Risk Management Process and Public Implementation of Environment Projects in Rwanda: A Case Study of Landscape Restoration Project at Amayaga Region

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Abstract

The research discussed the risks management process and public implementation of environmental project. The specific objectives of this study were to identify the extent to which monitoring and control process can influence public implementation of environmental projects in Rwanda, to assess the role of community involvement to ensure effective public implementation of environmental projects in Rwanda and to establish the relationship between project risk management process and public implementation of environmental projects in Rwanda. The study employed a stratified cross-sectional correctional research design to observe the Landscape Restoration Project at Amayaga Region. The target population of 102 included various staff members, and a sample of 81 was randomly selected from different departments. Questionnaires and documentation were utilized for data collection, and SPSS version 21 aided in data analysis, generating frequency tables and percentages. Findings showed that project monitoring and control, project risk evaluation, project knowledge and communication to a constant zero, public implementation of environmental projects in Rwanda would be at 0.463. In addition, any unit increase on project monitoring and control would increase public implementation of environmental projects in Rwanda by a factor of 0.174. Any unit increase in project risk evaluation would increase public implementation of environmental projects in Rwanda by a factor of 0.192. Lastly any unit in project knowledge and communication would increase in public implementation of environmental projects in Rwanda by a factor of 0.167.The study concluded that project monitoring and control has a positive and significant effect on public implementation of environmental projects in Rwanda. It was evidenced by regression results that revealed that project monitoring and control contributed to a significant increase in public implementation of environmental projects in Rwanda. Project monitoring and control through effective transparency and accountability on project finance and increasing of risk awareness, competent project teams, cost variance assessment, instituting effective budgeting, effective supply chain management and effective project team management contribute to improving public implementation of environmental projects in Rwanda.

Keywords: *Risk Management Process, Public Implementation, Environment Projects, Landscape Restoration Project, Amayaga Region, Rwanda*

1. Introduction

Worldwide managing the project risks more effectively and increasing the chances of environmental protection remain important aspects throughout employing project risks management strategies, applying and implementing strong policies and increasing capacity building for the concerns of the project risks management abilities (Adams, 2009)

However, project risk management process still focus largely on internal control and audit functions, and primarily financial risk, rather than on identification and comprehensive management of risk. Corporate governance standards should place sufficient emphasis on identification of risks (Coccia, 2005).

In African countries, there is considerable ambiguity and uncertainty associated with predicting both the probability of the event occurring at a specific time and place resulting from losses to the affected community. These effects occurs during environmental degradation where all plants, human continue to lose life (Al-Tamimi & Al-Mazrooei , 2007)

The effect of domestic heating on air quality was mentioned by 37% as was improving public access to information on industrial emissions and application of emission limit values: the effect of traffic on air quality was mentioned by 33%, the effect of agriculture on air quality by 31% and assessing/preventing further soil contamination around installations was mentioned by 29%. Defining more stringent emission limit values was mentioned by 27%, drawing up air quality action plans was mentioned by 24%, noise action plans by 14% and waste water avoidance by 12%. One of the respondents stressed the importance of cooperation between environmental authorities and another said that local level authorities lacked technical equipment to measure air pollution and there was no possibility to check the accuracy of self-monitoring reports (Adams, 2009)

In Rwanda, project risk management process presents the low level due to climate changes which frequently continue to occur. Business activities are major cause of environmental degradation and poor strategies are observed to proper protection of environment. The national authorities, institution bodies and other environmental partners do not actively involved in deciding the protective measures on environment and sometimes may be as result of limited funds and related skills of decision makers (Ministry of environment Report, 2014).

The overall research gap existing in this research more specifically in Rwanda is that there is a gap existing between populations grows and human activities related to environmental protection. However, in Rwanda, there are still over exploitation of natural resources such as lands, water, wildlife, flora, forests and mineral sites which need to be protected throughout special measures to avoid the worst in the future as far as ecology and socio-economic aspects In Rwanda there is a need to elaborate environment policy, laws for resources management and protection to ensure efficient sustainability in the use of natural resources for present and future generations. That is the reason why researcher wants to assess the project risk management process and environmental protection in Rwanda, case of Ministry of environment.

1.2 Objectives of the Study

1.2.1 General Objective

The general objective of the study was to assess risks management process and public implementation of environmental projects in Rwanda, case of landscape restoration project at Amayaga region.

1.2.2 Specific objectives

The specific objectives of the study were as follow:

   (i)   To examine the role of project monitoring and control process on public implementation of environmental projects in Rwanda.

  (ii)   To evaluate the impact of project risk evaluation on public implementation of environmental projects in Rwanda.

 (iii)   To analyses the influence of project knowledge and communication on public implementation of environmental projects in Rwanda.

 (iv)   To analyses impact of environmental program on the project monitoring and control process

1.3 Research Hypothesis

Ho1: There is no significant relationship between project monitoring and control process and public implementation of environmental projects in Rwanda.

Ho2: There is no significant relationship between project risk evaluations and public implementation of environmental projects in Rwanda.

Ho3: There is no significant relationship between project knowledge and communication and public implementation of environmental projects in Rwanda.

2.1 Empirical Review

A study conducted by Brunnermeier and Cohen (2003), to assess the concept of monitoring and evaluation and how this contribute to environmental protection revealed that the environmental protection plan is important and this is the basis of achieving environmental protection requiresments.As countries implement monitoring and evaluation practices on environmental conservation, this has led to environmental protection target.

The field survey conducted by Gluch (2005) to assess the problems of environmental degradation in social working environment sowed that lack of environmental information management in social working environment have led to negative effects of environmental degradation. The development of business and economic activities has led to problems of environment but international environmental programme acts were implemented to achieve environmental protection targets.

A study done by Apgar (2006) in Poland to assess the role of risks management and environmental protection in both developed and developing countries showed that the environmental protection targets are influenced by effective risks assessment, prevention and control. This has led to the performance role of environment protection and investment promotion abilities. As indicated, the study revealed that in Poland the conservation of natural environment increased from 415 MPLN (million zloty; 4 zloty per USD) to 8,585 MPLN in 1999, which corresponds to 1.9% of GDP or 8.2% of total investments from the state budget

The study conducted by United Nations (2002) in USA on the how to avoid environmental risks, the study showed that managing risks within working environment is soothing of great important as this leads to financial and reputation risks like business interruption. Therefore,

environment agencies put more relevance on the risks of harm which affect human health within working natural environment.

Another study done by Sarkis (2001), Delmas&Montiel (2008), Theyel (2000) and Faulkner *et al* (2005), showed that productive firms or industries have a great deal of environmental management strategies which comprises good decision making, responsibility role in environmental protection and risks assessment. However, practices related to environment need to be taken during the process of manufacturing, in the operating system which leads to minimum risks and bring about efficiencies in cost reduction against risks.

The empirical evidence conducted by Dahlmann*et al* (2008), Zutshi&Montiel (2004), González *et al.,* (2008) and Padma *et al.,* (2008), showed that the implementation of environmental management strategies is important to individuals and organizations as this practice enables the organization operate within safe and productive environmental system which is remarked by competition.

A study conducted by Hamimah (2008) in Malaysia revealed that regulations, policies against environmental risks need to be taken to define the industry productive life cycle within operating location. This will help the existing industry engage in new plant location with high sensitive to productivity.

Another study conducted by Foreign Multinational Corporation (2007) showed that community plays important role in taking responsibilities to protect environment. Therefore, planting trees, information sharing and biodiversity maintenance and protection leads to environmental protection success.

The field survey conducted by Theyel (2000) and Faulkner *et al* (2005) revealed that environment management requires taking long term strategies by institutions whether public or private to ensure its success. Therefore, environmental risk reduction need to be achieved if the use of specialized risks avoidance and reduction and must be the one participating in policy making and protection. Within institutions, it is important to maintain department engaging in risks reduction to make environment more productive and fruitful.

A study conducted by Foreign Multinational Corporation (2007) about the determinants of new plant location in USA showed that the impact of environment stringency is negative and not statistically significant. Risks arising within working environment and the way productive firms react about it represent an important dimension for organization changes.

2.2 Research Gap

The UN's study in the USA (2002) emphasizes the critical role of agencies in reducing environmental risks that adversely impact human health. However, it underscores that the reduction of risks within work environments cannot solely rely on institutional agencies. Researchers note the growing relevance of individual responsibility in mitigating risks that could potentially harm the natural environment.

Padma et al. (2008) advocate for the implementation of strategies for environmental protection, emphasizing the need for responsibility in risk reduction. The contemporary complexities within work environments, including climate, political, economic, cultural, and technological changes, pose challenges to effective risk assessment and reduction strategies. Current observations reveal weaknesses in the formulation of strategies, planning, and protective policies.

According to the Foreign Multinational Corporation's study (2007) on industrial location and project risk management, strategic planning and adequate space are essential in the location of industries, which must be accompanied by effective technology management to prevent environmental degradation and pollution. Despite these insights, there remains a gap in the

enforcement of environmental protection policies and the execution of core strategic plans. Environmental degradation persists due to both human activities and natural disasters, further complicated by the challenges posed by evolving nature, technology, and human activities..

2.3 Conceptual Framework

The conceptual framework is the picture of the study variables in terms of relationship. In the context of this research; it shows how the independent variable affects the dependent variable. However, this research presents project risk management process as independent variable whereas environmental protection is dependent variable.
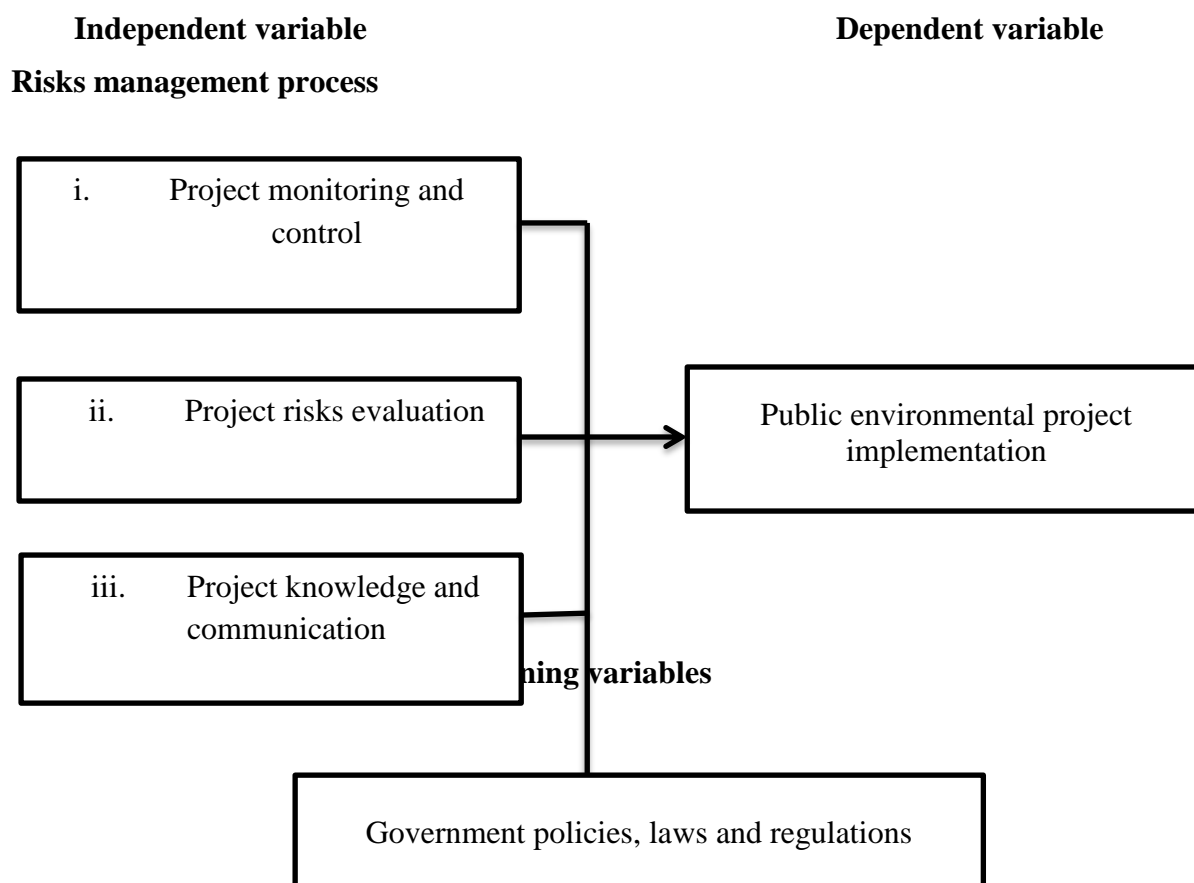

Figure 2.1: Conceptual framework

Source: Research, 2021

A dependent variable is the outcome variable, the one that is being predicted. Variation in the dependent variable is what the researcher tries to explain. The independent variables also known as the predictors or explanatory variables are factors that explain variation in the dependent variable. It presents how Independent variables assess risks management process and public implementation of environmental projects in Rwanda.

3. Materials and Methods

The research employed a correlational research design, emphasizing the cause and effect relationship between study variables. It adopted a quantitative approach using questionnaires as the primary data collection instrument. The target population comprised three key departments within the Ministry of Environment in Rwanda, totaling 102 individuals. The sample size was determined using the Yamane formula, resulting in 81 participants selected

from various departments based on proportional representation. Both purposive and simple random sampling techniques were employed for the selection of participants.

Data collection involved the use of a semi-structured questionnaire and secondary documents, ensuring comprehensive information gathering on the topic of project risk management and environmental protection. The questionnaire was administered with an introduction letter from Mount Kenya University, facilitating the collection of data within a week. The research upheld ethical values, maintaining politeness, patience, and respect during interactions with respondents.

Following data processing, which included editing and coding, the research data was analyzed using IBM version 21. The results were presented through tables, figures, charts, and graphs, enabling a systematic presentation of the findings concerning the project risk management process and environmental protection at the Ministry of Environment in Rwanda. Ethical considerations were prioritized throughout the research process, ensuring a respectful and collaborative environment during data collection and analysis.

4.1 Presentation of findings

This focus of this section is study variables under investigation.

4.1.1 Project monitoring and control

The first objective was to examine the influence of monitoring and control process on public implementation of environmental projects in Rwanda. Table 4.8 presents the finding on how respondents responded to various statements on the variables on monitoring and control process.

Table 4.1: Project monitoring and control

	1	2	3	4	5
There is environment protection department within landscape restoration project at Amayaga Region	0 (0.0%)	0 (0.0%)	9 (12.0%)	40 (53.3%)	26 (34.7%)
The protection measures of environment resulted from risks assessment and evaluation at Amayaga Region	0 (0.0%)	1 (1.3%)	21 (28.0%)	24 (32.0%)	29 (38.7%)
Monitoring and control practices leads public implementation of environmental projects at Amayaga Region	0 (0.0%)	1 (1.3%)	11 (14.7%)	35 (46.7%)	28 (37.3%)
At Amayaga Region continuous project cost adjustments are carried out to mitigate project cost overrun	0 (0.0%)	0 (0.0%)	21 (28.0%)	36 (48.0%)	18 (24.0%)
Amayaga Region error elimination is done to avoid deviation of the project from the intended direction	0 (0.0%)	12 (16.0%)	10 (13.3%)	25 (33.3%)	28 (37.3%)

Research Finding presented in Table 4.1 shows 26 (34.7 percent) of respondents strongly agreed, 40 (53.3 percent) agreed and 9 (12.0 percent) were neutral, while none neither disagreed nor strongly disagreed regarding to whether there is environment protection department within landscape restoration project at Amayaga Region. Concerning the protection measures of environment resulted from risks assessment and evaluation at Amayaga Region, 29 (38.7 percent) of the respondents strongly agreed, 24 (32.0 percent) agreed, 21 (28.0 percent) not sure, 1 (1.3 percent) disagreed and none strongly disagreed. In respect to whether monitoring and control practices leads public implementation of environmental projects at Amayaga Region 28 (37.3 percent) strongly agreed, 35 (46.7

percent) agreed, 11 (14.7 percent) were neutral, 1 (1.3 percent) disagreed and none strongly disagreed. While to whether at Amayaga Region continuous project cost adjustments are carried out to mitigate project cost overrun 18 (24.0 percent) strongly agreed, 36 (48.0 percent) agreed, 21 (28.0 percent) were neutral, interestingly none disagreed and none strongly disagreed. Consequently, regarding to whether Amayaga Region error elimination is done to avoid deviation of the project from the intended direction 28 (37.3 percent %) strongly disagreed, 25 (33.3 percent) disagreed, 10 (13.3 percent) were neutral, 12 (16.0 percent) agreed and none strongly agreed

The score assessment of agreements about monitoring and control on public implementation of environment projects in Rwanda, a case study of landscape restoration project at Amayaga region was strongly agreed by 351.8% while the percentage rate of agreements is 386.4%. The percentage rate of neutral is 27.2%, the percentage rate of disagreements was 24.3 % and the percentage rate of strongly disagree was 12.3%. Therefore, the percentage rate of agreements on the statements reflecting this objective is 351.8/8+386.4/8= 43.975%+48.3%=92.275% while the percentage rate of disagreements on the statement of this objectives is 27.2/8+24.3/8+12.3/8= 3.4%+3.0375%+1.5375%=7.975%. However, the average score of agreements become (92.275%+7.975 %.)/5=20.05. This implies that respondents <20.05% were disagreed on the statements of monitoring and control as important aspect to influence public implementation of environmental project while respondents >20.05% were agreed on the statements of monitoring and control process to have influence on public implementation of environmental projects in Rwanda, more specifically at Amayaga Region.

Therefore, these findings are supported by the study conducted by Apgar (2006) in Poland who assessed the role of risks management and environmental protection in both developed and developing countries. His study also put more focus on environmental protection targets measured by effective risks assessment, prevention and control. This has led to the performance role of environment protection and investment promotion abilities.

4.1.2 Project Risks Evaluation

The second objective was to determine the influence of project risk evaluation on public implementation of environmental projects in Rwanda. Table 4.9 presents the finding on how respondents responded to various statements on the variables on project risk evaluation.

Table 4.2: Project Risk Evaluation

Project Risk Evaluation	1	2	3	4	5
An evaluate risks leads effective environmental protection in Rwanda	0 (0.0%)	4 (5.3%)	9 (12.0%)	31 (41.3%)	31 (41.3%)
Establishing risks provides ways of protecting environment in Rwanda	0 (0.0%)	4 (5.3%)	8 (10.7%)	15 (20.0%)	48 (64.0%)
Building an attitude and knowledge on environmental risks has led to environmental project	0 (0.0%)	0 (0.0%)	11 (14.7%)	17 (22.7%)	47 (62.7%)
The use of monitoring and evaluation specialist has led to public implementation of environmental projects in Rwanda	0 (0.0%)	10 (13.3%)	13 (17.3%)	24 (32.0%)	28 (37.3%)
Setting environmental policies led to public implementation of environmental projects in Rwanda	0 (0.0%)	3 (4.0%)	11 (14.7%)	19 (25.3%)	42 (56.0%)

Research Finding presented in Table 4.2 shows 31 (41.3 percent) of respondents strongly agreed, 31 (41.3 percent) agreed and 9 (12.0 percent) were neutral, while 4 (5.3 percent) disagreed and none strongly disagreed regarding to whether an evaluate risks leads effective environmental protection in Rwanda. Concerning establishing risks provides ways of protecting environment in Rwanda, 48 (64 percent) of the respondents strongly agreed, 15 (20.0 percent) agreed, 8 (10.7 percent) not sure, 4 (5.3 percent) disagreed and none strongly disagreed. In respect to whether Building an attitude and knowledge on environmental risks has led to environmental project 47 (62.7 percent) strongly agreed, 17 (22.7 percent) agreed, 11 (14.7 percent) were neutral, none disagreed and none strongly disagreed. While to whether the use of monitoring and evaluation specialist has led to public implementation of environmental projects in Rwanda 28 (37.3 percent) strongly agreed, 24 (32.0 percent) agreed, 13 (17.3 percent) were neutral, interestingly 10 (13.3 percent) disagreed and none strongly disagreed. Consequently, regarding to whether setting environmental policies led to public implementation of environmental projects in Rwanda 42 (56.0 percent %) strongly agreed, 19 (25.3 percent) agreed, 11 (14.7 percent) were neutral, 3 (4.0 percent) agreed and none strongly agreed.

From this study, the study was also supported by Brunnermeier and Cohen (2003), who assessed the concept of monitoring and evaluation and how this contribute to environmental protection.From his study, he argued that the environmental protection plan is important and this is the basis of achieving environmental protection requiresments.As countries implement monitoring and evaluation practices on environmental conservation, this has led to environmental protection target.

4.1.3 Project Knowledge and Communication
The third objective was to establish the influence of project knowledge and communication on public implementation of environmental projects in Rwanda. Table 4.10 presents the finding on how respondents responded to various statements on the variables on project knowledge and communication.

Table 4.3: Project knowledge and communication

Project knowledge and communication	1	2	3	4	5
Community plays important role in public implementation of environmental projects at Amayaga Region	1 (1.3%)	2 (2.7%)	3 (4.0%)	15 (20.0%)	54 (72.0%)
Community is mobilized to use chemicals towards project risk management process at Amayaga Region	0 (0.0%)	8 (10.7%)	16 (21.3%)	25 (33.3%)	26 (34.7%)
Community is Sensitized on environmental protection towards project risk management process in Rwanda	0 (0.0%)	3 (4.0%)	8 (10.7%)	29 (38.7%)	35 (46.7%)
Community is encouraging to plant trees to ensure environmental protection	3 (4.0%)	6 (8.0%)	13 (17.3%)	23 (30.7%)	30 (40.0%)
Community is encouraged to participation in disaster risk reduction to ensure environmental protection process	0 (0.0%)	4 (5.3%)	8 (10.7%)	15 (20.0%)	48 (64.0%)

Research Finding presented in Table 4.3 shows 54 (72.0 percent) of respondents strongly agreed, 15 (20.0 percent) agreed, 3 (4.0 percent) were neutral, while 2 (2.7 percent) disagreed and 1 (1.3 percent) strongly disagreed regarding to whether community plays important role in public implementation of environmental projects at Amayaga Region. Concerning

Community is mobilized to use chemicals towards project risk management process at Amayaga Region, 26 (34.7 percent) of the respondents strongly agreed, 25 (33.3 percent) agreed, 16 (21.3 percent) not sure, 8 (10.7 percent) disagreed and none strongly disagreed. In respect to whether community is Sensitized on environmental protection towards project risk management process in Rwanda 35 (46.7 percent) strongly agreed, 29 (38.7 percent) agreed, 8 (10.7 percent) were neutral, 3 (4.0 percent) disagreed and none strongly disagreed. While to whether the community is encouraging to plant trees to ensure environmental protection 30 (40.0 percent) strongly agreed, 23 (30.7 percent) agreed, 13 (17.3 percent) were neutral, interestingly 6 (8.0 percent) disagreed and 3 (4.0 percent) strongly disagreed. Consequently, regarding to whether community is encouraged to participation in disaster risk reduction to ensure environmental protection process 48 (64.0 percent %) strongly agreed, 15 (20.0 percent) agreed, 8 (10.7 percent) were neutral, 4 (5.3 percent) agreed and none strongly agreed.

These findings collected from landscape restauration project at Amayaga region are supported by the study done by Foreign Multinational Corporation (2007) which showed that community plays important role in taking responsibilities to protect environment. Therefore, planting trees, information sharing and biodiversity maintenance and protection leads to environmental protection success.

4.1.4 Implementation of Environmental Projects

The study shows the extent to which Implementation of Environmental Projects indicators were achieved. The level of agreement with the following statements relating to Implementation of environmental projects. Respondent's responses are shown in Table 4.11 below.

Table 4.4: Implementation of environmental projects

Implementation of environmental projects	1	2	3	4	5
Environmental management plan has led to environmental protection in Rwanda.	0 (0.0%)	0 (0.0%)	11 (14.7%)	17 (22.7%)	47 (62.7%)
Information sharing, participation in decision making have led to effective protection of environment	0 (0.0%)	8 (10.7%)	16 (21.3%)	25 (33.3%)	26 (34.7%)
Environmental management plan project are completed within the budget allocated	0 (0.0%)	10 (13.3%)	13 (17.3%)	24 (32.0%)	28 (37.3%)
Project implementation is done within the expected design	0 (0.0%)	4 (5.3%)	9 (12.0%)	31 (41.3%)	31 (41.3%)

Source: Primary data, 2023

From the findings, dominant part of the respondents showed that 47 (62.7 percent) of respondents strongly agreed, 17 (22.7 percent) agreed, 11 (14.7 percent) were neutral, while none disagreed and none strongly disagreed regarding to whether environmental management plan has led to environmental protection in Rwanda. Concerning Information sharing, participation in decision making have led to effective protection of environment, 26 (34.7 percent) of the respondents strongly agreed, 25 (33.3 percent) agreed, 16 (21.3 percent) not sure, 8 (10.7 percent) disagreed and none strongly disagreed. In respect to whether environmental management plan project are completed within the budget allocated 28 (37.3

percent) strongly agreed, 24 (32.0 percent) agreed, 13 (17.3 percent) were neutral, 10 (13.3 percent) disagreed and none strongly disagreed.

While to whether the Project implementation is done within the expected design 31 (41.3 percent) strongly agreed, 31 (41.3 percent) agreed, 9 (12.0 percent) were neutral, interestingly 4 (5.3 percent) disagreed and none strongly disagreed.

4.2 Correlation Analysis

The study conducted a Pearson product moment correlation analysis to determine the correlation between the risks management process and public implementation of environmental projects in Rwanda, case of landscape restoration project at Amayaga region. Basically, it looked at project risk management process in terms of project monitoring and control, project risk evaluation and project knowledge and communication. The outcomes are presented in Table 4.12.

Table 4.5: Correlation analysis

	Project implementation	Project Monitoring and control
Project Risk Evaluation (r)	0.843	0.796*
Project Knowledge and Communication (r)		

**-Correlation is significant at the 0.01 (2 tailed)
*- Correlation is significant at the 0.05 (2 tailed)

The results in Table 4.5 indicates that, there exists a strong, significant and positive correlation between project monitoring and control and public implementation of environmental projects in Rwanda, as shown by correlation factor, r=0.833, P V=0.000< 0.05. From correlation findings there exists a strong positive and significant correlation between project risk evaluation and public implementation of environmental projects in Rwanda as indicated by a correlation factors, r=0.845 with PV=0.000< 0.01. This demonstrated that project risk evaluation contributes to public implementation of environmental projects in Rwanda. The correlation findings also indicated that there exist a strong, significant and positive correlation between project knowledge and communication and public implementation of environmental projects in Rwanda as indicated by a correlation factors, r=0.845with PV=0.000< 0.05.

4.3 Regression analysis

4.3.1 Regression Results for project monitoring and control

A further regression analysis was carried out to determine the significant relationship between project monitoring and control on public implementation of environmental projects in Rwanda. Table 4.6 indicates results that explains the regression between project monitoring and control and public implementation of environmental projects in Rwanda whereby 16.4% of variation in the public implementation of environmental projects in Rwanda is explained by a unit change in project monitoring and control. In other words, the deficit of 83.6% is explained by other factors apart from project monitoring and control. The results are satisfactory through the indication of goodness of fit by the linear regression.

Table 4.6: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.415ᵃ	.172	.164	0.4070035

    a. Predictors: (Constant), Project monitoring and control

Result review that project monitoring and control is statistically significant in explaining public implementation of environmental projects in Rwanda. F-test was carried out to test the null hypothesis that there is no relationship between project monitoring and control and public implementation of environmental projects in Rwanda. The ANOVA test in Table 4.17 shows that the probability value (value=0.000) is less than α= 0.05 meaning that null hypothesis is rejected and conclude that there is a statistical significance relationship between project monitoring and control and public implementation of environmental projects in Rwanda.

Table 4.7: ANOVA results project monitoring and control

	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	6.131	1	6.131	4.063	.000ᵃ
1	Residual	28.634	93	.476		
	Total	34.765	94			

b. Dependent Variable: Public implementation of environmental projects

c. Predictors: (Constant), Project monitoring and control

Further, t-test was carried out in order to test the null hypothesis that there is no significant relationship between project monitoring and control and public implementation of environmental projects in Rwanda. Beta coefficient ($\beta = 0.452$) from the obtained model in Table 4.17 is less than 0.05 and constant $\alpha = 0.743$ more than 0. This implies that there is a significant relationship between project monitoring and control and public implementation of environmental projects in Rwanda therefore rejecting the null hypothesis. This is a clear indication that the model obtained is significantly fit.

$Y= 0.743 + 0.452X_1$

Table 4.8: Coefficient results on project monitoring and control Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.743	.335		5.899	.000
	Project monitoring and control	.452	.079	.561	6.870	.000

    a. Dependent variable: Public implementation of environmental projects

4.3.2 Regression Results for project risk evaluation

A further regression analysis was carried out to determine the significant relationship between Project risk evaluation and public implementation of environmental projects in Rwanda. Table 4.8 indicates results that explain the regression between Project risk evaluation and public implementation of environmental projects in Rwanda whereby 74% of

variation in the public implementation of environmental projects in Rwanda is explained by a unit change in Project risk evaluation. In other words, the deficit of 26% is explained by other factors apart from Project risk evaluation. The results are satisfactory through the indication of goodness of fit by the linear regression.

Table 4.9: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.753	.568	.740	.65724

b. Predictors: (Constant), Project risk evaluation

Result review that Project risk evaluation is statistically significant in explaining public implementation of environmental projects in Rwanda. To test the null hypothesis that there is no significant relationship Project risk evaluation and public implementation of environmental projects in Rwanda F-test was carried out. From ANOVA test in Table 4.17 the p-value= 0.000 meaning it's less than α= 0.05, hence rejecting the null hypothesis.

Table 4.10: ANOVA results for Project risk evaluation

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.296	1	16.296	6.075	.000ᵃ
	Residual	37.511	93	.476		
	Total	53.807	94			

b. Dependent Variable: Public implementation of environmental projects

c. Predictors: (Constant), Project risk evaluation

Further, t-test was carried out in order to test the null hypothesis that there is no significant relationship between Project risk evaluation and public implementation of environmental projects in Rwanda. Beta coefficient (β = 0.823) from the obtained model in Table 4.10 is less than 0.05 and constant α = 0.411 more than 0. This implies that there is a significant relationship between Project risk evaluation and public implementation of environmental projects in Rwanda therefore rejecting the null hypothesis. This is a clear indication that the model obtained is significantly fit.

$Y= 0.411 + 0.823X_2$

Table 4.11: Coefficient results showing effect of Project risk evaluation Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.411	.904		4.235	.000
	Project risk evaluation	.823	.071	.3645	4.577	.000

b.   Dependent variable: Public implementation of environmental projects in Rwanda

4.3.3 Regression Results for project knowledge and communication

A further regression analysis was carried out to determine the significant relationship between project knowledge and communication and public implementation of environmental projects in Rwanda. Table 4.18 indicates results that explains the regression between project knowledge and communication and public implementation of environmental projects in Rwanda whereby 40.3% of variation in the performance is explained by a unit change in project knowledge and communication. In other words, the deficit of 59.7% is explained by other factors apart from project knowledge and communication. The results are satisfactory through the indication of goodness of fit by the linear regression.

Table 4.12: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.688[a]	.473	.403	.472

    c. Predictors: (Constant), Project knowledge and communication

Result review that project knowledge and communication is statistically significant in explaining public implementation of environmental projects in Rwanda. To establish if the null hypothesis which stated that there is no relationship between project knowledge and communication and public implementation of environmental projects in Rwanda was true F-test was carried out. An ANOVA test was performed on the variable project knowledge and communication and the p-value obtained is less than 0.05 (p-value= 0.000). Therefore, null hypothesis is rejected implying there is relationship between project knowledge and communication and public implementation of environmental projects in Rwanda.

Table 4.13: ANOVA results for project knowledge and communication ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	6.002	1	6.002	6.734	.000[a]
1	Residual	6.684	93	.223		
	Total	12.686	94			

b. Dependent Variable: Public implementation of environmental projects

c. Predictors: (Constant), Project knowledge and communication

Further, t-test was carried out in order to test the null hypothesis that there is no significant relationship between project knowledge and communication and public implementation of environmental projects in Rwanda. Beta coefficient ($\beta = 0.296$) from the obtained model in Table 4.13 is less than 0.05 and constant $\alpha = 0.375$ more than 0. This implies that there is a significant relationship between project knowledge and communication and public implementation of environmental projects in Rwanda therefore rejecting the null hypothesis. This is a clear indication that the model obtained is significantly fit.

$Y= 0.375 + 0.296X_3$

Table 4.14: Coefficient results showing effect of project knowledge and communication Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.375	.230		1.629	.000
	Project knowledge and communication	.296	.090	.319	3.300	.000
c.	Dependent variable: Public implementation of environmental projects in Rwanda					

4.3.4 Multiple Regression Analysis

Multiple regression analysis was done with the aim of assessing project risks management process and public implementation of environmental projects in Rwanda, case of landscape restoration project at Amayaga region. The findings are presented in Table 4.12, 4.13 and 4.14.

Table 4.15: Combined Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865[a]	.749	.739	.15097

a. Predictors: (Constant), Project monitoring and control Project risk evaluation, Project knowledge and communication

From the results in Table 4.15 the determinant is 0.739 at 0.05 significant levels. It therefore implies that 73.9% of the disparities in the dependent variable Public implementation of environmental projects are elucidated by the independent variables (Project monitoring and control Project risk evaluation, Project knowledge and communication).

Table 4.16: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.137[a]	3	1.784	78.284	.000[b]
	Residual	2.393	105	.017		
	Total	9.531	108			

Results on Analysis of Variance found out that F= 78.284 and P=0.0000. This indicates an affirmative positive significant relationship between project risks management process and public implementation of environmental projects in Rwanda.

Table 4.17: Coefficient results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.463	.231		1.973	.106
	Project monitoring and control,	.174	.009	.444	1.815	.009
	Project risk evaluation	.192	.050	1.231	3.616	.036
	Project knowledge and communication	.16.7	.017	1.075	3.159	.025

The model can be represented as: $Y = 0.463 + 0.174 X_1 + 0.192 X_2 + 0.167 X_3$

It is evident that holding project monitoring and control, project risk evaluation, project knowledge and communication to a constant zero, public implementation of environmental projects in Rwanda would be at 0.463. In addition, any unit increase on project monitoring and control would increase public implementation of environmental projects in Rwanda by a factor of 0.174. Any unit increase in project risk evaluation would increase public implementation of environmental projects in Rwanda by a factor of 0.192. Lastly any unit in project knowledge and communication would increase in public implementation of environmental projects in Rwanda by a factor of 0.167.

5.1 Conclusion

The study findings demonstrate that project monitoring and control, project risk evaluation, and project knowledge and communication significantly contribute to the successful implementation of environmental projects in Rwanda. It is recommended that robust risk management processes be implemented, along with community education and sensitization, to curb environmental exploitation and promote biodiversity conservation. Encouraging the active involvement of environmental partners in decision-making processes and the enforcement of environmental policies and laws are crucial for sustainable environmental protection. Additionally, the study highlights the importance of continuously evaluating the impact of project risk evaluation and fostering effective project knowledge and communication for the successful execution of environmental initiatives in Rwanda.

5.3 Recommendations

The study recommends the initiation of a comprehensive risk management process and emphasizes the necessity of educating and sensitizing communities to mitigate the overexploitation of the environment and its biodiversity. Encouraging the active participation of environmental partners in decision-making and the implementation of effective environmental policies and resource management laws are crucial for ensuring sustainable environmental practices. The study further suggests evaluating the impact of project risk evaluation and prioritizing effective project knowledge and communication for successful environmental project implementation in Rwanda.

5.3 Acknowledgement

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