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Human resource, technical skills and performance of water projects in Uasin Gishu County, Kenya

Mary Fedha, Patrick Cheben
Department of Management Science and Project Planning, Faculty of Business and Management Science, University of Nairobi, Kenya

Abstract
Human resource and technical skills by employees of water service providers in Kenyan cities play a critical role in addressing water supply deficits, but the extent to which these variables influence performance of such water projects is not explicit. The purpose of the study was to determine the extent to which human resource and technical skills influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya. The study was grounded in Vroom's (1964) expectancy theory. Descriptive survey research design and correlation research design was adopted while Yamane's sample size determination formula, proportionate stratified random sampling and simple random sampling techniques were used to determine a sample size of 155 from a population of 252 elements. Quantitative data was gathered and analyzed descriptively and inferentially using mean scores, standard deviation, Pearson's Product Moment Correlation and regression models and finally hypothesis testing using *p*-value method tested. For objective one, results showed r = -0.019, F (1,144) = 43.6, R^2 = 0.1459 at $p = 0.01 < 0.05$, H_{01} was rejected and it was concluded that a significant relationship exist between human resource and performance of Eldoret Water and Sanitation Company water projects. For objective two, r = 0.458, F (1,144) = 29.29, R^2 = 0.105 at $p = 0.01 < 0.05$, H_{02} was rejected and it was concluded that a significant relationship exists between technical skills and performance of Eldoret Water and Sanitation Company water projects. It was recommended that strategies be put in place to ensure optimum human resource use for effective collection of revenue from water users. It was also recommended that staff training be undertaken regularly to enhance employee technical skills with a view to enhance their technical knowhow in order to undertake repairs and maintenance tasks for effective water distribution.

Keywords: human resources, technical skills, performance of water projects

Introduction

Vision 2030 (GoK, 2007) outlines a clear roadmap towards the achievement of water sufficiency in Kenya by the year 2030 yet despite this well laid out strategy there still exist glaring difference between renewable sources of water and access to safe and affordable drinking water. WASREB (2015) [15] estimates that there existed an average of 692m^3 per annum of water renewable resource against a proposed minimum of 1,000m^3 per capita per annum in the entire country. Ministry of Planning and National Development (MPND) (2007) further argues that if mitigation measures are not put in place by the year 2030, renewable water resource per capita will fall below the minimum water scarcity level of 500m^3 per year due to among other factors urban population growth, low human resource and technical skills of employees of water service providers and climate change. To make matters worse, it had been estimated that Kenya may additionally loose up to Ksh. 27 billion annually due to water related handling inefficiencies (WASREB, 2015) [15]. This means that causes of water supply insufficiency in Kenya is natural and also man-made, a situation that largely contributes to UN classification of Kenya as a water-scarce country. In Eldoret town, deficits that result in insufficiency of water supply are obvious from consumer point of view. Despite commissioning of 3(three) additional multi-billion Kenya Shillings water supply projects, there still exist huge water supply deficits (Eldoret Water and Sanitation (ELDOWAS) Company, (2020). This deficit is evidenced by frequent water rationing, supply cuts or even unexplained dry taps due to pipe bursts. Water supply deficits notwithstanding, ELDOWAS Company supplied 10,822,000m^3 of water to 276,914 out of 394,991 households (WASREB, 2015) equivalent to 107 m^3 per capita per annum yet the actual volume consumed by town residents was only 55 m^3 per capita per annum (ELDOWAS, 2020). This means that 55m^3 was unaccounted for. The study therefore sought to investigate the extent to which human resource and technical skills of ELDOWAS employees influence performance of Eldoret Water and Sanitation Company water projects in Uasin Gishu County, Kenya. The study was delimited to six water dams constructed by ELDOWAS Company namely; Elgarini dam, Chebara dam, Kerita dam, Two Rivers dam, Endaragua dam and Kipkarren dam projects. The study was interested in determining the extent to which Human resource and technical skills of employees influence performance of EDLOWAS Company water projects in Uasin Gishu county Kenta. The study findings would be important for planning, design and implementation of water projects to the extent that the human resources and technical skills of the project teams in the water service provider would be fully harnessed

Research Objective

1. To determine the extent to which human resource influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya.
2. To establish how technical skills influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya.

Research Questions

1. To what extent does human resource influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya?
2. How does technical skills influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya?

Research Hypothesis

1. H_{01}: There is no significant relationship between human resource and performance of Eldoret Water and Sanitation Company projects.
2. H_{02}: There is no significant relationship between technical skills and performance of Eldoret Water and Sanitation Company projects.

Literature Review

Theoretical and empirical literature was reviewed on human resource, technical skills and performance Eldoret Water and sanitation company water projects.

1.3.1 Performance of Water Projects

There is no universal definition of the concept "*performance*" Oxford Dictionaries Online (2012) defines performance as the action or process of performing a task or function, in terms of how successfully it is performed. On the other hand, performance of a water project refers to successful management of water projects upon completion in order to supply water on a sustainable basis (Knight, 2007). Brown and Williams (2015) conceptualize it as the capability of a water service provider to satisfy the supply demand. In this sense, performance of a water project refers to sustainable provision of water. Based on these definitions Knight, (2007) opines that water service provider's capacity to distribute water to consumers' entails deciding in advance quantities to supply in order to meet their needs. This means that, sufficient water supply upon successful implementation of water project forms the basis for performance of a water project. Activities subsumed under planning are defining goals, assessing risks, estimation and budgeting, allocating resources, defining tasks, and building schedules. While Geall and Moon (1998) acknowledged that project management consists of four basic functions: planning, organizing, controlling, and leading, each of which apply certain tools, techniques, and knowledge on projects. According to Project Management Book of Knowledge(PMBOK), planning and management is the application of knowledge, skills, tools and techniques in determining the steps for the execution by assigning teams specific tasks in order to meet project requirements, (PMI, 2008). In water projects, planning and management entails developing both managerial and technical skills for purposes of improving employee capacity to translate these skills to supply sufficient amounts of water (Gloria 2009). Project management therefore is a critical technique for the human resource in organizing institutional strategic goals.

It is not in doubt that successful project management is the basis for water project performance. That is why Conway (2004) argued that effective communication is a critical success factor for project performance and therefore imperative that all employees get in touch with one another continually. What isn't clear however is how much impact ineffective communications bears on water project outcomes (Larson, 2014). In this study performance of water projects refer to effective communication which facilitates sufficient water supply by ELDOWAS Company in such a manner that frequency of water supply interruptions is minimal while ensuring a shorter response time upon customer complaints. Based on this argument, the study sought to investigate the influence of human resource and technical skills on performance of ELDOWAS Company water projects in Uasin Gishu County, Kenya.

Human resources and Performance of water projects

Human resource is a set of people who make up workforce of an organization or business. Wooden (2000) conceptualize it as a group of individuals working in an organization on permanent basis, daily wages, temporary basis or on contract, collectively referred to as organizational workforce. Armstrong (2000) [4] described human resources as human capital, the knowledge and skills which individuals command in an organization. In his study on the Irish West Coast Water Project, O'Donnellet (2003) found that approximately two thirds of organizational value were perceived as composed of highly skilled technical human capital and that over half of that capital stemmed directly from people working, thinking and communicating within an organization. This means that human resource constitutes manpower, labor, personnel or simply people whose effort is employed in an organization and that this resource determines its performance.

Human resource is critical in project performance. That is why Mayes, (2018) acknowledges that a project company should revive its personnel's passionate knowledge through training programs. MoW (2008) similarly opines that development, regulation, and rewarding system communicate water service provider's outcomes for its workforces, while Merlevede (2014) confirms that aptitude and competency is necessary in sharpening and capitalizing culture through consistent assistances to advance steady skills and capabilities in a project company. A similar view was advanced by Armstrong (2002) [3] when he observed that, mentoring, coaching, job rotation are elements of training and development that enhance human capital. That is why in Abdul (2007) [1] framework on human resource development and its effect on performance, established that employee development means to develop their capabilities as a whole. That means that behavioral training techniques have a significant impact on performance of the water project company. Training however adds up to nothing if employees aren't committed to organizational goals. That is why Johnson (2009) argues that the most significant and complex component for the attainment of organizational performance is a human resource committed to the vision and mission of the organization. He further stated that human resource is primarily concerned with how people are managed, focusing on policies and systems put in place to ensure that organizational goals are attained. That is why Armstrong (2005) suggests that human resource output is an overall measure of organizational performance. This means that employee performance is what an employee does or does not do. De los Reyes and Jopillo (2015) similarly established that timely employee follow-up on payment of water tariffs by consumers has the net effect of increasing supply by 15%. Wadajo, Serbeh-Yiadom and Asfaw (2014) [16] on their part observed that employees increase the ease with which O&M workload in water projects is undertaken. Against this backdrop, the study examined the how human resource influence performance of ELDOWAS Company

water projects. Descriptive survey research design and correlation research design was used to determine the extent to which human resource influence performance of ELDOWAS Company water projects in Uasin Gishu County Kenya.

Technical Skills and Performance of Water Projects

Technical skills refer to individual aptitude in the performance of specialized tasks. Loria (2009) defined technical skills as adaptability by an employee to develop a positive attitude towards assigned tasks in a work environment. In her study, Barrett (2008) found that young people upon employment easily get disillusioned in terms of what they expect and the reality of what occurs in a work place. That is why Armstrong (2005) suggests that employees enter job market with college certificates ready to move up the ladder while much of what they learned is not necessarily applicable in the work environment. It is on that basis that Wooden (2000) alluded to some employees getting disillusioned and therefore fail to develop and sharpen their technical skills based on theoretical knowledge earlier acquired. This means that work place learning is necessary in order to build employee competencies.

It is apparent that developing workplace learning is critical for enhancing organizational performance. According to Knight (2007); Paisey and Paisey (2009) workplace learning means developing technical proficiency that improves a worker's readiness to develop a range of personal transferable skills. That is why Borden and Rajecki (2000); McCallum (2008): Ondrik (2012) [12] while studying workers' workplace preparedness and job prospects compared technical skills with overall project performance. In all the three studies they showed that a strong positive correlation exists between these two variables. However, Marie (2004); Lee-Kelly and Sankey (2008) were of contrary view when they showed that more than half of employees of water projects felt they were more than exceptionally well prepared for the position for which they were hired due to work experience rather than technical skills acquired through college qualifications. These finding allude to the fact that *"passion for work"* equally contribute towards performance of water projects. The ability to pursue development of technical skills is therefore domiciled in both technical experience and academic qualifications.

It is for that reason that the study was undertook to determine the influence of technical skills on performance of ELDOWAS Company water projects. Whereas Wandera, Naku and Afrane (2013) [14]; McCallum (2008): Ondrik (2012) [12]: Borden and Rajecki (2000) demonstrated that technical skills have influence water project performance. Marie (2004) similarly showed that there existed a strong positive correlation between technical skills and the overall project performance. Lee-Kelly and Sankey (2008) were however of contrary view when they established that project success is a function of commitment by top management and not technical skills while Marie (2004) established that more than 50% of water project employees held the view that work experience rather than technical skills acquired through college qualifications influence project performance. Despite divergence in findings, this study used descriptive survey research design and correlation research design to establish how technical skills influence performance of Eldoret Water and Sanitation Company projects in Uasin Gishu County, Kenya.

Research Methodology

The study adopted descriptive survey research design and correlation research designs. The target population was 252 employees of ELDOWAS Company working in six water projects, namely; Water Engineers, Hydrologists, Technicians, Masons, Water meter readers, Plumbers, and Casual workers assigned water works related tasks, Supervisors, Water billing clerks and the Maintenance crews. The characteristics of the population was their work assignments in ELDOWAS Company. The desired sample size was determined by Yamane's (1967) sample size determination formula provided as follows;

$$n = \frac{N}{1+N(e)2}$$

Where n = desired sample size,
N = study or target population,
e = level of precision or sampling error that the researcher wished to allow.
In this study a confidence level of 95% was desired which therefore gave a sampling error of ± 5% = 0.05

$$\therefore n = \frac{252}{1+252(0.05)2}$$

$n = 154.6$
≈ 155

Therefore, a study population 252 required a sample size of 155 subjects. Due to the heterogeneous nature of assignments and type of operations, subjects were first divided into seven (7) distinct strata in which proportionate stratified random sampling followed by simple random sampling technique was adopted to select the desired number from a sampling frame by use of computer random numbers. A distribution of subjects across each stratum, is outlined in the sampling design table 1

Table 1: Sampling Design

S/no	Name of water project	Number of Elements in the study population	Proportion of subjects the study population	No. of subjects selected proportionately from each project
1.	Kipkarren dam projects	45	0.178	27
2.	Endaragua dam	20	0.079	12
3.	Two Rivers dam	16	0.063	10
4.	Kerita dam	15	0.061	9
5.	Chebara dam	45	0.178	28
6.	Elgarini dam	40	0.159	25
7.	ELDOWAS Company	71	0.282	44
Total		252	1.000	155

Both primary and secondary data was desired in the study. Primary data was gathered using administered questionnaire, interview schedule and observation schedules while secondary data was gathered from project documents. Questionnaires was pre-tested using a purposive sample of 16 from Kakamega Water and Sanitation Company in Kakamega County. Test analysis showed Pearson Product Moment Correlation Coefficient, r = 0,8686 indicating that the research instrument was reliable for gathering data in the main study. Stability of the instrument was further established by determining the interrelatedness of items in the research instrument by use of Cronbach's Alpha Reliability Coefficient test. Content validity was ensured by seeking the opinion of the other researchers in confirming the adequacy of the research instrument while concurrent and predictive validity was undertaken by seeking opinion of other social science experts.

Quantitative data was collected by administered questionnaires while qualitative data was gathered by interview schedule and observation schedule. Quantitative data was analyzed descriptively and presented as mean scores and standard deviations and also by use of inferential statistical analysis involving correlation and multiple regression analysis to determine direction and dependence of independent and dependent variables. The models for analysis was represented as follows:

Linear regression Model:

$$Y=\beta_0+\beta_1X_1+\varepsilon \quad (1)$$

Where; Y = indicators of performance of water projects (Dependent Variable),
X_1 – Indicators of human resources (Independent Variable)
β_0 = Beta coefficient or the y- intercept,
β_1 = Beta coefficient of institutional capacity,
ε = error term.

Multiple regression model

$$Y=\beta_0+\beta_1X_1+\beta_2X_2+\varepsilon \quad (2)$$

Where; Y = indicators of performance of water projects (Dependent Variable)
β_0 = Beta coefficient on the y- intercept
β_1, Beta coefficient of human resource,
β_2, = Beta Coefficients technical skills,
X_1 = Human resources (Independent Variable),
X_2 = Technical skills (Independent Variable),
ε = error term

Null hypotheses (H_0) was tested at α = 0.05 significance level using p-value method and was rejected if p-value was more than 0.05 or otherwise not rejected.

Qualitative data was gathered and analyzed in an explanatory, subjective and detailed manner by finding patterns, features and themes from variables and presented in narratives and contextual form in the form of direct quotes, to confirm or not to confirm data gathered quantitatively, theories and hypotheses already stated in the research.

Results

Out of the 155 questionnaires issued, 145 were successfully administered and returned giving a questionnaire return rate of 92.90%. The response rate is close to what Adeniji (2011) got while studying participatory management of project execution in Nigeria in which he recorded a response rate of 94%.

Table 2: Multi-collinearity test

	Performance of water projects	Human Resource	Technical skills
Performance of water projects	1	-0.019**	0.458*
Human Resource	-0.019**	1	0.224
Technical skills	.458*	0.224	1

Statistical analysis in table 2 show that performance of water projects correlates weakly and negatively with human resources (r = -0.019, p = 0,01), moderately but positively with technical skills (r = 0,458, p = 0.01). This analysis implies that there was a week negative correlation of -0.019 between human resource and performance of ELDOWAS Company water projects in Uasin Gishu County, Kenya.

Performance of Water Projects

The items on performance of water projects were analyzed and results are presented as shown in Table 3

Table 3: Performance of Water Projects

No.	Item	n	Mean score	Standard Deviation
9a1.	Water supply interruptions lead to low quantities of water supply	145	2.69	1.563
9a2.	Water supply interruptions is a sign of insufficient supply	145	3.42	1.124
9a3.	Water insufficiency is usually due to lack of quantity of water	145	4.02	0.861
9a4.	Inefficient revenue collection results from inadequate water supply	145	3.50	1.196
9a5.	Water supply interruptions results in inadequate water supply	145	3.76	1.095
	Frequency of supply interruptions	145	3.478	1.168
9b1.	Water supply interruptions is due to poor response time by ELDOWAS Company	145	3.97	0.769
9b2.	Water supply interruptions is a sign of insufficient supply	145	3.77	0.948
9b3.	Water insufficiency is due to poor response time to customer complain	145	4.07	1.076
9b4.	Inefficient revenue collection is due to poor customer service	145	3.91	0.734
9b5.	Response time to customer complain is a measure of water supply interruptions	145	3.84	1.254
	Quantity of water supplied	145	3.912	0.956
9c1.	Enforcement and compliance of water regulation lead to its sufficiency	145	3.63	0.863
9c2.	Enforcement and compliance of water regulation guarantees its sufficiency	145	3.37	1.165
9c3.	Enforcement and compliance of water regulation increases response time to customer complain	145	3.45	1.083
9c4.	Enforcement and compliance of water regulation improves response time to customer complain	145	3.37	1.556
9c5.	Enforcement and compliance of water regulations reduces water supply interruptions	145	4.35	0.699
	Response time to customer complain	145	3.634	1.073
	Composite mean of performance of water projects	145	3,674	1,065

Table 3 indicated that out of 145 respondents who participated in the study, all of them responded to the items on performance of water projects. Item 9a1 sought to establish whether water supply interruptions lead to low quantities of water supply and the response had a mean score of 2.69 and standard deviation of 1.563. This means that majority of respondents were not sure whether or not water supply interruptions lead to low water quantities. Item 9a2 sought to establish whether water supply interruptions are signs of insufficient supply and the response had a mean score of 3.42 with standard deviation of 1.124. This means that this means that they agreed that water supply interruptions lead to insufficient water supply. Item 9a3 sought to establish whether water insufficiency is usually due to lack of quantity of water and their response gave a mean score of 4.02 with standard deviation of 0.81. This means that they agreed that agreed that insufficiency is usually due to lack of quantity of water. Item 9a4 sought to determine whether inefficient revenue collection results from inadequate water supply and their response gave a mean score of 3.50 with standard deviation of 1.096. This means that they agreed that inefficient revenue collection results from inadequate water supply. Item 9a5 sought to determine whether water supply **i**nterruptions result in inadequate water supply and their response gave a mean score of 3.76 and standard deviation of 1.095. This means that they agreed that water supply **i**nterruptions results in inadequate water supply. The composite score of frequency of supply interruptions 3.478 with standard deviation of 1.168. This means that frequency of supply interruptions leads to inadequate water supply. Item 9b1 sought to determine whether water supply interruptions are due to poor response time by ELDOWAS Company employees and the response had mean score of 3.97 with standard deviation of 0.769. This means that they were in agreement that water supply interruptions are due to poor response time by ELDOWAS Company. Item 9b2 sought to determine whether water supply interruption is a sign of insufficient supply and the response had a mean score of 3.77 with standard deviation of 0.948. This means that water supply interruption is a sign of insufficient supply. Item 9b3 Sought to determine whether water insufficiency is due to poor response time to customer complain and the response had a mean score 4.07 with standard deviation of 1.076. This means water insufficiency is due to poor response time to customer complain. Item 9b4 sought to establish whether inefficient revenue collection is due to poor response time to customer service and the mean score was 3.91 with standard deviation of 0.734. This means that inefficient revenue collection is due to poor response time to customer service. Item 9b5 sought to determine whether response time to customer complain is a measure of water supply interruptions and the means score was 3.84 with a standard deviation of 1.254. This means that response time to customer complain is a measure of water supply interruptions. The composite score of quantity of water supplied is 3.912 with a standard deviation of 0.956. This means that quantity of water supplied determines its sufficiency. Item 9c1 sought to establish whether enforcement and compliance of water regulation lead to its sufficiency and the response had a mean score of 3.63 with standard deviation of 0.863. This means that they agreed that enforcement and compliance of water regulation lead to its sufficiency. Item 9c2 sought to determine whether enforcement and compliance of water regulation guarantees its sufficiency and the response gave a mean score of 3.36 with standard deviation of 1.165. This means that they were not sure whether or not enforcement and compliance of water regulation guarantees its sufficiency. Item 9c3 sought to determine whether enforcement and compliance of water regulation increases response time to customer complain and the response had a mean score of 3.45 with standard deviation of 1.083. This means that they agreed that enforcement and compliance of water regulation increases response time to customer complain. Item 9c4 sought to determine whether inefficient revenue collection is due to poor customer service and their response gave a mean score of 3.37 with standard deviation of 1.556. This means that inefficient revenue collection is due to poor customer service. Item 9c5 sought to establish whether enforcement and compliance with water regulations reduces water supply interruptions and the response had a mean score of 4.35 with standard deviation of 0.699. This means that they strongly agreed that enforcement and compliance of water regulations reduces water supply interruptions. The composite mean score of response time to customer complain had a mean score of 3.636 with standard deviation of 1.073. This means that customer complain reduces water supply interruptions. The overall composite mean of performance of water projects had a mean score of 3.674 with standard deviation of 1.065. This means that there was performance of ELDOWAS Company water projects

Interviews revealed that ELDOWAS Company employees were of the view that payment of water bills plays a role in sustaining Operations and Maintenance activities which in turn minimizes water supply interruptions as one employee rightfully pointed out that:

"……non-payment of bills on time by water consumers is the single greatest causes of poor maintenance of water supply infrastructure which in turn contributes to insufficient water supplies……"

This observation agrees with what De Los Reyes and Jopillo (2015) established when they showed that timely payment of water tariffs by consumers increase water supply by 15% due to increase in resources to fund O&M. This means that performance of water projects depends on timely and efficient collection water tariffs from consumers.

Human Resources, technical skills and Performance of Water Projects

In this study human resource and technical skills together with their respective indicators were interrogated as separate subthemes.

Human Resources and Performance of Water Projects

The items on human resources were analyzed descriptively and results are presented as shown in Table 4.

Table 4: Human Resources and Performance of Water projects

No.	Item	n	Mean score	Standard Deviation
5a1.	Absenteeism is not frequently experienced at work place	145	3.8	1.047
5a2.	The level of staff absenteeism is low	145	3.89	0.928
5a3.	Staff absenteeism doesn't interfere with work performance	145	3.91	0.971
5a4.	Absenteeism by co-workers do not affect your work much	145	3.87	1.162
5a5.	Cases of absenteeism are rarely experienced	145	3.43	1.303
	a. Frequency of absenteeism	145	3.867	1.082
5b1.	Employees usually work overtime	145	3.99	0.911
5b2.	Water supply needs is achieved when employees work overtime	145	4.21	0.887
5b3.	Overtime allowance is usually paid promptly	145	3.88	0.784
5b4.	Employees don't prefer to work overtime	145	3.32	1.064
5b5.	Working overtime helps in addressing water supply needs	145	3.32	1.412
	b. Number of overtime hours	145	3.744	1.012
5c1.	I feel contented when I accomplish tasks I'm assigned	145	3.73	1.396
5c2.	I feel contented when I produce work results in the shortest time	145	2.63	1.350
5c3.	Work productivity is output of assigned work per time	145	3.13	1.291
5c4.	Working with co-workers enhances my work performance	145	4.30	0.822
9c5.	Our consumers are always satisfied with our services	145	3.48	1.014
	c. Level of employee productivity	145	3.454	1.175
	Composite mean score of human resources	145	3.688	1.089

Table 3 indicated that out of 145 respondents who participated in the study, all of them responded to the items on human resources and performance of water projects. Item 5a1 sought to establish whether absenteeism is not frequently experienced at work place and the response had a mean score of 3.8 with standard deviation of 1.047. This means that they were in agreement that absenteeism is not frequently experienced at work place. Item 5a2 sought to establish whether the level of staff absenteeism is low and their response had a mean score of 3.89 with standard deviation of 0.938. This means that they were in agreement that the level of staff absenteeism is low.

Item 5a3 sought to determine whether staff absenteeism doesn't interfere with work performance and the response had a mean score of 3.91 with standard deviation of 0.971. This means that they agreed that staff absenteeism doesn't interfere with work performance. Item 5a4 sought to establish whether absenteeism by co-workers do not affect their work much and the response gave a mean score of 3.87 with standard deviation of 1.163. This means that they agreed that absenteeism by co-workers do not affect work much. Item 5a5 sought to determine whether cases of absenteeism are rarely experienced and response gave a mean score of 3.43 with standard deviation of 1.303. This means that they agreed that cases of absenteeism are rarely experienced. The composite frequency of absenteeism had a mean score of 3.867 with standard deviation of 1.082. This means that they agreed that absenteeism is rarely experienced.

Item 5b1 sought to determine whether employees usually work overtime and the response gave a mean score of 3.99 with standard deviation of 0.911. This implies that they were in agreement that employees usually work overtime. Item 5b2 sought to determine whether water supply needs are achieved when employees work overtime and the response gave a mean score of 4.21 with standard deviation of 0.887. This means that they agreed that water supply needs are achieved when employees work overtime. Item 5b3 sought to establish whether overtime allowance is usually paid promptly to staff and the response showed a mean score of 3.88 with standard deviation of 0.784. This means that they were of the view that overtime allowance is usually paid promptly to staff.

Items 5b4 sought to establish whether employees don't prefer to work overtime and their response gave a mean score of 3.32 with standard deviation of 1.064. This implies that they were indifference as to whether or not employees prefer to work overtime. Item 5b5 sought to determine whether working overtime helps in addressing consumers' water supply needs and their response registered a mean score of 3.32 with standard deviation of 1.412. This means that they were not sure whether or not working overtime helps in addressing consumers' water supply needs. The composite of overtime hours gave a mean score of 3.744 with standard deviation of 1.012. This implies that majority were of the view that working overtime helps in addressing water supply needs.

Item 5c1 sought to determine whether employees felt contented when they accomplish tasks assigned and the response had a mean score of 3.73 with standard deviation of 1.396. This implies that they were of the view that employees felt contented when they accomplish tasks assigned to them. Item 5c2 sought to establish whether employees feel contented when they produce work results in the shortest time and their view had a mean score of 2.63 with standard deviation of 1.350. This implies that they were not sure whether or not production of work results elicits contentment. Item 5c3 sought to establish whether employee work productivity is output of assigned work over time and their response had a mean score of 3.13 with standard deviation of 1,291. This means that they were not sure whether or not employee work productivity is output of assigned work over time.

Item 5c4 sought to determine whether working with co-workers enhances employee work performance and their response had a mean score of 4.30 with standard deviation of 0.822. This means that they agreed that working with co-workers enhances employee work performance. Item 5c5 sought to determine whether consumers are always satisfied with services provided and their view had a mean score of 3.48 with standard deviation of 1.014. This implies that they agreed that consumers are always satisfied with services provided. The composite employee productivity had a mean score of 3.454 with standard deviation of 1.175. This implies that employee productivity contributes to water supply needs. The overall composite mean score of human

resources was 3.688 with standard deviation of 1.089. This implies that respondents agree that human resource contribute to performance of EDLOWAS Company water projects in Uasin Gishu.

The view that human resources influence performance of ELDOWAS Company water projects was further confirmed from the interviews when one employee pointed out that:

"…….five years ago when employee strength was 188 people strong, we
Strained to cope with water supply interruptions due to supply breakdown,
the turnaround time for repairs then was 48 hours but today with additional
60 more technical staff, our repair time for water supply interruptions have
Reduced by 24 hours at most……"

This observation was supported was by secondary data contained ELDOWAS Company's Annual report ELDOWAS (2020) in which it was documented that about 40% in water losses was reduced due to hiring of 60 additional water maintenance technicians. These findings are consistent with what Wadajo, Serbeh-Yiadom and Asfaw (2014) [16] observed when they showed that employees increase eased repair workloads in water projects. These findings are supported by Borden and Rajecki (2000) who discovered that there existed a strong positive correlation between technical skills and overall project performance. These findings are however at variance with what Marie (2004) established when she demonstrated that that more than 50% of water project employees felt they were more than exceptionally well prepared for the position for which they were hired due to work experience rather than their technical skills acquired through college qualifications. This means that variation in observation occurs between technical skills and performance of water projects.

Regression analysis

The corresponding regression model was identified as follows;

Performance of ELDOWAS Company water project = f (Human resources).

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$ Analysis of variance statistics on influence of human resource on performance of ELDOWAS Company water projects was undertaken and is shown on table 5.

Table 5: ANOVA Statistics on human resources on performance of water projects

Model	Sum of Squares	df.	Mean Square	F	Sig.
Regression	15.004	1	15.004	F(1,144)	0.00
Residual	88.545	144	0.326	= 43.6	
Total	103.549	145	0,380		
R-squared = 0.1339		Adj. R-squared = 0.142		Root MSE =.571	

The statistic, F (1, 144) = 43.6 at $p < 0.05$, shows that the regression model is statistically significant in predicting the dependent variable. The $R^2 = 0.1339$ indicate that 13.39 per cent in performance of ELDOWAS Company water projects was explained by human resources. Regression analysis result for the influence of human resources on performance of ELDOWAS Company water projects is shown in table 6.

Table 6: Coefficient of Human Resource in Performance of Water Projects

Performance of water projects	Unstandardized Coefficient	Standardized beta	Std. Err	T	P>t
Constant	1.907		.209	9.13	0.000
Human resource	.372	.381	.055	6.79	0.000

The regression equation indicates that predicted performance of ELDOWAS Company water projects = 1.906 + 0.381 (human resource). The results indicate that a unit increase in human resource results in 0.380-unit increase in performance of ELDOWAS Company water projects. Correlation analysis established that human resource has a week negative correlation with performance of ELDOWAS Company water projects. Regression analysis indicated that 14.49 per cent in water projects was explained by human resources.

Hypothesis Testing

Thus null hypothesis 1 was tested at 95% confidence interval given that $p < 0.05$ and the null hypothesis was rejected. It was concluded that there is no significant relationship between human resource and performance of water projects. The null hypothesis was rejected and it was concluded that Human resources has a significant influence on performance of water projects. These findings are in agreement with similarly study undertaken by Wadajo, Serbeh-Yiadom and Asfaw (2014) [16] in which they used descriptive survey design and cluster sampling technique by selecting a sample of 400 to established that 71.2% of respondents concurred that participation in water project results to its performance.

However, despite the application of well-trained human resource secondary data from ELDOWAS Company and WASREB indicated that there exist deficits between quantities of water supplied and the quantities distributed to consumers indicating that performance of ELDOWAS Company water projects are not operating optimally. Therefore, in order to increase performance of water projects, more employees need to be involved in reducing water supply deficits. This could be ensured through extensive mobilization and awareness creation among employees on the need to respond to customer complaints, repairs and reduction in water supply interruptions. Although study findings agree with what Wadajo, Serbeh-Yiadom and Asfaw (2014) [16]; De los Reyes and Jopillo (1985) [7] study finding is therefore confirmatory of the extent to which predictor variable influence dependent variable.

Technical Skills and Performance of Water Projects

In this section, descriptive and inferential statistics on the influence of Technical skills on performance of ELDOWAS Company water projects was analyzed. Indicators of Technical Skills were; capability of problem solving, capability of skills use at work, and level of communication skills. Influence of technical skills on influence of performance of ELDOWAS Company water projects was tested using 15 items. The items assessed the extent to which technical skills influence performance of ELDOWAS Company water projects in Uasin Gishu County, Kenya. The items on technical skills were analyzed and results presented as shown in Table 7.

Table 7: Technical Skills and Performance of Water Projects

No.	Item	n	Mean score	Standard Deviation
6a1.	I have ability to address all tasks assigned to me	145	4.03	0.919
6a2.	In case I'm unable to solve a problem I consult my colleagues	145	4.17	0.877
6a3.	Work related problems shared among co-workers is immediately addressed	145	4.07	0.917
6a4.	Customers are usually satisfied when their problems are addressed	145	4.26	0.743
6a5.	I'm satisfied with my own capability of solving problems	145	3.48	0.988
	a. Capability of problem solving	145	4.002	0.889
6b1.	I have capability to address water supply interruptions	145	3.87	1.020
6b2.	Most staff have capabilities to address water supply issues	145	3.95	0.881
6b3.	I usually address water supply interruptions in record time	145	3.85	1.029
6b4.	Sometimes our customer are not satisfied with service we offer	145	3.37	1.173
6b5.	Response time to customer complain is satisfactory	145	3.54	0.933
	b. Scope of capability of skills	145	3.716	1.007
6c1.	I always communicate any water supply interruptions	145	3.96	0.974
6c2.	Water supply interruptions is immediately communicated	145	3.94	0.982
6c3.	Most water supply interruptions are addressed at once	145	4.20	0.990
6c4.	Our customers are usually satisfied with our method of communications	145	3.19	1.069
6c5.	Communication by the water company is always satisfactory	145	3.28	1.088
	c. Level of Communication skill	145	3.714	1.021
	Composite mean score of Technical Skills	145	3.810	0.972

Table 7 indicated that out of 145 respondents who participated in the study, all of them responded to the items on technical skills and performance of ELDOWAS Company water projects. Item 6a1 sought to establish whether an employee has ability to address all tasks assigned to him and the response had a mean score of 4.03 and standard deviation of 0.919. This means that they agreed that an employee has the ability to address all tasks assigned to him. Item 6a2 sought to determine whether employees consult their colleagues if they are unable to solve a problem and response had a mean score of 4.17 and standard deviation of 0.877. This means that they were in agreement that employees consult their colleagues if they are unable to solve a problem. Item 6a3 sought to determine whether work related problems shared among co-workers is immediately addressed and a response with a mean score of 4.07 with standard deviation of 0.917. This means that they agreed that work related problems shared among co-workers is immediately addressed.

Item 6a4 sought to determine whether customers are usually satisfied when their problems are addressed and response had a mean score of 4.26 with standard deviation of 0.743. This means that respondents agreed that customers are usually satisfied when their problems are addressed. Item 6a5 sought to establish whether an employee is normally satisfied with their own capability of solving problems and there was a mean score of 3.48 with standard deviation of 0.988. This means that employees agreed that their capability of solving problems. Composite score for capability of problem solving was 4.002 with standard deviation of 0.889. This implies that respondents agreed that they were capable of solving water supply related problems.

Item 6b1 sought determine whether employees communicate any water supply interruptions and the response had a mean score of 3.96 with standard deviation of 0.974. This means that respondents agreed that employees communicate any water supply interruptions. Item 6b2 sought to determine whether most staff have capabilities to address water supply issues and the response had a mean score of 3,95 with standard deviation of 0.881. This means that they agreed that most staff have capabilities to address water supply issues. Item 6b3 sought to determine whether employees usually address water supply interruptions in record time and the response had a mean score of 3.85 with standard deviation of 1.029. This means that respondents agreed that employees usually address water supply interruptions in record time.

Item 6b4 sought to establish whether customers are sometimes dissatisfied with services offered by ELDOWAS Company and response had a mean score of 3,37 with standard deviation of 1.173. This means that respondents agreed that customers are sometimes dissatisfied with services offered by ELDOWAS Company. Item 6b5 sought to discover whether response time to customer complain is satisfactory and the response had a mean score of 3.54 with standard deviation of 0.933. This mean that respondents agreed that response time to customer complain is satisfactory. The scope of capability of skills had a mean score of 3.54 with standard deviation of 1.007. This means that respondents agreed that the scope of capability of employees influence performance of water projects

Item 6c1 sought to determine whether employees regularly communicate water supply interruptions and their response recorded a mean score of 3.96 with standard deviation of 0.974. This means that respondents agreed that employees regularly communicate water supply interruptions. Item 6c2 sought to determine whether water supply interruptions are immediately communicated and the response showed a mean score of 3.94 with standard deviation of 0.982. This means that respondents agreed that water supply interruptions are immediately communicated. Item 6c3 sought to discover whether most water supply interruptions are addressed at once and the response recorded a mean score of 4.20 with standard deviation of 0.990. This means that respondents agreed that most water supply interruptions are addressed at once.

Item 6c4 sought to determine whether customers are usually satisfied with methods ELDOWAS Company adopts in communicating with water consumers and the response had a mean score of 3.19 with standard deviation of 1.069. This means that respondents were not sure whether or not customers are usually satisfied with methods ELDOWAS Company adopt in communications with water consumers. Item 6c5 sought to determine whether communication by the water company is always satisfactory and the response had a mean score of 3.28 with standard deviation of 1.088.

This means that respondents were not sure whether or not communication by the water company is always satisfactory. The composite score for the level of Communication skill was 3.714 with standard deviation of 1.021. This means that respondents agreed that the level of communication in ELDOWAS Company was satisfactory. The composite mean score for technical skills was 3.810 with standard deviation of 0.972. This means that respondents were of the view that technical skills influence performance of water projects.

The view that technical skills influence performance of ELDOWAS Company water projects was confirmed through the interviews when one employee stated that:

"…the capacity to perform more challenging maintenance assignments
Was enhanced after a six months short training course in Germany from
Where I gained technical skills on effective communication with other
Field staff while undertaking monitoring of water supply defects along
Water supply lines…."

This observation agrees with findings by Ondrik (2012) [12] who observed that extensive consultations enabled project teams to secure the project success. These finding however disagrees with what Lee-Kelly and Sankey (2008) established when they demonstrated that project success is a function of commitment by top management and not information dissemination nor technical skills.

Correlation Analysis

The correlation statistics shown in table 4.6 indicate that performance of water projects has a moderate but positive correlation with Technical skills (r = 0.458, p = 0.01). Correlation analysis shows that there was a moderate positive correlation of 0.458 between technical skills and performance of ELDOWAS Company water projects in Uasin Gishu County, Kenya.

Regression Analysis

The corresponding regression model for the hypothesis was identified as follows:

Performance of water projects = f (Technical skills)

$Y=\beta_0+\beta_2X_2+\varepsilon$ Analysis of variance statistics on influence of technical skills on performance of water projects was undertaken and is shown on table 8.

Table 8: ANOVA Statistics on Technical skills on Performance of Water Projects

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.061	1	11.061	F(1, 272) = 32.53	0.01
Residual	92.487	144	.340		
Total	103.549	145	.379		
R-squared = 0.105		Adj R-squared = 0.104		Root MSE=.583	

**Critical value for 2-tail F-test = 5.02

The statistic, F (1,144) = 29.29, p < 0.05, shows that the regression model is statistically significant in predicting the dependent variable. The R^2 = 0.105 indicate that 10.50 per cent in performance of water projects is explained by technical skills. Regression analysis result for the influence of technical skills on performance of ELDOWAS Company water projects is shown in table 9.

Table 9: Coefficients for technical skills on performance of water projects

Project sustainability	Unstandardized Coefficient	Standardized beta	Std. Err.	T	P>t
Constant	2.132		.209	10.22	0.000
Project planning	.316	.327	.055	5.70	0.000

The regression equation indicates that predicted performance of water projects = 2.13 + 0.316 (Technical skills). Correlation analysis established that technical skills has a positive and moderate influence on performance of ELDORET Company water projects. Regression analysis indicated that 10.50 per cent in performance of water projects was explained by technical skills.

Hypothesis Testing

Thus null hypothesis 2 was tested at 95% confidence interval given that p < 0.05 the null hypothesis was rejected and it was concluded that there is a significant relationship between technical skills and performance of ELDOWAS Company water projects in Uasin Gishu County, Kenya.

Technical skills have a significant influence on performance of ELDOWAS Company water projects. This means that technical skills has influence on performance ELDOWAS Company water projects in Uasin Gishu County, Kenya. Interviews agreed with this finding when one employee of ELDOWAS Company stated that;

"……although planning of maintenance and repair works largely depends on a technical skills of water technicians technical skills is key to success of project performance….."

Although findings by Wandera, Naku and Afrane (2013) [14]; McCallum (2008) agree with the study finding, Lee-Kelly and Sankey (2008); Borden and Rajecki (2000) further showed the extent to which performance of ELDOWAS Company water projects is influenced by technical skills. Marie (2004) established contrary findings when she established that planning maintenance of water works it did not contribute to performance of water projects. Despite divergence in study observations, this study shows the extent of the association between technical skills and performance of ELDOWAS Company water projects do exist. This study finding is therefore confirmatory on the extent to which technical skills influence performance of water projects.

Conclusion

For objective one, analysis showed that 14.49% in performance of water projects is explained by human resources while a weak negative correlation (r = -0.019) was found to existed between predictor and dependent variable. The hypothesis $H_{01,}$ F (1,144) = 43.6 at p = 0.01< 0.05 was rejected and it was concluded that a significant relationship existed between human resource and performance of Eldoret Water and Sanitation Company water projects. It was established that performance of ELDOWAS Company water projects depends on how effective employees

regularly and effectively ensure water is supplied and follow-up customer billing in order to support revenue collection. It was therefore concluded that human resource mobilization forms the basis of performance of ELDOWAS Company water projects. For objective two, analysis showed that 29.29% in performance of water projects is explained by technical skills. A positive but moderate correlation (r = 0.458) was found to exist between predictor and dependent variable. For hypothesis $H_{02,}$ F (1,144) = 29.29 at p = 0.01< 0.05 was rejected and it was therefore concluded there is a significant relationship between technical skills and performance of Eldoret Water and Sanitation Company water projects. It was established that performance of ELDOWAS Company water projects depends on how effective employees are trained to handle more challenging technical operations and maintenance. It was therefore concluded that technical skills be enhanced through regular trainings as a basis for improving performance of ELDOWAS Company water projects.

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