

**INCENTIVES IN GOVERNANCE OF WATER RESOURCES TO MITIGATE
IMPACTS OF DAMS ON LIVELIHOODS: A CASE STUDY OF CHEBARA,
ELGEYO-MARAKWET COUNTY, KENYA**

By

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DECLARATION

I declare that this research thesis is my original work and has not been presented for examination in any other university

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Appendix 1. Household Survey Questionnaire and Key Informants Checklist

List of Abbreviations

ELDOWAS	Eldoret Water and Sanitation Company.
IUCN	International Union for Conservation of Nature
UNEP	United nations environmental program
UNESCO	United Nations Education Scientific and Cultural Organization
KNBS	Kenya National Bureau of Statistics
SDG	Sustainable Development Goals
WHO	World Health Organization.
WCD	World commission on Dams
UNICEF	United Nations international Children's Education Fund
UN	United Nations
SPSS	Statistical Package for the Social Sciences
SAPs	Structural Adjustment Programs
IWRM	Integrated Water Resource Management

Abstract

Studies have shown that dams have unexpected adverse impacts on the livelihoods of local communities. The overall objective of this study was to analyze water governance, using both qualitative and quantitative methods, the impacts on the livelihoods that Chebara dam has had on the local community. Primary data was collected through household surveys from 100 respondents including key informant interviews and participants observations. The 100 respondents were randomly selected to represent the target population, of 271 households, living at about 5 kilometers radius from the dam within Chebara region. Chebara region is located in Elgeyo-Marakwet county, about 390 km northwest of Nairobi. Secondary data was collected from published articles, books and government reports. Qualitative data was analyzed by comparison with case studies of stakeholder relationships and thematic analysis whereas quantitative data was analyzed through household survey data revealed that the community derived social and economic benefits from the ELDOWAS limited. The results indicate that about 68% of those interviewed reported that they have benefited from ELDOWAS through social amenities such as schools, hospitals, dispensaries, roads. Ecologically, 81% of the community had no idea there was any conservation and re-forestation done by ELDOWAS, and those who were aware were dissatisfied. However, about 3% of the respondents had been employed or had a member of their family employed directly by ELDOWAS. About 6% of the households' interview received water from ELDOWAS, however the water supply was irregular. of the respondents 4% said the water received was regular at an average of 2-week intervals. There was a significant correlation ($R= 0.684$) between water source and gains from the dam from the community members who received piped water, there was also better access ($R=0.815$). In conclusion, the Chebara dam has been beneficial to the local communities through trainings, access to water and capacity building geared towards water conservation. This study recommends that

while the dam has been beneficial to the community, there needs to be a continuous community-based plan for sharing benefits from the dam.

CHAPTER ONE: INTRODUCTION

1.0 Background Study

Incentives in natural resources, according to Lin & Chang (2011), could be used to encourage community participation, resource and benefit sharing, foster cooperation among different stakeholders and most importantly emphasize the need to conserve natural resources. The Natural resources/ benefits sharing Act 2014, suggests that incentives should be availed equitably and fairly to all stakeholders, with special considerations to local communities and minority groups withing communities.

A study by Scudder in 2005 found that communities displaced by dams and living near dams are generally impoverished (Scudder 2005). However, all dam sites are quite different, with communities facing different challenges and having different needs. There is therefore needs to study if the community in Chebara has benefitted in any way as a result of creation of the dam (Foley, 2019). African dams rarely have environmental impacts done before construction is done, leading to unfathomable consequences to communities living around the dam and those displaced by the dam as well. A study by IUCN for example in the Rufiji dam in Tanzania showed that the social and ecological impacts were never studied nor properly documented (IUCN, 2019). Whereas, rivers are common within the community, dams are manmade and therefore communities need to adapt to the dam's effects on their livelihoods. The construction of dams on upland areas, which has low population density often have effects on indigenous people whose voices are rarely heard (Schapper & Urban, 2020).

Water management approaches such as IWRM have been adopted in many developing nations countries including Kenya (Grigg, 2016). The incentive creation program is an important precondition for their functioning but has been widely neglected. Benefit sharing as an incentive

mechanism can enable stakeholders to enjoy different benefits derived from water resources rather than physical water per se. Benefit sharing, a mechanism of providing incentives in governance of water resources ensures all stakeholders benefit from cooperation. However, lack of enjoyment of incentives by stakeholders mostly communities undermines collective action because some water resources have become zero-sum where gains by a one stakeholder or country results in loss to other stakeholders. Viewed through a Boserupian lens, benefit sharing opens the possibility of expanding the size of the 'cake' so that all users can gain from effective water utilization (Mapedza *et al.*, 2011). Some researchers argue that the concept of resource benefit sharing seems straightforward and logical, however, the application of the concept in real-time is quite difficult especially where different communities are involved since an incentive to one group cannot be an incentive to another group (Svendsen, 2001; Fischer *et al.*, 2004; Huppert, 2007).

1.1 Statement of Research Problem

According to the World Commission on Dams (2016), ‘People adversely affected by dam projects should be the first to benefit from the project. Appropriate mechanisms should be introduced to ensure equitable distribution of development opportunities generated by the dam’. Revenue sharing from a large dam has been successfully done in Japan where farmers were given cash in terms of rent and trained on agricultural practices.

Water is a basic commodity that should be accessible and adequately available for all individuals. For this to happen, water reservoirs are typically created in less inhabited uplands leading to displacement of communities originally living in these said areas (Kaneti, 2020). Communities living near large dams bear the most impacts on the livelihoods for the existence of dams within their locality and should ideally therefore, be the first beneficiaries of the revenues generated from these reservoirs (Mokorosi and Van der Zaag, 2007). Reservoir authorities can fund mutually beneficial projects, including village-level electrification and environmental services schemes, in which resettled populations are paid for forest maintenance and protection, to prevent erosion and deforestation. Reservoir access can also be provided for fishing, aquaculture and agriculture (Singer & Watanabe, 2015). Studies have been undertaken on operation of incentives in Integrated Water Resource Management (Mapedza *et al.*, 2011; Huppert, 2007).

As dams are often built in relatively impoverished, less populated upland regions by outside investors, the electricity supplies, and revenues commonly accrue to distant urban and industrial centers, leaving few benefits for local residents. (Johnston., 2012).

Nakayama & Furuyashiki (2009) and Mkorosi & van der Zaag (2007) noted in an analysis of two dam projects in southern Africa, however, that although benefit-sharing is often upheld as an ideal, the reality is that the affected people tend to mainly enjoy indirect benefits such as community services or livelihood assistance, with the most vulnerable. It is, of course, important to bear in mind that every dam and dam site is different (Foley *et al.*, 2017) and therefore research needs to be conducted to see if communities living around Chebara dam, Elgeyo Marakwet county, would benefit both directly and indirectly as a result of having the dam in their locality, and if the benefits result in positive ecological outcomes.

1.2 Research Questions

1. What are the types of incentives used to foster collaboration between all water stakeholders in ELDOWAS?
2. What are the benefits derived by communities from the ELDOWAS?
3. How are the benefits from the revenues generated by the ELDOWAS shared?
4. How do the incentives affect communities' socio and economic wellbeing and environmental conditions around the dam?

1.3 Research Objective

The overall objective of this study was to analyze natural resource governance, specifically water, by assessing the incentives used for benefit sharing of revenues collected by the ELDOWAS, at Chebara, Elgeyo-Marakwet County.

The specific objectives were to;

1. Examine the types of incentives used to enhance collaboration between all stakeholders
2. Assess the benefits derived by communities from the Eldoret Water and Sanitation Company Limited

3. Assess the effect of incentives on communities' socio and economic wellbeing
4. Assess the impacts of the incentives on the environmental conditions around the dam.

1.4 Justification

Communities living near dams suffer the biggest impacts on their livelihoods as a result of creation of the dam and should be the first beneficiaries of resources gotten as a result of construction of the dam (Singer and Watanable, 2014, Schulz and Adams, 2019). Various studies have shown however, that this isn't the case and communities living in upland areas are mostly impoverished as a result of dam construction in their locality (Scudder 2005). Different dams have different communities with various albeit different needs and therefore, there is need to study if the community in Chebara has benefitted in anyway as a result of the construction of the dam. (Foley *et al.*, 2017).

Benefits sharing is aimed at not only improving community social and economic welfare but also improving the environment. Therefore, benefit sharing schemes shouldn't be one-offs but rather continuous (Johnstone, 2012; Foley *et al.*, 2017) there is therefore need to study if the community living around Chebara dam continually benefits from the dam. (Haas, 2009). Benefits from dams should also be availed to the community by the dam managing authority and studies should be done to see the effects if any of the dam on local communities (Skinner *et al.*, 2009).

Chebara was specifically studied because it is the largest water dam providing water for ELDOWAS. Case studies in West Africa showed that although dams create significant economic development opportunities, the financial benefits they generate are mostly enjoyed by urban dwellers with insignificant portion left to the local community and local authorities (Skinner *et al.*, 2009). In Burkina Faso for example 40% of the revenue is used for local community improvement (Skinner *et al.*, 2009). Therefore, there is need to study if there is a percentage of revenue dedicated to community welfare by ELDOWAS.

Eldoret is one of the fastest growing towns in Kenya (KNBS, 2018) The revenue collection efficiency since ELDOWAS took over from Eldoret Municipal Council increased from 62% when water provision was being managed by Eldoret Municipal Council to 85% by ELDOWAS. In context to the whole country, 85% is quite high compared to the national average which is from about 50% to about 70%. In the financial year that ended in 2017, ELDOWAS had an outstanding profit of 180,354,195 million according to the office of the auditor general. Therefore, it is essential to study if communities have benefited from ELDOWAS because audit reports suggest ELDOWAS is quite efficient and profitable perhaps the best run water company in the country (Kipkosgei, 2018; Muuma, 2006).

This study is aimed at understanding the various benefits if any accrued by the community as a result of creation of the dam in Chebara. It also aimed to understand the governance of water resources and revenue sharing from natural resource collected in one place but rather enjoyed in another place. The community would benefit from this study because it will clearly form a platform of understanding the role communities play in management of natural resource projects within their localities which they themselves aren't the biggest beneficiaries of the harvested resource but bear the biggest impacts for the resource to be harvested or collected.

The company would also benefit in understanding ways in which it can improve the community livelihood, how to improve the community participation and what can be done to enhance collaboration between the various stakeholders. The company would also understand the community perception towards them and how company can be improved through effective collaboration between the various stakeholders for better social, economic and ecological outcomes.

1.5 Scope and Limitation of the Study

The scope of this study was Chebara center and Chebara dam a radius of 5 km from the center of the dam. This study was conducted through households' surveys, observations and secondary data sources.

This study was only limited to the study of incentives: infrastructure, schools, hospitals, trainings and other benefits accrued by the community as a result of the dam being in the location and the effects that these said incentives have on the ecosystem.

The assumption used was that there were no benefits to the community as a result of investment in the creation of the dam and also from the water resources collected in the dam and the surrounding catchment area of Chebara. The number (271) of the total households in the five-kilometer radius was based on the nyumba kumi list available at the chief's office (Key informant I). Although the study can be done in another dam site, Chebara was the only dam studied because of the effectiveness of ELDOWAS in collection of revenue and also the profitability of the company compared to other water companies in the region (Auditor General Report, 2017). Although Chebara was the only dam studied, it is possible to study other dams managed by ELDOWAS, however, Chebara was chosen because it is the major source of water for ELDOWAS and Uasin-Gishu county providing over 80% of the water.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter explored the literature review of topics related to the research questions of this research study. The literature review discussed peer-reviewed articles that discuss about trans-boundary water-related conflicts, laws governing water use and privatization, incentives in natural resource management, collaborations in management, benefit-sharing mechanisms, citizen involvement in natural resource management, and water stress, use and accessibility. This chapter also explored the theoretical and conceptual framework for this research.

2.1 Access and Benefits Sharing of Natural Resources

Access and Benefit Sharing Agreement as explained by the Nagoya protocol is an agreement that defines the fair and equitable sharing of benefits arising from the use of natural resources. (Robinson, 2014). After the Rio conference of 1992, access and benefits sharing came to the fore front. However, it wasn't until 1998 when a panel of experts clarified and set principles and concepts related to benefits sharing. In 2000 an ad-hoc open-ended committee was setup to facilitate the implementation of guidelines for access and benefits sharing.

Communities living near large dams bear the most burden for the existence of dams within their locality and should ideally therefore, be the first beneficiaries of the revenues generated from these reservoirs (Mokorosi and Van der Zaag, 2007). Reservoir authorities can fund mutually beneficial projects, including village-level electrification and environmental services schemes, in which resettled populations are paid for forest maintenance and protection, to prevent erosion and

deforestation. Reservoir access can also be provided for fishing, aquaculture and agriculture (Singer and Watanabe, 2015).

Although access and benefit sharing are an ideal and should be practiced, various literature have shown that in practice with regards to dams there is little to no evidence of this. Communities are often neglected and ignored leading to impoverishment of communities living around the dams. (Nakayama & Furuyashiki, 2009; Mokorosi & van der Zaag, 2007).

A study of 50 dams by Scudder in 2005 showed that communities rarely get any benefits from the dam management authority leading to impoverishment of communities as well as destruction of natural resources (Scudder 2005) a study in west African dams showed that there is little improvement of communities as a result of creation of dams in their localities (Skinner 2009). Benefits sharing is one of the most effective ways of community improvement and community involvement in management of resources. (World commission on dams 2000). World commission on dams in 2016 recommends that although communities living near dams bear the greatest impacts as a result of the dam and should therefore be the first beneficiaries of any resources harvest from the dam, be it electrical, agricultural or drinking water (World commission of Dams 2016).

2.2 Trans-boundary water related conflicts globally and in Kenya

Globally, there were about 276 water basins and 295 ground water aquifers that cross political boundaries. For example, the Amazon, the Nile and the Danube, which made water the most shared natural resource globally (Block & Nelson, 2016). Naturally, human populations tend to grow within river basins. About ¼ of the world's population relies on ground water which is transboundary (Block & Nelson, 2016). With shared resources globally, there is a tendency for conflicts in use and management to occur between the various stakeholders. There are two schools of thought on conflict

and poverty where one argues that poverty causes conflicts whereas another argues that conflict causes poverty.

However, what was clear was that poor governance of natural resources results in both poverty and conflicts as had been the case with water and counties (Gurr *et al.*, 2001). According to Beach *et al.*, (2001), while conflicts on natural resources are common it is more often that the resources when sustainably used are sufficient for everyone. Nevertheless, bad governance which manifests through: lack of access, lack of benefits sharing and misinformation and lack of community involvement among other things results in misuse of resources, poverty and degradation of resources and conflicts (Erwin, 2002). Regionally, there are common water disputes, the Arab-Israeli, the Nile Basin and the Tigris-Euphrates, along with a number of other water-related conflicts. Other conflicts that have been experienced are between African countries such as Ethiopia and Egypt during the construction of the great renaissance dam by Ethiopia (EcoPeace, 2018).

In Kenya, the formation of counties led to flare up between counties as a result of shared water resources as exemplified in the Ewaso basin and Tana-river basins. (Mutiga *et al.*, 2010). This study was done in Elgeyo-Marakwet with the aim of establishing the governance perspectives in place for collaboration between the community and the company and the effects it had on the social, economic and ecological aspects of the community.

2.3 Laws Governing Water Use and Privatization/Commercialization and Its Impacts On ELDOWAS.

Globally, universal humanitarian policies recognize access to safe and clean water as a basic human right. Globally, The Lisbon charter is a well-known public policy framework of recommended

measures and regulation in drinking water supply, sanitation and wastewater management services. This charter is made up of five key principles for public policy and regulation on water and wastewater services. This charter through the international water organization has been translated to suit various regions and countries with the aim of sustainable development of the water sector and achieving the SDG 6. The main premise of the Lisbon Charter was that the reliable supply of safe, affordable, acceptable and accessible drinking water and sanitation, and the sustainable and safe management of wastewater are fundamental to the health of communities and to their sustainable socioeconomic development. Interestingly, the charter clearly states that stakeholders in water sector have to keep open and honest communication channels, with honesty and transparency with a view of compromise on conflicting interests (Lisbon Charter 2014).

In Kenya, the Constitution of Kenya (2010) states that water is a devolved function that is managed at the county level. The constitution just like the Lisbon charter recognizes the importance of water partnerships for sustainable development. It recognizes that safe and accessible water is a basic human right and charges the 47 counties to ensure that the citizens have access to water. Upon the realization that privatization would lead to improved services, the 1974 water acts underwent reforms in 1999 and 2002 through The State Corporations Act (2002), Chapter 446, Laws of Kenya. The aim of the 2002 water policy was to establish the role of the government as the regulator and delegated the services to the communities, municipalities, and other private actors. (Mumma, 2005).

However, despite the delegation to increase water access, by 2000 more than half of the population lacked clean water. Privatization was seen as a method of improving services and access to safe water (Fine & Bayliss, 2008). The Water Act 2002 then established several institutions that included the Minister, the Water Resources Authority, Catchment Boards, Regional Water Committees, the

Water Apportionment Board, Local Water Authorities, and Water Undertakers but it was not enough to solve the problems of lack of water. In 2010 with the new constitution there was need to amend the water act 2002 to make it compatible with the constitution. As a result, we now have the Water Act 2016 which outrightly devolves the provision access, and management of water resources to private firms.

Privatization led to formation of publicly owned institutions which manage water and sewerage on behalf of various regions. Privatization led to establishment of companies such as Eldoret Water and Sanitation (ELDOWAS) Company, Nakuru Water and Sewerage Company, Nairobi Water and Sanitation Company among many others. Some of these privatized water companies have been really successful such as Nyeri, Eldoret and Kisii water companies. Therefore, the general perception is that more people have had access to water because these companies were privatized. For instance, as at 2004, according to UNESCO and WHO reports, 61% of the total population had access to portable water and this figure has been rising in part due to the efficiency of private companies compared to the bureaucratic inefficiency of the defunct National Water Conservation and Pipeline Corporation.

According to the UN Habitat review of water and sanitation in cities (2003), just like in other African contexts, the way out chosen by the Kenyan Government in the 1980s and 1990s as part of the implementation of Structural Adjustment Programs (SAPs) was to privatize public sector enterprises, including public water services. Privatization in the water sector just like in other sectors has had profound effects on improved service delivery. Globally, water was always seen as a public resource and not a market commodity and therefore, privatization and provision of water services by multinationals is seen as a recent trend.

Additionally, collaborations between governments, local communities and water companies are to ensure communities get water because as pointed out by case studies such as in Buenos Aires, Atlanta and Manila, private companies are more often than not interested in money and not the wholesome need for social, economic and ecological development of the communities whose jurisdiction lies the natural resource and water services provided (Peda *et al.*, 2011). Privatization of water companies in Kenya begun in three towns Nyeri, Eldoret and Nakuru (K'Akumu & Appida, 2006). This involved changing of policy to allow for privatization of water companies. (K'Akumu & Appida, 2006) Initial studies suggest that privatization was donor driven and was bound to fail as the created agencies still had the same bureaucracies which privatization aimed to solve. curiously also, corruption and poor provision continued although there were marked improvements in revenue collection and water loss was reduced as evidenced by Eldoret water and sanitation company. Therefore, there is need to study if the improvement in revenue collection as a result of privatization of ELDOWAS resulted in community improvement (K'Akumu, 2015).

2.4 Incentives in management of natural resources

Incentive theory states that humans are pulled towards some actions which lead to both materials, for example financial rewards and non-material rewards like titles (Armstrong, 2015). Incentive theory has been built upon the drive theory of psychologist Clark Hull, which suggest that incentives are tools used in governance to encourage positive behavior. With regards to water resources, incentives can be used to; encourage community participation, resource and benefit sharing, foster cooperation among different stakeholders and most importantly emphasize the need to conserve natural resources (Fehrenbacher, 2013).

Commonly, incentives have been divided into four categories; remunerative and financial, moral, coercive, and finally natural and intrinsic incentives (Dalkir, 2013). Globally, incentives have been used with varying degrees to empower communities, develop infrastructure, conserve the environment and avert conflicts. In India, for instance, the Maoist Movement was involved in conflict because there was abundant windfall from natural resources but the communities didn't get much from it and also the community had significant cultural attachment to the ecosystem especially water resources which were degraded as a result of liberalization of the mining sector (Kennedy, 2014). Payment for ecosystem services is an attachment of economic value to natural resources with the thinking that those who benefit from natural resources should pay those who provide or protect the natural resources (Chalise, 2008).

This payment for ecosystem services approach has been successful because it generates revenue and rewards the providers and protectors of ecosystem services (Thapa, 2016). Reduced emission from deforestation and forests degradation commonly called RED+ program has been used as an incentive tool globally and regionally to encourage conservation, which is another way that community's benefit from conserving natural resources, although this is mainly in the forestry sector. Where carbon trades are done between communities and companies to incentivize the communities to keep forests for the greater global good (Myers, 2007). French company Veolia, which is the biggest water company in the world positing revenues of more than 12 billion Euros uses incentives as a mechanism for conservation of water resources (Alex, 2011). Veolia uses an amount equivalent to 87% of it is running expenses in conservation activities which are mainly aimed at community empowering and partnering for sustainable use of water resources (Veolia Financial Publications, 2019).

In addition, Veolia in an attempt to support entrepreneurship through corporate social responsibility, applies new relationship-based incentive models. (Veolia CSR, 2019). Locally, a good example used by water companies such as ELDOWAS is the “User Pays Polluter Pays” principle where a value is attached to water with the aim of making people conceptualize the value of natural resources which would otherwise be misused.

Another incentive used in conservation is payment for ecosystem services. The concept behind this incentive is that there is attaching of economic value to the services provided by ecosystems, which results in positive ecosystem outcomes (Engel *et al.*, 2008). Perhaps Veolia CSR approach of using a value (87%) of its total expenses could be implemented by ELDOWAS and other water companies in Kenya to ensure the community, company and employees know the total amount to be used for CSR. This value could be beneficial in the case of water companies pushing it towards conservation of water towers, improving infrastructure and improving social amenities in communities inside water catchments.

2.5 Collaboration in management of natural resources

Collaborative management of natural resources, which is defined by Food Agricultural Organization (2019), as shared decision-making over natural resources by the State and resource users such as communities. A natural resource, according to Oxford dictionary (2019), is defined as resources which exist not as a result of creation of mankind. They could be seen as a gift of nature and are broadly categorized as being either renewable or non-renewable. Water is a critical natural resource which is renewable but population growth, climate change, misuse, poverty and poor planning may have made water scarcity increase especially in less developed countries.

Nevertheless, natural resources as defined above have vested interests from various stakeholders all of whom have different uses, needs, and perceptions and since water is a gift from nature, one cannot deny any one the right to access and its use (Basco-Carrera *et al.*, 2017). Even the Constitution of Kenya (2010) clearly states that everyone has a right to clean and safe water in adequate amounts. Different stakeholders having different points of view have to be considered for harmony in management of water and natural resources.

Locally, in the case of water in Chebara dam, the community plays a role in management of the catchment, ELDOWAS manages, treats and distributes the water. The residence in various part of Eldoret town benefit from the water, both Elgeyo-Marakwet and Uasin-Gishu county, have a stake in the water management and use, various other stakeholders are involved both actively and passively, and all the views of these stakeholders must be considered so as to reduce conflict and maximize both social and economic benefits from the dam and its catchment.

However, with all the stakeholders in mind there has been a tendency to focus on the social and economic perspective of benefits accrued from natural resources. Studies tend to focus on the above-mentioned aspects with regards to governance of natural resources through collaboration (Bjärstig, 2017). There is need to study if collaborations result in positive ecological outcomes or negative ones. The collaborations may also not result in full community participation, as pointed out by Mutune and Lund (2016), where Kenya forest service collects the revenue at the Eastern bloc of the Mau forest and the community benefits minimally from other indirect sources. Additionally, the Kenya Forest Service (KFS) fully owns and controls licensing, and right to access, which implies that licenses from community members can be withdrawn at any point in time as deemed fit by the

Kenya forest service. With this in mind there is need to determine whether communities' benefit from the natural resources in their locality and if collaborations result in positive social, economic and environmental outcomes. Privatization of water companies in Kenya begun in three towns Nyeri, Eldoret and Nakuru (K'Akumu & Appida, 2006). This involved changing of policy to allow for privatization of water companies. (K'Akumu & Appida, 2006) Initial studies suggest that privatization was donor driven and was bound to fail as the created agencies still had the same bureaucracies which privatization aimed to solve. curiously also, corruption and poor provision continued although there were marked improvements in revenue collection and water loss was reduced as evidenced by Eldoret water and sanitation company. Therefore, there is need to study if the improvement in revenue collection as a result of privatization of ELDOWAS resulted in community improvement. (K'Akumu, 2015).

2.6 Benefit-Sharing Mechanism in Management of Natural Resources

A community has different groups of people who also have different perspectives with regards to use, management and conservation of natural resources. Water is a critical natural resource that is essentially important for communities to survive and therefore communities need to be involved in management, use and conservation of water resources. As had been pointed out, one aspect of good governance is access and benefit sharing through transparent and just use of natural resources. Transparency and community involvement often lead to conservation.

In Ghana, the government collects revenue from mining companies' worth about 131.2 billion dollars. To encourage economic development and facilitate transfer of wealth acquired, the government divides this income as follows: 80% goes to support of mining and mining related

activities and budgetary allocation for support of mining, 10% is used for mineral development fund and compensation of communities for the cost of mining and the remaining 10% is transferred to the office of administrator of stool lands, who in-turn transfers the cash directly to beneficiaries (Standing, 2014).

Additionally, according to Standing (2014), other successful cash transfers done in the past include instances like in Alaska forty years ago for purposes of conservation and restoration of the environment. These cash transfers would in an ideal situation result in reduced poverty, improved conservation and consequently, better governance because governance advocates for benefits-sharing access and transparency among many other key pillars of governance (Ibrahim & Yeboah, 2014). However, despite cash transfers having been proven to be successful in countries such as Alaska in the 70s, Ghana has been having cases where the transfers have not been particularly a success (Barrientos, 2005). These problems, which include poor resource and benefits sharing, in the sub-Saharan Africa have resulted in subsequent conflicts (Cerami, 2013). According to Rabirot (2004), when executed correctly, benefit-sharing can eliminate these conflicts.

In the case of Kenya, lack of transparency and poor governance have been an issue. Poor resource sharing is always a sure route to conflicts as has been witnessed in Kenya with the perennial land and tribal clashes ("KENYA: Tribal Clashes," 2014). Tensions and conflicts are guaranteed to stop development and lead to degradation of the environment (Campbell 2003). Bold moves need to be made to ensure such dividends are transferred to communities. Poverty reduction through cash dividends transfers is very possible and practice (Department for International Development, 2011). As has been pointed out by Armitage (2012), water companies are some of the most profitable companies. In the UK water companies have faced massive cash inflows and high dividends paid out

to investors. This borrowing has caused the investors to demand for dividends (Armitage 2012). Just like ELDOWAS, water companies in the UK make huge profits but unlike ELDOWAS, the UK companies are publicly traded companies in the London stock exchange. These companies pay large dividends to its shareholders (Armitage, 2012). The Water companies in the UK just like in Kenya are natural monopolies and their willingness to pay dividends is driven by various factors such as profits and demands from investors and also to attract investors.

Additionally, as pointed out by Moss (2014), oil to cash approach could provide a solution against the common resource curse as a result of windfall from mining of natural resources. Several African countries have natural resources such as oil and some of these minerals earn the respective countries huge amounts of revenue. However, the revenue collected has more often than not benefited a small group of elite people in the said resource mining countries. Oil and other sources of unearned income in African countries are believed to drive corruption, expand wealth gaps, political suppression and even conflict (Moss, 2014). This tragic state is far too common especially in less developed economies nonetheless, various countries still fall into this category and as a result we have countries rich in minerals but their people still languish in abject poverty (Walder, 1998).

According to Moss (2014), for there to be effective cash transfers from oil, the following three Steps of Oil-to-Cash must be accomplished. The first is that there has to be creation of a separate fund to receive windfall revenues. Secondly, there has to be formulation of clear rules for sharing dividends logically directly to the local citizens. Thirdly, the dividends must be used to setup a viable tax collection system. Further analysis of cash transfers proves that, these are sure methods for economic problems because they mitigate chronic poverty, narrow income inequality, boost nutrition, increase

school attendance, enhance health care access, and at times encourage local business investment (DFID, 2012).

As pointed out, oil-cash model is applicable to any resource windfall as long as the three steps pointed out are followed (Moss, 2010). Cash transfers from natural resources are more likely to have desired effect in countries where there is bad business environment and corruption. The above two scenarios where cash transfers could work well, show that Kenya could be an ideal candidate for cash transfer from natural resource windfall. As pointed out by Transparency International, Kenya is relatively corrupt with a score of 28/100 where 0 is the most corrupt and 100 is the least corrupt (Transparency International, 2018). Perhaps with examples of successful cash transfers in various countries such as Ghana, Brazil, Venezuela and Iraq, some form of cash transfer could be used to enrich the households of Chebara and facilitate not only economic development but also social and ecological development (Standing, 2014).

2.7 Citizen Involvement in Management of Natural Resources

The United Nations Conference of 1992 dubbed the Rio convention of human environment identified that humans were at the center of environmental degradation and therefore, to conserve the environment and subsequently the natural resources therein, there was need for community involvement in management, use and conservation of natural resources. It has therefore resulted in member states adopting Environmental Impact Assessment as a tool for community involvement in consecration and sustainable use of natural resources.

However, as much there is emphasis in need for community involvement in use and management of natural resources, there are barriers to this as pointed out by Denhardt *et al.*, (2009). In less

developed countries, degradation of natural resources has been as a result of lack of social capital and the care-free attitude of the people towards the use and conservation of natural resources. Poverty, poor food security, poor education systems among many other challenges riddling less developed countries have resulted in reduced social capital and consequently, reduced citizen participation in management of natural resources (Denhardt *et al.*, 2009).

In Kenya, poverty can be alleviated through the involvement of communities' approach. The right governance through community involvement strategies needs to be transparent and active. According to the World Bank report (2011), community members should be involved, irrespective of wealth and their economic status, in the management of natural resources for a successful approach to problems in the developing countries.

2.8 Water availability in Kenya

Water being a necessity attracts a lot of turnover and as a result, there is a lot of revenue made by water companies. Especially where water laws are flexible and the country is considered water stressed. According to the United Nations Environmental Program (2019), about 30% of the world's population reside in countries such as Kenya which are water stressed. A country is considered water stressed if the supply is less than 1,000 meters cubic per capita. Kenya's falls in the category of water stressed countries because its water supply is less than 650M³ per person annually.

In Kenya, the growing population and the more people who live beyond the poverty line means that there is pressure on natural resources especially freshwater (UNESCO, 2012). Further evidence of the water challenges faced in Kenya is provided by the water report of 2005 (World Bank, 2005). In addition, Veola to support entrepreneurship through corporate social responsibility, applies new relationship-based incentive models.

Despite government efforts to ensure sustainable, affordable and accessible water, more than 50% of the Kenya rural population still lack portable clean and consistent water source. The millennium goal was set out through the water act of 1974 which stated that the government will actively try to ensure that water is accessible to all at affordable rates and realistic distance from the households by the year 2000 (Wandiga *et al.*, 2017). This target was of course not achieved and as pointed out by Wandiga in 2017, close to 30% of people in urban areas remain unconnected to water and about 53% in rural areas are yet to receive water connections. Despite efforts by county governments, the national government and NGOs to sink boreholes, water scarcity remains a challenge in Kenya (UNEP Freshwater, 2005)

2.9 Water Use and Accessibility in Kenya

Globally, about more than a billion people have little access to universally acceptable standards of drinking water (WHO & UNICEF, 2004). It is estimated that by 2030, about 70% of the world's population will face server water scarcity. A report released by the Ministry of Water and Irrigation (2005) indicated that According to the ministry of water and irrigation in 2005, it was estimated that about 60% of the Kenyan urban rich population had access to clean safe water from safe and consistent sources. Worryingly, the urban poor due to infrastructure for example in slums access to safe water feel to as low as 60%. However, the percentage with regards to rural areas is low and according to Kenya Integrated Household Budget Survey (KIHBS) in 2006 was as low as 40% this is considerably lower than 60% in urban areas.

This tragic statistic proves that the communities living around water catchments and dams such as Chebara and Ndakaini deserve to get at least some water from the dam. These communities not only need clean water but they need piped water from the dam regularly. The irony of water being sourced from rural areas to be supplied to urban areas beats logic because as has been pointed out the real water scarcity issues lie in rural areas. Therefore, rural areas of Chebara and other water dam catchment areas are actually supposed to get water from the dam.

The idea behind privatization was that it would provide improved services for the water users. While the argument on the importance of privatization is solid, it fails to consider the social and environmental effects of privatization of water companies (Anyang *et al.*, 2000). This aspect of privatization has led to disregard of social and ecological impacts in favor of economic impacts (Briscoe and De Ferranti, 1988 In Galana-Kulalu, water kiosks were set up by the world bank with the aim of accessible water. The water was to be sold in privately controlled kiosks to an intended population of about 2000 people. The aim of world bank was to ensure access, affordability and efficiency with regards to drinking water. The community members ended up paying more than 20% of their income on water as a result of the kiosks.

According to Gerold (2003), his paper “Water: our mutual friend? The privatized water companies are distrusted, and change is needed” pointed out Water shortages are common, that water companies make super-normal profits while investments had fallen off. This mirrors well with ELDOWAS because, ELDOWAS makes a lot revenue and lack of community involvement among other things results in distrust and resource misuse. Some perceive it as a tool for investors to reap maximum reward for investment.

However, water companies such as ELDOWAS, which lack community involvement that results in misinformation, should be a service provider and not a money minting firm. As was the case in the UK where there was distrust between the public and the privatized water companies, could the same be said for Kenya? As pointed out earlier, the challenge with privatization of water companies was that the focus shifts towards profits instead of a wholesome look into the social, economic and ecological considerations. Degradation of the environment as a result of water abstraction by water companies is a very likely possibility where water companies with the aim of making lots of cash overstretch the rivers.

Nonetheless, the responsibility for conservation of water catchments should not fall on the hands of community members when all the benefits that are derived from the dam fall on the hands of the water company. There could also be hidden costs associated with water damming, and these costs could be felt directly by the community (Willis and Garrod, 1998).

2.10 Theoretical framework

This research was informed by three theories, which are the incentive theory, access theory and the stakeholder theory. The incentive theory, which was built upon the drive theory of psychologist Clark Hull, indicated that humans are drawn to do certain tasks as a result of imminent rewards (Armstrong, 2015). There have been several successful incentives used in management of natural resources that may alter human behavior with regards to management and conservation of natural resources.

The second theory, access theory by Ribot & Peluso (2003), which this study has relied heavily, defined access as the ability to benefit from things. In the case of ELDOWAS and Chebara there was

to be attempts to study access of water as a resource by the community and also access to the benefits accrued elsewhere by ELDOWAS as a result of revenue collected from distribution of water in Eldoret town and its environs. In retrospect, access and incentive theories were also to be used to illustrate impacts of benefits-sharing and collaboration in management of natural resources to not only ensure social and economically positive outcome but to also ensure sound sustainable environmental outcomes.

Lastly, this project has used the stakeholder theory, which heavily relates to Corporate Social Responsibility. Corporate Social Responsibility (CSR) is a firm's response against rising concerns and complains as a result of the firms' activities (Hill and Jones 1992). These concerns normally arise from the various shareholders, which include employees, community members, partners and competitors. There are various aims for CSR that include sustainable use and exploitation of natural resources, as a method of benefits-sharing and community development. The main challenge facing proper implementation of CSR is governance (Bhaduri & Selarka, 2016). Corporate governance includes policies adopted by firms to attain its vision and objectives and meet stakeholder expectations.

However, the main theory that this research study has built its framework on is the Incentive theory. The incentive theory was introduced by Logan (1968) who pointed out how rewards change relationships between various parties. In this research, the incentive theory informs the way all the stakeholders involved are using incentives and benefits-sharing activities to engage each other. The research determined the impact of the incentives and benefits-sharing amongst the stakeholders. Empirically, the incentives given to the communities in form of programs should make a difference

in the location that the companies are making money off of the natural resource. Therefore, this social responsibility should make a huge difference in the livelihoods of the various communities.

However, measuring the effects of construction of a dam may not be easy especially on the ecological aspects but to measure the social aspects, one need to find a sample of members of the community around the dam whose lives have been directly affected in one way or the other as a result of construction of the dam. This measuring aspects has informed how the variables for this research revolved around the incentives, benefits-sharing activities, and their impacts on the stakeholders of the Chebara Dam over the years.

2.11 Conceptual Framework

The conceptual framework is based on access and benefits sharing framework by the conventional of biological diversity (Kate, 2004). The relationships between the various variables and actors have been indicated by the framework. Although benefits sharing is an ideal believed to bring about positive social, economic and ecological change, it is an ideal which is rarely practiced (Schulz & Adams, 2019). Various arms of the government are used to implement laws and act as custodians of natural resources on behalf of the Kenyan people.

Additionally, implementation of laws aimed at benefit sharing are implemented by both the county government and national government. Community laws and norms also play a part in management of natural resources and management of water resources and consequently play a part benefit sharing and resource use and conservation. Investors like the European Union, German development bank within the region also play a part in ensuring the financial investments have returns both social, economic and ecological and therefore play an important role in management of the dam. The overall aim of benefit sharing is community development and conservation.

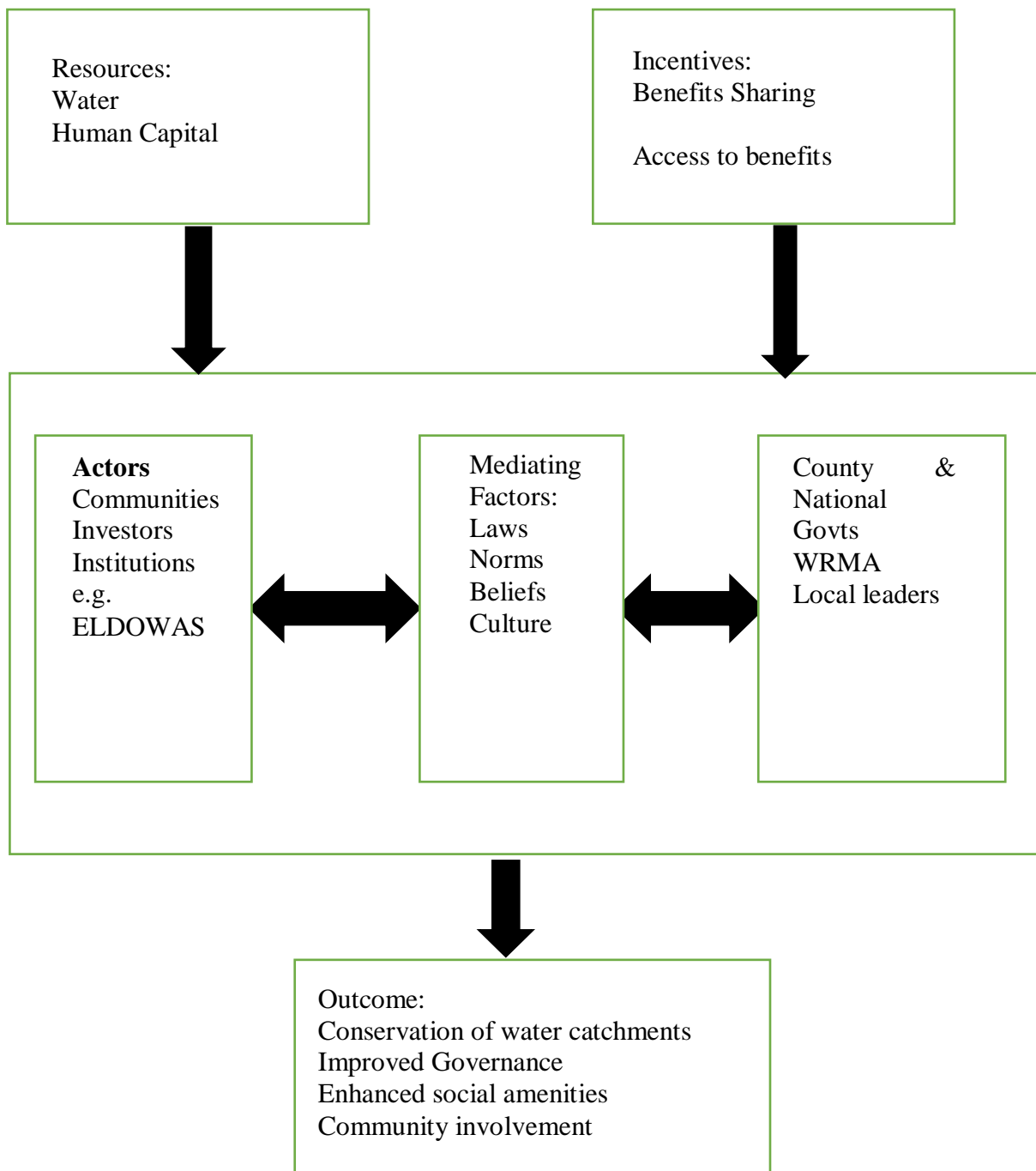


Figure 2. 1 Conceptual Framework Representing the Variables in this Research

CHAPTER THREE: METHODS AND MATERIALS

3.1 Description of the Study Area.

Below is a map of Kenya showing the location of Chebara dam. Chebara dam is about 70 kilometers from Eldoret town. It is located about 390 kilometers North-west of Nairobi.

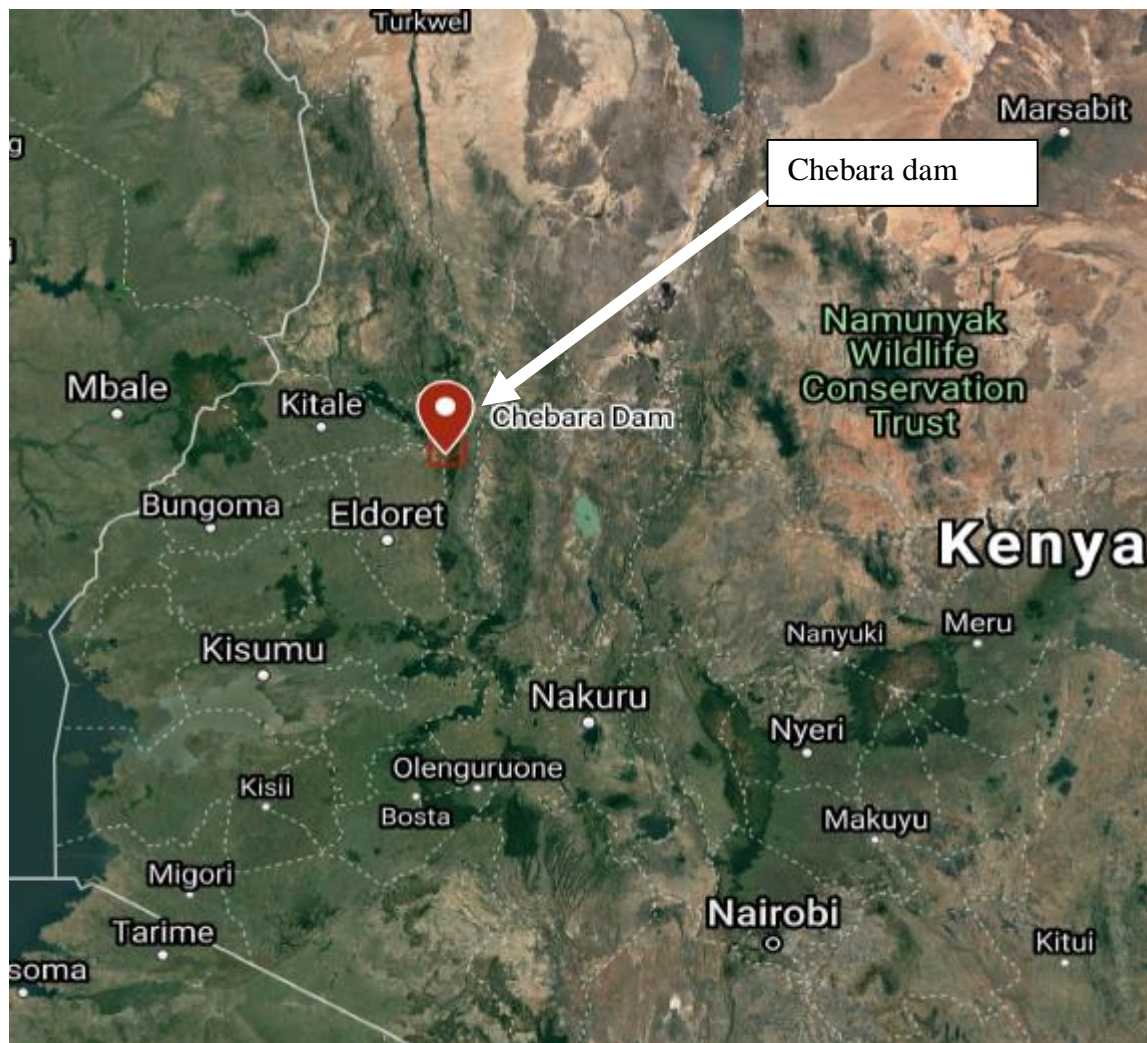


Figure 3. 1: Map of Kenya with showing Pinned Locations of Nairobi, Eldoret and Chebara Towns (Source: Google Maps, 2019)

The next image shows the aerial view of the altitude contours of Chebara region. This shows that the altitude of the region is 2400 meters above sea level.



Figure 3. 2 : A satellite image of Chebara Dam (Source: Google Maps, 2019)

Chebara dam is the main source of water for the fast growing Eldoret town. Chebara dam is located at coordinates $0^{\circ} 52' 48''$ N, $35^{\circ} 30' 0''$ E at the border of Uasin-Gishu and Elgeyo-Marakwet counties. The climatic conditions are favorable for farming with the region having an average temperature of between 14°C to a maximum of 24°C . The main crops include maize, beans, potatoes and passion fruits. Despite maize being the staple food for the country, in the study area, maize did poorly due to the unfavorable weather conditions; the main cash crop for the community was Irish potatoes. Despite being a very rainy area with lots of pasture for livestock only a few households kept high grade dairy cattle such as Friesian cows.

However, almost all households kept cows, sheep and goats. Although there was more preference to sheep more than goats. The average Rainfall annually is about 1200 mm. The climate in Chebara catchment is warm and temperate. The major community in that area is the Marakwet community, which is a minority sub-tribe of the Kalenjin community. The main economic activity of the communities around Chebara dam is rain fed agriculture. The soil type in Chebara Dam is mainly silty loamy soils, which is favorable to a variety of crops grown in the region from maize and wheat which are common all over the Rift-valley to fewer common plants like apples which can do well but most members of the community are yet to take it up.

Eldoret town and its Environs is the major beneficiary of water from Chebara dam catchment but the neighboring urban centers to Chebara Dam include Tambach, Chebiemit, Iten, Cheptongei, Kapyego, Kimnai, and Chesoi are the ones which are impacted directly by the presence of the dam. According to the Kenya Population Census Report (2009), these urban centers have an approximate population of 2000 to 10,000 each, and growing. Nonetheless, the Chebara catchment forms part of the troubled Embobut forest where there were efforts to conserve it as it forms a big part of the country's water tower. The dam was built in 1993 with funding through the German government under GIZ. The dam is managed by ELDOWAS, is a private, publicly owned company whose headquarters is Eldoret town.

3.2 Research design

This was a cross sectional study based on household surveys. The study employed both qualitative and quantitative approaches to address the study objectives. On one hand, the quantitative approach used the descriptive correlational type of research design, which explores the relationship between variables using SPSS statistical analyses. In this research, the variables are the incentives and

benefits-sharing activities of the stakeholders of Chebara Dam, and their impacts on their lives and natural resources.

On the other hand, the qualitative approach used the case study research design, which explores similar cases of the same event that this research has emulated. In this research, the case study relates to how the stakeholders of dams have related to the community in the direct vicinity. Additionally, the aim of using both qualitative and quantitative approaches to this research is to ensure that there was a broad and wide range of data collected to ensure that the research questions and by extension objectives were addressed in the best and most accurate possible way.

3.3 Sample size

The sample population included households living around the dam. According to Kibret *et al.*, (2015), the consequences of creation of a dam are felt more strongly by households living within a radius of 5 kilometers from the center of the dam. Proximity to the dam has been defined as a distance of less than 5km from the dam. The sample study area was selected to be of households who lived close by the dam not more than 5 kilometers from the dam, outside of which would have been an excess population to consider. The approximate households in the selected area of a radius of 5km from the center of the dam was estimated to be with about 271 households.

However, the research sample size for the study was 100 households, which was selected based on MacCallum *et al.*, (1999) sample size, who suggested that samples should be at least 100. This was also in line with the rule of 5 (Garson & Khosrow-Pour, 2008), which states that there should be at least 10 subjects for each variable.

3.4 Data collection

The data from this research was collected through both primary and secondary sources. Primary data was collected by use of structured and unstructured questionnaires, survey maps and interviews. Whereas the questionnaires were administered to members of the community around the catchment of Chebara dam. Semi-structured questionnaires were used to collect data regarding the perspective of water resource management authority in Eldoret and Iten and Water resource Users Association was in Chebara. This also formed the group of interviewees that were part of the key informants. The interviews were used on key informants of the research study. The secondary data was collected from Journal articles, summary reports, and gazette articles of Parliament.

3.5 Sampling Procedure

The key informants were purposively sampled. The key informants included person in charge of corporate social responsibility, the person in charge of Chebara dam, the community leaders around Chebara dam, the chief, sub-chief and other community leaders such as religious leaders, youth leaders, institutions, water resources user's association members. The key informants were selected because they were important to inform the study objectives.

3.5 Data analysis

The data collected from the above-mentioned questionnaires was organized in SPSS. Quantitative data and information was analyzed by correlation analysis, percentages and tabulations. The correlation analysis was done to test the relationship of the different variables. The qualitative data was organized in themes and content analysis was employed. In this study,

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

The research results are presented and discussed in this chapter. The research presents the demographic profile of the respondents and a discussion of the findings. The research discusses the types of incentives that ELDOWAS uses to enhance collaboration between stakeholders and the benefits that the community share due to the construction of the dam. It analyses the effects of the incentives/benefits sharing from ELDOWAS and dam construction on the socio-economic well-being of Chebara community. The chapter also gives evidence relevant to the research questions and objectives and answers the hypothesis of the study.

4.2 Population Variables

Based on the response, the research commenced the data analysis process. The following are the demographic features;

4.2.1 Age of Respondents

The age of respondents is very vital in the study because it gives a strong relationship between the long-term dam knowledge of the dam and the incentives, benefits, and correlation between the incentives and the socio-economic wellbeing of the residents. Figure 4.1 shows the group's age distribution with all the respondents as adults above 18 years old.

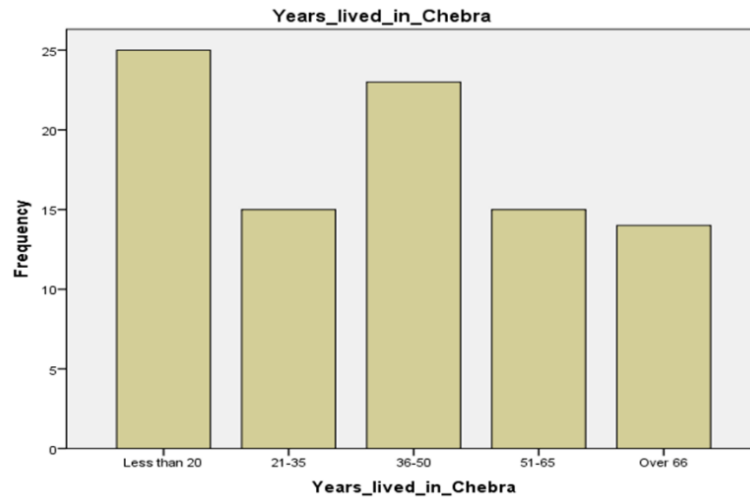


Figure 4. 1: Bar Graph showing Age groups of Respondents

Figure 4.1 shows that majority of the respondents were between age group 36-45 the least were under 25 but above 18, which is the age of consent. The age group (36-45) respondents contributed to 24% of the households. There was a uniform distribution of respondents for the older age groups, which was about 18% of the sample population each. The lowest number of respondents, which was under 25 age group were 10% of the sample population, which could be attributed to rural-urban migration (Greiner & Sakdapolrak, 2013). The young population move to towns to look for job opportunities and education in urban institutes. The different age groups were evenly distributed at about 15% of the sample population, which gave the research a good variety of response.

4.2.2 Gender of Respondents

In this research, the sample was collected targeted and purposive. However, this population composition and features were normal and was made up of most residents of Chebara Dam and employees of ELDOWAS limited. The sample analysis of this research, as shown in Figure 4.2, showed that the gender composition of the respondents was 53% men and 47% were women.

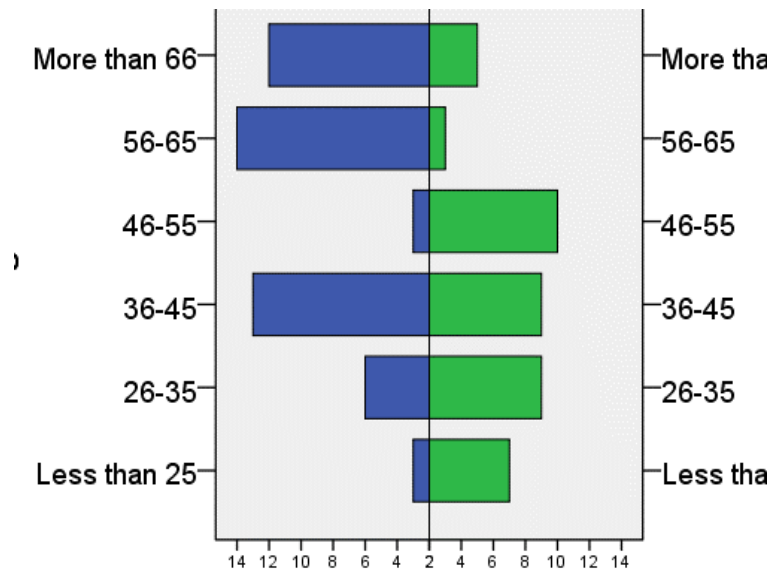


Figure 4. 2: Chebara Age group and gender Pyramid

4.2.3 Education Level of Respondents

In this research study, the education level describes the ability of respondents to understand and point out the incentives and benefits of the Chebara Dam and the ELDOWAS limited activities in their lives. Overall, 66% of the respondents had achieved a high school education qualification. There are some gender differences by education with 11% of the men have graduated from college and only 4% of the women. The reason for few graduated women could be due to the high ageing population with women that stayed behind as men have moved to urban regions in search of job opportunities (Greiner & Sakdapolrak, 2013).

Additionally, the data split by a number of people in a household show that 61.1% are less 9 members in a household with those of category 5 to 9 being the highest at 32%. Based on the results shown in Figure 4.3, majority of the respondents had received a formal education.

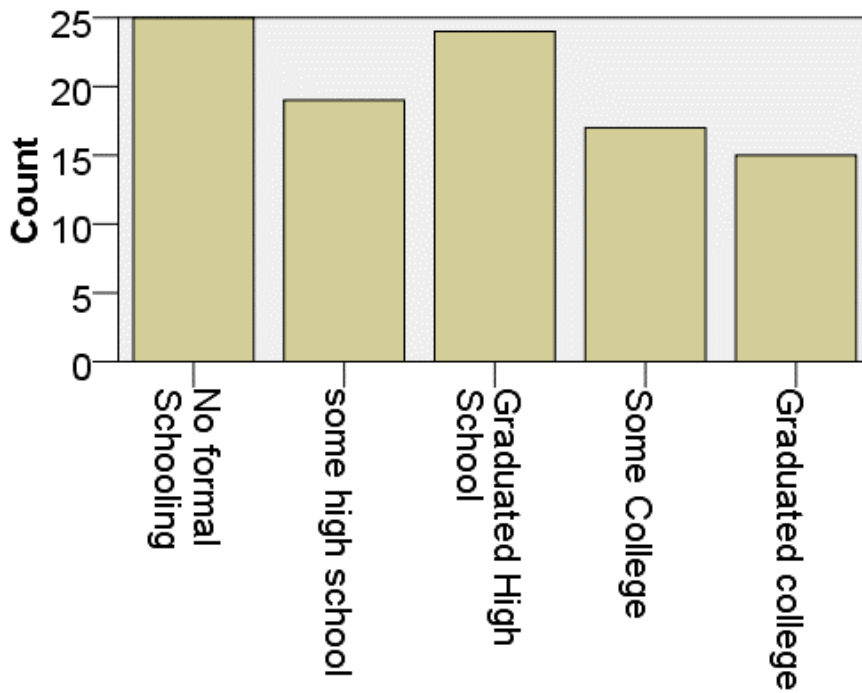


Figure 4. 3: Highest Education Level of Respondents

4.2.4 Years Lived in Study Area

In this study, the respondents' number of years lived in Chebara Dam is significant because it shows the population that have experienced every event created through the ELDOWAS company, which is an important source for this research. The majority of the respondents, 25%, have lived in Chebara region for less than 20 years with 14% of them having been there for over 66 being the least. Figure 4.4 shows that 14% of the respondents have lived long enough to notice the changes that have occurred due to the presence of the dam and form social networks to exploit these benefits and incentives.

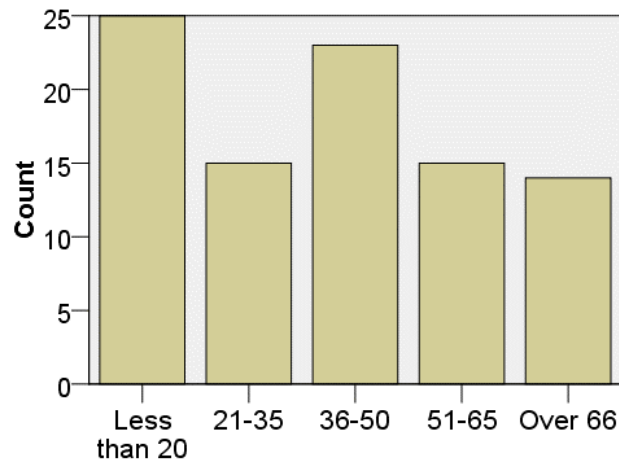


Figure 4. 4: Years lived in the Study Area

The data from Figure 4.3 and 4.4 can also be interpreted as that several community members have lived within Chebara locale for many years. Several members of the community have not emigrated to other towns. The longevity of the stay makes the data collection even more reliable since majority of residents have been around since the construction of Chebara dam.

4.3 Types of Incentives used to Enhance Collaboration between Stakeholders

4.3.1 Ecological Projects and Activities

ELDOWAS limited has been creating initiatives that were used to encourage collaboration between the community and the company. The ecological activities and projects are tree planting and clean-up activities, which have been conducted in Chebara Region since the company started in 1993.

On the existence of the ecological projects and activities, 81% were not aware of its existence while 19% were aware. Of the latter, when asked the name of the projects 78.9% acknowledged they knew about the tree planting initiative while the rest, 21.1%, said they only knew of clean-up projects.

4.3.2 One-off Marathons

ELDOWAS led a one-off marathon to incentivize the locals and involve them as stakeholders. However, when the respondents who knew of ELDOWAS projects were asked about their mode of involvement through the one-off marathon only 47% responded to have been involved in its preparation, 11.8% were involved in the clean-up projects, 23.5% were involved in tree planting initiatives and 17.6% were not involved in any project, as shown in Figure 4.5.

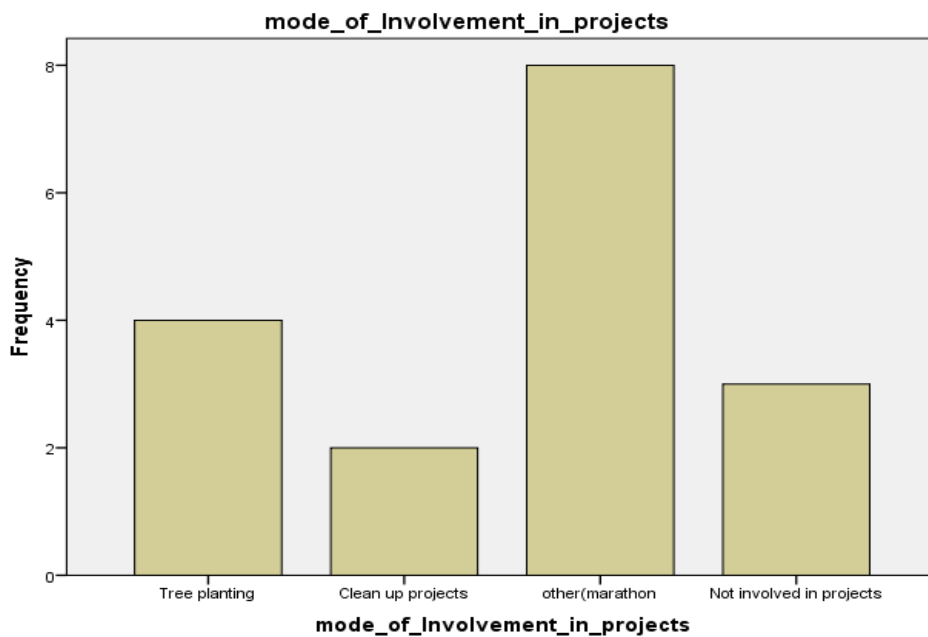


Figure 4. 5: Mode of Involvement with Incentives

4.3.3 Consultations with Locals

Consultation with the locals is among the incentives that a company uses to enhance collaboration between the locals and ELDOWAS company. From the respondent's data, Chebara region members involved with the management of the dam has been low with 91% saying they were not involved. Of the 9% who were involved, 22.2% are in the organization while 77.2% are in the conservation of the dam.

Additionally, consultations can come in the form of opinion considerations of the stakeholders. From the respondent's data, 57.1% felt that any opinion they voiced were never taken into consideration, 28.6% said sometimes their opinion were considered, and only 14.3% said that they were heard by those in management (Figure 4.6).

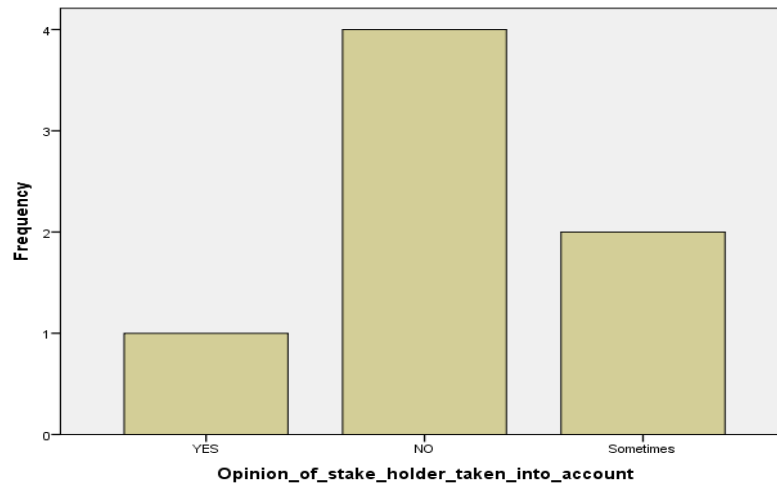


Figure 4. 6: Opinion Consideration by Management

It should be noted, however, that there are no specific roles for the stakeholders.

4.4 Benefits the Communities Derived from ELDOWAS Limited

4.4.1 Social Amenities Developments

One of the major benefits the communities derived from ELDOWAS limited was social amenities in the form of schools, hospitals, roads, and dispensaries. According to the locals, most of the residents are teachers, nurses, and drivers of trucks in Chebara. Therefore, the aforementioned institutions create employment among the locals. From Chebara respondents' data, 67% acknowledge the social amenities developments, these respondents were actively employed in the aforementioned social amenities, 25% mentioned incomplete developments, and 8% claimed that ELDOWAS did not bring any developments in the region.

4.4.2 Source of Water

As a direct benefit of the construction of the dam and ELDOWAS limited, the Chebara region members are supposed to get water to their households. However, from the Chebara region respondents, 87% said their source of water was from rivers, 7% got them from boreholes, 6% sourced from ELDOWAS (Figure 4.7) because majority are used to fetching water from the river, and the dam directly. From those that received water from ELDOWAS, 6.9% said they received water daily whereas 93.1% said there was an irregular supply of water. From those that source their water from rivers, 86.4% said they were not connected to piped water from ELDOWAS while 12.6% cited technicalities.

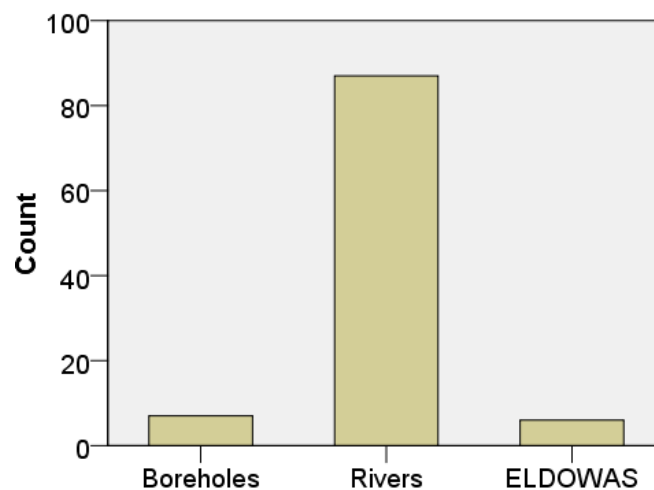


Figure 4. 7: Chebara Respondents Source of Water

4.4.3 Employment at ELDOWAS

As a direct benefit to the creation of ELDOWAS limited, it is expected that the community should be able to get employment. From the data, 97% said they did not have any of their household members employed at ELDOWAS whereas only 3% had a member employed (Figure 4.8). The data indicates that there are few direct benefits that the Chebara community gain from ELDOWAS limited. Out of

the 3%, 66.7% had less than two household members employed whereas 33.3% had more than two household members employed.

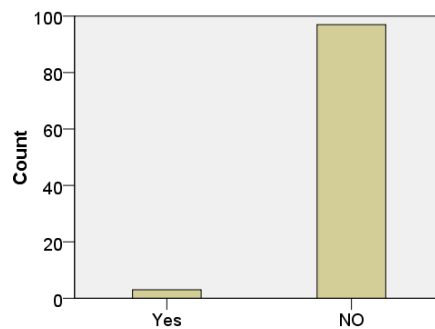


Figure 4. 8: Household Members employed at ELDOWAS

4.4.4 Training of Water Conservation and Treatments

Through seminars, ELDOWAS has been training Chebara region members on water conservation and treatment methods. From the data, 6% had a household member involved in training and all of them received training of water conservation and treatment while 94% said they were never involved in the training of any kind.

4.5 The Effects of Incentive and Benefits Sharing from ELDOWAS on Socio-Economic Well-being of the Communities

In order to achieve the objective of determining the effect of incentives and benefits sharing from ELDOWAS on the socio-economic well-being of the communities, the study carried out two-tailed correlation tests using the Statistical Package for Social Sciences (SPSS) statistical tool to determine the relationships between the variables. The measures of socio-economic variables were picked from the questionnaire on four areas i.e. the community gains, change in day-to-day activities, Chebara regional growth, and the local economic growth in Chebara.

4.5.1 Effect on Community Gains

4.5.1.1 Correlation between Ecological projects and Activities and Community Gains

Table 4. 1 Pearson Correlation for Ecological projects and Activities vs Community Gains

Variables	Ecological projects and activities	Gains as a result of the dam
Ecological Projects and Activities	1	.542**
Gains as a result of the dam	.542	1
N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.1, the Pearson correlation coefficient between the use of ecological projects and activities as an incentive and the community gains by the community is $R=0.542$ and $P=0.0016$ and is statistically significant at 0.01 level of significance. Therefore, there is a positive linear relationship between the use of ecological projects and activities and what the community gains.

The relationship implies that the ecological projects and activities have been beneficial to the community. The community has gained from the ecological projects and activities that ELDOWAS has been holding in the area. This result goes on to show that privatization of water companies may result in positive ecological outcomes as well as economic and social outcomes.

As pointed out by Muuma (2005), the positive correlation shows that in line with the Lisbon charter of 2014 water should be sustainably used for the improvement of community and ecological conservation. Also, as pointed out by Bjärstig (2017), most studies focus on economic or social

outcomes when it comes to collaborative management of natural resources. This study showed that the community not only benefited from collaborative management of water resources but it also led to ecological conservation. The incentives were not only economic and social but also an ecological consideration as pointed out by the positive correlation results above

4.5.1.2 Correlation between Social Amenities Development and Community Gains

Table 4.2 Correlation between Social Amenities Development and Community Gains

Pearson’s correlation in 2-tailed significance	Gains as a result of the dam	Social amenities brought by the dam
Gains as a result of the dam	1	.106
Social amenities brought by the dam	.106	1
N	100	100

From Table 4.2, the Pearson correlation coefficient between the social amenities developments as benefit-sharing projects and the community gains in Chebara is 0.106 and is statistically insignificant at 0.01 level of significance. Therefore, there is a weak positive correlation between the social amenities brought by the dam and the community gains.

The social amenities developments in the area as a benefits-sharing project have had lower impact on the community gains over the years in Chebara Region. Commonly, incentives are easily grasped when they are physically tangible, for example as infrastructure, schools or hospitals (Dalkir, 2013). The positive correlation, in this research, showed that the community members were in agreement with the findings of Kennedy (2014), which suggested that infrastructure can be used as an incentive for community development and for collaboration.

Although as pointed out by Mutune and Lund (2016), the community may not fully benefit, especially financially in relation to the management of natural resources. However, the community perception of social amenities, as a result of the dam, by community members were positive concerning the effects of the dam in the Chebara area.

4.5.1.4 Correlation between Source of Water and Community Gains

Table 4. 3: Correlation between the Source of Water and Community Gains

Pearson's correlation in 2-tailed significance	Community gains brought about by its use	Water source
Community gains brought about by its use	1	.684**
Water source	.684	1
N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.3, the Pearson correlation coefficient between locals' source of water and the community gains brought about by their use is 0.684 and is statistically significant at 0.01 level of significance. Therefore, there is a strong positive linear relationship between the two variables.

Nevertheless, these results imply that the construction of the Chebara Dam has significantly led to the development of social amenities in the area. These developments are evident through the construction of schools, dispensaries and government offices in the Chebara region. According to UNEP (2019), Kenya is a water stressed country. However, through the positive correlation results between water source and social amenities brought by the dam, it shows that perhaps dams can solve the lack of access for clean water in rural areas (Wandiga *et al.*, 2017).

Furthermore, incentive theory states that humans are pulled towards actions which result in material or immaterial gains (Armstrong, 2015). In this case, the positive correlation showed that water and social amenities by the dam were good incentives and went hand in hand according to the community members.

4.5.1.5 Correlation between Employment and Community Gains

Table 4. 4: Correlation between Employment and Community Gains

Pearson's correlation in 2-tailed significance	Gains	Water source
Gains as a result of the dam	1	.055
Family members employed by ELDOWAS	.055	1
N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.4, the Pearson correlation coefficient between the employment of locals and the community gains that lead from them in Chebara is 0.055, which indicates that there is no correlation. Therefore, since the correlation is statistically insignificant, we can conclude that there is no linear relationship between the two variables. Perhaps this is because there are too few people employed per household to be considered as a benefit by the entire community.

Additionally, this result could imply that the ecological projects and activities last but a short period and its effects are not felt for a long period in Chebara region. Nevertheless, as pointed out by Engel *et al.*, (2008), the concept behind incentives is putting value on natural resources to encourage conservation, one of the incentives that ELDOWAS could have used is employment but with this regard, it fails badly. In this study, the number of locals from Chebara employed by ELDOWAS is

too small and insignificant per household and this is not in line with the Lisbon Charter (Veolia CSR, 2019).

4.5.2 Changes in Day-to-Day Activities

4.5.2.1 Correlation between Age and the Changes in day-to-day activities

Table 4. 5 Correlation between Age and Day-to-Day changes in activities in Chebara

Pearson’s correlation in 2-tailed significance	Age	Day activities affected
Age	1	.210
Dams effect on day to day activities	.210	1
N	94	100

From Table 4.5, the Pearson correlation coefficient between age and the changes in day-to-day activities in Chebara is 0.210 and is statistically insignificant at 0.05 level of significance. Therefore, there is a no correlation between age and changes in day-to-day activities. The majority of the respondents age was 30-45 years, which is in the middle-ages. Since the correlation is in the lower probabilities, it implies that the population have felt little effect of the dam on their day to day activities.

Buchman *et al.*, (2014) explored population and age dynamics and found out that day to day activities are interlinked with age. Changes in day to day activities are felt more closely with regards to disruptive activities, however, some like the case in Chebara may not be felt by the community since there hasn’t been much change as a result of the dam, for instance majority of the community

members don't get piped water and therefore still go to the river or use boreholes. Since 6% have gotten piped water albeit irregularly.

4.5.2.2 Correlation between Ecological projects and Activities and Changes in day-to-day activities

Table 4.6: Correlation between Ecological projects and activities and Changes in day-to-day activities

Pearson's correlation in 2-tailed significance	Knowledge of ELDOWAS ecological projects	Day activities affected
Knowledge of ELDOWAS ecological projects	1	.593**
Dams effect on day to day activities	.593	1
N	100	100

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.6, the Pearson correlation coefficient between the use of ecological projects and activities as an incentive and the changes in day-to-day activities in Chebara is $R = 0.593$ and is statistically significant at 0.01 level of significance. Therefore, there is a positive linear relationship between the use of ecological projects and activities and changes in day-to-day activities. This result means that the ecological projects and activities increase the daily activities experienced in the area on the day of the occurrence.

Additionally, human beings are at the center of conservation and degradation, which implies that knowledge of ELDOWAS projects is always directly correlated with the effects on the daily lives of the locals. Poverty, poor food security, poor education systems among many other challenges riddling less developed countries have resulted in reduced social capital and consequently, reduced

citizen participation in management of natural resources (Denhardt *et al.*, 2009). This correlation agreed with the Rio Convention, which placed humans as the center for degradation and conservation, and in this case, explains the results of the study.

4.5.2.3 Correlation between Consultation with Locals and Changes in day-to-day activities

Table 4. 7: Correlation between Consultation with Locals and Changes in day-to-day Activities

Pearson’s correlation in 2-tailed significance	Dams effect on day to day activities	Ways ELDOWAS revenue should be used
Dams effect on day to day activities	1	.307
Ways ELDOWAS revenue should be used	.307	1
N	100	100

From Table 4.7, the Pearson correlation coefficient between consultations with the locals and the changes in day-to-day activities in Chebara is $R= 0.307$ and is not statistically significant. Therefore, there is a weak linear relationship between the use of ecological projects and activities and changes in day-to-day activities. The effects of the period of consultation with the locals probably has not been happening consistently enough to have a larger impact on the daily activities of Chebara region. According to Romenti (2010), stakeholder engagement is vital for the increased business activities in an area. Stakeholder engagement increases business activities because there are more ideas on the table that would increase development and implementation of new projects, creates bridging social capital with a community, and increases credibility of an organization. In this case, the lack or reduced consultation with locals in Chebara robs ELDOWAS company ideas and social capital with the community. However, community involvement doesn’t necessarily change day to day activities

of community members. Furthermore, the members haven't been involved enough in management or running of the dam enough to warrant a change in their day to day activities.

4.5.2.4 Correlation between Social Amenities Development and Changes in day-to-day activities

Table 4.8: Correlation between Social Amenities Development and Changes in day-to-day Activities

Pearson's correlation in 2-tailed significance	Dams effect on day to day activities	Social Amenities brought by Dam Construction
Dams effect on day to day activities	1	.221
Social Amenities brought by Dam Construction	.221	1
N	100	100

From Table 4.9, the Pearson correlation coefficient between the use of social amenities activities as an incentive and the changes in day-to-day activities in Chebara is 0.221 and is not statistically significant at 0.05 level of significance. Therefore, there is no linear relationship between the use of social amenities and activities and changes in day-to-day activities. The construction of social amenities in the area have had an impact on the daily activities because they cater for students from schools, sick people from dispensaries and business men working within the business area but it has no significant impact because the students only have transferred income, which limits their spending, and the sick people spend much of their income in the clinic and have limited spending in the business area.

According to Besser & Miller (2013), the main activities in rural areas revolve around social amenities where population holds constant and the social capital of the region is related to the

community support. In this case, the amenities have specified times of day, hence the lower daily activities that is attributed to the occasional movement into social amenities centers. For instance, daily activities are visible in the morning and evening for school kids, which means the rest of the day experiences very little activity besides the other social amenities.

4.5.2.5 Correlation between Source of Water and Changes in day-to-day activities

Table 4. 2: Correlation between Source of Water and Changes in day-to-day activities Table

Pearson's correlation in 2-tailed significance	Dams effect on day to day activities	Water source
Dams effect on day to day activities	1	.023
Water Source	.023	1
N	100	100

From Table 4.9, the Pearson correlation coefficient between the sources of water and the changes in day-to-day activities in Chebara is 0.023 and is therefore, not statistically significant at 0.05 level of significance. There is no correlation between water source and effect of the day to day activities of the dam on the community. This lack of relationship is because only 6% of the community members receive water from Chebara and those who received it, got it at an average of once every fortnight. There has been no developed infrastructure that has increased access to water for the residents, which leads them to over-rely on the rivers and boreholes.

Additionally, the community before got water from the river and this hasn't changed much with 93% of those interviewed still getting water from the river. Without access to piped water residents are forced to rely on sources like boreholes and rivers to supplement their water needs. According to

Bain *et al.*, (2011), when companies that source natural resources connect infrastructure to local areas, they share benefits and increase daily activities in the area. However, in this case, the ELDOWAS company has not created the necessary infrastructure for the locals, which forces them to source from unsafe and traditional water sources like boreholes and rivers.

4.5.2.6 Correlation between Employment and Changes in day-to-day activities

Table 4. 3: Correlation between Employment and Changes in day-to-day activities Table

Pearson’s correlation in 2-tailed significance	Dams effect on day to day activities	Members employed at ELDOWAS
Dams effect on day to day activities	1	.215
Members employed at ELDOWAS	.215	1
N	100	100

From Table 4.10, the Pearson correlation coefficient between the effect of the dam on the day to day activities and employment is 0.215 and is not statistically significant. Therefore, there is no positive linear relationship between the effect of the dam on the day to day activities and employment. The effect of employment created by ELDOWAS on the daily activities in Chebara Dam is limited because the number of people whose relatives or household members are employed is small, only 3% had a household member or relative employed, which means there is a small impact of the dam on employment in Chebara area. According to Diao *et al.*, (2019), employment in rural areas increases daily business activities, transforms livelihoods and changes day to day activities.

4.5.3 Chebara Regional Growth

4.5.3.1 Correlation between age and Chebara Regional growth

Table 4. 4: Correlation between the Age and Chebara Regional Growth

Pearson's correlation in 2-tailed significance	Age	Local region growth attributed to the dam
Age	1	.315
Local regions growth attributed to the development of the bank	.31 5	1
N	92	98

From Table 4.11, the Pearson correlation coefficient between Chebara regional growth and age of the respondents is 0.315 and is not statistically significant. Therefore, there is no positive linear relationship between gains as a result of the dam and growth of the region. This result probably means that the majority of the respondents' majority age group (35-46) have had witnessed limited effects on the regional growth of the area. The age group has had limited impact on the regional growth economically, politically and socially. Buchman *et al.*, (2014) elaborated on the contribution of the older rural generation and their overdependence on employment for livelihood that results in lower regional growth with a lack of employment.

4.5.3.2 Correlation between Ecological projects and Activities and Chebara Regional growth

Table 4.12: Correlation between Ecological projects and activities and Chebara Regional Growth

Pearson's correlation in 2-tailed significance	Knowledge of ELDOWAS ecological projects and activities	Local region growth attributed to the dam
Knowledge of ELDOWAS ecological projects and activities	1	.139
Local regions growth attributed to the development of the bank	.139	1
N	98	98

From Table 4.12, the Pearson correlation coefficient between the use of ecological projects and activities as an incentive and Chebara Regional growth is 0.139 and is not statistically significant at 0.01 level of significance. Therefore, there is no correlation between the use of ecological projects and activities and Chebara Regional growth. This result implies that the ecological projects and activities has had little effect on the regional growth of the region, which is because the activities rarely occur. This periodic occurrence therefore, has done little to grow the economy of Chebara region over time.

According to Kousis (2002), this limited growth is known as ecological marginalization. He further explored the subject and concludes that it occurs when local natural resources are overtaken by private organizations, they disrupt biological resources, lower generation of socio-economic impacts on the locals and contribute to the loss of local people's resources base. The Chebara dam fulfills this illustration of the ELDOWAS organization and the consequences to the locals as outlined in this research.

4.5.3.3 Correlation between Training on water conservation and treatment, and Chebara

Regional growth

Table 4. 13 Correlation between Training on water conservation and treatment, and Chebara

Regional Growth

Pearson's correlation in 2-tailed significance	Local region growth attributed to the dam	Training of water conservation and treatment
Local regions growth attributed to the development of the bank	1	.813**
Training of water conservation and treatment	.813	1
N	98	100

** . Correlation is significant at the 0.01 level (2-tailed).

From Table 4.13, the Pearson correlation coefficient between the Training of water conservation and treatment as an incentive and Chebara Regional growth attributed to the dam is 0.813 and is statistically significant at 0.01 level of significance. Therefore, there is a strong positive linear relationship between training of water conservation and treatment and growth of the region.

The incentive activities done due to the presence of Chebara dam like training on water conservation, and water treatment seminars have been influential in the economic growth of the region because these activities have educated the households living in Chebara region on matters pertaining to public health. The training of locals enhances the quality of life for development (Joseph, 2016). Therefore, explains the success of training seminars from ELDOWAS in Chebara region. The efforts that the company have put to train the locals on the significance of public health matters has created development in the area since it has improved the quality of their lives.

4.5.3.4 Correlation between Consultation with Locals and Chebara Regional growth

Table 4. 14: Correlation between Consultation with Locals and Chebara Regional Growth

Pearson's correlation in 2-tailed significance	Consultation with the Locals	Regional Growth
Consultation with the Locals	1	.336
Regional Growth	.336	1
N	9	9

From Table 4.14, the Pearson correlation coefficient between the use of consultation as an incentive and regional growth in Chebara is 0.336 and is therefore not statistically significant at 0.01 level of significance. Therefore, there is no linear relationship between consultation and growth of the region. The stakeholder consultation with the locals has had a relatively low impact on the regional growth. The impact can be attributed to how the region has been recognized since the building of the dam in the region. Romenti in 2010 suggested that while local regional growth can be as a result of community and company partnerships, lack of stakeholder involvement, especially local community would result in perceptions of lack of growth even when there is growth (Romenti, 2010). Involvement of community members, may result in perception of positive impacts of the dam on the local region economy (Romenti, 2010).

4.5.3.5 Correlation between Social Amenities Development and years lived in Chebara.

Table 4. 5: Correlation between Social Amenities Development and Chebara Regional Growth

Pearson's correlation in 2-tailed significance	Social amenities brought as a result of the construction of the dam	Years lived in Chebara
Social amenities brought as a result of the construction of the dam	1	.303
Years lived in Chebara	.303	1
N	92	92

From Table 4.15, the Pearson correlation coefficient between the use of social amenities as an incentive and years lived in Chebara is $R=0.303$ and is therefore not statistically significant at 0.01 level of significance. Therefore, there is lack of linear relationship between social amenities and years lived in Chebara.

Besser & Miller's (2019) research found that availability of social amenities does not necessarily guarantee economic growth in rural areas. Therefore, this result reinforces the impact of ageing population and over-dependence on job opportunities that are lacking in the region. The older adults have little impact on the regional developments as well as the ELDOWAS company.

4.5.3.6 Correlation between Source of Water and Chebara Regional growth

Table 4.16: Correlation between Source of Water and Chebara Regional Growth

Pearson's correlation in 2-tailed significance	Chebara region experiencing more growth than surrounding region	ELDOWAS as a water source
Chebara region experiencing more growth than surrounding region	1	.598**
ELDOWAS as a water source	.598	1
N	37	39

** . Correlation is significant at 0.01 level (2-tailed)

From Table 4.16, the Pearson correlation coefficient between the sources of water and Chebara Regional growth is 0.598 and is statistically significant at 0.01 level of significance. Therefore, there is a strong positive linear relationship between employment and Chebara Regional growth.

It should be noted that this correlation was done only for those who received water from ELDOWAS, this was only at 6% of the population and this showed that water supply for the locals is a key incentive and the supply should be raised from the current 6% of the households to more. There is increased access of water as a result of the dam and this can be attributed to the existence of the dam. (Kibret *et al.*, 2015). Access to clean water is a measure of societal growth, and although there is little access to piped water from the dam, there is relatively more access to piped water in Chebara than in surrounding area and centers. This creates the positive correlation between water source and growth of Chebara in comparison to neighboring centers.

4.5.3.7 Correlation between Employment and Chebara Regional growth

Table 4.1 7: Correlation between Employment and Chebara Regional Growth

Pearson’s correlation in 2-tailed significance	Chebara region experiencing more growth than surrounding region	Members employed at ELDOWAS
Chebara region experiencing more growth than surrounding region	1	.369
Members employed at ELDOWAS	.369	1
N	98	100

From Table 4.17, the Pearson correlation coefficient between the use of employment as an incentive and Chebara Regional growth is R=0.369 and is statistically insignificant. Therefore, there is no positive linear relationship between employment and Chebara Regional growth. This is simply because, while water dams can create an employment source for local communities as illustrated by

Skinner in 2009 and Scudder in 2005, this had not been the case in Chebara as only about 3% of members had a household member or relative employed by the dam.

The use of employment as an incentive has had a relatively small effect on the regional growth because it has not been widespread and consistent. Furthermore, most members are employed and transferred to Eldoret town, and Diao *et al.*, (2019) confirmed the little impact of urban employment on rural residence. The low standards of living in rural areas demand little investments, which explains how the results indicate ELDOWAS employees have created little regional growth.

4.5.4 Local Economic Growth in Chebara

4.5.4.1 Correlation between One-off marathon and Local Economic Growth in Chebara

Table 4.6: Correlation between the One-off marathon and Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	One-off marathon	Chebara region experiencing more growth than surrounding region
One-off marathon	1	.315
Chebara region experiencing more growth than surrounding region	.315	1
N	92	98

From Table 4.18, the Pearson correlation coefficient between the one-off marathon as an incentive and local economic growth is 0.315 and is therefore not statistically significant at 0.01 level of significance. Therefore, there is no positive linear relationship between the use of one-off marathon event and local economic growth. Although ideally, events that bring people to assemble in the Chebara region, should have a positive impact on the economy of the region, the community isn't

involved in planning and the event occurs rarely and irregularly and this may explain the impact it has had on the growth of the region.

4.5.4.2 Correlation between Ecological projects and Activities and Local Economic Growth in Chebara

Table 4.19: Correlation between Ecological projects and Activities vs Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	Chebara region experiencing more growth than surrounding region	Knowledge of ELDOWAS ecological projects
Chebara region experiencing more growth than surrounding region	1	.139
Knowledge of ELDOWAS ecological projects	.139	1
N	98	100

From Table 4.20, the Pearson correlation coefficient between the use of ecological projects and activities as an incentive and Local Economic Growth in Chebara is 0.139. Therefore, there is a no linear relationship between the use of ecological projects and activities and Chebara Regional growth.

This correlation is perhaps because the households cannot point out what ELDOWAS has done and what the county government has done. This can also be attributed to the fact that there is no known active consultative process between the stakeholders, lack of consultation means lack of knowledge of the ecological projects. This can be explained by the findings of Skinner in 2009, where in west

African dams' little knowledge of dam projects for the community's results in little to no perception of the growth in the locality attributed to the dam (Skinner *et al.*, 2009)

4.5.4.3 Correlation between Ecological activities such as Training on water conservation and treatment and Local Economic Growth in Chebara

Table 4.7: Correlation between Training on water conservation and treatment, and Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	Chebara region experiencing more growth than surrounding region	Training on water conservation and treatment
Chebara region experiencing more growth than surrounding region	1	.813**
Training on water conservation and treatment	.813	1
N	98	100

From Table 4.20, the Pearson correlation coefficient between training on water conservation and treatment, and Chebara experiencing growth more than the surrounding region is 0.813 and is statistically significant at 0.01 level of significance. Therefore, there is a strong positive linear relationship between the training on water conservancy and treatment, and Chebara Regional growth.

Nevertheless, these results imply that the training and infrastructure growth has spurred an increasing local economic growth in the region. As was discussed in the literature review, Veolia company uses a similar set-up where incentives such as conservation activities have been instrumental in increasing economic activities in an area, and in the larger picture increased Regional Growth (Veolia Inc., 2019).

4.5.4.4 Correlation between Social Amenities Development and Local Economic Growth in

Chebara

Table 4.81: Correlation between Social Amenities Development and Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	Social amenities brought by the dam	Local economic growth attributed to the dam
Social amenities brought by the dam	1	.134
Local economic growth attributed to the dam	.134	1
N	98	98

Table 4.21 above and Table 4.22 below, the Pearson correlation coefficient is 0.134 in both values, between social amenities development and economic growth, and is not statistically significant. Therefore, there is a no linear relationship between social amenities' development and economic growth attributed to the dam.

Additionally, the construction of social amenities in the area has pulled people towards Chebara town, which has influenced its economic activities on a daily basis. But the periodic flow of people in and out of Chebara center reduces the impact on the local economic activities in the Region (Besser & Miller, 2019). As stated earlier, rural regions over-depend on the social amenities for economic growth, which implies that the periodic flow of people yields low economic growth, as shown in the results above.

4.5.4.5 Correlation between Source of Water and Local Economic Growth in Chebara

Table 4.92: Correlation between Source of Water and Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	Chebara region experienced more growth than the surrounding areas	Water Source
Chebara region experienced more growth than the surrounding areas	1	.011
Water Source	.011	1
N	98	100

From Table 4.22, the Pearson correlation coefficient between Source of Water and Chebara experiencing growth more than the surrounding region is 0.011, which indicates lack of correlation. Therefore, since it is not statistically significant at 0.01, we can conclude that there is no linear relationship between ELDOWAS as a source of Water and Local Economic Growth in Chebara. In other words, since there is little to no water supply from ELDOWAS for the residents of Chebara, there has been low economic growth in the area.

Nevertheless, the correlation is because the number of households who receive tapped water is far too few at 6% and the supply was reported as irregular. This result relates to the findings of Peda *et al.*, (2011), which discussed the failure of private companies to promote developments in communities that do not earn the private water companies' money, in this case ELDOWAS.

4.5.4.6 Correlation between Employment and Local Economic Growth in Chebara

Table 4.103: Correlation between Employment and Local Economic Growth in Chebara

Pearson's correlation in 2-tailed significance	Chebara region experienced more growth than the surrounding areas	Members Employed at ELDOWAS
Chebara region experienced more growth than the surrounding areas	1	.369
Members Employed at ELDOWAS	.369	1
N	98	100

From Table 4.23, the Pearson correlation coefficient between employment and Chebara experiencing growth more than the surrounding region is 0.369 and is not statistically significant at 0.01 level of significance. Therefore, there is a weak positive linear relationship between the source of Water and Local Economic Growth in Chebara.

This lack of correlation is because very few people are directly and indirectly employed by the dam. Employment being a consistent source of income, which directly translates to economic transformation in the region is lacking for residents of Chebara Region. According to Doppelhofer, Hansen, & Weeks (2016), one of the variables of economic growth of an area is employment of its locals, which is lacking for Chebara Region.

CHAPTER FIVE: CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The specific objectives of this research study were to find out the types of incentives used by the ELDOWAS company to enhance collaboration among all stakeholders, assess the benefits derived by the communities from the ELDOWAS company and dam construction, and to investigate the effect of the incentives/benefits sharing on the communities' socio-economic wellbeing of the communities around the dam. In summary, the research reports that the incentives used by ELDOWAS company include ecological projects and activities and consultations with the locals.

Additionally, the benefits that the communities derived from ELDOWAS company include social amenities developments, direct source of water, employment at ELDOWAS company and training on water conservation and treatments. Through the correlation data, the research was able to determine the effects of the incentives/benefits sharing on the socio-economic well-being of the communities. The variables for the socio-economic well-being of the residents in Chebara area are community gains, Chebara regional growth, changes in the day-to-day activities, and the local economic growth in Chebara.

From the analysis of the correlation, the results indicate that incentives like ecological projects and activities have changed the day-to-day activities and have brought gains to the communities but have a weak impact on the Chebara regional economic and regional growth. Consultations with the stakeholders and the community have had a strong impact on the local economic growth and brought gains to the community but have not translated to enough social amenities' developments in Chebara. The analysis shows that social amenities developments thus far have a weak impact on all fronts, namely changes in day-to-day activities, Chebara local and regional economic growth, and the

gains that it has brought to the communities. The training seminars on water conservation and treatments have had a strong impact but only on the regional and local economic growth in the area because there were few reported cases of water-borne diseases.

However, through ELDOWAS as a source of water, the community has gained from the piped water and has brought recognition to the area in terms of regional growth but there little gained in terms of the normal day-to-day activities and the local economic growth in Chebara.

5.2 Conclusion

The study concludes that ELDOWAS company has been able to involve stakeholders through incentives like annual ecological activities and projects, consultation seminars with the locals, and Marathons aimed at conservation that was held between 2006 and 2011. These activities have objectively been successful in the past for involving the stakeholders, as is used by ELDOWAS for the same reasons but its impact on the Chebara community has been seasonal at best.

The study concludes that the Chebara dam construction has brought several benefits to the community, which include social amenities developments like schools, roads, and dispensaries, it has brought piped water for residents of Chebara, through training in water conservation and treatment seminars, and through employment in the ELDOWAS company. The dam has been of huge benefit to the community especially on local infrastructure and social amenities.

On the effects of the company on the communities, the research concludes that ecological projects and activities have had strong impacts on community gains and the changes in daily activities on the said days but has had little effect on the regional and local economic growth whereas the consultation

with the stakeholders has strongly impacted the local economic growth and the gains in the community

Finally, the research concludes that the dam has been beneficial to the community in three major aspects; development of social amenities, access to water for the community and lastly capacity building in terms of trainings.

5.3 Recommendations

Dam Management

There is need for increased access of piped water within the locality and as shown, the impacts of dams on livelihoods is permanent on local communities and therefore incentives need to be handed to communities continually. Natural Resources/benefits sharing Act, 2014, places emphasis on the need for community involvement in sharing of natural resource benefits. However, the aspects of implementation with regards to dam water resources over a prolonged period of time needs to be established, especially considering that community's loose access to rivers which are a major water source for dams to be created.

The ELDOWAS should involve the community more with regards to management, use, conservation and revenue allocation from the dam because the direct money transfers to the locals may not be possible without ensuring that the communities understand clearly what benefits they are accruing by having the dam or any other natural resource in their location.

Governmental organizations in charge of water resources such as WARMA and Water services Boards should be at the forefront in ensuring infrastructural developments carried out by private

organizations have full involvement of community members. The distrust between private organizations managing water resources and communities will continue to be an issue until such companies realize the importance of community involvement in decision making and management of resources.

Areas of Further Research

There is a need for further studies on inter-county natural resource and how to best solve issues emerging from the management and use of such resources. Various proposals have been put in place including payment by the resource using county to the resource having county. Natural resource conflicts can be reduced or even eliminated when there is good governance of the said resources. Research on the natural resource sharing with other counties should be done in relation to the communities surrounding them. As shown in this research, communities who have been directly affected for there to be exploitation of resources need to be considered when windfall from the exploitation of the resources is acquired, failure to which conflicts will emerge and sometimes, conflicts can lead to war causing untold damage to resources and a countries economy as a whole.

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Appendices

Appendix 1

Questionnaire and key informant checklist

ASSESSMENT OF BENEFIT SHARING OF REVENUES COLLECTED BY WATER COMPANIES: A CASE STUDY OF ELDORET WATER SANITATION COMPANY LIMITED

Introduction

The following questionnaire shall be used to find out pertinent issues surrounding the above titled research topic. The findings will be used discretely and analysis will be done without bias to enable the researcher come to verifiable and conclusive findings. This research maybe be used to improve among other things benefit sharing and therefore result in improved conservation of water resources in the region. Benefit sharing is one of the key pillars of good leadership and can result in profound economic, social and ecological good. These questions will go a long way in helping the researcher find answers important to this topic however:

1. In case the interviewee feels offended by any of the questions he or she should ignore the question
2. The answers shall be kept confidential and only used for academic purposes. The findings shall be made available through publications, however names shall not be used in the publication
3. Personal information such as names and age shall not be published
4. Conversation can be recorded by the researcher for future reference by the researcher

The questionnaire shall have two sections the first section being the social demographic questions.

A. Social demographic questions

1. What is your age in years?

2. What is your gender?

[1] Male

[2] Female

2. For how many years have you lived in Chebara region?

.....
.....
.....

3. What is your main source of income?

.....
.....
.....

5. What is the size of your land that you own in acres?

.....
.....
.....

6. What is your highest education level attained?

[1] No formal schooling

[2] Some high school

[3] Graduated high school

[4] Vocational/ technical school

[5] Some college

[6] Graduated college

[7] Post graduate study

7. What is the number of people currently living in this household.....

i. incentives used to enhance collaboration between all stakeholders

Questions

1. What is your household water source?

1. Boreholes.....

2. Rivers

3. ELDOWAS

.....

2. If you get water from ELDOWAS how often is the supply?

a. How regularly do you get water from ELDOWAS

1. Regular

2. Irregularly

b. How frequent is the water supply?

1. daily

2. weekly

- 3. monthly
- 4. other (specify)

c. If no regular supply, why is it so?

.....
.....

3. What is your opinion of the dam in regards to the following:

a. The location?

.....
.....
.....

b. Water levels?

.....
.....
.....

c.

a. How has your households benefited from the ELDOWAS?

- I. Employment
- II. Water supply
- III.

Social amenities (schools, hospitals/dispensaries, roads)

.....
.....

b. Are there any members of your household who have been employed at ELDOWAS?

1= YES; 2= NO

.....

a) IF YES how many of your household members are employed by ELDOWAS

.....
.....

6. Are there any ecological projects and activities done by ELDOWAS that you know of?

1= YES.

2= NO.

If yes, please tell me what projects?

a. Tree planting

b. Clean up projects

c. Other specify

If yes (in question 5) were you involved in these projects?

.....

.....

If you were involved, please tell me how?

.....

.....

If you were not involved why was it so?

.....

.....

7. As community members are you involved in management of the dam and water in any way?

Yes=1.....

No=2.....

.....

If yes how?

.....

.....

B. If no would you wish to be involved and why?

Yes=1.....

.....

No=2

If you are not involved in the management of the dam, why is it so?

.....

.....

If yes in (6 b) why and in what way?

.....
.....
.....

8. When was the dam constructed?

.....

Have there been any expansions or planned expansions of the dam?

.....
.....
.....
.....

9. How was your household affected by the construction/expansion of the dam?

.....
.....
.....
.....

10. Was your household compensated for the dam to
be built/expanded?

.....
.....
.....
.....

11. Do you feel you were adequately compensated for the dam?

.....

.....
.....
.....
.....

12. Do you feel your opinion taken into account with regards to the management, use and conservation of the dam?

.....
.....
.....
.....
.....

11. Do you consider yourself as a stake holder of ELDOWAS and why?

Yes=1.....
.....
.....

No=2.....
.....
.....

b) If yes is your opinion as a stakeholder taken into account with regards to the management, use and conservation of the dam?

.....
.....

.....

.....12. Are you actively involved in the management of the dam?

Yes=1.....

.....

No=2.....

.....

i. IF yes in 12 what role do you play in management and conservation of the dam?

1. Not specific.....

2. (Some specify).....

13. Were you involved in the planning process for the construction of the dam in the year1993?

14. As a community member, were you consulted on the dam expansion in the year, 2009?

.....

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.....

ii. Assess the benefits derived by communities from the Eldoret Water and Sanitation Company Limited

1. Have there been any developments carried out by ELDOWAS in this region?

.....
.....
.....
.....

2. Do you feel the ELDOWAS revenues should be used to improve the conditions of people around this region?

.....
.....
.....
.....

If yes, how would like it utilized?

Has any of your household members received trainings related to management or wise use of water as a resource, from ELDOWAS>?????

1= YES; 2= NO

If yes, what training did you or household member receive from ELDOWAS?????

iii. To assess the effect of incentives on communities' socio and economic wellbeing and environmental conditions around the dam

1. Have there been any significant community gains as a result of having the dam in this region?

.....
.....
.....
.....

2. Have there been any significant rise in water borne (Malaria, typhoid, cholera) diseases as a result of the dam being created here?

3. Did construction and subsequent expansion of the dam affect your lives?

Yes=1.....

No=2.....

.....

a) IF YES how?

4. Have there been any development projects carried out in this region as a result of having the dam here? If yes which ones?

.....
.....
.....
.....

5. In your opinion are there any environmental conservation practices in this region?

.....
.....
.....
.....

6. Do you think the environmental conditions in have changed as a result of having the dam in this region?

.....
.....
.....
.....

7. Do you think the creation of the dam in this region changed the day to day activities of community members of Chebara region?

Yes=1.....

.....

No=2.....

.....

IF

YES

how?

.....

8. Have there been improved social amenities like schools, hospitals and churches in this region as a result of the building of the dam?

.....
.....
.....
.....

9. Have community members been exposed to any trainings on environmental conservation and water conservation by ELDOWAS?

.....
.....
.....
.....

10. Compared to surrounding regions would you say the region has experienced growth over the years?

.....
.....
.....
.....

11. Do you think the local region's economic growth can be attributed to having the dam in this locality?

1= yes; 2= no

If yes, please can you approximate what proportion of local region economic growth is attributed to the dam?

.....
.....
.....
.....

