



**ASSESSMENT OF THE ROLE OF WATER SECTOR REFORMS IN ENHANCING SOCIO-ECONOMIC DEVELOPMENT: A CASE STUDY OF MANDERA COUNTY**

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**ABSTRACT**

*Water sector reform was thought would help ensure adequate supply of water and transform the socio-economic status of Mandera County Citizens. Nothing so far shows that water challenges in Mandera County would soon end. It is in this regard that the study assessed the role of water sector reforms in enhancing socioeconomic development in Mandera County. To achieve this objective the study analyzed the effects of operation cost, community participation, policy, and sustainability concerns on socio-economic development in Mandera County. The study employed used descriptive research design which sought to establish factors associated with certain occurrences, outcomes, conditions or types of behavior. The target population was 540 and the sample size was 10% of the target population which was 54. Questionnaires were used to collect Data. A computer aided statistical package for social sciences was employed for analysis. The study found that operation cost, community participation, policy and sustainability concern had a statistically significant influence on socioeconomic development in Mandera County. The study concluded that operational cost, community participation, policy and sustainability concern is significantly and positively related to socioeconomic development. The study recommended that the county government should have a proper outline of the operational costs of the water reforms. This will ensure that all costs of reforms are covered to achieve the intended goal. The study suggested that the county government should ensure that it incorporate the community in every step of the water reforms. This will enhance community participation in government activities. The study recommended that the county government should improve on the policy on water reforms. This will ensure effective implementation of the projects. The study suggested that the county government should have a thorough research on sustainability of the water reforms. This will ensure that they promote socioeconomic development.*

**Key words:** *Operational Cost, Community Participation, Policy, Sustainability Concerns, Socio-economic Development.*

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## INTRODUCTION

Water sector reform refers to the process of implementing changes in the sector to ensure better water service delivery and resource management, enhanced availability of water for economic development, improved living conditions for all Kenyans and sustainable conservation of water resources for posterity and future. To keep the reforms on track the formulation of guiding principles was necessary to improve governance and transparency, participation and empowerment of stakeholders, communication, affordability and equitable access, performance of institutions and sustainability. These principles are intended to fulfil human rights to water and sanitation and achieve MDGs and Kenya vision 2030 (GOK Report, 2002).

The Indian water sector is in dire need of reforms, faced with the dwindling supply of clean water and persistent increase in population a policy framework is long overdue. Over the last decade the water catchment areas have been systematically destroyed by the poor who have no regard for environment. The Indians are traditionally attached to their religious and cultural beliefs which contribute tremendously to the pollution of rivers (Sunil et al, 2006).

According to Hernandez et al, (2011) the conservation of the Amazon forest is in essence crucial for maintaining a continuous flow of water. The increased logging activities in the forest if left unchecked would in the near future affect water conservation efforts. He argues that the Brazilian economic growth may not be sustainable if policies are not put in place to safe guard the environment. This is particularly true since the high rise urban residential areas have fully, began to feel the brunt of water rationing. The Brazilian water sector policy proposes the inclusion of the private sector as an alternative to government intervention, and the involvement of water users and other sectors in the management of water through decentralized governance arrangements (Almeida, 2009).

In Botswana where water scarcity is acute water reforms, including privatization, have encountered

considerable challenges and failures, especially in areas where livestock farming is the economic mainstay. This has led to the formulation a water policy framework setting up the independent regulatory institution to oversee the implementation of the water sector reforms. Within the general restructuring and privatization framework, the establishment of regulation was generally prescribed by donors in order to attract more aid for water and sanitation programmes. It was argued that regulatory institutions should be coherent, accountable, transparent and predictable independent bodies (Ndlovu, 2011).

The water sector reform in Kenya involved the development of new policies, new legislation and new sector institutions in order to address the challenges associated with access and provision of water services, improved customer satisfaction, increased development investment and enhanced governance (GOK Report, 2004). Water supply and sanitation in Kenya is characterized by low levels of access, in particular in urban slums and in rural areas, as well as poor service quality in the form of intermittent water supply. Only 9 out of 55 water service providers in Kenya provide continuous water supply. Seasonal and regional water scarcity exacerbates the difficulty to improve water supply. The Kenyan water sector underwent far-reaching reforms through the Water Act No. 8 of 2002. Previously service provision had been the responsibility of a single National Water Conservation and Pipeline Corporation as well as of a few local utilities established since 1996. After the passage of the act service provision was gradually decentralized to 117 Water Service Providers (WSPs). These are linked to 8 regional Water Services Boards (WSBs) in charge of asset management through Service Provision Agreements (SPAs). The Act also created a national regulatory board (WASREB) that carries out performance benchmarking and is in charge of approving SPAs and tariff adjustments. The Ministry of Water and Irrigation is in charge of policies for water supply and the Ministry of Public Health and Sanitation is

in charge of policies for sanitation (GOK Report, 2004).

Although urban water tariffs are high by regional standards (US\$0.46 per m<sup>3</sup> on average in 2007) the level of cost recovery is low due to a high level of non-revenue water (average of 47%) and high costs. Costs are high due to the need to tap distant water sources (e.g. Mombasa is supplied from a source located 220 km from the city) and due to high levels of staffing (11 workers per 1000 connections or more than twice the sector benchmark). Investment in the sector increased fivefold from US\$55m in 2004–05 to almost US\$300m in 2008–09. 58% of this amount was financed by the government with its own resources, 31% by external donors and 11% was self-financed by utilities (GOK Report, 2007).

### **Statement of the Problem**

The water sector in Kenya has undergone major structural reforms aimed at improving service provision. The Government through the Ministry of Water and Irrigation found it necessary to formulate and implement policy guidelines that would drive the reform agenda in the water sector. However the water sector reforms has not effectively helped the water service boards mitigate the emerging challenges of climate change, population pressure, environmental degradation, and limited endowment of water resources, temporal variation in the availability of water, national policies, increased water-use conflicts, rapid urbanization and the challenges of low-income areas (Darrel et al, 2011).

Before the water sector reforms, there lacked meaningful sustainable water service delivery which is essential for socio-economic development. Sustainability of water systems in the rural water sector in Kenya also received relatively little attention. There was also no adequate administrative machinery to implement reforms in Kenya (O'Brien, 2010).

The implementation of water reforms in Mandera County has been hampered by; over lapping of roles and responsibilities of key public actors, inadequate

institutional set-up, lack of a sound knowledge that support integrated management of multi-sectoral use of the water, and training of personnel and institutional development. Previous water sector reforms have not been consistent with the County's socio-economic development plans due to lack of equitable water allocations in this predominantly pastoralist area. It is against this background this study assessed the role of water sector reforms in enhancing socioeconomic development with a view to addressing the gaps.

### **Purpose of the Study**

The purpose of the study was to assess the role of water sector reforms in enhancing socioeconomic development in Mandera County. The objectives of the study were;

- To establish the effect of operational cost on socioeconomic development in Mandera County.
- To examine the extent to which community participation influence socioeconomic development in Mandera County.
- To determine the influence of policy on socioeconomic development in Mandera County.
- To assess the extent to which sustainability concern influence socioeconomic development in Mandera County.

### **LITERATURE REVIEW**

#### **Critical Review of Empirical Studies and Research Gaps**

Kenya is a water scarce country and faces numerous management challenges. It is in this recognition that the Government prioritized increasing access to sustainable and affordable water services within its overall policy framework of the economic recovery strategy for wealth and employment creation. The sector has thus undergone major structural reforms aimed at improving service provision. The Government through the Ministry of Water and Irrigation found it necessary to modernize the sector to conform to emerging challenges like climate change, population pressure,

environmental degradation, and limited endowment of water resources, temporal variation in the availability of water, national policies, increased water-use conflicts, rapid urbanization and the challenges of low-income areas. Water supply and sanitation are also among the key issues emphasized under the social pillar of the Kenya Vision 2030. The Vision envisages availability and access of water to all by the year 2030. In order to address the challenges associated with access and provision of water services, the Kenya water sector underwent significant reforms after the Water Act 2002 was enacted by parliament. The main objective of the reforms was to manage water services and resources efficiently by separating responsibilities of providing water to consumers from water provision and management (Ramo et al, 2006).

Before the water sector reforms, there lacked meaningful sustainable water service delivery which is essential for socio-economic development. Sustainability of water systems in the rural water sector in Kenya also received relatively little attention. There was also no adequate administrative machinery to implement reforms in Kenya (Tito et al, 2010). There was over lapping of roles and responsibilities of key public actors in the water sector which were the main causes of conflicts and poor performance. Ministry of Water Irrigation and Ministry of Local Government would formulate, regulate and provided services and this diminished checks and balances, accountability and escalated conflicts thus adversely affecting service delivery. This meant inadequate institutional set-up which resulted in poor water sector performance.

There was also no sound base for expanding the knowledge that supports integrated management of multi-sectoral use of the water, training of personnel and institutional development. Previous water sector reforms were not consistent with national economic and social plans. This was coupled with lack of equitable water allocations and permits based on allocation plans (Tito et al, 2010). Water user fees (tariffs) were not being charged

based on volumetric measuring but haphazardly depending on the region served and the class of the customers. This therefore necessitated the implementation of water sector reforms in order to address poor water service performance which was evident before the reforms leading to inadequate delivery of clean, safe and reliable water to the population (Kwame et al, 2003). This has been achieved through restructuring of water sector for improved sector performance and also addressing challenges in the management of the resources and delivery of water and sanitation services. Safe, clean and reliable water has been declared as one of the human rights in the new constitution and therefore the need to align the water delivery function to all relevant institutions.

The adoption of an institutional framework at various levels is considered as one of the key strategic outcomes in the water reforms. According to World Bank, (2006) report effective institutions are required at national, provincial and local level to ensure that all stakeholders can contribute to the decision making process. The Act also addresses institutional weaknesses that existed in the past such as poor organizational structures, conflicting, missing or overlapping functions and responsibilities, bureaucracy, inadequate funds, lack of skilled personnel and shortage of essential facilities

The water sector reforms were occasioned by the inability of existing institutional structural arrangements and proper administrative machinery to effectively and efficiently provide safe, clean and reliable water for the growing population in a coordinated manner (Amani, 2011). The institutions were almost being run down due to rampant corruption in awarding of consultancy services, project designs and construction of water catchments facilities like dams and general infrastructures to boost water service delivery.

The well-organized corruption cartels in the water institutions have continued to adversely affect the approved budgetary allocation from treasury due to misuse and open diversion of funds (Jande et al,

2010). The water service delivery institutions have had major challenges in mobilizing funds from donor partners because of the much publicized corruption in the institutions that should attract the funds. The institutions also lack proper master plan, action plans and comprehensive frameworks which can be presented for any sound financial external support.

There has been lack of proper coordination among the institutions created after reforms resulting into duplication of roles and therefore consuming the scarce resources at the expense of good and reliable customer care to the water consumers. The consumers have not been positively considered over time due to lack of meaningful customer focus and feedback method on how to improve service delivery. The duplication and depletion of limited resources has continued to adversely affect the expansion of much needed assets for water pipeline in order to reach the expanding population in the service area. The much expected operations of the water institutions has been faced with major problems in terms of adequate and regular reporting, continuous monitoring and correct evaluation of performance by the other statutory institutions mandated with regulating water service provision. This lack of monitoring and evaluation has caused major governance issues because the chief executive officers and management teams have continued to operate inefficiently. The problem of the weak water institutions in Kenya has continued to slow economic growth because the population spends meaningful time in looking for water to fetch for their own domestic use and their livestock. If water was available as expected after the reforms, then the time wasted in searching for the water would have been directed into better use for economic growth (Joel et al, 2011).

There are several important challenges facing the water sector in both developing and developed countries (Hall et al, 2001). The first challenge consists of maintaining the existing infrastructure, which includes reducing leakages and replacing and expanding networks. In order to achieve this, there

is a need for financial autonomy including sustainable and equitable tariffs, and efficient revenue collection. In addition, the utility company should be properly managed, which would include building managerial capacities and improving efficiency and productivity. Since water is a basic necessity, sociopolitical issues such as an affordable price, transparency and accountability must be considered. And finally, issues of environment and health such as public health needs, conservation and environmental management must be dealt with in an appropriate manner.

Holland, (2008) conducted a study on the background and status of reforms in the water and sanitation sector in Kenya using regression analysis. He found out that the reforms are positive and in the right direction except that the process faces challenges in funding, bureaucracy, too many institutions and that the organizations which were formed to carry out the reforms do not work as a team. He also found out that the institutions which are mandated to carry out the reforms are faced with corruptions challenges. He recommended that there is need for a revision on the number of institutions mandated to carry out the reforms. He did also recommend that all the board of directors in these institutions should be trained on corporate governance guidelines.

Ministry of Water & Irrigation, (2007) conducted a study on the National water services strategy (NWSS) which was published and was prepared in accordance with section 49 and 50 of the water act 2002. The study found out that sound institutional frameworks to adequately carry out the water sector reforms were not properly functional. There were also improper design programs to carry out water facilities expansion to all areas in Kenya. The study found out that there were no enough strategies and funds to expand water to all underserved areas in the republic. There was no proper national monitoring and evaluation mechanisms on water service deliveries and no well documented investment programs in the water sector to carry out water reforms effectively. The

study recommended that, for the success of the reforms in the country, there should be arrangements to come up with well-structured and working water institutions to ensure that at all times there, is in every area of Kenya, a person and institution providing water supply to the citizens at fair tariffs. The other recommendation of the study was the need to design programs to bring about the progressive extensive of water supply infrastructure to all the Kenya people.

Vondach, (2007) conducted a study on the process of reforming water sector in Kenya. The study found out that the initial experiences in Kenya towards reforms in the water sector were positive but slow .The study found out that there was need in providing water services to the citizens and therefore there was need to advance further the water sector reforms. The study found out that the financial base and ability to carry out the reforms were inadequate and therefore the need to focus on these for the success of the water sector reforms. The study recommended that there was need for efficient and well-structured institutions to carry out reforms as a team and within a short period so that the reforms are finalized for the citizens to drink and access adequate and quality water. The study recommended that the water services trust fund, an organization mandated with mobilizing funds for carrying the reforms be strengthened and supported by the parent ministry of water so that the financial base is boosted. The study recommended an optimal integration of the water resources management in the country so that all the citizens have adequate water.

Jairo et al, (2009) conducted a study on water sector reforms in Kenya on improving governance and human rights to water in Kenya. He found out that the sector still needed more resources to carry out the water sector reforms. He found out that it was a major challenge in improving water coverage in both rural areas and informal settlements within urban towns. The study found out that there was lack of critical capacity in the areas of governance, human rights and commercial orientation and

regulations in the water sector. The study found out that there was inadequate communications and information management tools to carry out the water sector reforms successfully. The study further found out that there were inadequate sector reforms mechanisms for monitoring and evaluating the success and extend of the water sector reforms. He recommended that all necessary investments towards better tools were necessary and vital in fast tracking the water sector reforms because they will provide precise timely feedback on how the reforms are progressing so that any corrective action can be undertaken in time. He recommended aggressive and innovative methods of mobilizing resources so that the budget for carrying out the reforms can be met timely.

## **Theoretical Framework**

### **Institutional Transaction Cost Theory**

This study hinges on the institutional transaction cost theory which explains the challenges of water sector. The institutional trans-action cost theory as generalized by North, (2004) to include non-economic factors and amended further to include the performance and transaction cost impacts of institutional linkages can be used as a diagnostic framework to interpret the way different factors affect the change process. Broadly, these factors can be grouped into: endogenous factors that are internal to the water sector (e.g. water scarcity, water conflicts, financial and physical crisis) and the water institutions (i.e. institutional linkages) and exogenous factors that are outside the strict confines of both the water sector and its institutions (e.g. economic development, demographic growth, technical progress, economic and political reforms, international commitments and natural disasters).

Since the exogenous and endogenous factors are interrelated and their relative impacts differ by context, it is difficult either to isolate their individual roles or to generalize the direction of their effects. But, these effects can be tracked by conceptualizing them as part of either the transaction costs or the opportunity costs of

institutional change. The transaction costs cover both the real and monetary costs of altering the regulatory, monitoring and enforcement mechanisms related to water development, allocation and management. There are also intricate linkages between the transaction costs of earlier reforms and those of subsequent reforms. While it is possible to estimate these costs and benefits in ex-ante and ex-post contexts using both quantitative and qualitative information, the framework is equally valuable as a diagnostic tool in understanding the individual and joint effects of various factors affecting the process of water institutional change (Saleth & Dinar, 2004).

### **Agency Theory**

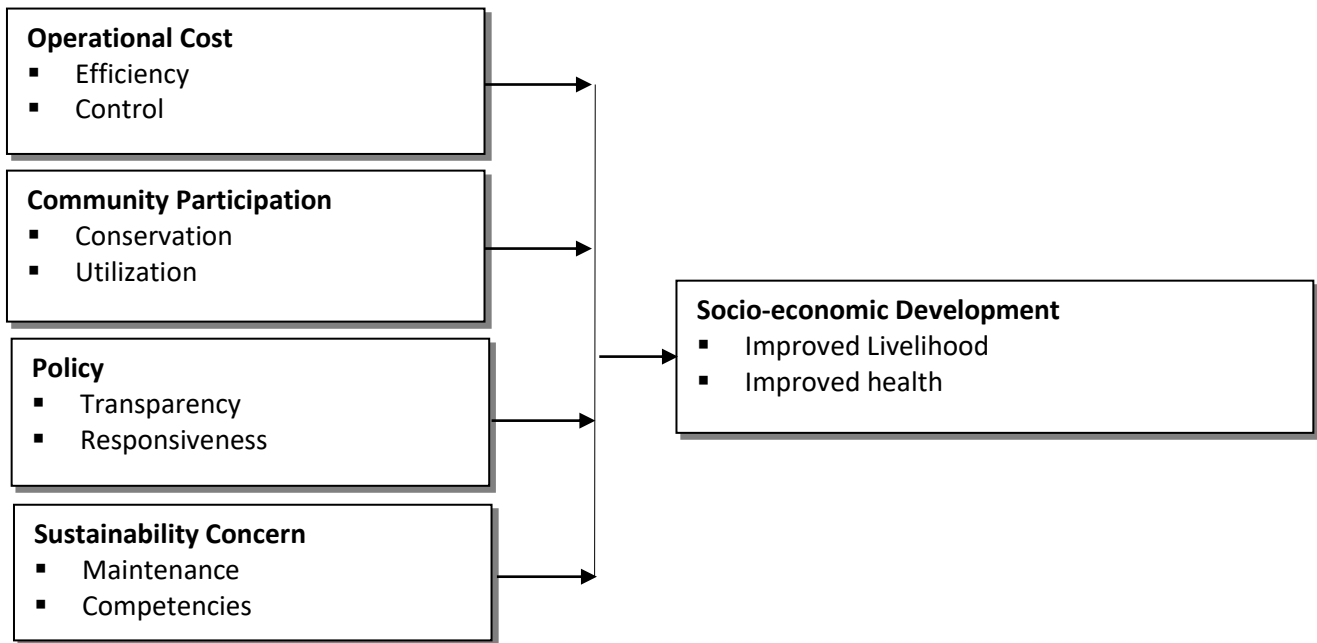
Agency Theory, and the incentives of agents, focuses on addressing the two principal problems that occur in an agency relationship (Keser, 2000). Firstly, the agency problem where the agent's and principal's interests are not aligned in terms of desires and risk, and secondly, the fact that it may be very expensive and difficult for the principal to actually verify what the agent is doing. Agency Theory is concerned with how the principal can best motivate the agent to perform in a manner consistent with the interests of the principal, bearing in mind that the principal may have difficulty in monitoring the agent's activities (Vital et.al., 2002). Further, it is likely that the agent will not always act in the best interests of the principal because of the self-interest of the agent. The basis of Agency Theory is that commensurate remuneration can solve agency problems, and that the management can therefore influence employees' behaviour by controlling their incentives. One of the problems though is the determination of the level and type of remuneration awarded to the agent (Vital et.al.,

2002). Agency theory remains the foundation on which the vast majority of performance appraisal research relies (Marc et.al., 2007). The manner in which performance is achieved relates to how managers motivate employees to align themselves to the interests of the principal. It is therefore necessary to understand how motivation theory relates to performance and how this fits into performance management strategies.

### **Stakeholder's theory**

Stakeholder theory can be defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives". Unlike agency theory in which the managers are working and serving for the stakeholders, stakeholder theorists suggest that managers in organizations have a network of relationships to serve. Similarly, the stakeholder approach also considers the provision of resources as a central role. This will result in the organizations ability to build consensus among all critical stakeholders. The board of directors is hence seen as the place where conflicting interests are mediated, and where the necessary cohesion is created. The stakeholder theory argues about the importance of an organization paying special attention to the various stakeholder groups that include; customers, suppliers, employees, the local community is deemed to also have a stake in a project. The representation of all stakeholder groups on boards is therefore necessary for effective corporate governance (Gibson, 2000). Stakeholder theory challenges agency assumptions about the primacy of shareholder interests. Instead it argues that a organizations should be managed in the interests of all its stakeholders. These interests include not only those of the shareholder but also a range of other direct and indirect interests.





**Independent Variables**

**Dependent Variables**

**Figure 1: Schematic Presentation of the Framework**

The conceptual framework shows the relationship that exists among variables. Potentially, one of the most powerful aspects of the Framework is that it provides a succinct way of explaining the influence of independent variables on the dependent variable. The framework sets out the components for assessing the role of water sector reforms in enhancing socio-economic development. These variables can be seen on Figure 1 which include; operation cost, community participation, policy and sustainability concern.

**METHODOLOGY**

The research was conducted in Mander County, which is located in the North Eastern part of Kenya. This study adopted a descriptive research design and relied on a case study where by the unit of study was Mander County. The target population was the MCAs, NGOs, CBOs, and officials of the Ministry of Water in Mander County. In this study 540 individuals formed the target group. Questionnaires were used as the main data collection instruments, while interviews and focus groups would enhance clarity of certain issues.

Purposive sampling technique was used to select the ideal subjects for the study. A stratified random sampling technique was used to sample individuals from the various groups. The study adopted a sample determination strategy by Mugenda & Mugenda, (2003), which states that a sample of at least 10% is appropriate for a large population and has a margin of error that is statistically determinable.

The researcher carried out a pilot study to pre-test and validate the questionnaire. The researcher selected a pilot group of 10 individuals to test the reliability of the research instrument. Based on their responses, validity tests were done to check for the validity and usability of the instrument. Cronbach’s Alpha, was calculated to measure the internal consistency reliability of the instrument. If the value of Cronbach’s Alpha is greater than 0.7 then the instrument is considered reliable.

The questionnaire was administered to the participants with the help of five research assistants. Before processing the responses, the completed questionnaires were edited for completeness and consistency. The researcher used

both qualitative and quantitative techniques in analyzing the data. Content analysis was used to analyze the qualitative data while descriptive analysis such as mean, frequencies and percentages were used to analyze the data. In addition, the inferential statistics such as correlation and regression model was used. The organized data was interpreted because of concurrence to objectives using assistance of computer packages especially statistical package for social scientists (SPSS) version 21 to communicate research findings. The study also used ANOVA to test the level of significant of the variables on the dependent variable at 95% level of significance. Tables and charts were used for data presentation. After the analysis and interpretation of data, a final report was written to provide a summary of the findings.

The study used the following regression model.

$$Y = a + X_1OC + X_2CP + X_3P + X_4SC + e$$

Where Y= socio-economic development.

a=constant

$X_i$ 's= coefficient of variables of the study

OC=Operational Cost, CP=Community Participation,

P=Policy and SC=Sustainability Concern.

**Table 1: Operational Cost**

Category	Frequency	Percent
Very High	27	56
High	18	38
Moderate	3	6
Low	0	0
<b>Total</b>	<b>48</b>	<b>100</b>

The respondents were required to give their view on whether the operation cost would have an influence on socioeconomic development in Mandera County. The results were as shown in

**Table 2: Influence of Operation Cost on Socioeconomic Development**

Category	Frequency	Percent
Yes	38	79
No	10	21
Total	48	100

### Community Participation

The respondents were asked to indicate the extent to which community participation affect

e=represents the error term.

$$OC = [Y - a - X_2CP - X_3P - X_4SC - e] / X_1$$

$$CP = [Y - a - X_1OC - X_3P - X_4SC - e] / X_2$$

$$P = [Y - a - X_1OC - X_2CP - X_4SC - e] / X_3$$

$$SC = [Y - a - X_1OC - X_2CP - X_3P - e] / X_4$$

### RESULTS

The study targeted a sample of 54 respondents. They were all issued with questionnaires, from where 48 filled and returned the questionnaires forming a response rate of 89% which accord to Mugenda (2009) is excellent.

#### Operational Cost

The respondents were required to rate the operational cost of water services in Mandera County. The results were as shown in Table 1. The findings showed that majority of the respondents 56% indicated that the operational cost of water services in Mandera County is very high, while 28% indicated that is high while 6% were moderate. This implied that the operational cost of water services in Mandera County is very high.

Table 2. The findings show that 79% of the respondents agreed that operation cost would have an influence on socioeconomic development in Mandera County while 21% said no.

socioeconomic development in Mandera County. Resulted were as shown in Table 3. Findings show that majority of the respondents 52% indicated that

community participation affect socioeconomic development in Mandera County to a large extent, 38% indicated to a very large extent while 8% were

moderate. This infers that community participation affect socioeconomic development in Mandera County to a large extent.

**Table 3: Community Participation**

Category	Frequency	Percent
Very Large Extent	18	38
Large Extent	25	52
Moderate Extent	4	8
Small Extent	1	2
<b>Total</b>	<b>48</b>	<b>100</b>

The respondents were asked to give their opinion on whether the liquidity of art work would influence socioeconomic development in Mandera County. The findings were as shown in table 4. The

results show that 83% of the respondents agreed that the liquidity of art work would influence socioeconomic development in Mandera County.

**Table 4: Influence of Liquidity of Art Work on Socioeconomic Development**

Category	Frequency	Percent
Yes	40	83
No	8	17
<b>Total</b>	<b>48</b>	<b>100</b>

**Policy**

The respondents were required to rate the policy for socioeconomic development in Mandera County. The findings were as shown in Table 5.

From the findings, 50% of the respondents indicated that the policy for socioeconomic development in Mandera County is good, 27% indicated it is moderate while 19% indicated it is excellent.

**Table 5: Policy**

Category	Frequency	Percent
Excellent	9	19
Good	24	50
Fair	13	27
Poor	2	4
<b>Total</b>	<b>48</b>	<b>100</b>

The respondents were asked to give their view on if the policy has an influence on socioeconomic development in Mandera County. As shown in Table 6. The results show that 90% of the respondents

agreed that the policy has an influence on socioeconomic development in Mandera County while 10% indicated no.

**Table 6: Influence of Policy on Socioeconomic Development**

Category	Frequency	Percent
Yes	43	90
No	5	10
<b>Total</b>	<b>48</b>	<b>100</b>

### Sustainability Concern

The respondents were asked to indicate the extent to which sustainability concern influence socioeconomic development in Mandera County. As shown in Table 7. From the findings majority of the

respondents 52% indicated that sustainability concern influence socioeconomic development in Mandera County to a very large extent, 40% indicated to a large extent while 6% were moderate.

**Table 7: Sustainability Concern**

Category	Frequency	Percent
Very Large Extent	25	52
Large Extent	19	40
Moderate Extent	3	6
Small Extent	1	2
<b>Total</b>	<b>48</b>	<b>100</b>

The respondents were asked to give their thought on if sustainability concern would have an influence on socioeconomic development in Mandera County. As shown in Table 8. The findings showed

that 81% of the respondents agreed that sustainability concern have an influence on socioeconomic development in Mandera County whereas 19% indicated no.

**Table 8: Influence of Sustainability Concern on Socioeconomic Development**

Category	Frequency	Percent
Yes	39	81
No	9	19
<b>Total</b>	<b>48</b>	<b>100</b>

### Regression Analysis

Regression analysis was used to establish the relationship between the independent and dependent variables.

Model summary was used in analysing the variation of the dependent variable because of changes in the predictor variables. The results were as

presented in Table 9. The value of adjusted R<sup>2</sup> (0.639) suggest that 63.9% variation in socioeconomic development can be attributed to changes in operational cost, community participation, policy and sustainability concern. The remaining 36.1% suggest that there are other factors that affect socioeconomic development in Mandera County that were not part of this model.

**Table 9: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.801 <sup>a</sup>	0.641	0.639	0.10613

Analysis of variance was used in determining whether the data used in the study was significant. 0.05 was the selected level of significance used in this study. From the findings, the F-calculated value was greater than the F-critical value (15.4222 > 2.5893.893) and the p-value was 0.001 which was

less than 0.05. This was an indication that operational cost, community participation, policy and sustainability concern had a significant influence on socioeconomic development in Mandera County.

**Table 10: Analysis of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.916	4	2.979	15.4222	.001 <sup>b</sup>
	Residual	8.306	43	0.193		
	<b>Total</b>	<b>20.222</b>	<b>47</b>			

The beta coefficients were computed and then fitted to the regression model. The regression model was:

$$Y = 0.896 + 0.385X_1 + 0.361X_2 + 0.394X_3 + 0.401X_4 + e$$

From the findings, operational cost had a statistically significant influence on socioeconomic development in Mandera County (B=0.385, P=0.002). Also, operational cost had a significant and positive influence on socioeconomic development. Community participation had a statistically significant influence on socioeconomic

development in Mandera County (B=0.361, P=0.002). Further, community had a significant and positive influence on socioeconomic development.

Policy had a statistically significant influence on socioeconomic development in Mandera County (B=0.394, P=0.002). Also, policy had a significant and positive influence on socioeconomic development. Sustainability concern had a statistically significant influence on socioeconomic development in Mandera County. Further, sustainability concern had a significant and positive influence on socioeconomic development.

**Table 11: Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.896	0.125		7.168	0.000
Operational Cost	0.385	0.103	0.324	3.738	0.002
Community Participation	0.361	0.101	0.311	3.574	0.002
Policy	0.394	0.099	0.337	3.980	0.002
Sustainability Concern	0.401	0.112	0.369	3.580	0.002

a. Dependent Variable: Socioeconomic Development

## CONCLUSIONS AND RECOMMENDATIONS

The study found that operation cost would have an influence on socioeconomic development in Mandera County. Further, operational cost had a statistically significant influence on socioeconomic development in Mandera County. The study concluded that operational cost is significantly and positively related to socioeconomic development. The study revealed that community participation had a statistically significant influence on socioeconomic development in Mandera County. The study concluded that community participation is significantly and positively related to socioeconomic development.

The study found that policy had a statistically significant influence on socioeconomic development in Mandera County. The study concluded that policy is significantly and positively related to socioeconomic development. The study revealed that sustainability concern had a statistically significant influence on socioeconomic

development in Mandera County. The study concludes that sustainability concern significantly and positively related to socioeconomic development.

The study recommended that the county government should have a proper outline of the operational costs of the water reforms. This will ensure that all costs of the reforms are covered to achieve the intended goal. The study suggests that the county government should ensure that it incorporate the community in every step of the water reforms. This will enhance community participation in government activities. The study recommended that the county government should improve on the policy on water reforms. This will ensure effective implementation of the projects. The study suggested that the county government should have a thorough research on sustainability of the water reforms. This will ensure that they promote socioeconomic development.

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