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Abstract

The purpose of the study was to establish the significant Influence of resource allocation on Strategic project implementation of Irrigation in Rwanda. This was achieved by looking at the following specific objectives: To evaluate the influence of resource allocation on strategic project implementation of Irrigation in Rwanda, to establish the influence of strategic financial resources on the strategic project implementation of Irrigation in Rwanda, to investigate the influence of strategic infrastructural development on strategic project implementation of Irrigation in Rwanda, to establish the influence of strategic technological resources on strategic project implementation of Irrigation in Rwanda and to investigate the influence of government regulation on strategic project implementation of Irrigation in Rwanda. The study adopted both descriptive and correlational designs. The researcher used stratified random sampling technique to select a sample size of 150 employees from the population of the employees of Kagitumba Irrigation Scheme. The strata were that of senior management, middle management, supervisory and administration/ support staffs. Within each of the four strata simple random sampling was done to identify individual respondents who were issued with a questionnaire to respond to research statements. Primary data was collected using semi-structured questionnaires. The questionnaires were administered by the help of research assistants in each and every department. The collected data was analyzed using SPSS software. Factor analysis was done to establish the appropriateness of the questionnaire constructs. Both descriptive and inferential statistics were used. The study recommends that the irrigation board members should ensure that they have the right resources in the organization and allocated well for the right purpose and at the right time. This will help them to engage closely and creatively with activities that will improve the Strategic project implementation of the organization. The study also recommends that the irrigation board executive should demonstrate commitment toward empowering company employees, and to develop staff and famers to fill future vacancies.

1. Introduction

Strategic project implementation and resource allocation practices vary significantly across different regions, including European countries, American countries, Asian countries, and African countries. These variations are influenced by factors such as climate, geography, water availability, agricultural practices, and socio-economic considerations. By an overview of strategy implementation and resource allocation in each of these regions, with examples and case studies.

European Countries: In European countries, irrigation practices are influenced by the varying climatic conditions across the continent. Water resources in Europe are generally abundant, but their distribution is uneven. Some regions, such as southern Europe, experience water scarcity, while others have surplus water. On the other hand, countries like the Netherlands focus on precision agriculture and efficient water management to optimize irrigation practices (Eurostat, 2021).

Asian Countries: Asian countries exhibit a wide range of irrigation and resource allocation practices. In countries like India and China, which have large agricultural sectors and densely populated regions, irrigation plays a vital role in food production and water management.

African Countries: In African countries, irrigation and resource allocation practices are influenced by the continent's diverse climates, including arid, semi-arid, and humid regions. Water scarcity is a significant challenge in many African countries, and sustainable water management is crucial for agriculture and food security. For instance, in Morocco, drip irrigation systems have been successfully implemented in agriculture to mitigate water scarcity and increase crop yields (FAO, 2014). Similarly, in Ethiopia, the construction of large-scale irrigation projects, such as the Grand Ethiopian Renaissance Dam, aims to enhance water availability and agricultural productivity (Tesfaye *et al.*, 2019).

Despite the importance of resource allocation in strategic management, limited research has been conducted on the impacts of resource allocation on strategy implementation in the irrigation sector in Rwanda. Furthermore, while there is a considerable body of literature on resource allocation and strategy implementation in other industries and sectors, little research has been conducted on this topic in the context of Irrigation in Rwanda. Thus, there is a gap in knowledge regarding how resource allocation affects strategy implementation in the irrigation sector in Rwanda, and this study aimed to address this gap.

The general objective of this study is to examine the significant influence of resource allocation on strategic project implementation at Muvumba - Kagitumba irrigation project.

The research specific objectives for this study are:

- i. To evaluate the influence of staff development on strategic project implementations of Kagitumba irrigation scheme.
- ii. To establish the influence of financial resources on strategic project implementations of Kagitumba irrigation scheme.
- iii. To assess the influence of infrastructure development allocations on strategic project implementations of Kagitumba irrigation scheme.
- iv. To assess the influence of strategic information and technology deployment on strategic project implementation of Kagitumba irrigation scheme.
- v. To assess the influence of government regulations on the strategic project implementation of Kagitumba irrigation scheme.

Research Hypothesis:

- Ho1:** Strategic staff development has no significant influence on the strategic implementation of irrigation in Rwanda.
- Ho2:** Strategic financial resources have no significant influence on the strategic implementation of irrigation in Rwanda.
- Ho3:** Strategic infrastructure development allocations have no significant influence on the strategic implementation of irrigation in Rwanda.
- Ho4:** Strategic information and technology deployment has no significant influence on the strategic implementation of irrigation in Rwanda.
- Ho5:** There is no moderating influence of government regulations on the influence on the strategic implementation of irrigation in Rwanda.

2. Literature review

This chapter reviewed the information from other researchers who have carried out research in the same field of study in prior years. It also offers a critical analysis of previous studies that have been done by other scholars in the area.

2.1 Theoretical review

The study was guided by the implementation theory, resource-based theory, system theory and regulation theory.

The Resource-Based View Theory

The resource-based view's roots can be found in earlier studies. The importance of resources and their effects on company performance are emphasized in writings by Chandler (1972) and Williamson (1975), which can be viewed in retrospect. based on resources view of the firm contends that companies can outperform others if they can build valuable resources or talents that are difficult for rivals to replicate or replace (Cooke *et al.*, 2005).

The RBV can aid in the investigation of how a project acquire distinctive, unique capabilities and how such capabilities might be transferred to new management and structures (Marvel et al, 2013). According to Ganley (2010), resources are what enable an organization to function, and it is important to use caution when distributing these resources to an institution. Allocating these resources might be challenging, but with good planning, businesses can acquire the resources they require.

The human, financial, and technological resources of a company are a few examples. These organizational resources are all essential to an institution's development and success.(Kennedy *et al.*, 2020). The main claim is that the firm's realized strategy is shaped by how its resources are distributed. The process of resource allocation can be understood in order to comprehend strategy-making. According to RBV, a firm's sustained competitive advantage is attained by virtue of its unique resources, which are both firm-specific and rare, valuable, one-of-a-kind, non-tradable, and non-substitutable.

The RBV theory has drawn flak for having few significant managerial implications (Priem & Butler, 2001). It appears to instruct managers to create, acquire, and build a suitable organization, but it is mute on how to go about doing this (Connor, 2002). Another criticism is that the RBV exaggerates managers' ability to control resources or foresee their future value by invoking the "illusion of ultimate control," trivializing property-rights issues (McGuinness & Morgan, 2000).

However, RBV was never meant to offer managerial recommendations because it is a theory that aims to explain why some organizations have a superior SCA to others (Barney, 2003). There is no need to require the RBV to produce theoretically sound recommendations because any explanations it may offer may be nothing more than suggestive but still be useful to managers.

Systems Theory

Systems theory springs from biology and its content free and applicable to many fields of study. It is not actually a theory but a rather high-level abstraction. Systems Theory can be defined as a working hypothesis, the main function of which is to provide a theoretical model for explaining, predicting, and controlling phenomenon (Bertalanffy, 1962).

System theory is crucial in explaining operational strategies and resource allocation. If an organization structure of a firm does not facilitate good communication, then departmental conflict may arise. The consequences of poor communication may be reflected in the performance of the overall organization. It is therefore important to formulate an organization culture that will facilitate proper communication between employees, management, suppliers and customers. This theory is relevant to the study as it helps in understanding organizations as systems. From the theory, organizations interact with outside world which are often referred to as systems. Sections of organizations interact amongst themselves to see a certain objective met.

This theory addressed two variables namely strategic infrastructural development and strategic technology deployment.

Stakeholder Theory

Organizational theorist Ian Mitroff was the first to define stakeholder theory in his 1983 book *Stakeholders of the Organizational Mind*. Shortly after, R. Edward Freeman, a business administration professor and philosopher, published a piece on stakeholder theory in the *California Management Review* in 1983.

Anyone with an interest in a project, company, or organisation is considered a stakeholder. More importantly, because it can affect senior management, project leaders, team members, customers, users, and many other people, stakeholder management is essential for the success of any project or business. Stakeholder theory is a part of the larger discipline of stakeholder management, which builds rapport with stakeholders by controlling their expectations and goals. A strategic plan is necessary to manage this process.

Stakeholders are first identified, their impact and interest are assessed, and a communication strategy is developed to keep them updated. However, not every shareholder is created equal. Prioritizing provides a structure for effectively managing them, not that some are more important than others. (Keup, 2022) Once more, it is crucial to manage stakeholders and create an effective strategic strategy. Because of this, managers must prioritise and concentrate on the most significant stakeholders those with authority, proximity, and urgency. Stakeholder theory is then applied in this situation.

Stakeholder theory provides a description of business that is widely recognised in the area of business ethics. A discipline that focuses on wisdom, or what it means to live a decent life, is what ethics is at its foundation. In this part, we examine a number of important business-related

topics involving stakeholder theory in ethics. We start by describing the basic ethical principles inside the theory.

3. Research methodology

The purpose of this study is to investigate the resource allocation strategy implementation at Kagitumba Irrigation project. The study aims to examine the factors that influence resource allocation decisions, identify the challenges faced during resource allocation and suggest ways to improve resource allocation in the organization.

3.1 Research Design

This study used a correlational and descriptive survey research design. Lavrakas (2008) describes a descriptive survey research design as a systematic research method for collecting data from a representative sample of individuals using instruments composed of closed-ended and/or open-ended questions, observations, and interviews.

The choice of correlational research approach was because it was used to explore relationships between variables and to predict a subject score on one variable given his or her score on another variable. The method also provides information concerning the degree of relationships between the variables being studied.

3.2 Population and Sample size

The target population of this study was 150 employees both in managerial and non-managerial level from Kagitumba irrigation scheme. The unit of observation constituted of the senior management, middle management, supervisory and administration/ support staffs.

The sample of 150 was generated using Israel formula for a population less than 10000.

$$n = p(1 - p) \left(\frac{z}{d} \right)^2$$

Where:

n = sample size;

z = the table value for the level of confidence, for instance;

95% level of confidence =1.96, **90%** level of confidence =1.645, **99%** level of confidence=2.576

d = margin of error; Precision level desired or the significance level which was 0.08 (8%) for the study

P = proportion to be estimated, Israel (1992) recommends that if you don't know the value of p then you should assume p = 0.5

Therefore, the sample size was 150 employees was obtained as follows;

$$0.5(1 - 0.5) \left(\frac{1.96}{0.08} \right)^2 = 150$$

A random sampling design was used to identify the 150 employees.

Table 1: Sample matrix

Strata	Population	Sample	Percentage Sample
Senior Management	35	14	41
Middle Management	59	25	41
Supervisory	57	25	41
Support staff	211	87	41
Total	362	150	41

The study used purposive sampling to select participants for the interviews. The sampling based on the participants' knowledge and experience in resource allocation. The participants selected from different departments in the organization to obtain a diverse range of views on resource allocation.

3.3 Data Collection Methods

The study used both primary and secondary data collection methods. The primary data collected through structured and semi-structured interviews with managers and employees of Kagitumba Irrigation scheme. The interviews will be conducted face-to-face, and the participants selected based on their knowledge and experience in resource allocation. The interviews recorded using a digital voice recorder and transcribed for analysis.

The secondary data collected from company records, reports, and other relevant documents related to resource allocation in the organization. The documents will be sourced from the company's website, archives, and other relevant sources.

3.4 Data Analysis and Processing

Data analysis was thus quantitatively using the statistical package for social scientists (SPSS V20) for both descriptive and inferential statistics. Prior to any analyses, data was made ready and cleaned through checking for errors and completeness, editing, coding, transcribing and entering them directly into SPSS software. Qualitative data was analysed through content analysis since it involved discussions in prose.

Descriptive Statistics were used in transforming the raw data into a form that can be easily understood and interpreted. This was usually the first form of analysis where averages are calculated, frequency distributions given and percentage distributions provided.

Correlation analysis was also used. This involved the analysis of the degree of individual independent variable and the dependent variable. To conduct bivariate analysis the study used Pearson correlation coefficient. This correlation coefficient ranges between -1 and 1 and it thus measured the degree to which two variables are linearly related.

The higher the magnitude of the correlation coefficient the higher the degree of association between two variables. To obtain the causal effect relationship, the study used the following multivariate regression model

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta X_5 + \varepsilon \dots\dots\dots(i)$$

Where; Y was the strategy implementation, X₁, X₂, X₃, X₄ and X₅ represents staff development strategy, availability of finances, infrastructure development, information and technology deployment and government regulations respectively. β_0 represents the constant term of regression while β_1 , β_2 , β_3 , β_4 , and β_5 represents the regression coefficients while ϵ represents the error term of regression which was assumed to be randomly distributed.

4. Research findings

The data analysis is in line with the particular goals where patterns were looked into, understood, and conclusions made about them. The study's particular goals were to establish the influence of resource allocation on strategic project implementation of Irrigation in Rwanda impacted by strategic staff development, strategic financial resource availability, strategic infrastructure development, strategic information and technology use, and government regulation. The study results were discussed in this chapter in connection to the study's variables. The comparison of the current findings to those of other studies in relevant fields has also been covered in length.

4.1 Relationship between Resource Allocation and Strategic Project Implementation

The correlation data are shown in Table 2 and reveal a strong and positive link between resource allocation and strategic project implementation. This shows that improvements in resource allocation resulted in improved strategic project implementation from the irrigation scheme.

The correlation coefficient of 0.716, which indicates a favorable association between resource allocation and strategic project implementation in irrigation scheme, serves as evidence of the relationship. The p value of 0.000, which is smaller than the crucial limit, further supported this (0.05). The study's findings are in line with those of (Katou & Budhwar, 2010), who reported that HR policies related to recruitment, training, promotion, incentives, benefits, involvement, and health and safety are positively correlated with organisational performance and found support for the universalistic model.

Table 2: Relationship between Resource Allocation and strategic project implementation

		Strategic project implementation	Resource allocation
Pearson Correlation	Strategic project implementation	1.000	.766
	Resource allocation	.766	1.000
Sig. (1-tailed)	Strategic project implementation	.	<.001
	Resource allocation	.000	.
N	Strategic project implementation	150	150
	Resource allocation	150	150

To empirically ascertain whether resource allocation plan was a key factor of success in irrigation scheme, regression analysis was done. Table 3's regression results show that the regression between resource allocation plan and strategic project implementation had a decent goodness of fit. The efficiency of resource allocation can explain 58.7 percent of strategic project implementation variances, according to a R squared of 0.587. This suggests that the

other factors, such as government regulations, account for 41.3% of the strategic project implementation variances.

Table 3: Model Summary^b for Resource Allocation.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.766 ^a	.587	.584	4.36247

a. Predictors: (Constant), Resource allocation

b. Dependent Variable: Strategic project implementation

Table 4 displays the ANOVA table. The whole model was significant, as shown by a F statistic of 173.136. According to the results, the resource allocation plan was statistically significant in predicting how the Muvumba - Kagitumba irrigation scheme performed. The effectiveness of strategic project implementation was also examined by Richard and Johnson (2001) using a sample of banks.

They discovered that strategic project implementation effectiveness was directly related to employee turnover and that the relationship between this measure and return on equity was stronger among banks with higher capital intensity.

Table 4: ANOVA for resource allocation

MODEL		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3672.755	1	3672.755	173.136	<.001
	Residual	3139.538	148	21.213		
	Total	6812.293	149			

Table 5 displays the resource allocation approach coefficients. Since the p-values for the constant and gradient are less than 0.05, the findings demonstrate that the resource allocation approach significantly adds to the model. The results suggest that a positive unit change in the effectiveness of a resource allocation caused a change in strategic project implementation at a rate of 0.322.

Table 5: Coefficients^a of Resource Allocation

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.441	1.525		2.257	.025
	Resource Allocation	.322	.021	.782	15.264	.000

a. Dependent Variable: Strategic project implementation

4.2 Multivariate Regression

A multiple regression analysis was conducted to investigate the joint causal relationship between the independent and dependent variables. Regression results in Table 6 indicate that the goodness of fit for the regression of independent variables and performance is satisfactory. An R squared of (0.587) indicates that (58.7%) of the variances in the Strategic project implementation are explained by the variances in the resource allocation strategies employed in the organization.

The regression equation is as follows;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$$

Where: β_0 is Constant

Y is the strategic project implementation of Muvumba – Kagitumba irrigation scheme, X1, X2, X3, X4 and X5 represents staff development strategy, availability of finances, infrastructure development, information and technology deployment and government regulations respectively.

Regression of coefficients results in Table 6 shows that there is a positive and significant relationship between staff development, finances availability, infrastructure development, information, technology deployment, government regulations and Strategic project implementations. These were supported by beta coefficients of 0.218, 0.313, 0.395, -0.226 and 0.615 respectively. These results show that a change in either of the variables will definitely lead to a positive change in Strategic project implementation.

Table 6: overall regression coefficients^a

MODEL		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.196	1.596		2.003	.047
	Staff Development	0.218	.151	.143	1.447	.150
	Resource Availability	0.313	.246	.205	1.271	.206
	Infrastructure Development	0.395	.167	.238	2.365	.019
	Information and technology deployment	-0.226	.141	-.145	-1.603	.111
	Government Regulations	0.615	.142	.423	4.334	.000

A. Dependent Variable: Strategic Project Implementation

$$Y = 3.196 + 0.218X_1 + 0.313X_2 + 0.395X_3 - 0.226X_4 + 0.615X_5$$

4.3 Hypothesis Testing

Hypotheses testing required the use of multiple regression analysis. This was performed using the field data and the results interpreted according to the R2, beta coefficients and P-values at P < 0.005 significance level. The variables under study were regressed on strategic project implementation indicators and a composite strategic project implementation measure computed to reflect overall strategic project implementation. Five research hypotheses that the study sought to test are presented in Table 7 below.

Table 7: Hypothesis Testing Results

Variables	R2	Beta coefficient	P-value	Findings	Verdict
Staff Development	0.539	0.218	0.150	Significant	Reject null hypothesis
Financial Availability	0.625	0.313	0.206	Significant	Reject null hypothesis
Infrastructure Development	0.549	0.395	0.019	Significant	Reject null hypothesis
Information and technology deployment strategy	0.416	-0.226	0.111	Significant	Reject null hypothesis
Government regulations	0.13	0.615	0.000	Significant	Reject null hypothesis

5. Conclusion

The goal of the study was to determine how resource allocation affected the strategic project implementation of Kagitumba irrigation scheme in Rwanda. According to the study's findings, the strategic project implementation of Rwanda's Kagitumba irrigation system is significantly influenced by resource allocation. The findings showed that strategic infrastructure development, strategic financial resource allocation, and strategic staff development, strategic information and communication technology and government regulations have a significant influence on affected the strategic project implementation of Kagitumba irrigation scheme.

6. Recommendations

According to the study, in order for regulations and regulatory framework to be effective, they must be evaluated not only in terms of how they protect current customers and increase utility efficiency, but also in terms of how they ensure that the services are accessible to the underprivileged in the communities while remaining cost-effective. It also suggests lowering existing regulatory frameworks to boost access to water and irrigation services and to enhance the nature of that access in terms of the services' accessibility, cost, and sustainability.

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