



**Influence of project risk management strategies on project performance: A case of essential oil extraction in Horizon Sopyrwa in Musanze district, Rwanda**

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**Abstract:** *The study entitled “Effect the effectiveness of risk management techniques on project outcomes: Essential oil extraction project in Horizon SOPYRWA in Musanze district, Rwanda” was conducted for assessing how performance of essential oil extraction project was affected through risk management techniques. In her investigation, she combined primary and secondary sources. Documentary search was used to get secondary source data, and 138 employees of Horizon SOPYRWA, particularly those in the department responsible for essential oil extraction, provided primary source data. The researcher employed census sampling and purposeful sampling to choose each of these respondents, while questionnaires, interviews, observations, and documentation served as the primary data gathering instruments. The outcomes of SPSS version 28 were provided as descriptive statistics along with inferential statistics (Bivariate Correlation Analysis). According to the findings, each independent variable exhibited a favorable linear association with overall Project success. The effectiveness of EOE projects was impacted by risk acceptance and avoidance techniques at rates of 53.1% ( $r=0.531$ ,  $sig=0.034$ ) and 55% ( $r=0.550$ ,  $sig=0.028$ ), respectively, which explains why the link was strongest. Despite the reality both risk transferal and risk exploitation techniques contributed on the undertaking's efficiency at a rate of 26.8% ( $r= 0.268$ ) each, they did not have a strong link with it. The model summary from multiple regression analysis reveals that risk avoidance, risk acceptance, risk mitigation, risk transferal, and risk exploitation are the five predictors that can explain 68% of change in project performance implementation. This implies that other factors not included in this research could account for the remaining 32% of the variation. It was suggested that Management keep holding frequent meetings and training sessions on project planning, project implementation, and project evaluation in order to guarantee the use of risk management strategies and the program's success. The management should assess and distribute the contingency funds set aside for risks by including anticipated risks in their endeavor plan and providing potential mitigation measures.*

**Key words:** *Risk avoidance; Risk acceptance, risk mitigation, risk transferal, risk exploitation and project performance.*

## 1. Introduction

Risk reduction is a system that assures continuous improvement and progress in work application and implies to organizations decision making. RM is employable in a corporation to avoid crisis and it also beneficial in building the organizations value. According to Wilson and Shlyakter, good management practices always view RM as a crucial component of a productive workplace (1997).

Recently, a risk management concept becomes highly popular in many organizations and companies. To mitigate the right economic budget and for reducing project associated risks, many times construction companies with wide and multiple projects are keen to adopt the RM practices. To improve performance and profit, many oil companies started to establish risk management procedure. Usually, different type of businesses, projects and profession have their own kind of risk descriptions, meanings and management strategy, depending on every one's perception and understanding in the team as mentioned by Samson S, 2009).

The rapid increase essential oils are in need is being driven by several factors, most notably: i) a growth in disposable consumer income, particularly in Asia, Latin America and Africa, and ii) changing customer habits, with a growing interest in naturally-sourced products (MINECOFIN 2012). The aromatic compounds industry is in Rwanda currently underdeveloped. There are only a small number startup companies where Horizon SOPYRWA is included. Oil industries are frequently exposed to dangers and several risks, but RM tools and practices are set to deal with these problems, which assure the protection of their workers and organizations. Using the information at hand, this study tries to pinpoint risk management tactics and measures and how they affect the outcome of essential oil production in Horizon SOPYRWA

## 2. Statement of the problem

According to NAEB (2005), essential oil companies in Rwanda faced three main challenges since incorporation in 2005: slow smallholder farmer mindset change from subsistence to commercial farming; difficulties acquiring land for expansion; and access to impact investment and so that's why Horizon SOPYRWA report of 2005 stated that it was increased demand than the supply.

Particularly in SOPYRWA, to a demand that exceeds supply due not only to three above main challenges but also to RM is not properly implemented or monitored. Prices at the source may decrease if supply for fragrance oils are greater than demand, but these savings are typically

negligible and are not passed on to the consumer. Supply chains are stretched by increases in demand, and the coronavirus pandemic will undoubtedly bring about considerable adjustments, especially where the economy is already unstable.

In addition to demand which is higher than supply, Companies have suffered significant financial losses because many organizations with high project budget and less monitoring usually suffer economically and have to pay the cost of negligence. According to Fauver and Naranjo, organizations must deal with loss of value and negative perceptions on account of gaps in governance, information management, and missed communications (2010). All this evidence is a outcome of small negligence and improper monitoring by management incorporate several precautionary measures likewise RM strategies for oil industry including horizon SOPYRWA.

### **3. Research objectives**

In this study, our main objective is to determine how project risk management affects the performance of essential oil production in Rwanda.

The specific objectives are the followings:

1. To find out the influence of risk avoidance strategy on performance of essential oil extraction project in Musanze district,
2. To evaluate the impact of risk acceptance strategy on success of essential oil production project in Horizon SOPYRWA
3. To examine risk mitigation strategy according to essential oil production project in Rwanda
4. To ascertain the impact of transferal strategy regarding the creation of essential oils in Horizon SOPYRWA
5. To evaluate the impact of risk exploitation strategy on manufacturing of essential oils project.

### **4. Research hypotheses**

**H1.** There is significant influence of project risk management strategies on project performance

**H1a.** There is significant influence of risk avoidance on performance of essential oil extraction project

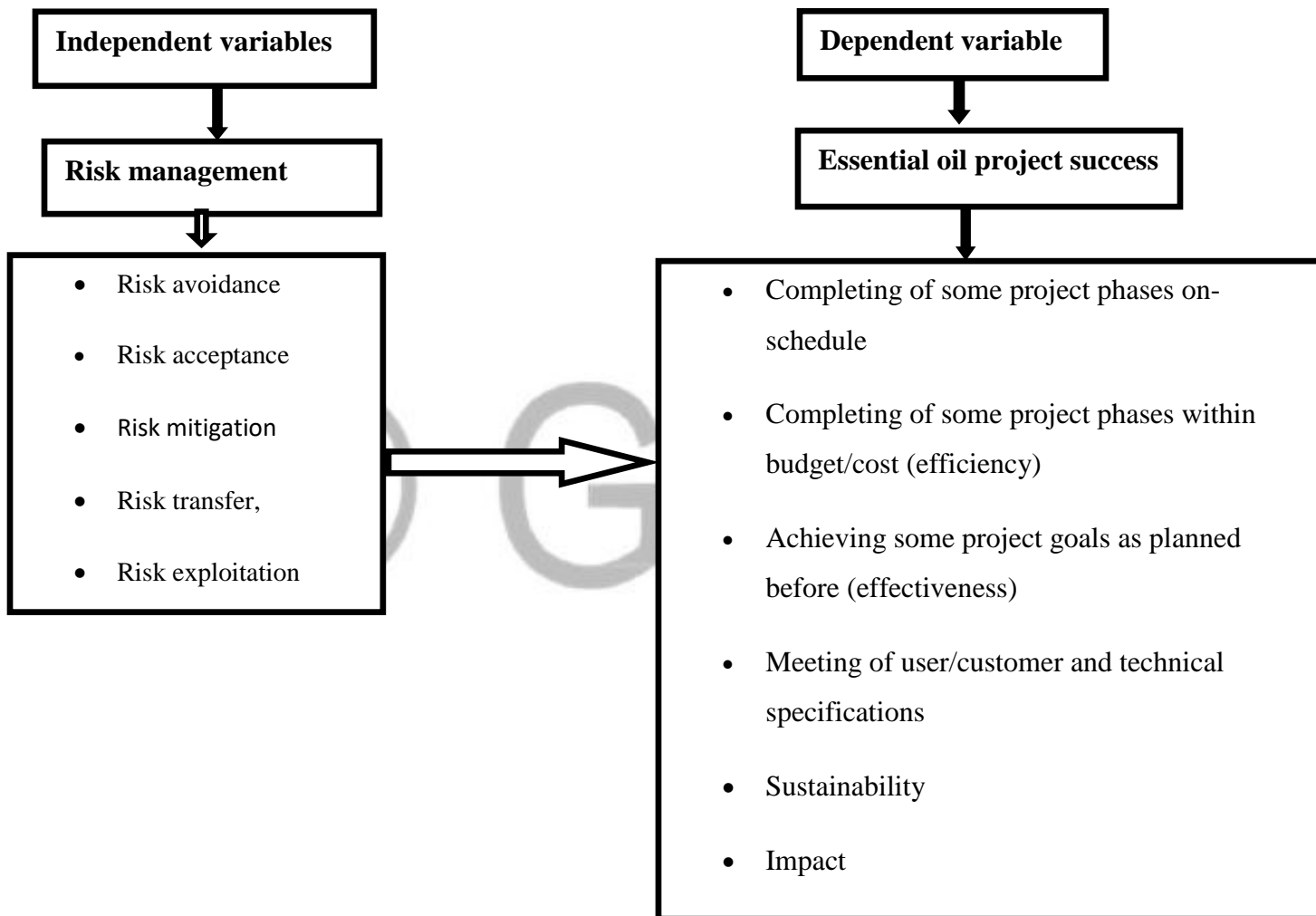
**H1b.** Risk acceptance strategy has a significant influence on the success of essential oil production project

**H1c.** Mitigation has significant influence on essential oil production success in Rwanda.

**H1d.** Risk transferal has significant influence on essential oil extraction performance in Horizon SOPYRWA.

**H1e.** Risk exploitation strategy has significant influence on essential oil extraction performance in Horizon SOPYRWA.

## 5. Conceptual framework of the study



## 6. Methodology

**Research Design:** The study has adopted a descriptive research design and correlational research design.

**Study population:** The study's target population was probably 138 employees ranged in three categories for reliable data collection such as Management staff (managers and administration), senior staff (Field officers, technicians, labo analysts, agronomists and raw material supply) and junior staff (who are other contract workers).

**Sample size:** By census enquiry method; all these 138 employees constitute our target respondents

**Data Collection tools:** During our research, we have put an effort on the following tools: Questionnaire, Interview guide, Observation, Documentary review

## 7. Research findings

### 7.1. Impact of risk avoidance strategies on essential oil project performance

Finding out how risk avoidance approach affected the achievement of the essential oil extraction operation in the Musanze district was the study's initial goal.

**Table 1: Impact of risk avoidance strategies on essential oil project performance**

	SA	A	N	D	SD		
	%	%	%	%	%	Mean	Std. Deviation
Implementing the EOE project in accordance with the already planned actions	32.6	30.4	17.4	11.6	8.0	3.681	1.261
Managers of essential oils make sure to avoid any risky behaviors.	31.9	37.7	13.0	7.2	10.1	3.855	1.309
To minimize risks, all project managers in EO hold frequent meetings.	8.7	44.2	23.2	15.2	8.7	3.739	1.263
There is a list of potential occurrences that could affect achieving the goals, and they come with explicit instructions.	32.6	32.6	18.1	10.9	5.8	3.840	1.263
To monitor, identify, and manage risk, management and staff participate in periodic reviews and risk management planning exercises.	37.0	31.2	15.9	10.9	5.1	3.753	1.185

<b>Average Score</b>	<b>28.56</b>	<b>35.22</b>	<b>17.52</b>	<b>11.16</b>	<b>7.54</b>	<b>3.773</b>	<b>1.2562</b>
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Source: Primary data, 2022

Table 4.4's results indicate that overall risk avoidance strategies have an impact on EOE project performance, with an average mean of 3.773 and a standard deviation of 1.2562, as strongly attested by 28.56% of the respondents, 35.22% in agreement, 17.52% in neutral, 11.16% in disagreement, and 7.54% strongly disagreeing.

## 7.2: Impact of risk acceptance strategies on essential oil project performance

Assessing the influence of risk acceptance approach on the effectiveness of the essential oil production project in Horizon SOPYRWA in the Musanze district was the study's second goal.

**Table 2: Impact of risk acceptance strategies on essential oil project performance**

	<b>SA</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>		
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>Mean</b>	<b>Std. Deviation</b>
Once a risk is found, it is acknowledged and disclosed to others.	36.2	26.8	10.9	15.2	10.9	3.623	1.389
When a risk arises, EOE project managers warn of it and acknowledge its impact.	41.3	28.3	18.1	8.0	4.3	3.942	1.144
The risk management policy is known to the staff.	42.8	32.6	11.6	8.0	5.1	4.000	1.152
All risk management rules and regulations are accessible to employees.	42.0	32.6	11.6	8.0	5.8	3.971	1.177
Employees are informed on risk management and control techniques.	42.0	32.6	13.0	8.0	4.3	4.000	1.126

<b>Average Score</b>	<b>40.86</b>	<b>30.58</b>	<b>13.04</b>	<b>9.44</b>	<b>6.08</b>	<b>3.907</b>	<b>1.1976</b>
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Source: Primary data, 2022

The above table's average mean of 3.907 showed that risk acceptance tactics have an influence on the outcome of the EOE project, with a standard deviation of 1.1976.

### 7.3. Impact of risk mitigation strategies on essential oil project performance

The effectiveness of the initiative to produce essential oils in Horizon SOPYRWA in the Musanze district was examined as the third goal of this study.

**Table 3: Impact of risk mitigation strategies on essential oil project performance**

	<b>SA</b>	<b>A</b>	<b>N</b>	<b>D</b>	<b>SD</b>		
	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>Mean</b>	<b>Std. Deviation</b>
A regular meeting is held to review the EOEP's progress, potential risks, and solutions.	31.2	39.9	11.6	10.1	7.2	3.775	1.202
Employees receive training on potential hazards, how to identify them, and how to report any issues.	41.3	28.3	17.4	8.0	5.1	3.927	1.1691
Every day, management and representatives assess the project's risk.	41.3	28.3	17.4	8.0	5.1	3.927	1.169
Employees receive regular training in risk management, control, and reporting.	39.9	26.8	18.8	8.7	5.8	3.860	1.203
The project management team adheres to a risk management policy that has been established.	39.1	28.3	19.6	8.7	4.3	3.891	1.150
<b>Average Score</b>	<b>38.56</b>	<b>30.32</b>	<b>16.96</b>	<b>8.7</b>	<b>5.6</b>	<b>3.876</b>	<b>1.178</b>

Source: Primary data, 2022

In general, with an overall mean of 3.876 and a standard deviation of 1.178, the results in Table 4.6 imply that risk mitigation techniques have an impact on the success of EOE initiatives. 30.32% of respondents agreed, 16.96% were neutral, 8.7% disagreed, and 5.6% strongly disagreed, while 38.56 percent of respondents highly agreed.

#### 7.4. Impact of risk transfer strategies on essential oil project performance

Determine the effect of transferal technique on essential oil production in Horizon SOPYRWA in the Musanze district was the fourth objective of this study.

**Table 4.: Influence of risk transfer strategies on essential oil project performance**

	SA	A	N	D	SD		
	%	%	%	%	%	Mean	Std. Deviation
Risk associated with any EOEP activity is offset by other EOEP actions.	17.4	37.7	23.9	9.4	11.6	3.398	1.217
The employee and Horizon Sopyrwa Company used to split the cost of insurance premiums.	41.3	28.3	16.7	8.0	5.8	3.913	1.192
Health insurance is used by managers as an illustration of risk transfer since the financial risks related to medical care are shifted from the individual to the insurer.	42.8	31.2	15.2	5.8	5.1	4.007	1.130
<b>Average Score</b>	<b>33.833</b>	<b>32.4</b>	<b>18.6</b>	<b>7.733</b>	<b>7.5</b>	<b>3.772</b>	<b>1.1796</b>

Source: Primary data, 2022



The data shown in the above table demonstrate that risk transferal strategies have an impact on the success of the EOE project with an average mean of 3.772 as well as a standard deviation of 1.1796.

### 7.5. Influence of risk exploitation strategies on essential oil project performance

Assessing the effect of risk exploitation strategy on the essential oil production project in Horizon SOPYRWA in the Musanze district was the fifth objective of this study.

**Table 5: Influence of risk exploitation strategies on essential oil project performance**

	SA	A	N	D	SD		
	%	%	%	%	%	Mean	Std. Deviation
There are regular evaluation mechanisms and use of evaluation outcomes for next activities	37.7	32.6	12.3	10.1	7.2	3.833	1.2415
Management consider and calculate risk management during the initial project planning and is part of the oversight agenda	48.6	26.8	14.5	6.5	3.6	4.101	1.102
The management clearly state the responsibilities and accountability for identification of risk	46.4	27.5	13.8	8.0	4.3	4.036	1.148
The management use specific risk management tools to control and manage risk	44.2	27.5	15.9	8.0	4.3	3.992	1.149
The Project management team follow a policy set out for management of risk in project	45.7	26.1	16.7	7.2	4.3	4.014	1.146
<b>Average Score</b>	<b>44.52</b>	<b>28.1</b>	<b>14.64</b>	<b>7.96</b>	<b>4.74</b>	<b>3.995</b>	<b>1.157</b>

Source: Primary data, 2022

With a standard deviation of 1.157 and an average mean of 3.995, the aforementioned table demonstrated that risk exploitation strategies have an effect on the success of the EOE project.

**Table 6: Correlation coefficients**

	Coefficients	T- Statistics	P-Value
(Constant)	3.859	6.460	<.001
Risk avoidance	.036	.446	.006
Risk acceptance	.035	.401	.038
Risk mitigation	.045	.517	.046
Risk transferal	.025	.277	.028
Risk exploitation	.067	.790	.007
Key	Significant level at 5%		

The regression equation ( $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \epsilon$ ) becomes:

$$Y = 3.859 + 0.036X_1 + 0.035X_2 + 0.045X_3 + 0.025X_4 + 0.067X_5$$

Where Y is the dependent variable (project performance), X<sub>1</sub> is the risk avoidance independent variable, X<sub>2</sub> is the risk acceptance independent variable, X<sub>3</sub> is risk mitigation independent variable, X<sub>4</sub> is risk transferal independent variable while X<sub>5</sub> is risk exploitation independent variable.

According to the constructed regression equation, holding constant at zero all components, the project performance will be 3.859. (Risk avoidance, risk acceptance, risk mitigation, risk transferal, and risk exploitation). According to the data findings analyzed, a unit increase in risk avoidance will lead to a 0.036 improvement in project performance, with all other independent variables set to zero. For every unit increase in risk acceptance, 0.045 for every unit increase in risk mitigation, 0.025 for every unit increase in risk transfer, and 0.067 for every unit increase in risk exploitation, a project's performance will increase. This implies that embracing risk, utilizing risk, and avoiding risk all contribute more to the success of EOE projects.

## **8. Conclusion and recommendations**

### **8.1. Conclusion**

The results of the study indicate that risk management practices and EOE project success are strongly positively correlated. Despite avoiding, accepting, transferring, mitigating, and utilizing risks, project implementers continue to accomplish projects. Effective project risk management is essential to achieving project objectives, such as increasing output to balance the demand and supply problem.

### **8.2. Recommendations**

According to the found results, the following recommendations have been formulated and addressed to:

- ✓ All project implementers should be encouraged to prioritize risk management of their projects since it will help them achieve project performance.
- ✓ Management should continue to schedule regular meetings and trainings on project planning, project implementation, and project evaluation skills in order to assure appropriate implementation of risk management approaches and the success of the program.
- ✓ It is also advised that Horizon SOPYRWA employ highly skilled managers, particularly field officers and supervisors, to help them hone their management skills while supervising and completing projects.
- ✓ The capable human resource should ensure that it follows all recommended management practices, which include improving monitoring and evaluation capacities through effective supervision and guaranteeing effective communication with the project's staff.
- ✓ To analyze and distribute the risk-related contingency funds, management should also include feasible mitigation techniques in the project plan along with projected hazards.
- ✓ An advanced study on the effect of risk management techniques on the efficacy of essential oil extraction in Horizon SOPYRWA should be carried out in other distinct essential oil extraction units in Rwanda in order to confirm the relevance of this study at the national level.

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