The Influence of Project Management Approaches on the Sustainability of Non Governmental Organisations in Some Selected Towns in Cameroon

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Abstract

This study assessed the influence of project management approaches on the sustainability of NGOs in Cameroon, Survey research design was adopted collecting data from a sample of 150 staffs from NGOs selected from the three different towns, sing a structured questionnaire develop with likert scale items ranging from strongly disagree to strongly agree, and analyzed using multiple regression techniques to explore the relationships between project management approaches and sustainability indicators. The results indicated that agile and lean project management approaches significantly enhance NGO sustainability with a p-value of 0.067 and 0.000 by promoting flexibility, adaptability, and efficient resource utilization. Conversely, the waterfall project management approach showed a negative, though not statistically significant, with a p-value of 0.746 highlighting its limitations in dynamic contexts. The critical path project management approach was found to positively influence sustainability through effective planning and timely execution of project activities with a p-value of 0.001. These findings align with previous research, underscoring the importance of adopting adaptive and efficient project management strategies. The study concludes that NGOs should consider integrating agile, lean, and critical path methodologies to maximize their sustainability. It also recommends that external stakeholders, including government agencies and donors, support NGOs through funding, training, and regulatory reforms to create a conducive operational environment. Future research should explore the specific mechanisms through which these methodologies impact NGO sustainability and investigate the role of external support in enhancing project management practices.

Keywords

Project Management Approaches, Sustainability, Agile, Lean, Critical Path Waterfall

1. Introduction

Non-Governmental Organizations (NGOs) have emerged as vital agents of development in many developing countries, including Cameroon. They address a myriad of issues ranging from poverty alleviation to environmental conservation [1]. The growth of the NGO sector in Cameroon over the past two decades reflects a broader recognition of civil society's role in promoting sustainable development and community empowerment [2]. However, despite their significant contributions, many NGOs face challenges related to sustainability, primarily due to inadequate funding, political instability, and the evolving nature of community needs [3].

Project management is a critical determinant of the success and longevity of NGO initiatives. The choice of project management approaches can significantly influence resource allocation, stakeholder engagement, and the achievement of organizational objectives [4]. Traditional project management methods, such as the Waterfall Model, may not adequately address the unpredictable environments in which NGOs operate, particularly given the rapidly changing socio-political landscape in Cameroon [5]. Conversely, adaptive methodologies like Agile and Results-Based Management (RBM) offer greater flexibility and a focus on outcomes, making them more relevant for NGOs striving for long-term impact [6].

This study aims to explore the influence of different project management approaches on the sustainability of NGOs in selected towns in Cameroon. By investigating how agile project management approach can affect the sustainability of NGO's in some selected towns in Cameroon, To examine the influence of lean project management approach on the sustainability of NGO's in some selected towns in Cameroon, to analyze the extent to which the waterfall project management approach influence the sustainability of NGO's in some selected towns in Cameroon and to Investigate how the critical path project management approach of project management influence the sustainability of NGO's in some selected towns in Cameroon. these methodologies affect resource management, stakeholder participation, and overall project effectiveness, the research seeks to provide insights that can help improve the sustainability of NGO interventions.

However this work was guided by the following hypotheses;

H_0: Adopting agile project management approach has no statistical significant influence on the sustainability of NGO's in some selected towns in Cameroon.

H_0: Lean project management approach has no statistical significant influence on the sustainability of NGO's in some selected towns in Cameroon.

H_0: Waterfall project management approach has no statistical significant influence on the sustainability of NGO's in some selected towns in Cameroon.

H_0: Critical path project management approach has no significant influence on the sustainability of NGO's in some selected towns in Cameroon.

2. Literature Review

2.1 Conceptual Literature

2.1.1 Project Management Approaches

Project management approaches have evolved over time , incorporating various methodologies to suit different project needs [7]. According to [8], there exist Hybrid Project Management(HPM) approaches; its combines traditional and agile methodology to leverage their strenghts while mitigating weaknesses. HPM approaches include Water-Scrum-Fall, Waterfall Agile, and Hybrid V-Model.

2.1.2 Agile Project Management Approache

Agile project management is a methodology that emphasizes flexibility, collaboration, and iterative progress towards achieving project goals. Originally conceptualized in the software development industry through the Agile Manifesto in 2001, Agile has since been adopted across various sectors for its ability to enhance project responsiveness and adaptability [9]. At its core, Agile promotes values such as customer collaboration over contract negotiation, responding to change over following a plan, and prioritizing working solutions over comprehensive documentation. These principles are particularly valuable in environments characterized by uncertainty and rapid change, where traditional project management methods may falter due to their rigidity and sequential nature [10].

2.1.3 Lean Project Management Approach

Lean Project Management is a methodology that originated from the manufacturing industry, specifically the Toyota Production System (TPS), which aimed to eliminate waste and improve efficiency [10]. Lean principles focus on creating more value for customers with fewer resources by optimizing processes, reducing waste, and promoting continuous improvement [11]. The core philosophy of Lean is encapsulated in five principles: defining value from the customer’s perspective, mapping the value stream, creating flow, establishing pull, and pursuing perfection. These principles guide organizations in delivering high-quality products and services efficiently and effectively, aligning closely with the goals of project management in various sectors.

As Lean continues to evolve and adapt to new contexts, future developments are likely to focus on integrating Lean principles with other methodologies, such as Agile and Six Sigma, to create more comprehensive and adaptable project management frameworks [12]. This integration could offer new opportunities to enhance project efficiency, quality, and responsiveness, driving further innovation and improvement in project management practices [13].

2.1.4 Waterfall Project Management Approach

Waterfall project management is one of the earliest and most traditional methodologies used in project management. It was first formally described by Dr. Winston W. Royce in 1970 in his paper "Managing the Development of Large Software Systems" [14]. The Waterfall model is a sequential design process, often used in software development processes, where progress is seen as flowing steadily downwards (like a waterfall) through several phases. These phases typically include requirements analysis, system design, implementation, testing, deployment, and maintenance [15]. Each phase must be completed before the next phase begins, and there is no overlap between the phases. This model is built on the assumption that projects proceed through these stages linearly, making it suitable for projects with well-defined requirements and processes [16].

However, the Waterfall model’s rigidity poses significant challenges, particularly in environments where requirements are prone to change. This can lead to a lack of early feedback and engagement, potentially causing alignment issues and missed opportunities for early problem identification [17].

To address these limitations, modern project management practices have adapted the Waterfall approach to include more flexibility and iterative elements. Hybrid models like "Water-Scrum-Fall" integrate Agile’s iterative delivery within the structured framework of Waterfall, allowing for ongoing adjustments and incremental value delivery [18]. These adaptations enable organizations to benefit from the clear structure and predictability of Waterfall while maintaining the agility to adapt to evolving project requirements and stakeholder needs [19].

2.1.5 Critical Path Project Management Approach

The Critical Path Method (CPM) is a project management technique that was developed in the late 1950s by DuPont and Remington Rand to manage complex, large-scale projects with many interdependent tasks [20]. CPM involves identifying the sequence of crucial steps or activities-known as the critical path-that determine the minimum project

duration [21]. These activities are critical because any delay in them directly affects the project's completion time. By focusing on the critical path, project managers can effectively plan, schedule, and control project activities, ensuring timely delivery [19].

The Critical Path Method offers several advantages that make it a valuable tool for project managers. One of the primary benefits is its ability to provide a clear and structured overview of the project timeline and critical tasks [22]. By identifying the critical path, project managers can prioritize their efforts on the tasks that are most likely to impact the project's timely completion, ensuring that these tasks receive the necessary resources and attention [19].

The use of these tools reduces the manual effort required and increases the accuracy and efficiency of CPM analysis. Moreover, the integration of CPM with other project management methodologies and frameworks has expanded its applicability and effectiveness.

2.1.6 Sustainability of NGOs

Sustainability of NGOs involves examining their ability to maintain their activities and impact over the long term, which is crucial for their effectiveness in addressing societal needs and achieving their missions. Sustainability in this context encompasses financial stability, organizational resilience, and ongoing relevance to their target communities or causes [4]. NGOs often face challenges such as funding fluctuations, donor dependence, and evolving social and political landscapes, which can affect their sustainability efforts [2]. Ensuring sustainability requires strategic planning, effective resource management, and adaptation to changing environments [11].

2.1.7 Conceptual Framework

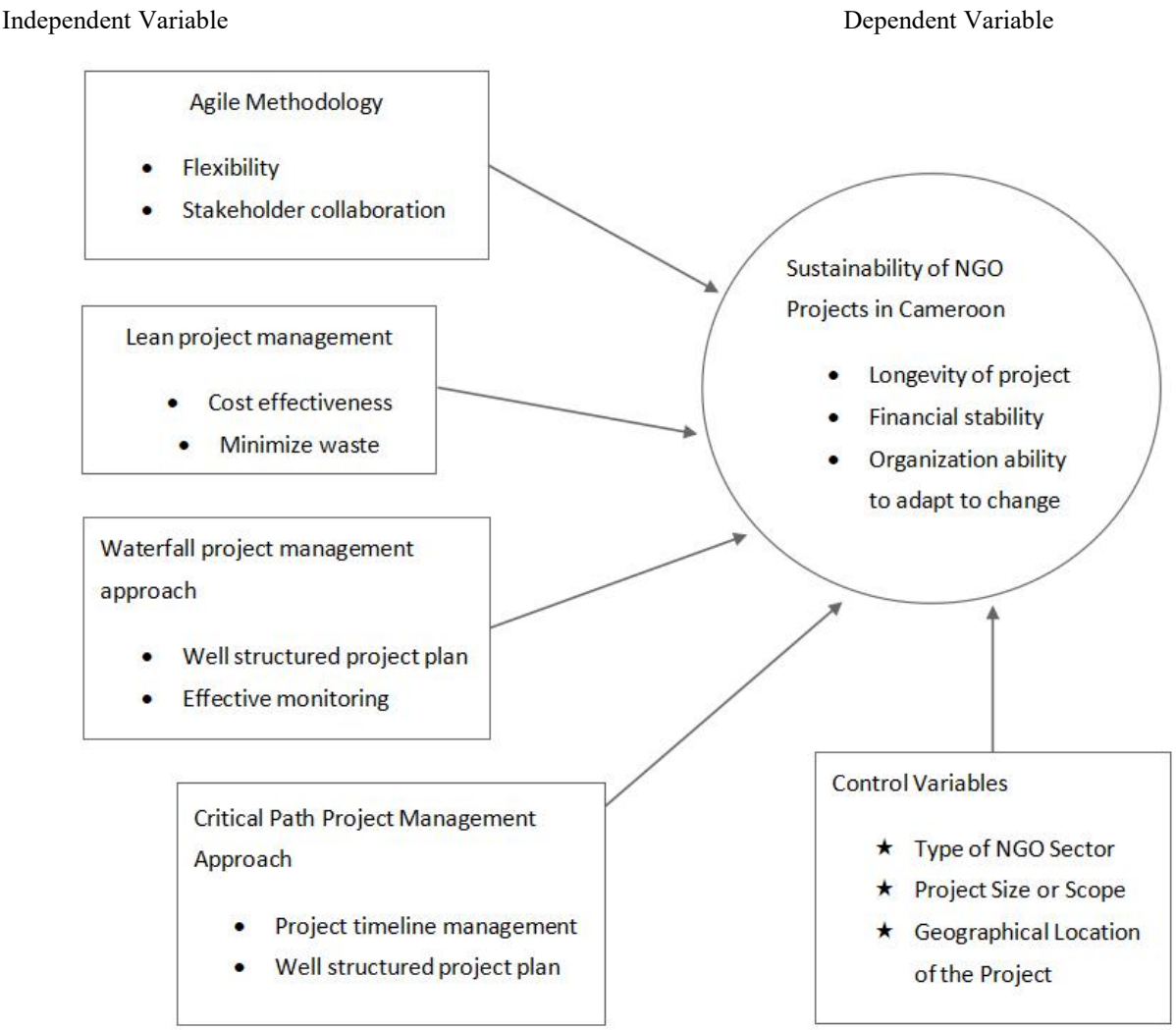

Figure 1. Conceptual Framework

2.2 Theoretical Literature

2.2.1 Systems Theory of Organization Management

The Systems Theory has roots in various disciplines, and its development is attributed to several notable figures. One of the early proponents is biologist Ludwig von Bertalanffy, who introduced the idea of a general systems theory in the

1940s. Other influential contributors include Ross Ashby, Kenneth Boulding, and Anatol Rapoport. The theory gained prominence in diverse fields such as biology, psychology, sociology, and management sciences.

Systems Theory is a holistic and interdisciplinary conceptual framework that views a system as an interconnected and interdependent set of elements working together to achieve a common goal. It emphasizes the interactions and relationships between these elements rather than focusing solely on individual components. The theory suggests that understanding the whole system is crucial to comprehending the behavior and dynamics of its parts. Systems can be open or closed, and they can exhibit self-regulation, adaptability, and feedback mechanisms. The Systems Theory assumes that systems strive for equilibrium or balance, and deviations from this balance trigger adjustments to restore stability. The framework of Systems Theory consists of key components: elements, boundaries, inputs, outputs, processes, and feedback. This framework facilitates the analysis of complex systems and their behavior, making Systems

2.2.2 Institutional Theory

Institutional Theory has evolved with contributions from various scholars across disciplines. Notable proponents include John Meyer, Paul DiMaggio, W. Richard Scott, and Douglass North. [19] and [23] are among those who have significantly shaped the theory's development. The work of these scholars has been instrumental in establishing Institutional Theory as a key perspective for understanding how institutions influence and shape the behavior of organizations and individuals. Institutional Theory posits that organizations conform to established norms, values, and practices within their institutional environment to gain legitimacy and ensure survival. It explores how institutions, defined as shared sets of cultural, normative, and regulative elements, influence organizational structures, behaviors, and strategies. The theory emphasizes that organizations often mimic prevailing institutional practices, even if those practices do not necessarily lead to optimal efficiency. Institutionalization occurs as organizations adopt structures and behaviors that align with the expectations of their institutional environment, contributing to a sense of legitimacy and acceptance.

One fundamental assumption of Institutional Theory is that organizations seek legitimacy and survival within their institutional environment. This assumption underscores the impact of the institutional environment in shaping organizational form and behavior. The framework of Institutional Theory revolves around three pillars of isomorphism: coercive, normative, and mimetic. This tripartite framework provides a comprehensive understanding of how external forces shape and mold organizations within their institutional environments.

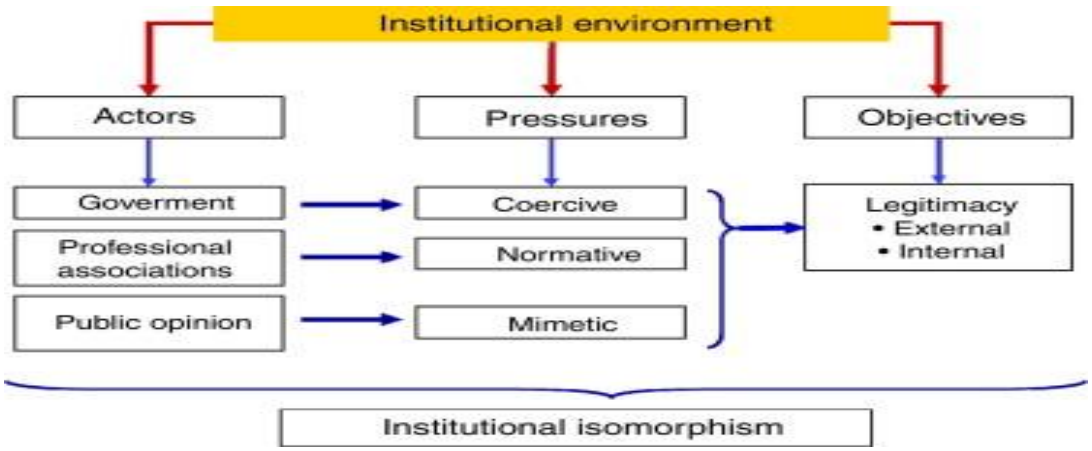

Figure 2. Institutional theory model

Source: DiMaggio and Powell 1992

In the case of NGOs, this implies that their project management approaches may be influenced not only by practical considerations but also by the need to align with expectations from donors, governments, and the broader societal context in Cameroon.

2.3 Emperical Literature

According to [8], in their study aimed at investigating the influence of project management approaches on the sustainability of Non-Governmental Organizations (NGOs) in the United States. Employing a mixed-methods approach, the researchers utilized surveys and in-depth interviews to collect both quantitative and qualitative data. The results highlighted a positive correlation between collaborative project planning and stakeholder communication with higher levels of sustainability. However, challenges such as resource allocation and financial constraints were identified as potential barriers. The study recommended that U.S. NGOs prioritize collaborative planning, enhance stakeholder communication, and address financial constraints to improve long-term sustainability.

According to [24], also conducted a study aimed at exploring the relationship between project management approaches and sustainability within South Korean Non-Governmental Organizations (NGOs). Employing a quantitative approach,

the researchers distributed structured surveys to a representative sample of South Korean NGOs. Statistical analyses, including regression and correlation, were applied to examine the relationships among variables. The study revealed a significant positive correlation between effective project management practices and sustainability, with financial stability emerging as a crucial factor. NGOs with robust financial planning and diversified funding sources demonstrated higher levels of sustainability. Recommendations from the study included focusing on strengthening financial planning, diversifying funding streams, and integrating effective project management practices into organizational strategies to enhance long-term sustainability in South Korean NGOs.

In a parallel study conducted in Malaysia by [25], the authors aimed to investigate the relationship between project management approaches and sustainable outcomes in Non-Governmental Organizations (NGOs) across Malaysia. The study's objectives were to analyze the effectiveness of agile methodology, lean project management, and the critical path methodology in influencing the sustainability of NGOs in the Malaysian context. Employing a quantitative research design, the researchers administered surveys to a diverse sample of Malaysian NGOs and conducted statistical analyses to examine the correlations between project management strategies and sustainable outcomes. The findings indicated that agile methodology positively contributed to the adaptive capacity of NGOs, supporting long-term sustainability. Lean project management practices were associated with improved resource efficiency and sustainable project outcomes. However, the critical path methodology showed nuanced effects, suggesting that its application should be context-specific. The study recommended that Malaysian NGOs consider agile and lean methodologies in their project management practices while carefully assessing the suitability of the critical path methodology based on project characteristics. This research in Malaysia complements the understanding of project management strategies and their implications for NGO sustainability within the regional context.

2.4 Literature Gap

Despite the extensive research on project management approaches and their impact on the sustainability of NGOs, significant conceptual gaps remain. Previous studies have largely focused on the application of conventional project management methodologies, such as Waterfall, Agile, and Lean, within the context of corporate or for-profit sectors [26; 27]. This gap highlights the need for research that explores how project management approaches can be uniquely adapted to support the long-term sustainability and impact of NGOs in such environments.

3. Methodology

3.1 Research Design

This study adopts a survey research design to systematically investigate the sustainability of NGO projects in Bamenda, Buea, and Douala, Cameroon. The population of this study comprises Non-Governmental Organizations (NGOs) operating within the Towns of Bamenda, Douala, and Buea in Cameroon constituting about 88 NGOs with 69 national and the rest being international NGOs. The selection encompasses a diverse range of NGOs engaged in social, economic, and environmental projects.

The sample size for this study comprises 150 employees engaged in the activities of this NGOs operating in the three selected towns in Cameroon. It allows for a diverse representation of NGOs across sectors and geographic locations, ensuring that the findings reflect the heterogeneity of project management practices and sustainability challenges within the NGO community in Cameroon.

Table 1. Distribution of sample size

SN	Name of NGO	Location	Population
1	SHUMAS	Bamenda	34
2	RADA Network	Bamenda	17
3	World Food program	Buea	23
5	Plan International	Buea	27
6	NRC(Norwegian Refugee Council)	Douala	29
7	Danish Refugee Council	Douala	21
	Total		150

Purposive sampling was employed to select participants for the study. The study incorporates both primary and secondary data sources. Primary data is obtained directly from participants through interviews, focus group discussions, and surveys conducted with representatives from Non-Governmental Organizations (NGOs) operating in Cameroon. The instruments for data collection in this study include a structured questionnaire.

3.2 Model Specification

The study used a linear regression model to examined the relationship between independent variables and the dependent variable within the context of NGOs operating in the town's of Bamenda, Buea and Douala also Testing for some control variables such as size of the NGO and Sector of operation. The model was developed as followed

$Y = \beta 0X0 + \beta 1APMA + \beta 2LPMA + \beta 3WPMA +, \beta 4CPMA + \beta T5OS + \beta 6AO + Ü$

Where

Y: sustainability of NGOs

β0, β1, β2, β3, β4, β5 Variables to be estimated

APMA: Agile Project Management Approach

LPMA: Lean Project Management Approach

WPMA: Waterfall project management approach

CPPMA: Critical Path Project Management Approach

OS: Organization Size

AO: Area of Operation

Ü = Error Term

The data analysisusing multiple regression techniques.

4. Results

4.1 Pre-Test

Table 2. Correlation Matrix

	Sustainability	agile project management approach	Lean project management approach	Waterfall project management approach	Critical path project management approach
Sustainability	1.00				
agile project management approach	.265	1.00			
Lean project management approach	.438	.234	1.00	.	
Waterfall project management approach	-.058	-.084	.045	1.00	
Critical path project management approach	.317	.256	.171	-.204	1.00

Table 2 presents a correlation matrix showing the relationships between sustainability and different project management approaches (Agile, Lean, Waterfall, and Critical Path) as perceived within NGOs in selected towns in Cameroon. Each cell in the matrix represents the correlation coefficient between pairs of variables, ranging from -1.00 to +1.00, where values closer to +1.00 indicate a strong positive correlation, values closer to -1.00 indicate a strong negative correlation, and values close to 0 indicate little to no correlation. Examining the correlation between Sustainability and the Agile project management approach reveals a positive correlation coefficient of 0.265. This indicates a modest positive relationship between adopting Agile methodologies and perceived sustainability of NGO projects. While not exceptionally strong, this correlation suggests that NGOs that implement Agile practices may tend to more sustainable.

Secondly, the correlation coefficient between Sustainability and Lean project management approach is 0.438, indicating a moderately positive relationship. This suggests that NGOs implementing Lean project management practices perceive higher levels of sustainability in their projects compared to those not employing Lean principles. This correlation underscores the potential effectiveness of Lean methodologies in enhancing sustainability outcomes within NGOs.

Thirdly, the correlation between Sustainability and Waterfall project management approach is -0.058, indicating a weak negative relationship. This suggests that there is little correlation between adopting Waterfall methodologies and perceived sustainability of NGO. A negative correlation in this context implies that NGOs relying more on Waterfall practices may not necessarily perceive their projects as more sustainable.

Fourthly, the correlation coefficient between Sustainability and Critical Path project management approach is 0.317, indicating a moderately positive relationship. This suggests that NGOs using Critical Path methodologies tend to perceive higher levels of sustainability in their projects. The positive correlation implies that effective project planning and management, characteristic of Critical Path, may contribute positively to sustainability outcomes within NGOs.

Table 3. Model Summary

Model Summary[b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.570[a]	.325	.307	.47915	1.892
a. Predictors: (Constant), Agile project management approach, Lean project management approach, waterfall project management approach and Critical path project management approach					
b. Dependent Variable: Sustainability					

Table 3 presents the model summary for a regression analysis assessing the relationship between different project management approaches (Agile, Lean, Waterfall, and Critical Path) and the dependent variable, Sustainability, within NGOs in selected towns in Cameroon. The R (multiple correlation coefficient) of 0.570 indicates a moderate positive relationship between the combined predictors (Agile project management approach, Lean project management approach, Waterfall project management approach, and Critical Path project management approach) and the Sustainability of NGO projects. This suggests that these project management approaches together explain approximately 32.5% of the variance in Sustainability outcomes among the NGOs studied.

Secondly, the R Square (coefficient of determination) value of 0.325 indicates that the predictors included in the model account for 32.5% of the variation in Sustainability. This means that while the selected project management approaches have a statistically significant relationship with Sustainability, other factors not included in the model may also influence sustainability outcomes in NGO projects.

Thirdly, the Adjusted R Square of 0.307 adjusts the R Square value to account for the number of predictors in the model and provides a more conservative estimate of the proportion of variance explained. This adjusted value suggests that approximately 30.7% of the variance in Sustainability can be attributed to the project management approaches considered, after adjusting for the number of predictors.

Fourthly, the Standard Error of the Estimate (0.47915) indicates the average amount that actual Sustainability scores may deviate from the predicted scores by the regression model. A lower value indicates a better fit of the model to the data, suggesting that while the predictors explain a significant portion of the variance, there is still some variability in Sustainability that is not accounted for by the model.

Lastly, the Durbin-Watson statistic of 1.892 assesses the presence of autocorrelation in the residuals of the regression model. A value close to 2 suggests no significant autocorrelation, which is favorable for the reliability of the regression results.

Table 4. ANOVA Results

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.838	4	3.959	17.246	.000[b]
	Residual	32.831	143	.230		
	Total	48.669	147			
a. Dependent Variable: Sustainability						
b. Predictors: (Constant), agile project management approach, Lean project management, Waterfall Project Management Approach, Critical path project management approach						

Table 4 presents the results of the Analysis of Variance (ANOVA) for the regression model assessing the relationship between various project management approaches (Agile, Lean, Waterfall, and Critical Path) and Sustainability as the

dependent variable within NGOs in selected towns in Cameroon. ANOVA is used to analyze the significance of the regression model and its individual predictors. The ANOVA table is divided into three main sections: Regression, Residual, and Total. The Regression section provides information on how well the predictors (project management approaches) collectively explain the variance in the dependent variable (Sustainability). The Sum of Squares (SS) for Regression is 15.838, indicating the total variance explained by the predictors. The degrees of freedom (df) are 4, corresponding to the number of predictors in the model. Mean Square (MS) is calculated by dividing SS by df, giving a value of 3.959. The F-statistic (F) tests the overall significance of the regression model and has a value of 17.246. This F-value is compared against the critical value to determine if the model is statistically significant. The significance level (Sig.) associated with the F-statistic is 0.000, which is less than the conventional alpha level of 0.05, indicating that the regression model as a whole is statistically significant.

The Residual section of the ANOVA table provides information on the variability in the dependent variable that is not explained by the predictors included in the model. The Sum of Squares for Residual is 32.831, representing the unexplained variance or error within the model. The degrees of freedom for Residual are 143, calculated as the total number of observations minus the number of predictors in the model. The Mean Square for Residual is 0.230, calculated as SS Residual divided by df Residual. Lastly, the Total row in the ANOVA table sums up the variability in the dependent variable. The Total Sum of Squares is 48.669, which is the sum of SS Regression and SS Residual, representing the total variance in Sustainability across all observations.

Table 5. Presentation of Regression Results

Coefficients[a]										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	1.023	.532		1.923	.057	-.029	2.075		
	agile project management approach	.127	.069	.133	1.845	.067	-.009	.263	.909	1.100
	Lean project management approach	.398	.075	.381	5.276	.000	.249	.547	.905	1.105
	Waterfall Project Management Approach	-.023	.070	-.023	-.325	.746	-.160	.115	.945	1.058
	Critical path project management approach	.236	.068	.259	3.491	.001	.102	.370	.857	1.167
a. Dependent Variable: Sustainability										

Table 5 presents the regression coefficients for the model assessing the influence of different project management approaches (Agile, Lean, Waterfall, and Critical Path) on Sustainability as the dependent variable within NGOs in selected towns in Cameroon. The "Constant" term in the regression model indicates the estimated value of Sustainability when all predictors (Agile, Lean, Waterfall, and Critical Path project management approaches) are zero. In this case, the constant (B) is 1.023 with a standard error of 0.532. The t-value of 1.923 and the associated p-value of 0.057 suggest that the constant term is not statistically significant at the conventional alpha level of 0.05. This means the intercept alone does not significantly predict Sustainability, but rather, the predictors in combination do.

Secondly, examining the predictors, the coefficient (B) for Agile project management approach is 0.127 with a standard error of 0.069. The standardized coefficient (Beta) of 0.133 indicates the strength and direction of the relationship after accounting for the different scales of measurement. The t-value of 1.845 and the p-value of 0.067 suggest that Agile project management approach is marginally significant in predicting Sustainability. However, caution should be exercised due to its p-value being slightly above the conventional threshold of 0.05.

Thirdly, the coefficient for Lean project management approach is 0.398 with a standard error of 0.075, and a Beta value of 0.381. The t-value of 5.276 and the p-value of 0.000 indicate that Lean project management approach has a statistically significant positive relationship with Sustainability. This suggests that NGOs implementing Lean methodologies tend to have higher levels of perceived sustainability in their projects.

Fourthly, the coefficient for Waterfall Project Management Approach is -0.023 with a standard error of 0.070, and a Beta value of -0.023. The t-value of -0.325 and the high p-value of 0.746 indicate that Waterfall project management approach does not significantly predict Sustainability. The confidence interval for B (-0.160 to 0.115) includes zero, further indicating the lack of statistical significance.

Lastly, the coefficient for Critical Path project management approach is 0.236 with a standard error of 0.068, and a Beta value of 0.259. The t-value of 3.491 and the p-value of 0.001 indicate a statistically significant positive relationship between Critical Path methodology and Sustainability. NGOs that emphasize Critical Path project management tend to perceive their projects as more sustainable, as reflected by the significant coefficients and low probability of these results occurring by chance.

4.2 Test of Hypotheses

H_0: Agile Project Management Approach has no significant influence on the sustainability of NGO's in some selected towns in Cameroon.

The regression coefficient of Adopting agile methodology is 0.127, which show that Adopting agile methodology has a direct impact on sustainability of NGO's in the selected towns in Cameroon. This means 1unit increase in Adopting agile methodology will let to 0.127 increase in sustainability of NGOs which is in line with the study of Lee and Kim, (2020. The result is statistically significant at 10% level (p-value=0.067<0.1). We reject the null hypothesis which stated that agile project management approach has no significant influence on the sustainability of NGOs in some selected towns in Cameroon.

H_0: Implementing lean project management approach has no significant influence on the sustainability of NGO's in Some Selected Towns in Cameroon.

The regression coefficient of lean project management is 0.398, which show that Adopting agile methodology has a direct impact on sustainability of NGO projects in Cameroon This means 1unit increase in lean project management approach will let to 0.398 increase in sustainability of NGOs in the selected towns in Cameroon. The result is statistically significant at 10% level (p-value=0.067<0.1) which align with the study of [24] We reject the null hypothesis which stated that Implementing lean project management approach has no significant influence on the sustainability of NGO's in some selected towns in Cameroon.

H_0: The use of the waterfall Project Management Approach has no significant influence on the sustainability of NGO projects in Cameroon.

The regression coefficient of waterfall model is -0.023, which show that waterfall model has a direct impact on sustainability of NGO's in some selected towns in Cameroon This means 1unit increase in lean project management will let to -0.023 a decrease in sustainability of NGOs in the selected towns in Cameroon. The result is statistically insignificant at 10% level (p-value=0.746>0.1). We accepted the null hypothesis which stated that Implementing waterfall project management approach has no significant influence on the sustainability of NGO projects in Cameroon which is contrary to the work of [25]

H_0: Critical Path Project Management Approach has no significantly influence the sustainability of NGO's in Some Selected Towns Cameroon.

The regression coefficient of Critical path methodology is 0.236, which show that Critical path project management approach has a direct impact on sustainability of NGO's in the selected towns Cameroon This means 1unit increase in Critical path methodology will let to 0.236 increase in sustainability of NGOs in Cameroon. The result is statistically significant at 5% level (p-value=0.001<0.05). We reject the null hypothesis which stated that Critical path project management approach has no significant influence the sustainability of NGOs in the selected towns in Cameroon.

5. Discussion of Findings

The study set out to investigate the influence of different project management approaches on the sustainability of NGOs in selected towns across Cameroon. Each approach-Agile, Lean, Waterfall, and Critical Path-was analyzed to discern its impact on NGO sustainability, drawing conclusions based on empirical data and existing literature.

The findings from this study provide a nuanced understanding of the influence of various project management approaches on the sustainability of NGO projects in Cameroon. The adoption of the agile methodology was found to significantly enhance the sustainability of NGO projects. This methodology's flexibility and adaptability allow NGOs to effectively respond to changing environments and unforeseen challenges, thereby promoting long-term project viability. The positive impact of agile methodology on NGO sustainability aligns with the study by [24], which demonstrated similar benefits in the Singaporean context. Their research underscored how agile methodologies enable NGOs to be more responsive and resilient, thus improving their sustainability. The significant correlation observed in this study reinforces the importance of adopting flexible project management strategies to navigate the complex and often volatile operational landscapes faced by NGOs in Cameroon.

Similarly, the study found that lean project management has a notable positive impact on the sustainability of NGO projects in Cameroon. Lean project management focuses on maximizing value by eliminating waste and improving efficiency, which directly contributes to more sustainable project outcomes. This finding is consistent with [28] research in Kenya, where lean project management practices were associated with enhanced resource utilization and efficiency. The Kenyan study highlighted that NGOs adopting lean methodologies were better positioned to achieve their objectives sustainably, due to more effective use of resources and streamlined processes. In Cameroon, the application

of lean project management similarly supports NGOs in managing their resources more judiciously and achieving better project sustainability.

However, the findings regarding the waterfall model were less conclusive. The regression analysis indicated a negative coefficient (-0.023), suggesting that an increase in the application of the waterfall model might decrease the sustainability of NGO projects, although this result was not statistically significant at the 10% level (p-value=0.746). This implies that while the waterfall model has traditionally been valued for its structured and sequential approach to project management, it may not be as effective in the dynamic and often unpredictable contexts that NGOs in Cameroon operate within. On the other hand, the critical path methodology showed a significant positive impact on the long-term sustainability of NGO projects, with a regression coefficient of 0.236. This methodology helps in detailed project planning and timely execution of project activities, which is crucial for the long-term success of NGO initiatives.[29] study in Nigeria supports this finding, highlighting the importance of robust project planning mechanisms while also acknowledging the challenges of adaptability in dynamic environments. They recommended integrating agile and lean practices to enhance the critical path methodology's effectiveness, a recommendation that is equally relevant for NGOs in Cameroon to ensure sustainable project outcomes.

6. Conclusion

In conclusion, the study reveals that Agile, Lean, and Critical Path project management approaches significantly contribute to the sustainability of NGOs in selected towns in Cameroon. Agile and Lean methodologies, in particular, enhance flexibility, efficiency, and continuous improvement, while the Critical Path approach ensures effective scheduling and resource management. Conversely, the Waterfall approach's lack of flexibility and adaptability may limit its effectiveness in dynamic project environments. These insights provide valuable guidance for NGOs in choosing appropriate project management strategies to enhance their sustainability and achieve long-term project success.

7. Recommendation

Based on Agile project management which significantly enhances the sustainability of NGOs in selected towns in Cameroon, several strategic recommendations can be made to further leverage Agile methodologies. Firstly, NGOs should prioritize the adoption of Agile practices to boost their adaptability and responsiveness to changing project requirements and stakeholder needs. Given that the study showed a positive correlation between Agile implementation and sustainability, NGOs can benefit from Agile's iterative approach, which allows for regular reassessment and adjustment of project goals. This flexibility is crucial in environments where project conditions and community needs can change rapidly. NGOs should focus on training their teams in Agile principles and practices, fostering an organizational culture that embraces change and continuous improvement. Workshops, certification programs, and Agile coaching can be effective ways to build and sustain this competency within the organization.

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