Meckling, 1976).

Agency theorists see the primary function of boards is to act in the interest of shareholders (Bainbridge, 1993). Water resources management by the board is essential to ensure that it does not pursue its own interests at the expense of the users and as such it should be held in high regard. Amy & Thomas (2003) contend that a director's monitoring function is to monitor the CEO, monitor strategy implementation, planning CEO successor and evaluating and rewarding the top managers.

Social Conflict Theory

A theory propounded by Karl Marx that claims society is in a state of perpetual conflict due to competition for limited resources. Conflict theory holds that social order is maintained by domination and power, rather than consensus and conformity. According to conflict theory, those with wealth and power try to hold on to it by any means possible, chiefly by suppressing the poor and powerless. Conflict theory also ascribes most of the fundamental developments in human history, such as democracy and civil rights, to capitalistic attempts to control the masses rather than to a desire for social order. Conflict theory has been used to explain a wide range of social phenomena, including wars and revolutions, wealth and poverty, discrimination and domestic violence and the intervention of the government laws on protection of the poor is necessary (Weber, 2004). The above theory relates to the government policy on the equitable sharing of water resources.

Stakeholder Theory

Community participation is well explained by the Stakeholders Theory. Stakeholder perspectives on organizations have rapidly increased in popularity and now represent a mainstream method of organizational performance management; stakeholder analysis and a managerial response to greater organizational complexity; stakeholder management. The relevance of stakeholder theory is demonstrated by its standing as the "dominant discourse" in organization theory (Pesqueux & Damak-Ayadi, 2005), and by its application across a range of management disciplines. Its key proposition is that sustainable organizational success in large part depends on systematic consideration of the needs and goals of salient stakeholders (Fraser and Zarkada-Fraser, 2003).

According to Lozano (2005), recent advances in stakeholder theory have moved from "hub and spoke" conceptions of the firm as the focal

organization to a view of the corporation and its stakeholders as embedded in a complex network of relationships. In addition according to Pettijohn, Pettijohn, & Taylor (2007), the stance taken is consistent with evidence from management and HR contexts that the quality and acceptability of decision-making in stakeholder-accountable organizations is enhanced by incorporating stakeholder perspectives. While the studies cited and conclusions drawn relate to employee stakeholders, the paper demonstrates that the proposition has validity across internal and external business environments.

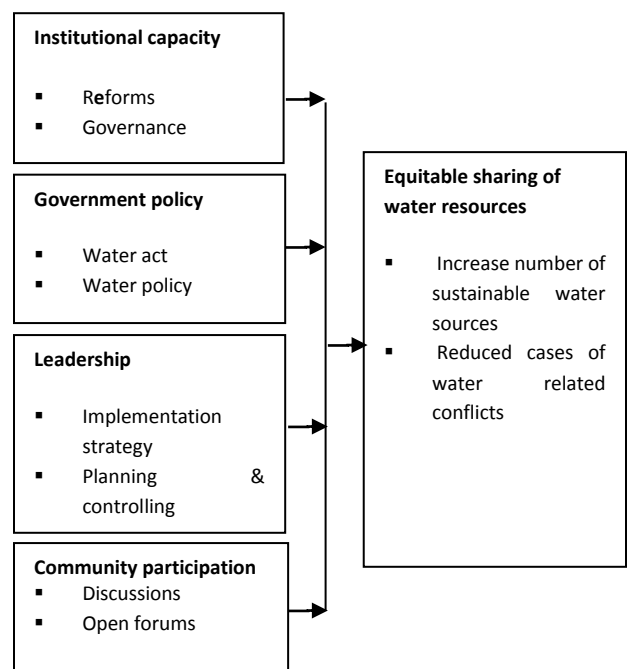
According to Greenwood (2002), there is increasing interest in the relationship between ethics, employee and corporate governance. Gago & Antolin (2004), added that stakeholder theory is seen as key to developing a more practical view of corporate social responsibility (CSR). However, what the debate lacks is an ethical philosophy of performance management and an organization development technique for implementing this (Introna & Pouloudi, 1999). According to Niebuhr (1963), a philosophical rationale for the ethical use of stakeholder theory can be developed from Niebuhr's concept of "the responsible self". This suggests individuals act responsibly if they consider the consequences of envisaged actions in terms of their likely impact on those affected by them. The paper relates this to the contemporary business context to develop the concept of 'the responsible organization'.

Conceptual Framework

According to Jabareen (2008) a conceptual framework is a network of interlinked concepts that together provide a comprehensive understanding of a phenomenon or phenomena. The concepts that constitute a conceptual framework support one another, articulate their respective phenomena, and establish a framework-specific philosophy

According to Orodho (2009) a conceptual framework describes the relationship between the research variables. Jabareen (2008) argues that a variable is a measurable characteristic that assumes different values among subjects. An independent variable is that variable which is presumed to affect or determine a dependent variable (Jabareen, 2008). A dependent variable is a variable dependent on another variable like the independent variable. A dependent variable is the variable which is measured in the research study (Everitt, 2002).

Mugenda (2008) defines conceptual framework as a concise description of the phenomenon under study accompanied by a graphical or visual depiction of the variables of the study. According to Young (2009), conceptual framework is a diagrammatical representation that shows the relationship between dependent variable and independent variables. This is as illustrated below.



Independent Variables **Dependent variable**
Conceptual Framework

Institutional capacity

Institutional capacity encompasses, the functions (tasks) that institutions should have the competence (ability) to perform, for ease of analysis, we subsume relations, rules, values, behaviour, etc. within the concept of “structure”. (LNMC, 2004). In order to ensure availability of adequate and equitable sharing of water resources, the Water Act 2002 as well as the Integrated Water Resource Management Strategy propose institutional reforms that separate water resources management functions from water services functions. It recognizes the role of water users in the management of water resources at the micro catchments level. A national water management authority has been established as an institution in order to manage water resources in the country. In addition seven regional water catchment boards have been established. These include: Lake Victoria Basin North Water Resource Management Authority, Lake Victoria Basin South Water Management Authority, EwasoNgiro North Basin, EwasoNgiro South Basin, Tana River Basin Water Resource Management Authority, Rift Valley Inland Basin, AndAthi River Basin. It is therefore evident that the Water act 2002 has led to the separation of institutional service, the decentralization of roles and responsibilities while laying emphasis on the participation of communities in resource management (Jaspers, 2003).

According to Morgan & Qualman (2010), “traditional institutional development” focuses on what an organization has in terms of resources and structure, and on how it performs its various functions. It has the character of “organisational engineering” that concentrates on improving administrative procedures through the “supply” of training, technical assistance and some “systems development”. Whereas traditional institutional development is primarily concerned with

government institutions and public sector organisations, “governance” broadens out to include the judicial and legal system, the electoral and parliamentary system, political parties, the media, the private sector and civil society organisations (CSOs, which include non-governmental organisations/NGOs and community based organisations/CBOs). In contrast to the “supply” nature of traditional institutional development, the intention of the governance approach is to respond to the “demand” by the above-mentioned stakeholders. Its aim is to promote and strengthen accountability, transparency, legitimacy, pluralism and participation. This in turn compels one to address the question of the “enabling environment” in which these values can take root and flourish, i.e. the political, economic, social and cultural contexts in which the “governance” initiatives are attempted. (Mugo, Swallow & Place, 2004)

Institutional and governance arrangements are two broader models to organize the delivery of benefits to water affected populations. The first approach is to provide “ring fenced” increases in the development budgets of the villages and municipalities where affected populations live and the surrounding development region (or a block grant allocation, with the condition it is used for beneficiary defined development initiatives and not for administration). Existing local governance structures would then prioritize the use of benefit sharing funds (and non-monetary forms of sharing) in consultation with dam-affected populations. This model does not preclude the local government, village or tribal councils from sub-contracting for targeted delivery of benefits to community-based organizations representing water-affected groups. The second generic approach is to establish a long-term Fund, or Trust, with a distinct identity. Typically budgets would be set for different local development programmes, or grant application

programmes (or a mix). The governance arrangements are necessarily integrated with existing local development and basin management organizations where they exist. (Gitobu & Julia, 2001).

Government policy

The Kenyan constitution provisions - Section 69 (1) and (2), provide for public (The State and Citizens) participation in the management, protection and conservation of natural resources. Further, Water (2002) and Forest (2005) Acts' provide legislative frameworks for CBNRM. Natural Resources in Naivasha basin significant to Socioeconomic Development and relevant to CBNRM include land, water, forests and fisheries, all governed by the respective legislative frameworks. Most of these Acts (EMCA, Water, Forest, Land and Fisheries) have provisions for CBNRM. CBNRM principles focus on the collective management of ecosystems to improve human well-being; and aim at devolving Natural Resource Management (NRM) to local community level. This empowers communities to sustainably manage their own resources without permanently damaging, depleting or degrading them.

The Water Act No. 8 (2002) provides a comprehensive institutional framework for the management of water resources in Kenya. The Sessional Paper No. 1 (1999) on National Policy on Water Resources Management highlights the following problems that constrain the development of the water sector and those requiring attention to generally include but not be limited to: the shortage of funds for development, operation and maintenance of water supplies and management of water resources; institutional weaknesses especially the scarcity of manpower and the lack of skills of the users to properly operate and maintain water supplies; water resources availability due to its

uneven distribution both in space and time; poor choice of technology in water supply development and inconsistent project selection criteria that has resulted in the adoption of technologies and delivery mechanisms and lack of proper co-ordination of the various actors in the sector.

Lack of proper inter-linkages with other water related sectors. The government is currently implementing the Water Act. The Act states that abstraction is permitted only during flood flow periods on condition that 90 days storage is provided. The irrigation water is in some cases required during the low flow and in the absence of adequate storage facilities. To store water during flood flow for use during the low flow, it is expected that water consumers will abstract water during the low flow. Currently those authorized to abstract irrigation water during the flood flow do not have the requisite storage facilities. (NEMA, 2004)

Though the Water Act regulates abstraction of lake water through permits the law does not specify the abstraction limit. This is characteristic of open access to lake water with a serious threat to sustainability. Naivasha watershed management is affected by numerous and sometimes conflicting legislative frameworks. For example, the Water Act, the Environmental Management and Coordination Act have an expressed mandate to conserve the catchment areas, with each institution claiming the leadership role. With the current harmonization of the natural resources legislation in line with the constitution, conflicting roles on supervision, management, coordination and use will be clearly stated thereby enhancing sustainable use and management of water resources (GoK, 2013).

Leadership

Leadership though better governance, accountability water resources' by increasing allocative efficiency adhering to the local needs and interests, improving efficiency through increased

accountability of local governments, having fewer bureaucratic layers and by providing equitable opportunities for people (WHO, 2005; Omar, 2003). When the power and authority to make decisions where the local people have a direct say on how things are done at the grassroots, equitable distribution of water resources will be tremendously improved. This is because; there will be accountability and direct participation of the people in the running of the day to day activities of the local regional/county governments; UNDP, 2007). Muriu .A.R (2012), notes that equitable sharing of water resources is based on the simple concept of getting resources to where they are needed. Brinkerhoff & Leighton (2010), opinions that, in leadership in water resources allocation systems, district water authorities are often given power to allocate non personnel, non-capital investment funds at the local level to social sector budgets. This flexibility allows for some local priority-setting according to needs within social sectors. Bossert et al, (2002) also observes that in devolution, significant authority and responsibility remains at the center. Functional responsibilities are defined, so that the center retains policy making and monitoring roles, and the periphery gains operational responsibility for day to day administration.

The objectives and principles of effective leadership in government is to promote democratic and accountable exercise of power as well as giving powers of self -governance to the people and enhance the participation of the people in the exercise of the powers of the State and in making decisions affecting them in regard to equitable sharing of water resources (Constitution of Kenya, Chapter 11, 2010). When authority and decision making is taken to the grassroots, decision making will be faster while the people will own the process. This will then lead to improved equitable distribution of water resources, involving a variety

of mechanisms to transfer administrative, ownership and/or political authority for water resources allocation from the central government to alternate institutions, has been promoted as a key means of improving water sector performance (WB, 2009).

Community participation

Community participation involves holding discussions and open forums between community members themselves and with government authorities or non-governmental organizations involved in advocacy so as to contribute ideas for inclusion in policy development and change in operation strategy. They help achieve the implementation of management, making decisions on how to use the available water resources, transfer of relevant management technologies and dissemination of information. The process of community consultation helps in the planning process and may take different approaches, for example, Participatory Rural Appraisal, Participatory Livelihood Assessment or a wider approach through village or area development. The consultation should develop mechanisms of monitoring agreed undertakings and their enforcement (Jaspers, 2003)

It is therefore evident that the Water act 2002 has led to the separation of institutional service, the decentralization of roles and responsibilities while laying emphasis on the participation of communities in resource management. An integrated approach in water resource management using the catchments approach has been developed as evidenced in the formation of the basin authorities. The economic recognition of the value of water is noted. The act also spells out the need for the formation of water user associations within water resource or reservoir areas that shall be responsible for mobilizing communities in water resource management. They

are voluntary associations or forums for cooperating with government systems in enforcing legislation and delivery of services. Since they are forums, they may not be registered. They are a mechanism of providing space for people to discuss and exchange ideas on how to manage their local water resources. The water user associations organize themselves to manage their local resources with which they interact by agreeing on appropriate regulations. Water user associations have common interests such as living near an irrigation scheme, living near water wells or rivers (IUCN, 2002)

The community participation in watershed management in the Lake Victoria Basin has been stimulated by the realization by the community that they are the primary stakeholders in the watersheds where they live. A number of stakeholders can be identified in a watershed. These can be classified as the primary stakeholders who live, own land and use the watershed resources. These are the community and governmental bodies. There are also the secondary stakeholders who are the people who trade with watershed resource owners and obtain commodities such as fish, food products and rice from the watershed. Then there are tertiary stakeholders who include those who live in distant places and receive resources produced from the watersheds such as water consumers in towns, importers of timber products, foods, etc. The recognition of all these categories of stakeholders is useful in the process of watershed management (Ongoro, 2001)

The participation of stakeholders in decision making processes and therefore governance of water resources is a critical strategy in ensuring the sustainability of watersheds in the provision of resources. It can also help in the operationalization process of the new water sector strategy by

governments. Benefit sharing will need to operate between various actors and multiple levels while still ensuring that participating community members receive fair and substantial benefits for their contributions and incurred costs. Criteria for sharing in these benefits may include performance as well as, e.g., tenure, costs incurred, and equality. There may need to be a balance between inclusiveness and performance based criteria. Benefit sharing arrangements should be set in law, as unclear or poorly enforced laws make people vulnerable to losing out. In all cases, benefit sharing laws should allow local actors to appropriately adapt mechanisms to their circumstances. (Hongo, 2001). According to Krista Heiner, Eco Agriculture Partners report (2014) some of the opportunities for the local community include but not limited to the development of rain water harvesting techniques and water pans for water storage,(both on an individual and collective basis) the restoration and establishment of water pans and small dams, training and support for land use planning and management, the development of land use rules within the catchment, for access to resources in the lake, the commencement of stakeholder meetings to address the issue of public access, the development of integrated management plans, and the presence of public-private partnerships to promote more equitable access to riparian resources(GoK, 2012).

Empirical Literature

According to IMF (2003), Communities have identified a strong link between poverty and lack of access to improved water supply and sanitation (WSS) in Kenya's ASALs. Various key documents, notably the NPEP and the National Water Policy (NWP) have articulated this link and set ambitious targets aimed at increasing access to the poor. Despite significant investments, access by the rural population is limited (30%) and declining due to

non-performance of existing schemes (water pans projects). Impact has been more limited on the poor as investments have tended to benefit the better off. In an effort to develop programs that will increase poor people's access to improved water supply as a means of improving livelihoods, the Government need to organize extensive consultations that will result in the formulation rural water supply policy. Government policy is to withdraw from direct involvement in the implementation and management of water schemes and instead, hand them over to communities, local authorities and other service providers. This will be achieved by developing a rehabilitation program with the stakeholders to enhance ownership, and facilitate choice of technologies that are appropriate for management by communities and the other service providers. Handing over also requires clearly defined mechanisms to guide the process, and a functional legal and institutional framework (GoK, 2013). A study conducted by Yusuf & Saff (2009) on planning practices, strategy types, and the performance of indigenous firms in Bahrain and United Arab Emirates (UAE) reveals that despite the firms being long term planners, they do not have a monitoring and evaluation planning process and the majority of the firms are prospectors and analysers. Al Shaikh(2001) conducted a study on 131 firms in UAE to assess the presence or absence of strategic planning within the research context, to test whether relationships exist between strategic planning and firm characteristics, and to investigate who is involved in setting strategic planning. The results reveal that "prevalence of monitoring and evaluation strategic planning practices within this research context is low and not all companies believe in the value of SP. The impact of cultural and environmental factors might be behind such findings. Second, a lack of significant differences between small and large companies regarding planning orientations was related to the cultural

and environmental factors. Furthermore, it refutes the argument that large and old firms are likely to be established and, therefore, will have a clearer sense of vision for the future than smaller and younger firms. The fact that most companies in the Emirates are new should not be ignored, especially in that about 42% of the companies included in the study were 10 years old or less. (Al Shaikh, 2001).

Chiku(2007) conducted a study on factors influencing the effectiveness of monitoring and evaluation processes among local water funding NGOs in Malawi. Results revealed that "the level of implementation of the monitoring and evaluation strategic plans was low. In comparison, the implementation was lower for organizational capacity building activities as compared to project activities. HIV and AIDS NGOs had higher levels of implementation as compared to their human rights counterparts. The major causes of the low implementation were the local NGOs' inadequate financial independence from donors to respond effectively and autonomously to the needs and priorities of their beneficiaries; and inadequate capacity for the boards, management, donors, consultants and communities to effectively go through the strategic planning process (Chiku,2007).

Sustainable access to safe water is estimated at around 60% in urban and 40% in rural settings though missing baseline data and sustainable information systems hinder obtaining a clear nationwide picture and thus, coverage can only be estimated (UNDP, 2013). The main constraint to development, income generation, food security water scarcity in the ASAL areas for example is inadequate equitable water sharing. Since it is not economically viable to plan and implement large piped schemes in these areas, the Government has identified water pans as the most appropriate technologies. The Government proposes rehabilitation and construction of these facilities in partnership with communities and on contract with

the private sector. The improvement packages will include development of proper community water project policies which can on the user training on appropriate land use and range management to avoid environmental degradation to ensure sustainability or these projects for equitable sharing of water resources (IMF, 2013).

RESEARCH METHODOLOGY

Introduction

This chapter discusses the study design and methodology that was used in collecting and analyzing data on the assessment of determinants influencing equitable sharing of water resources in Kenya with a case of Lake Naivasha basin.

Research Design

A research design is the plan, structure of investigation conceived to obtain answers to research questions that includes an outline of the research work from hypothesis, methods and procedures for collecting and analyzing data and presenting the results in a form that can be understood by all (Mugenda & Mugenda, 2008). This study employed a descriptive research. The design would enable the study to combine both quantitative and qualitative research approaches. Qualitative approaches enables collection of data in form of words rather than numbers. It provides verbal descriptions rather than numerical (Kothari, 2009).

The research used this approach because the data to collected using the main questionnaire was quantitative which could be analyzed using statistics. Qualitative approach on the other hand involved interpretation of phenomena without depending on numerical measurements or statistical methods. The design was preferred for it's fact finding and exploratory in the capacity of establishing the truth.

Target Population

The target population in a research is the total number of the individuals in a group that the researcher will be intending to work on Kothari (2004). In this study 371 staff of Water Resource Management Authority(WARMA) - Naivasha Sub-county were used and who were working in the Lake Naivash Riparian Association(LNRA) namely, Upper Gilgil, Middle Malewa, Upper Malewa, Wanjohi, Mukungi, Upper Turasha, Lake Naivasha, Lower gilgil, Mariba, Lower Malewa and Karati. The water resource management authority of this region had come up with these subdivisions as a way to involve communities of this area in water management.

Sample Size and Sampling Technique

A sample size is a set of observations drawn from a population by a defined procedure (Creswell, 2003). Owing to practical difficulties with responses from large survey groups, a meaningful survey sample size had to be determined. An appropriate sample size was calculated. A representative sample size was determined using *Fisher et al*, Sample size calculation formulae (*Fisher et al* 1998);

$$n = \frac{Z^2_{1-\alpha/2} P (1-P)}{d^2}$$

Where;

n = Minimum sample size required

d² = Absolute precision (5%)

α = Level of significance at 95% confidence interval (5%)

Z = Standard normal deviate corresponding to 95% confidence interval (1.96)

P = Assumed proportion of the population with positive attitude towards telemedicine (50%)

Therefore,
$$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 385$$

Total number of the study population (Sampling frame) is 371. This is a finite population since the sampling frame is < 10, 000. Thus applying a finite correction factor (1 / (1+n/N)) the calculated sample size changes as follows;

$$\begin{aligned} n_{fcf} &= n / (1+n/N) \\ &= 385 / (1+385/371) \\ &= 188 \end{aligned}$$

Thus, the minimum number of participants required for the study was to be 188. Cooper & Schindler (2008), states that stratified random sampling is appropriate when obtaining a sample from a heterogeneous population. The study adopted stratified random sampling in the selection of the respondents in the WARMA regions, to eliminate as far as possible, biases in the choice of the sample.

Data Collection Tools and Techniques

The study used questionnaires to collect primary data from the respondents as research tools (Kothari, 2005). Young, (2009) points out that, questionnaires are appropriate for studies since they collect information that is not directly observable as they inquire about feelings, motivations, attitudes, accomplishments as well as experiences of individuals.

Reliability of the research instruments

Reliability is the extents to which a research instrument yields findings that are consistent each time it is administered to same subjects (Mugenda&Mugenda, 2003).The measurement of reliability provides consistency in the measurement variables(Kumar,2000)). Cronbach alpha is the basic formula for determining the reliability based on internal consistency (Kim & Cha, 2002). The standard minimum value of alpha of 0.7 is

recommended Gupta (2004) as the minimum level for item loadings. Higher alpha coefficient values means there is consistency among the items in measuring the concept of interest. Suppose that we assume a sum of K components (K-items or test lets) $X=Y_1+Y_2+.....Y_k$. Cronbach's α

$$\alpha = \frac{K}{K-1} \left(1 - \frac{\sum_{i=1}^K \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

where σ_X^2 the variance of the observed total test scores, and $\sigma_{Y_i}^2$ the variance of component *i* for the current sample of persons.

If the items are scored 0 and 1, a shortcut formula is

$$\alpha = \frac{K}{K-1} \left(1 - \frac{\sum_{i=1}^K P_i Q_i}{\sigma_X^2} \right)$$

where P_i is the proportion scoring 1 on item *i*, and $Q_i = 1 - P_i$. This is the same as KR-20.

Alternatively, Cronbach's α can be defined as

$$\alpha = \frac{K\bar{c}}{(\bar{v} + (K-1)\bar{c})}$$

Where K is as above, \bar{v} the average variance of each component (item), and \bar{c} the average of all covariance's between the components across the current sample of persons (that is, without including the variances of each component).

Data analysis and Presentations

Data analysis is the representation of data gathered during a study (Orodho, 2010). This study gathered both quantitative and qualitative data which was coded and analyzed using Statistical Package for Social Sciences (SPSS) version 22 computer software. Descriptive statistics were used to analyze the data in frequency distributions and

percentages. Qualitative data was analyzed thematically by categorizing them along themes which were guided by the research questions to establish links between data and major patterns that will emerge from the research. Discussions and presentations of the analyzed data were done in tables of frequency distribution, percentages, bar graphs and pie-charts. Measures of dispersion were used to provide information about the spread of the scores in the distribution. The study also used multiple regression analysis and analysis of Variance (ANOVA) to analyze the degree of relationship between the variables in the study. This will provide an indication to the strength and direction of association between the variables. Multiple regression analysis will be used to test relationships between the variables. In this study, the statistical model will be developed from the conceptual framework as follows: the dependent variable (DV) which in the present study equitable sharing of water resources will take the variable [Y], and the coefficients of the independent variables (IV) denoted by X_1, X_2, \dots, X_4 will be used to show the relationship of the independent variables and the dependent variable. Statistically, analysis will be done using the model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where:

- Y = Equitable sharing of water resources;
- β_0 = Constant Term; $\beta_1, \beta_2, \beta_3$ and β_4 = Beta coefficients;
- X_1 = Community Participation;
- X_2 = Monitoring and Evaluation;
- X_3 = Institutional Capacity;
- X_4 = Government policy
- and ϵ = Error term

RESULTS AND DISCUSSIONS

Introduction

This chapter is a presentation of results and findings obtained from field responses and data broken into two parts.

Response Rate

From the data collected, out of the 188 questionnaires administered, 102 questionnaires were fully completed and returned making a response percent of 54.25%. This percentage concurs with Mugenda & Mugenda (2003) who argues that for generalization a response rate of 50% is adequate for analysis and reporting, 60% is good and a response rate of 70% and over is excellent, thus 54.25% was adequate for analysis.

Pilot Test Results

Reliability of a measure indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the instruments. In this study, cronbach alpha which is a reliability coefficient was used to indicate how well the items in the set are correlated to each other. The recommendation for cronbach alpha is that the closer the alpha is to 1 the higher the reliability (Sekaran, 2008). A value of at least 0.7 is recommended. Cronbach's alpha is the most commonly used coefficient of internal consistency and its computed as;

$$\text{Alpha} = \frac{N r}{N - 1}$$

Where

- r = mean inter item correlation
- N = number of items in the scale.

The Cronbach's alpha results were ranging between 0.852 and 0.901 and therefore the construct were acceptable.

Demographic Characterization of the Respondents

The study sought to find out the demographic information of the respondents which included gender, age, marital status and the level of education.

Gender Distribution

The findings as indicated that majority (62%) were male respondents with (38%) being females respondents. The results indicate that the two genders were adequately represented in the study since there is none which was more than the two-thirds.

Age Distribution

From the findings, majority (55%) indicated that they ranged between 41-50 years, followed by those who indicated that they are above 50 years with few (25%) and (15%) and indicating that they were 31-40 years and 20-30 years respectively. This implies that respondents were well distributed in terms of their age during the study.

Level of Education

From the study findings majority (40%) indicated that they had university first degree, followed by those who indicated that they had diploma at (33%) with few (14%) indicating that they had master's degree and (7%) doctorate qualification respectively and this implies that respondents were well educated and that they were in a position to respond to research questions with ease.

Work Experience

The findings as indicated that majority (55%) of the respondents indicated that they had been in the implementation of the water resources management projects over 10 years followed by those who indicated that they had been in the management of water resources for a period of 8-9 years (25%), 15% indicating that they had 5-8 years and with only few (5%) indicating that they had been in management of water resources for a period more than 2-5 years.

Institutional capacity

The study sought to find out whether reforms did increase number of sustainable water sources. The study showed that 70% of the respondents indicated that it ensured that there was

environmental protection and conservation, 65% stated that it ensured that there was transparent service functions to water users, 60% indicated that it recognized users at micro catchment levels, 76% of the respondents posited that the training of technical committee, 55% stated that it reduced risks of the water related conflicts and 58% of the respondents stated that it enhanced decision making and problem solving in the on equitable water resources sharing. This can be deduced that water reforms on the institutional capacity can increase number of sustainable water sources thus equitable sharing of water resources.

Governance on sustainability of water sources

The study sought to find out whether better governance reduced number of water users conflicts in the study area. The study results showed that 78% of the respondents indicated that it ensured that there was environmental protection and conservation, 85% stated that it ensured that there was transparent service functions to water users, 56% indicated that it recognized users at micro catchment levels, 66% of the respondents posited that it enhanced decision making and problem solving in the on equitable water resources sharing. This can be deduced that effective water governance reduced water user's conflicts thus enhancing equitable sharing of water resources.

Leadership

The study sought to find out whether implementation strategy did increase number of sustainable water sources. The study results showed that 86% of the respondents indicated that it ensured that there was environmental protection and conservation, 66% stated that it ensured that there was transparent service functions to water users, 68% indicated that it recognized users at micro catchment levels, 54% of the respondents posited that the training of technical committee, 70% stated that it reduced risks of the water

related conflicts and 56% of the respondents stated that it enhanced decision making and problem solving in the on equitable water resources sharing. This can be deduced that implementation strategy can increase number of sustainable water sources thus equitable sharing of water resources.

Community Participation

The study sought to find out on the key stakeholders with the community involved in open forums and discussions on equitable sharing of water resources. The study results showed that majority of the respondents stated that beneficiaries, 25% stated implementing staff, 44% indicated the donors and 34% of the respondents stated the government. This implies that there was no clear key stakeholders involved for equitable sharing of water resources in the study area. The study results are in agreement with literature review by Otieno(2008) who observed that involvement of stakeholders and community in discussions about on equitable sharing of water resources programs often empowers them and promotes meaningful participation by diverse stakeholder groups which avail to the on equitable sharing of water resources sufficient and relevant information useful for the exercise.

Equitable Sharing of Water Resources

The study sought from the respondents to indicate rate of increase of sustainable water resources in the last five years (2011 to 2015). The study established that the rate of rate of increase of sustainable water resources was low with an average of 20% of the respondents stated that it increased by 10%, with an average of 30% of the respondents indicated that it increased by more than 10%, with an average of 32% of the respondents posited that it increased by less than 10%, with an average of 35 % of the respondents cited that it decreased by 10%, with an average of 25% of the respondents indicated that it decreased

by more than 10% and an average of 23% of the respondents indicated that it decreased by less than 10% in the last five years. The study findings imply that there was low increase of sustainable water resources in the last five years.

Correlation Analysis

Pearson correlation was used to measure the degree of association between variables under consideration i.e. independent variables and the dependent variables. Pearson correlation coefficients range from -1 to +1. Negative values indicates negative correlation and positive values indicates positive correlation where Pearson coefficient <0.3 indicates weak correlation, Pearson coefficient $>0.3<0.5$ indicates moderate correlation and Pearson coefficient >0.5 indicates strong correlation. The analysis of correlation results in the table below illustrates that between institutional capacity and equitable sharing of water resources there is a positive coefficient 0.692, with p-value of 0.008. It indicates that the result is significant at $\alpha = 5\%$ and that if the institutional capacity increases it will have a positive impact on 1.000. The correlation results between leadership and equitable sharing of water resources also indicates the same type of result where the correlation coefficient is 0.901 and a p-value of 0.001 which significant at $\alpha = 5\%$. The results also show that there is a positive association between community participation and equitable sharing of water resources where the correlation coefficient is 0.854, with a p-value of 0.002.

Further, the result shows that there is a positive association between government policy and equitable sharing of water resources where the correlation coefficient is 0.590, with a p-value of 0.012. This therefore infers that leadership contributed most to equitable sharing of water resources followed by community participation in equitable sharing of water resources, then institutional capacity while government policy had the least influence equitable sharing of water resources. The correlation matrix implies that the

independent variables are very major determinants of equitable sharing of water resources in the study area as shown by their strong positive relationship

with the dependent variable; equitable sharing of water resources.

Correlation Coefficients

		Equitable sharing of water resources	Institutional capacity	Leadership	Government policy	Community participation
Equitable sharing of water resources	R	1.000				
	Sig. (2-tailed)	.				
	N					
Institutional capacity	R	.692	1.000			
	Sig. (2-tailed)	.008				
	N	102				
Leadership	R	.901	.567	1.000		
	Sig. (2-tailed)	.001	.098	.543		
	N	102	102	.032		
Government policy	R	.590	.142	.212	1.000	
	Sig. (2-tailed)	.012	.001	.097		
	N	102	102	102		
Community participation	R	.854	.037	.046	.875	1.000
	Sig. (2-tailed)	.002	.000	.001	.543	
	N	102	102	102	102	

* Correlation is significant at the 0.05 level (2-tailed)

Multiple Regression Analysis

In addition, the researcher conducted a multiple regression analysis so as to test relationship among variables (independent) on the equitable sharing of water resources. The study applied the statistical package for social sciences (SPSS V. 22) to code, enter and compute the measurements of the multiple regressions for the study. According to the model summary Table below, R is the correlation coefficient which shows the relationship between the independent variables and dependent variable. It is

notable that there exists strong positive relationship between the independent variables and dependent variable as shown by R value (0.786). The coefficient of determination (R^2) explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable and the four independent variables that were studied explain 61.80% of the equitable sharing of water resources as represented by the R^2 . This therefore means that other factors

not studied in this research contribute 38.20% to the equitable sharing of water resources. This implies that these variables are very significant therefore need to be considered in any effort to

enhance equitable sharing of water resources in the study area. The study therefore identifies variables as critical determinants of equitable sharing of water resources in the study area.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.786	.618	.105	.002

Further, the study revealed that the significance value is 0.001 which is less than 0.05 thus the model is statistically significant in predicting how Institutional capacity, Leadership, Community participation and Government policy affect

equitable sharing of water resources in the study area. The F critical at 5% level of significance was 13.765. Since F calculated (45.860) is greater than the F critical (value = 13.765), this shows that the overall model was significant.

ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	65.908	4	16.477	45.860	.001 ^a
	Residual	34.865	97	.3594		
	Total	100.773	101			

NB: F-critical Value = 13.765; **Predictors: (Constant):** Institutional capacity, Leadership, Community participation and Government policy.

The study ran the procedure of obtaining the regression coefficients, and the results were as shown on the Table 4.9 Multiple regression analysis was conducted as to determine the relationship between equitable sharing of water resources and the four variables. As per the SPSS generated table below, the model equation would be $(Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon)$ becomes: $Y = 23.765 + 0.599X_1 + 0.678X_2 + 0.606X_3 + 0.506X_4$. This indicates that Equitable sharing of water resources = $23.765 + 0.599(\text{Institutional capacity}) + 0.678(\text{Leadership}) + 0.606(\text{Community participation}) + 0.506(\text{Government policy})$. According to the regression equation established, taking all factors into account (Institutional capacity, leadership, community participation and government policy) constant at zero equitable sharing of water resources was 23.765. The data

findings analyzed also shows that taking all other independent variables at zero, a unit increase in institutional capacity will lead to a 0.599 increase in equitable sharing of water resources.; a unit increase in leadership will lead to a 0.678 increase in equitable sharing of water resources, a unit increase in community participation will lead to 0.606 increase in equitable sharing of water resources and a unit increase in government policy will lead to 0.506 increase in equitable sharing of water resources. This infers that leadership contributed most to equitable sharing of water resources. At 5% level of significance, institutional capacity had a 0.009 level of significance; leadership showed a 0.005 level of significance, community participation showed a 0.007 level of significance and government policy showed a 0.010 level of significance hence the most significant factor was

leadership.

Regression Coefficient Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	P-value.
		B	Std. Error	Beta		
1	(Constant)	23.765	.223		2.615	.007
	Institutional capacity	.599	.203	.302	4.098	.009
	Leadership	.678	.150	.654	8.087	.005
	Community participation	.606	.197	.416	5.008	.007
	Government policy	506	.273	.263	2.546	.010

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

The study sought to establish the determinants of equitable sharing of water resources in Kenya. The study examined theoretically and empirically how various variables contributed to equitable sharing of water resources. In assessing the determinants, the study focused on how selected factors (Institutional capacity, Leadership, Community participation and Government policy.) influenced the equitable sharing of water resources. This chapter captures the summary of findings, from which conclusions were drawn and recommendations made.

Summary of the Findings

What is the influence of institutional capacity on equitable sharing of water resources in Kenya?

The study sought to establish whether institutional capacity influenced equitable sharing of water resources in the study area. From the descriptive analysis, the study results revealed that majority of the respondents indicated that water reforms and good governance increase number of sustainable water sources by ensuring that there is environmental protection and conservation, transparent service functions to water users, recognize users at micro catchment levels, training of technical committee, reduces risks of the water related conflicts, enhances decision making and problem solving in the on equitable water resources sharing, a reform reduce water conflicts and it enhanced decision making and problem solving in the on equitable water resources sharing. Further, the study revealed that the variable (Pearson correlation coefficient =.599) and p-value (0.009 < 0.05) statistically, strongly and significantly correlated to equitable sharing of water resources in the study area at 5% level of significance as it had a positive relationship with the dependent variable. This also reveals that the more institutional capacity improves the more the equitable sharing of water

resources in the study area. Therefore, from these quantitative results it can be deduced that the study which sought to establish the influence of institutional capacity on equitable sharing of water resources in the study area was achieved because it established that institutional capacity influences equitable sharing of water resources

How does leadership influence equitable sharing of water resources in Kenya?

From study results, it was established that the implementation strategy, planning and controlling increase number of sustainable water sources by ensuring there is environmental protection and conservation, transparent service functions to water users, recognize users at micro catchment levels, training of technical committee, reduces risks of the water related conflicts, enhances decision making and problem solving in the on equitable water resources sharing. Further, the study revealed that the variable (Pearson correlation coefficient =.678) and p-value ($0.005 < 0.05$) statistically, strongly and significantly correlated to equitable sharing of water resources in the study area at 5% level of significance as it had a positive relationship with the dependent variable. This also reveals that the more leadership improves the more the equitable sharing of water resources in the study area. Therefore, from these quantitative results it can be deduced that the study which sought to establish the influence of leadership on equitable sharing of water resources in the study area was achieved because it established that leadership influences equitable sharing of water resources

How does government policy influence equitable sharing of water resources in Kenya?

From study results, it was established that water act and policy increase number of sustainable water sources by ensuring that there is environmental

protection and conservation, transparent service functions to water users, recognize users at micro catchment levels, training of technical committee, reduces risks of the water related conflicts, enhances decision making and problem solving in the on equitable water resources sharing, a reform reduce water conflicts and it enhanced decision making and problem solving in the on equitable water resources sharing. Further, the study revealed that the variable (Pearson correlation coefficient =.506) and p-value ($0.010 < 0.05$) statistically, strongly and significantly correlated to equitable sharing of water resources in the study area at 5% level of significance as it had a positive relationship with the dependent variable. This also reveals that the more government policy improves the more the equitable sharing of water resources in the study area. Therefore, from these quantitative results it can be deduced that the study which sought to establish the influence of government policy on equitable sharing of water resources in the study area was achieved because it established that government policy influences equitable sharing of water resources.

How does community participation influence equitable sharing of water resources in Kenya?

From study results, it was established that the key stakeholders with the community involved in open forums and discussions on equitable sharing of water resources were implementing staff, donors and government. The normally have stakeholder meetings with the community to discuss on equitable sharing of water resources yearly. The community participation involved to carry out on equitable sharing of water resources is never adequate and equitable sharing of water resources reporting requirements from community is very lenient. The demonstration of the long term impact on equitable sharing of water resources to the community is rarely straightforward straight

forward. Further, the study revealed that the variable (Pearson correlation coefficient = .606) and p-value ($0.010 < 0.05$) statistically, strongly and significantly correlated to equitable sharing of water resources in the study area at 5% level of significance as it had a positive relationship with the dependent variable. This also reveals that the more community participation improves the more the equitable sharing of water resources in the study area. Therefore, from these quantitative results it can be deduced that the study which sought to establish the influence of community participation on equitable sharing of water resources in the study area was achieved because it established that community participation influences equitable sharing of water resources.

Conclusions

The study established that institutional capacity influenced equitable sharing of water resources in the study area. The water reforms on mandated institutions were not clear and could increase number of sustainable water sources by ensuring that there is environmental protection and conservation, transparent service functions to water users, recognize users at micro catchment levels, training of technical committee, reduces risks of the water related conflicts, enhances decision making and problem solving in the on equitable water resources sharing, a reform reduce water conflicts and it enhanced decision making and problem solving in the on equitable water resources sharing.

The study established that there was lack of effective leadership through better governance, accountability water resources' by increasing allocative efficiency adhering to the local needs and interests, improving efficiency through increased accountability of water resources, having fewer bureaucratic layers and by providing equitable opportunities for people When the power and

authority to make decisions where the local people have a direct say on how things are done at the grassroots, equitable distribution of water resources will be tremendously improved.

From the study results, it was established that effective implementation of water act and policy empowers communities to sustainably manage their own resources without permanently damaging, depleting or degrading them. A comprehensive institutional framework for the management of water resources in Kenya can enable to alleviate constrains that affect the development of the water sector especially on shortage of funds for development, operation and maintenance of water supplies and management of water resources; institutional weaknesses thus affecting equitable distribution of water resources.

The study established that community participation should involve discussions and open forums between community members themselves and with government authorities or non-governmental organizations involved in advocacy so as to contribute ideas for inclusion in policy development and change in operation strategy. The stakeholders are not well involved thus affecting decision making in regard to management of water resources.

Recommendations

The study recommends policy to enhance institutional capacity in the water sector. The water reforms on mandated institutions were should be clear to increase number of sustainable water sources by ensuring that there is environmental protection and conservation, transparent service functions to water users, recognize users at micro catchment levels, training of technical committee, reduces risks of the water related conflicts, enhances decision making and problem solving for equitable water resources sharing.

There is need to have better leadership by having better governance for accountability of water. This can be done by delegating the power and authority to make decisions where the local people have a direct say on how things are done at the grassroots as the equitable distribution of water resources will be tremendously improved in the area.

The study recommends for effective implementation of water act and policy to empower communities to sustainably manage their own resources. A comprehensive institutional framework for the management of water resources could alleviate constraints that affect the development of the water sector especially on shortage of funds for development, operation and maintenance of water supplies and management of water resources; institutional weaknesses to boost equitable distribution of water resources.

The study recommends for strategy to accommodate community participation in management of water resources through discussions and open forums between community members

themselves and with government authorities or non-governmental organizations involved in advocacy so as to contribute ideas for inclusion in policy development and change in operation strategy to enhance equitable sharing of water resources.

Recommendations for Further studies

Since this study sought to establish the determinants of equitable sharing of water resources in Kenya, it was established that from literature review that there are scanty studies available on factors influencing equitable sharing of water resources especially in Rift valley region, Kenya. Therefore, study recommends for similar studies to be undertaken in other areas for generalization of the findings of this study. Additionally, the study did not tie the determinants as the only factors influencing equitable sharing of water resources in the study area. Thus, there is need to undertake another research to examine the other factors which could be influencing equitable sharing of water resources in Kenya.

REFERENCES

- Britton, J. R., Boar, R. R., Grey, J., Foster, J., Lugonzo, J., & Harper, D. M. (2007). From introduction to fishery dominance: the initial impacts of the invasive carp *Cyprinus carpio* in Lake Naivasha, Kenya, 1999 to 2006. *Journal of Fish Biology*, 71(sd), 239-257.
- Coggon D. Rose G. and Barker D. (1997).Epidemiology for the Uninitiated: Case-control and cross sectional studies. *British Medical Journal*
- Collier, P., &Hoeffler, A. (2004).*Conflicts*. Cambridge: Cambridge University Press.
- Costanza, R. (2007).*Sustainability or collapse?an integrated history and future of people on earth*. Cambridge, Mass.: MIT Press in cooperation with Dahlem University Press.
- Dail, S. (2010).*The art of SukhdevDail*. Pacific Grove, CA: SukhdevDail.com.
- Deutsch, M. (2000).*The handbook of conflict resolution theory and practice*. San Francisco, Calif.: Jossey-Bass.
- Gitobu, Julia (Nov-2001): Gender, Environment Management and Conservation. A case of the Lake Victoria region. Paper Summer School 2005 Ong'or 140 FWU, Vol. 3, Topics of Integrated Watershed Management – Proceedings presented at East African Conference of Women Researchers and Conservation practitioners, Kisumu, Kenya.
- Government of Kenya (2002): Kenya gazette supplement, The Water Act 2002.
- Government of Kenya (2003): Towards a water-secure Kenya. In: Water Resources Sector Memorandum. Government Press, Nairobi, Kenya.
- Grafton, Q. R., & Hussey, K. (2011).Water Resources Planning and Management. New York: Cambridge University Press
- Hongo, H. And Masking M. (2001): Impact of livestock grazing to fringing wet-lands of Lake Victoria. In a report of the Regional Scientific Conference, 3-7 December 2001.
- International Union for Conservation of Nature (IUCN) (June 2002): Cross border trade and Fishing in Lake Victoria. Network of Environmental Journalists (NEJLV) Fact sheet No. 1, June 2003.
- Jaspers F.G.W. (2003): Institutional arrangements for Integrated River Basin Management. Water Policy No.5.Journal of the World Water Council.Alexandra U.S.A., pp.77-90.
- Lacoul, P., & Freedman, B. (2006). Environmental influences on aquatic plants in freshwater ecosystems. *Environmental Reviews*, 14(2), 89-136.
- Lake Naivasha Management Committee (2004): Lake Naivasha Management Plan.

- Marcouiller, D., & Mace, T. (1999). *Forests and regional development: Economic impacts of woodland use for recreation and timber in Wisconsin*. Madison, Wis.: University of Wisconsin--Extension, Cooperative Extension.
- Mekonnen, M., & Hoekstra, A. (2010). *Mitigating the water footprint of export cut flowers from the Lake Naivasha Basin, Kenya*. Delft: UNESCO-IHE.
- Mezirow, J. (2000). *Learning as transformation: Critical perspectives on a theory in progress*. San Francisco: Jossey-Bass.
- Mugo F.; Swallow. B And Place F. (2004): *Improving Land Management in the Lake Victoria Basin*. ICRAF Nairobi, Kenya.
- Munasinghe, M. (1993). *Environmental economics and sustainable development*. Washington, D.C.: World Bank.
- National Environment Management Authority (2004a): *State of Environment Report for Kenya* (unpublished Report).
- National Environment Management Authority (2004b): *Lake Naivasha Environment Management Plan* (unpublished).
- Okungu. J. (2002): *Water resources management in the Nyando basin: In Proceedings of a workshop on Reversing Environmental and Agricultural Decline in the Nyando river basin*. ICRAF, Kisumu, Kenya.
- Olaka, L. (2010). *Hydrology across scales sensitivity of East African lakes to climate changes*.
- Ong'or D.O. et.al. Ed. (2001): *Community conservation Initiatives. Towards livelihood security in the Lake Victoria Basin. Issues, problems and opportunities. A proceeding report*.
- Republic of Kenya (2002): *Water Act*. Nairobi, Government Printer.
- Rural Focus (2002): *Lake Naivasha Water Resource Management Programme* (unpublished report).
- Durkheim, E. (1938). *The Rules of Sociological Method*. Chicago: The University of Chicago Press. p. 67
- Sears, A. (2005). *A good book, in theory: A guide to theoretical thinking*. Peterborough, Ont.: Broadview Press.
- Weber, T. (2004). *Gandhi as disciple and mentor*. Cambridge: Cambridge University Press.
- Lake Naivasha basin integrated management plan 2012-2022