Strategic Value Addition and Performance of Coffee Export Project during Covid-19 Era in Rwanda: A Case Study of Charles Dorman Rwanda, Kamonyi District

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Abstract

This research investigated the impact of strategic value addition on the coffee export industry in Rwanda, particularly during the Covid-19 era, using Charles Dorman Rwanda in Kamonyi District as a case study. The study aimed to assess the influence of factors such as coffee accessibility to the global market, the involvement of coffee farmers, and the presence of high-quality coffee washing stations, and skilled labor on the export project's performance. Through a descriptive research design, data were collected from 124 respondents through questionnaires and from 9 senior managers and board members through semi-structured interviews. The sample size was determined using the Slovene formula, and respondents were selected through simple random sampling. SPSS version 24 was utilized to analyze the data, employing descriptive statistics, as well as correlation and regression analysis to uncover the relationships between the variables. The results have showed that training coffee farmers showed strong correlations with market expansion (r = 0.837), profitability (r = 0.804), and stakeholder satisfaction (r = 0.895). Higher quality coffee washing stations showed significant correlations with market expansion (r = 0.880), profitability (r = 0.910), and stakeholder satisfaction (r = 0.919). Voluntary coffee certification demonstrated strong correlations with market expansion (r = 0.884), profitability (r = 0.883), and stakeholder satisfaction (r = 0.892). In addition, other factors like market demand, financial support, and export incentives revealed highly significant positive correlations with market expansion, profitability, and stakeholder satisfaction. These findings underscore the multifaceted drivers shaping the project's performance. This study has demonstrated that training coffee farmers, investing in higher quality coffee washing stations, and implementing voluntary coffee certification significantly enhance the performance of the Charles Dorman coffee export project in Rwanda. Recommendations are made on continued government investment in coffee farmer training, improvements in coffee washing stations, streamlined certification processes, and active stakeholder engagement as well as collaboration since it is vital for project success and sustainability.

Keywords: *Strategic value addition, coffee export, Charles Dorman, Kamonyi District, Rwanda*

1. Introduction

The coffee export sector in Rwanda has historically been a significant contributor to the income of both farmers and the nation as a whole (Ngango & Kim, 2019). According to the Rwanda Development Board (RDB, 2021), coffee exports account for a substantial portion of the country's economy, with an annual production range of 20 to 22 thousand metric tons valued at approximately $69.2 million. However, despite its economic importance, the coffee industry faces a multitude of challenges that hinder its performance and potential for growth.

One of the persistent constraints facing coffee production in Rwanda is the inadequacy of production washing stations. This deficiency in infrastructure can lead to suboptimal processing and handling of coffee beans, resulting in a lower quality product (Mutandwa et al., 2019). Additionally, limited access to knowledge and training for coffee farmers has hindered their ability to adopt best practices in cultivation, harvesting, and storage. This lack of knowledge further contributes to the subpar quality of coffee destined for export markets (Ngango & Kim, 2019).

Furthermore, the Rwandan coffee industry has struggled to meet international standards due to issues related to harvesting and storage practices. These problems have adverse effects on the quality and marketability of Rwandan coffee on the global stage (Mutandwa et al., 2019). While some efforts have been made to address these issues, including the transition to exporting roasted coffee beans to add value to the sector (Nkurunziza, 2018), the COVID-19 pandemic exacerbated existing challenges. High input costs, a shortage of trained labor, poor agronomic practices, and inadequate marketing strategies further hampered the performance of coffee export projects (NAEB, 2021).

Despite the recognition of the need for value addition strategies to enhance coffee export performance (NAEB, 2021), empirical research in this area remains scarce. Existing studies, such as those by Uwizeye et al. (2017), Ngango & Kim (2019) and Mutandwa et al. (2019), have touched on related topics, but a comprehensive examination of the impact of strategic value addition on coffee export project performance in Rwanda is lacking. This research gap is a critical issue that needs to be addressed, given the enduring challenges faced by the Rwandan coffee industry and the imperative to improve its competitiveness on the global market.

In light of the aforementioned problems and research gaps, this study aims to empirically evaluate the effects of strategic value addition on the performance of coffee export projects in Rwanda. By doing so, it seeks to provide evidence-based insights and recommendations that can inform policy and practice, ultimately helping to enhance the economic prospects of coffee farmers and the nation as a whole in the post-COVID-19 era.

1.2 Research Objectives

1.2.1 General Objective

The main purpose of this research was to investigate the effect of strategic value addition on performance of coffee export project during Covid-19 era in Rwanda with a case of Charles Dorman Rwanda in Kamonyi District.

1.2.2 Specific objectives

(i) To assess the effect of training coffee farmers on its export project performance during Covid-19 era in Charles Dorman Rwanda in Kamonyi District.

(ii) To examine the effect of higher quality coffee washing stations on performance of its export project during Covid-19 era in Charles Dorman Rwanda in Kamonyi District.

(iii) To find out the effect of voluntary certification on performance of coffee export project in Charles Dorman Rwanda.

(iv) To analyze the factors contributing to variations in the performance of coffee export in Charles Dorman Rwanda during the Covid-19 era in Kamonyi District.

1.3 Research Hypotheses

HO₁: Training coffee farmers does not have effect on performance of its export project during Covid-19 era in Charles Dorman Rwanda in Kamonyi District.

HO₂: Higher quality coffee washing stations does not have effect on performance of its export project during Covid-19 era in Charles Dorman Rwanda in Kamonyi District.

HO₃: Voluntary certification does not have effect on performance of coffee export project during Covid-19 era in Charles Dorman Rwanda in Kamonyi.

HO₄: There is no significant association between the factors analyzed and the performance of coffee export in Charles Dorman Rwanda during the Covid-19 era in Kamonyi District.

2.1 Empirical Review

2.1.1 Coffee farmers training and export project performance

Miiro, Matsiko, and Mazur (2014) focuses on training farmers to enhance organizational performance with sample of 120 leaders of PMO trained in management skills of partnership in 4 years extension project. Hence, the results asserted that training facilitated as factors to transfer system in the form of the outcomes of training. Correlation results show relationship between personal capacity and outcome transferred (0.23 and p=0.01), members as fellows and leaders' support (r=0.24 and p=1%). Hence, support of supervisor encourages improvement of the capacity of farmers to increase good training services of coffee.

The study of Voytyuk *et al*., (2021) focused on mechanisms to involve farms in coffee export activities. The global market has concentrated on globalization to use farmer potentials to produce export products. The Russian farmers contribute to significant share to export products to have advantages for economic foreign partners. The study analyzed potential exportation of farmers to propose new mechanisms to involve farmers to increase export potential and export activities.

2.1.2 Higher quality coffee washing stations and performance of its export project.

The empirical research conducted in the field of coffee processing and quality research in Ethiopia by Behailu, *et al.,* (2018) with used of descriptive research design with 24 coffee processing firms. The results of the research have demonstrated good quality provision is the only way to remain on the global market which is competitive. These results look like the research of Bertrand et al (2021) on the production, growth and coffee bean quality arabica, the quality of coffee s the only selection criteria that enhance accessibility to global market.

The study of Hakorimana and Akcaoz (2017) focused on change of climate and sector of coffee in Rwanda as well as identifying economic and indicators of livelihood to engage production of coffee. The same research shows that at least five hundred thousand of farmers are engaged in production of coffee with other some crops like maize and bananas. The study also show that coffee contribute 30% to total revenue of exportation. However, the results show that even if the areas where to produce coffee are increasing but production of coffee is decreasing. Hence, the study recommended value addition in supply chain of coffee in Rwanda to benefit the society and communities in Rwanda.

2.1.3 Skilled labor and performance of coffee export project

The research conducted by Pyk (2017) focused on the influence of fair-trade coffee farmers performance in Tanzania. The results show that skilled labor experience among farmers with their plots size used in coffee production have affect positively coffee supplies revenue and productivity annually. The results also show that financial support and extension services negatively affect coffee production in Tanzania.

The empirical research conducted on competitiveness of export and its performance determinants in the coffee sector of Ethiopia. The results show statistically significant link between domestic consumption and competitive exportation of products. Other factors affecting competitiveness in exportation are level of local production, exchange rate, and global price of coffee. Hence recommendations were done on increasing production of quality coffee to ensure improvement of legal trade of coffee.

2.1.4 Other factors contributing to variations in the performance of coffee export

This research of Negeri and Ji (2023) investigated the influence of export knowledge and export commitment on the export performance of Ethiopian coffee exporting companies, with a specific focus on the mediating role played by product adaptation. Employing a quantitative approach, data from 273 Ethiopian coffee exporting firms were collected through structured questionnaires and analyzed using statistical tools such as SPSS version 25 and PLS-SEM version 3.2.8. The study unveiled several key findings: Export knowledge significantly impacts export performance ($\beta = 0.328$, $t = 9.927$, $p < 0.001$), indicating that a better grasp of export procedures and practices can enhance export outcomes. Moreover, product adaptation was identified as a mediator between export knowledge and export performance, with export knowledge remaining a significant predictor of export performance ($\beta = 0.141$, $t = 3.253$, $p < 0.001$). The indirect effect of export knowledge on export performance through product adaptation was also significant ($\beta = 0.188$, $t = 5.841$, $p < 0.001$), signifying partial mediation.

Furthermore, the same study of Negeri and Ji (2023) showed that export commitment significantly influences export performance ($\beta = 0.513$, $t = 21.779$, $p < 0.001$), underscoring the pivotal role of employee commitment in achieving successful exports. Similarly, product adaptation was found to mediate the relationship between export commitment and export performance, with export commitment remaining a substantial predictor of export performance even with this mediating factor ($\beta = 0.424$, $t = 13.455$, $p < 0.001$). The indirect effect of export commitment on export performance through product adaptation was also significant ($\beta = 0.089$, $t = 5.841$, $p < 0.001$), indicating partial mediation. In summary, these findings highlight the significance of export knowledge, export commitment, and effective product adaptation in improving export performance among Ethiopian coffee exporting companies, providing actionable insights for businesses in similar contexts.

This empirical study of Mutai (2019) examined into the determinants of coffee export performance in Kenya over a 38-year period from 1980 to 2018. It employs an Error Correction Model (ECM) due to integration among variables, ensuring rigorous analysis. The research investigates factors such as world real gross domestic product, trade openness, institutional quality, export capacity, domestic coffee production, world coffee production, foreign direct investment inflow, and real effective exchange rate. Findings reveal both short-term and long-term factors influencing coffee export earnings in Kenya. Institutional quality and real effective exchange rates positively impact coffee exports in both time frames, while domestic coffee production positively affects earnings in the long term. Additionally, competitive exchange rate regimes, possibly currency devaluation in favor of coffee exports, could boost competitiveness. Notably, 65.9% of the variation in coffee export earnings is explained by the model, signifying its explanatory power. Conversely, world real GDP exhibits an inverse relationship. The study recommends government policies to enhance institutional quality, reduce corruption, and support coffee farmers through subsidies and agricultural extension services.

2.2 Research Gap

This part of the research criticizes and identifies the gap from previous empirical research conducted in the field of strategic value addition and performance of coffee export. Hence, it is seen that most of the previous studies have neglected to consider the impact of coffee accessibility on market identification, income increase, and employment opportunities. Similarly, previous studies on training coffee farmers and export performance have overlooked the effects of farmer training on seed selection, planting methods, and capacity building.

The previous empirical researches conducted in this field of the study regarding the accessibility of coffee to the world market and performance of its export project such as the study of Lages and Montgomery (2014) who concentrated on the performance of export as marketing strategy and commitment adopted to show evidences of small and medium scale exporters; and the research of Karedza and Govender (2019) focused on the exploratory study on factors associated with performance of SMEs exportation but have ignored the effect of coffee accessibility to the world market in enhancing performance of export project especially in terms of identifying good market for the coffee, income increment and employment opportunities for the youth in the region where coffee is grown.

The previous empirical research conducted regarding training of coffee farmers and performance of its export project like study of Miiro *et al.,* (2014) carried out training farmers 'organizations performance; and research of Voytyuk, *et al.,* (2021) conducted on the involvement in farming mechanisms of export activities has concentrated on global market of coffee in terms of globalization which showed less attention on the effect of training coffee farmers in terms of training on selection of seeds, training on methods of planting and farmer capacity building on performance of coffee export project.

2.3 Conceptual Framework

The conceptual framework demonstrates the association between the as independent variable know as strategic value addition and dependent variable know as performance of coffee export as follow:
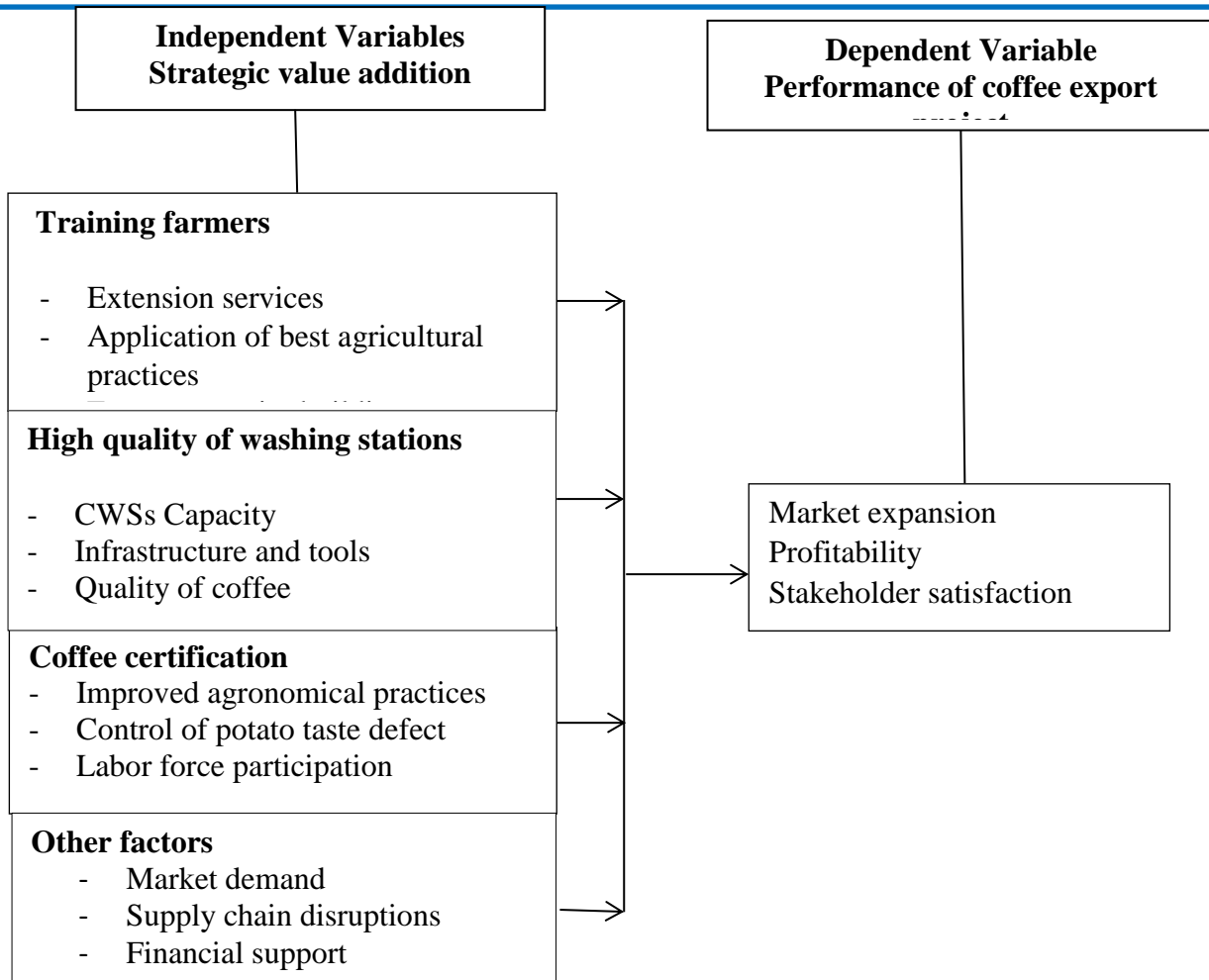
Figure 1: Conceptual Framework

Source: Researcher, 2022

The Figure 1 shows that strategic value addition is independent variable measured by coffee accessibility to the world market, training framers, high quality of washing stations and other factors like market demand, supply chain disruptions and financial support while dependent variable is performance of coffee export project is measured by market expansion, profitability and stakeholder satisfaction.

3. Materials and Methods

The research employed a mixed-method approach, combining qualitative and quantitative data collection techniques within a descriptive research design. The qualitative component utilized interviews conducted with staff members of Charles Dorman Rwanda, providing detailed information that complemented the quantitative data. On the other hand, the quantitative segment involved the administration of questionnaires using a Likert Scale to 124 respondents. The data obtained were subjected to descriptive and inferential statistical analyses using the SPSS version 24, enabling the researcher to draw appropriate conclusions based on the results.

The target population for the study consisted of 75 private farmers, 5 stakeholders, 100 cooperative members, 10 senior managers, 5 local leaders, and 5 board members associated

with Charles Dorman Rwanda. Using the Slovene formula, a sample size of 133 respondents was determined from the target population of 200 individuals. Stratified sampling was employed to select the respondents for the study, ensuring a representative sample across the various categories.

Validity and reliability of the research instruments were ensured through three pilot studies, demonstrating consistent and reliable results for all pre-tested variables. The questionnaire's reliability was confirmed using Cronbach's Alpha, establishing the instrument's validity and reliability for the main study on strategic value addition and the performance of the coffee export project.

The data collection procedures involved the distribution of questionnaires to the respondents, with a specified timeline for collection to avoid data loss. Additionally, semi-structured interviews were conducted with senior managers and board members, with their conversations recorded and later transcribed for thematic analysis. The data analysis process included the use of descriptive statistics and inferential statistical analyses, such as Pearson correlation and regression, to establish relationships and patterns between the study variables.

Ethical considerations were carefully adhered to, ensuring the protection of participants' interests and confidentiality. Respondents participated voluntarily, and their personal information remained anonymous. Proper citation and referencing of external sources were observed to maintain scientific integrity and avoid any form of academic misconduct, thereby upholding the ethical principles of the research.

4. Presentation of research findings

4.1 Coffee farmers training and export project performance

The descriptive and correlation results under this first objective of the study collectively revealed that training coffee farmers has a positive and significant effect on the performance of the Charles Dorman coffee export project in Rwanda. The positive perceptions of training effectiveness align with the strong correlations observed, suggesting that well-trained farmers contribute significantly to improved market expansion, profitability, and stakeholder satisfaction within this export project.

Table 1: Descriptive results of coffee farmers training and export project performance in Charles Dorman Rwanda

Coffee farmers training related statements	Mean	Std. Deviation
Trained on project design	4.702	0.687
Involved in extension services	4.725	0.620
Involved in application of best agricultural practices	4.687	0.724
Participated in building farmer capacity	4.725	0.608
Involved in coffee cultivation training	4.702	0.664
Overall mean	4.708	

Source: Field Data, 2023

The results presented in Table 1 demonstrated the perspectives of coffee farmers engaged in a training program in Rwanda's Charles Dorman export project. Analyzed through a 5-point Likert scale, the mean scores and corresponding standard deviations reflect participants' favorable perceptions of the training's effectiveness. The mean score of 4.702 (SD = 0.687), indicating a strong agreement among participants that they actively participated in project design training. Similarly, the high mean score of 4.725 (SD = 0.620) associated with

engagement in extension services highlights participants' collective strong agreement on their efficacy.

Positive perspectives were also evident in the realm of applying best agricultural practices, as reflected by a mean score of 4.687 (SD = 0.724). The mean score of 4.725 (SD = 0.608) shows participants' strong agreement regarding their involvement in capacity-building activities. The overall mean of 4.708 indicates a pervasive strong agreement among respondents that the coffee farmers' training positively influenced the performance of the coffee export project in Rwanda.

Table 2: Descriptive results of export project performance in Charles Dorman Rwanda

Export project performance related statements	Mean	Std. Deviation
NAEB project acquired new international customers of coffee	4.687	0.734
Local market of NAEB coffee produce has expanded	4.679	0.757
Production of coffee has increased over the six last months	4.702	0.664
Profitability of coffee has increased over the last six months	4.702	0.664
Stakeholders are satisfied with the current price of coffee	4.709	0.662
Overall mean	4.695	

Source: Field Data, 2023

Table 2 showed positive assessment of the export project's performance in Charles Dorman, Rwanda, assessed through a 5-point Likert scale. Participants agreed (mean = 4.687, SD = 0.734) that the NAEB project successfully gained new international customers, expanding its market reach. Similarly, participants noted the project's positive impact on the local market expansion (mean = 4.679, SD = 0.757).

Coffee production increase (mean = 4.702, SD = 0.664) and improved profitability (mean = 4.702, SD = 0.664) over the last six months received an agreement, as did stakeholders' contentment with coffee prices (mean = 4.709, SD = 0.662). The overall mean score of 4.695 signifies participants' favorable reception of the export project's performance. The consistent mean scores and moderate standard deviations suggested that market expansion, production, profitability, and stakeholder satisfaction affect overall performance of export project.

Table 3: Correlation between coffee farmers training and export project performance

		Market expansion	Profitability	Stakeholders satisfaction
Training farmers	Pearson Correlation	.837[**]	.804[**]	.895[**]
	Sig. (2-tailed)	.000	.000	.000
	N	131	131	131

Source: Field Data, 2023

The correlation analysis in Table 3 revealed strong positive relationships between coffee farmers' training and export project performance indicators. Training coffee farmers and market expansion show a Pearson correlation coefficient (r) of 0.837, training coffee farmers and profitability have a Pearson correlation of 0.804, and training coffee farmers and stakeholder satisfaction are correlated at 0.895, all at a significance level (Sig.) of 0.000. These findings showed a positive and significant relationship between training coffee farmers

and positive outcomes in market expansion, profitability, and stakeholder satisfaction within the Charles Dorman coffee export project in Rwanda. This implies that Ho_1 is rejected.

In an interview with one of the senior managers, he highlighted the tangible benefits of training coffee farmers within the Charles Dorman coffee export project, in his own word he said: "*We emphasized on training that have a direct impact on increasing annual coffee yields, which was crucial for sustaining income during uncertain times. Moreover, the focus on producing high-quality coffee aligned with market demands and resulted in higher earnings for farmers*". He said that training sessions conducted in groups fostered a sense of community and confidence among farmers, discouraging them from diverting away from coffee farming. Hence, this is shows that both qualitative and quantitative results proved that that training coffee farmers played a pivotal role in sustaining the coffee supply chain, ensuring its resilience in the face of adversity that enhance performance of the coffee export project in Rwanda.

4.2 Higher quality coffee washing stations and performance of its export project

The study's combined descriptive and correlation analyses revealed a positive and significant impact of higher quality coffee washing stations on the Charles Dorman coffee export project in Rwanda. This effect was evident in various aspects of coffee washing and strong correlations with project performance indicators.

Table 4: Descriptive results of higher quality coffee washing stations and export project performance

Higher quality washing station related statements	Mean	SD
Participated in washing coffee	4.702	0.664
Participated in deciding the timeframe of washing coffee in this project	4.679	0.757
Participated in deciding the budget attributed to washing machine in this project	4.702	0.664
Participated in deciding the community labour to help in washing machine of this project	4.717	0.623
Participated in deciding market opportunities of higher quality coffee of this project	4.702	0.687
Overall mean	4.700	

Source: Field Data, 2023

Table 4 showed the responses from participants through a 5-point Likert scale in relation to higher quality coffee washing stations. The mean score of 4.702 (SD = 0.664) reflects active participation in coffee washing, while the mean score of 4.679 (SD = 0.757) indicates their involvement in determining the washing timeframe. In addition, strong participant involvement is evident in the allocation of budget for washing machines, with a mean score of 4.702 (SD = 0.664), and in deciding community labor contribution, yielding a mean score of 4.717 (SD = 0.623).

The participants' contribution extends to identifying market opportunities for higher quality coffee, as indicated by a mean score of 4.702 (SD = 0.687). The overall mean score of 4.700 suggests a strong agreement on participation in activities to ensure higher quality coffee washing stations. Consistent mean scores and moderate standard deviations indicate participants' agreement in decisions related to coffee washing, machine budgeting,

community labor, and market opportunities. Hence, this implies that respondent's active and collaborative role in enhancing the success of the higher quality coffee washing station initiative has a positive effect on performance of Charles Dorman coffee export project in Rwanda.

Table 5: Correlation between higher quality coffee washing stations and export project performance

		Market expansion	Profitability	Stakeholders satisfaction
High quality coffee washing stations	Pearson Correlation	.880**	.910**	.919**
	Sig. (2-tailed)	.000	.000	.000
	N	131	131	131

Source: Field Data, 2023

Table 5 revealed significant positive relationship between higher quality coffee washing stations and export project performance indicators. Pearson correlation coefficients (r) of 0.880 for market expansion, 0.910 for profitability, and 0.919 for stakeholder satisfaction, all with a significance level (Sig.) of 0.000, signify significant and positive relationships. These findings imply that higher quality coffee washing stations strongly correlate with favorable outcomes in market expansion, profitability, and stakeholder satisfaction. The associations' strength is highlighted by the high correlation coefficients and very low p-values. Hence, the Ho_2 is rejected. This also resonates with earlier findings on coffee farmers' training, reinforcing the pivotal role of quality improvement initiatives in positively shaping export project performance.

In interviews conducted to other senior managers, the qualitative responses highlight the importance of best coffee washing station infrastructure and machinery in the Charles Dorman coffee export project. The interviewees emphasized that these facilities minimize human errors, aid in quality classification, prioritize efficiency, and play a crucial role in producing high-quality coffee. These insights align with the quantitative findings of the current study, which indicate a significant positive impact of higher quality coffee washing stations on project performance, including market expansion and profitability.

4.3 Voluntary coffee certification and performance of its export project

The descriptive and correlation results under this first objective of the study collectively revealed that voluntary coffee certification has a positive and significant effect on the performance of the Charles Dorman coffee export project in Rwanda. The positive perceptions of certification effectiveness align with the strong correlations observed, suggesting that well-trained farmers contribute significantly to improved market expansion, profitability, and stakeholder satisfaction within this export project.

Table 6: Descriptive results of voluntary coffee certification

Voluntary coffee certification related statements	Mean	SD
Participated in setting strategies that reduce coffee certification costs	4.725	0.620
Participated in enhancing the attainment of the requirements for voluntary certification	4.702	0.687
Participated in building local capacity to enhance voluntary coffee certification process	4.694	0.700
Provided information that helped to get multiple voluntary coffee certifications	4.717	0.623
Participated in deciding the voluntary coffee certifying bodies to work with	4.709	0.650
Overall mean	4.709	

Source: Field Data, 2023

Table 6 presents the descriptive results of voluntary coffee certification, as evaluated through participants' responses on a 5-point Likert scale. The involvement in setting strategies to reduce coffee certification costs received a mean score of 4.725 (SD = 0.620), underlining their commitment to cost-effective certification approaches. Similarly, the mean score of 4.702 (SD = 0.687) for enhancing the fulfillment of certification requirements signifies their proactive contribution to meeting necessary criteria.

Moreover, their participation in building local capacity to facilitate the certification process yielded a mean score of 4.694 (SD = 0.700), illustrating their dedication to enhancing local expertise. The mean score of 4.717 (SD = 0.623) for providing information leading to multiple certifications indicating their role in diversifying certification avenues. Participants were engaged in deciding the certifying bodies to collaborate with, as indicated by a mean score of 4.709 (SD = 0.650). The overall mean of 4.709 reflects participants' collective commitment to voluntary coffee certification efforts. The consistent mean scores, coupled with moderate standard deviations, suggest a strong agreement on active participation across various dimensions of the certification process to enhance export project performance.

Table 7: Correlation between voluntary coffee certification and export project performance

		Market expansion	Profitability	Stakeholders satisfaction
Coffee certification	Pearson Correlation	.884**	.883**	.892**
	Sig. (2-tailed)	.000	.000	.000
	N	131	131	131

Source: Field Data, 2023

Table 7 revealed the relationship between voluntary coffee certification and export project performance indicators. The Pearson correlation coefficients (r) of 0.884 for market expansion, 0.883 for profitability, and 0.892 for stakeholder satisfaction, all with a significance level (Sig.) of 0.000, signify a strong positive relationship between coffee certification and export performance. Hence, these results indicated that voluntary coffee certification is associated with improved market expansion, profitability, and stakeholder satisfaction within Charles Dorman export project in Rwanda.

In interviews conducted to board members, they emphasize that voluntary certification in the Charles Dorman coffee export project leads to improved market access, stable prices, enhanced farmer livelihoods, better record-keeping, quality improvement, environmental conservation, and social responsibility. The board member interviewees highlighted that coffee certification has positive impact on building commercial relationships, ensuring price stability, and promoting sustainable practices. These insights align with the quantitative results of this study by indicating that voluntary coffee certification significantly enhances project performance, including market expansion, profitability, and stakeholder satisfaction.

4.4 Other factors contributing to variations in performance of coffee project in Rwanda

The descriptive and correlation results under this objective showed participant perceptions of factors affecting coffee export project performance, highlighting market demand and supply chain disruptions as significant influences, while they also revealed highly significant positive correlations between these factors and export project performance indicators.

Table 8: Other factors contributing to variations in performance of coffee project

Other factors	Mean	SD
Market demand	4.702	0.664
Supply chain disruptions	4.717	0.623
Financial support	4.702	0.687
Regulatory changes	4.702	0.664
Export incentives	4.679	0.757
Trade restrictions	4.702	0.664
International price fluctuations	4.717	0.623
Overall mean	4.703	

Source: Field Data, 2023

Table 8 provides results on the factors contributing to variations in the performance of the coffee project, where market demand scored a mean of 4.702 (SD = 0.664), emerges as a central driver of project performance, supply chain disruptions, receiving a mean score of 4.717 (SD = 0.623), stand out as a universally recognized challenge that can impact project outcomes. Financial support, regulatory changes, trade restrictions, and international price fluctuations all exhibit consistent mean scores around 4.702, reflecting a collective belief in their substantial influence on project performance. Furthermore, the data indicates a slight variation in the perception of export incentives, with a mean score of 4.679 (SD = 0.757), suggesting that they also contribute to variation in coffee export project performance. Since, the overall man is 4.703 it implies that all these factors affect variations in performance of coffee export. Hence, the findings emphasize the participants' cohesive understanding of these multifaceted factors as key drivers shaping the performance of the coffee project.

Table 9: Correlation between other factors and export project performance

		Market expansion	Profitability	Stakeholders satisfaction
	Pearson Correlation	.822**	.843**	.876**
Other factors	Sig. (2-tailed)	.000	.000	.000
	N	131	131	131

Source: Field Data, 2023

The Table 9 shows the Pearson correlation coefficients between other factors which are market demand, financial support and export incentives, and indicators of export project performance which are market expansion, profitability, and stakeholders' satisfaction. The correlations are highly significant, with two-tailed p-values of .000, indicating a strong relationship between other factors and these performance indicators. Specifically, other factors exhibit a positive and significant correlation with market expansion (r = .884), profitability (r = .883), and stakeholders' satisfaction (r = .892). These findings suggest that increase in factors like market demand, financial support and export incentives yields a strong tendency for market expansion, improved profitability, and higher satisfaction among stakeholders in the coffee export project.

4.5 Regression results

The regression results presented by the use of model summaries, analysis of variances and regression coefficients between strategic value addition indicators as the predictors and indicators of coffee export project performance. They revealed positive and significant effect of strategic value addition indicators on market expansion, profitability, and stakeholders' satisfaction within the Charles Dorman coffee export project in Rwanda.

Table 9: Model summary of strategic value addition and market expansion

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.895ᵃ	.800	.795	.34243

a. Predictors: (Constant), Coffee certification , Training farmers, High quality coffee washing stations

Source: Field Data, 2023

In the model summary presented in Table 10, the coefficient of determination (R-squared) is 0.800, indicating that 80% of the variance in market expansion can be explained by the predictors: Coffee certification, Training farmers, and High quality coffee washing stations. The adjusted R-squared of 0.795 and a low standard error of the estimate (0.34243) suggest a reasonably good fit of the model to the data. Hence, this implies that unit increase of the predictor (strategic value addition indicators) explains 80.0% of variability in market expansion of Charles Dorman coffee export project in Rwanda.

Table 10: Analysis of variance of strategic value addition and market expansion

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	59.643	3	19.881	169.553	.000ᵇ
Residual	14.891	127	.117		
Total	74.534	130			

In Table 11, the analysis of variance (ANOVA) results for the model investigating the relationship between strategic value addition and market expansion are presented. The ANOVA tests the significance of the regression model as a whole. The regression model significantly explains the variance in market expansion (F = 169.553, p < 0.001). This indicates that the predictors collectively contribute to the variability observed in market expansion. The residual sum of squares represents the unexplained variability, and the total sum of squares accounts for the total variability in the dependent variable. Hence, the regression model with predictors (Coffee certification, Training farmers, High quality coffee washing stations) significantly explains the variance in market expansion.

Table 11: Regression coefficients of strategic value addition and market expansion

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.039	.232		.169	.866
Training farmers	.105	.111	.097	.940	.049
High quality coffee washing stations	.408	.168	.345	2.425	.017
Coffee certification	.480	.131	.470	3.671	.000

a. Dependent Variable: Market expansion

Source: Field Data, 2023

In Table 12, the regression coefficients for the model examining the relationship between strategic value addition and market expansion are presented. The results reveal the impact of different factors on the dependent variable, market expansion. The constant term is 0.039, but it's not statistically significant (t = 0.169, p = 0.866), meaning it doesn't significantly influence market expansion. The coefficient for training farmers" is 0.105 (t = 0.097, p = 0.490), which is statistically significant (p > 0.05), indicating that training farmers has a significant effect on market expansion.

Both high quality coffee washing stations and coffee certification coefficients are significant because like high quality coffee washing stations has a coefficient of 0.408 (t = 2.425, p = 0.017), and coffee certification has a coefficient of 0.480 (t = 3.671, p = 0.000). These positive coefficients indicate that improvements in high-quality coffee washing stations and coffee certification are associated with higher levels of market expansion.

The regression equation for market expansion (Y) based on these coefficients would be: Y = 0.039 + 0.105(training farmers) + 0.408(high quality coffee washing stations) + 0.480 (coffee certification). Hence, the results suggest that enhancing high-quality coffee washing stations and obtaining coffee certifications significantly contribute to increased market expansion within the context of the studied export project.

Table 12: Model summary of strategic value addition and profitability

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.918a	.843	.839	.26674

a. Predictors: (Constant), Coffee certification , Training farmers, High quality coffee washing stations

Source: Field Data, 2023

In Table 13 of model summary, the R-squared value of 0.843 indicates that 84.3% of the

variability in profitability is accounted for by the predictors: Coffee certification, Training farmers, and High quality coffee washing stations. The adjusted R-squared of 0.839 and a low standard error (0.26674) suggest a good model fit to the data. Hence, this implies that a unit increase in the predictors (strategic value addition indicators) explains 84.3% of increase in profitability of Charles Dorman coffee export project in Rwanda.

Table 13: Analysis of variance of strategic value addition and profitability

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	48.353	3	16.118	226.534	.000[b]
Residual	9.036	127	.071		
Total	57.389	130			

a. Dependent Variable: Profitability
b. Predictors: (Constant), Coffee certification , Training farmers, High quality coffee washing stations

Source: Field Data, 2023

In Table 14, the analysis of variance (ANOVA) results for the model examining the relationship between strategic value addition and profitability is presented. The ANOVA assesses the overall significance of the regression model. The regression model significantly explains the variance in profitability (F = 226.534, p < 0.001). This indicates that the combined influence of the predictors on profitability is statistically significant. The residual sum of squares captures unexplained variability, while the total sum of squares represents the overall variability in the dependent variable. Hence, the regression model with predictors (Coffee certification, Training farmers, High quality coffee washing stations) significantly accounts for the variability observed in profitability.

Table 14: Regression coefficients of strategic value addition and profitability

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.374	.180		2.073	.040
Training farmers	-.244	.087	-.258	-2.815	.006
High quality coffee washing stations	.923	.131	.891	7.054	.000
Coffee certification	.242	.102	.271	2.380	.019

a. Dependent Variable: Profitability

Source: Feld Data, 2023

In Table 15, the regression coefficients for the model investigating the relationship between strategic value addition and profitability are presented. The unstandardized coefficients (B) illustrate the effect of each predictor variable on the dependent variable (profitability), considering both the magnitude and direction of impact. The regression equation for predicting profitability (Y) based on the predictor variables is as follows: Y = 0.374 - 0.244(Training farmers) + 0.923(High quality coffee washing stations) + 0.242(Coffee certification).

The standardized coefficients (Beta) indicate the relative strength of the predictors' impacts, accounting for differences in their scales. The results suggest that training farmers (Beta = -

0.258), high quality coffee washing stations (Beta = 0.891), and coffee certification (Beta = 0.271) have statistically significant influences on profitability, as indicated by their p-values ($p < 0.05$).

The t-values and significance levels (Sig.) provide information about the statistical significance of each coefficient. The t-values are compared to critical values to determine if the coefficients are significantly different from zero. In this context, the coefficients for training farmers, high quality coffee washing stations, and coffee certification have t-values that exceed critical values, confirming their significant impact. Hence, the regression model suggests that training farmers, implementing high-quality coffee washing stations, and obtaining coffee certification significantly contribute to the profitability of the Charles Dorman export project in Rwanda.

Table 15: Model summary of strategic value addition and stakeholders' satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	.929ᵃ	.862	.859	.24863

a. Predictors: (Constant), Coffee certification , Training farmers, High quality coffee washing stations

Source: Field Data, 2023

Table 16 of model summary indicates that the relationship between strategic value addition and stakeholders' satisfaction is strong. The R-squared value of 0.862 implies that 86.2% of the variability in stakeholders' satisfaction is explained by the predictors: Coffee certification, Training farmers, and High quality coffee washing stations. The adjusted R-squared (0.859) and low standard error (0.24863) suggest a good model fit. Hence, this implies that a unit increase in the predictors (indicators of strategic value addition) affect 86.2% of increase in stakeholder satisfaction of Charles Dorman coffee export project in Rwanda.

Table 16: Analysis of variance of strategic value addition and stakeholders' satisfaction

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	49.126	3	16.375	264.890	.000ᵇ
Residual	7.851	127	.062		
Total	56.977	130			

a. Dependent Variable: Stakeholders satisfaction
b. Predictors: (Constant), Coffee certification , Training farmers, High quality coffee washing stations

Source: Field Data, 2023

In Table 17, the analysis of variance (ANOVA) assesses the significance of the regression model examining the connection between strategic value addition and stakeholders' satisfaction. The regression model significantly explains the variance in stakeholders' satisfaction ($F = 264.890$, $p < 0.001$). This signifies that the predictors such as coffee certification, training farmers, high quality coffee washing stations collectively have a significant effect on stakeholders' satisfaction. The residual sum of squares represents unexplained variability, while the total sum of squares captures overall variability in the dependent variable. Hence, the regression model with the specified predictors is highly significant in explaining the variability observed in stakeholders' satisfaction.

Table 17: Regression coefficients of strategic value addition and stakeholders' satisfaction

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.315	.168		1.870	.064
Training coffee farmers	.284	.081	.302	3.522	.001
High quality coffee washing stations	.544	.122	.527	4.462	.000
Voluntary Coffee certification	.108	.095	.121	1.137	.258

a. Dependent Variable: Stakeholders satisfaction

Source: Field Data, 2023

In Table 18, the regression coefficients for the model examining the relationship between strategic value addition and stakeholders' satisfaction are presented. The unstandardized coefficients (B) demonstrate the impact of each predictor variable on the dependent variable (stakeholders' satisfaction), both in terms of magnitude and direction. The regression equation for predicting stakeholders' satisfaction (Y) based on the predictor variables is as follows: Y = 0.315 + 0.284 (Training coffee farmers) + 0.544 (High quality coffee washing stations) + 0.108 (Voluntary Coffee certification).

The standardized coefficients (Beta) provide insight into the relative strength of the predictors' effects when accounting for differences in their scales. The results indicate that training coffee farmers (Beta = 0.302) and high quality coffee washing stations (Beta = 0.527) have a statistically significant positive influence on stakeholders' satisfaction, as evidenced by their p-values ($p < 0.001$). On the other hand, voluntary coffee certification (Beta = 0.121) does not have a statistically significant impact on stakeholders' satisfaction ($p = 0.258$).

The t-values and associated significance levels (Sig.) provide information about the statistical significance of each coefficient. The t-values are compared to critical values to determine if the coefficients are significantly different from zero. In this case, the coefficients for training coffee farmers and high quality coffee washing stations have t-values that exceed critical values ($p < 0.05$), indicating their significant impact. Hence, this implies that the model suggests that the training of coffee farmers and the implementation of high-quality coffee washing stations play significant roles in influencing stakeholders' satisfaction within the Charles Dorman export project in Rwanda.

4.6 Discussion

The findings of Miiro, Matsiko, and Mazur's (2014) empirical research provide strong support for the current study's first objective, emphasizing the significance of training coffee farmers and its positive impact on the performance of the coffee export project. Additionally, although Voytyuk et al. (2021) did not directly investigate the effect of training, their research indirectly emphasizes the importance of farmer capacity building, aligning with the current study's focus on enhancing farmer capabilities to drive export activities.

In terms of the second objective, the empirical study by Behailu et al. (2018) corroborates the current study's emphasis on the role of high-quality coffee washing stations in enhancing

project performance. Moreover, the research by Hakorimana and Akcaoz (2017) contributes valuable insights into the economic significance of quality improvement initiatives in the coffee sector, further strengthening the current study's findings on the positive influence of higher quality washing stations on the project's profitability and overall performance.

Pyk's (2017) study in Tanzania and the research on coffee export competitiveness in Ethiopia underline the multifaceted nature of factors influencing coffee export performance, with a specific focus on the significance of skilled labor. These findings resonate with the current study's exploration of skilled labor and its contribution to market expansion and profitability. Additionally, the research by Negeri and Ji (2023) in Ethiopia and Mutai's (2019) study in Kenya highlight the importance of various factors, including export knowledge, commitment, product adaptation, supply chain disruptions, financial support, and regulatory changes, all of which align with the comprehensive approach adopted in the current study to understand the various influences impacting the coffee export project's performance.

Therefore, the collective empirical evidence discussed here provides substantial support for the conclusions drawn in the current study, emphasizing the crucial role of training, high-quality washing stations, skilled labour, and other multifaceted factors in enhancing the performance of coffee export projects. The alignment between the current study's findings and the insights from these empirical studies underscores the complexity of the coffee export industry and the multifaceted strategies required to ensure its successful performance.

5.1 Conclusion

In conclusion, training coffee farmers in the Charles Dorman coffee export project significantly enhances project performance, with strong agreement on its positive impact. Participants' engagement in project design training and extension services, coupled with positive perspectives on best agricultural practices and capacity-building, underscores its effectiveness. Correlation analysis demonstrates its positive relationship with market expansion, profitability, and stakeholder satisfaction. Regression analysis confirms the significance of training, high-quality coffee washing stations, and coffee certification in driving market expansion. Hence, well-trained farmers contribute significantly to improved project performance in market expansion, profitability, and stakeholder satisfaction of Charles Dorman Coffee export project in Rwanda.

The second objective established a significant positive impact of higher quality coffee washing stations on the Charles Dorman export project in Rwanda. Participants' active involvement in coffee washing decisions and strong correlations with project indicators underscore their contribution. Strong correlations ($r = 0.880$ to 0.919) signify higher quality washing stations' association with market expansion, profitability, and stakeholder satisfaction. The regression model further confirms their essential role in driving profitability, emphasizing their substantial contribution to project performance.

Lastly, voluntary coffee certification significantly enhances the Charles Dorman export project's performance. Active participation and positive perceptions among participants reinforce its positive impact. Correlation analysis validates its positive and significant relationships to market expansion, profitability, and stakeholder satisfaction. While training coffee farmers and high quality coffee washing stations significantly contribute to stakeholder satisfaction, voluntary coffee certification plays a significant role in promoting project performance.

5.2 Recommendations

Based on the study's findings, several key recommendations are proposed for the government of Rwanda, the management team of Charles Dorman, and the project beneficiaries. Firstly, the government should continue investing in comprehensive training programs for coffee farmers, emphasizing partnerships and resource allocation. Secondly, the management team should prioritize continual improvements in coffee washing processes and streamline certification procedures, fostering collaboration with certification bodies.

Thirdly, active participation from farmers and stakeholders in training, quality enhancement, and certification processes is crucial, promoting knowledge-sharing within the farming community. Lastly, stakeholders should collaborate closely, emphasizing open communication and sustainable practices for long-term project success and growth. Implementing these recommendations through a collaborative approach is essential for ensuring the sustained prosperity of the Charles Dorman coffee export project in Rwanda.

5.3 Acknowledgement

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