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Assessment of development intervention sustainability in rural Ghana: The case of Oasis Foundation Child Labor Monitoring Project beneficiaries

Selorm Akaba [1*], Zenas Afram [2], Festus Annor-Frempong [1], Fodei L. Mammy [3]

[1] *Department of Agricultural Economics and Extension, School of Agriculture, University of Cape Coast, Cape Coast, Ghana*
[2] *Department of Health Information Systems, 37 Military Hospital, Neghelli Barracks, Accra, Ghana*
[3] *Rutgers School of Social Work, Rutgers, The State University of New Jersey, New Brunswick, NJ 08901, USA*

Abstract

Project sustainability on eliminating child labor in Ghana has received less attention. Issues confronting sustainability have rendered most projects not meeting needs of present and future generations. The study assessed the sustainability of development intervention by Oasis Foundation Child Labor Monitoring (CLM) Project in rural Ghana. The sustainability of social transformation intervention was assessed using an aggregation method to estimate indices for economic, institutional, social, and technical indicators. This was done through a cross-sectional survey where 130 households were randomly interview with structured interview schedule on face-to-face bases. Both descriptive and inferential statistics were conducted. Results revealed low level of sustainability of the project. Friedman's test and post hoc analysis using Wilcoxon signed test showed statistically significant differences in social, economic, technical, and institutional sustainability. Bonferroni correction result revealed social sustainability to be significantly higher sustainable than all other dimensions (economic; institutional; and technical. Institutional sustainability was also significantly higher than economic and technical sustainability indices. However, there was no significance between economic and technical sustainability. The indicators show large effect size on the sustainability of the project. Among other things, increased collaborations of development organizations together with government parastatals and beneficiary communities should provide appropriate impetus and resources to increase economic, technical and institutional sustainability.

Keywords: Child Labor; Civil Society; Impact Assessment; Social Transformation; Sustainability Index

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[*] Corresponding author. *E-mail address:* sakaba@ucc.edu.gh

1. Introduction

The present issues of child labor in cocoa growing communities can be worst in the future if the necessary actions are not taken now. The International Labour Organization (ILO) estimated that over 215 million children worldwide are laborers and engaged in activities that should be abolished. Among them, children under the age of 15 were about 152 million, and those engaged in hazardous or dangerous activities were about 115 million (ILO, 2010). Children below the age to work were mostly found in sectors such as mining and agriculture. In a child labor survey, about 80% of all children in employment were classified as laborers (Ghana Statistical Service, 2014). This is because they fall under the minimum working age of 18 years and were engaged in works that threaten health, safety, or were subject to conditions of forced labor.

The welfare of children in cocoa growing areas, who were engaged in child labor, continues to be a concern to Government of Ghana (GoG) and development agencies such as; the Ministry of Employment and Labour Relation, the Ministry of Education, the Ministry of Gender, Children and social protection and non-governmental organizations and donor agencies.

A large number of children were exposed to hazardous working conditions such as chemical spraying of cocoa trees without using protective clothing, carrying heavy loads of cocoa seeds, and use of machete (Mull and Kirkhon, 2005). Child labor and exposure to hazards were said to adversely affect school enrolment, participation, educational performance, and completion rate. The labor menace prompted the ILO to campaign against child labor through the implementation of various projects or programs. The CLM interventions began in the 1990's by the International Programme on the Elimination of Child Labour (IPEC) by the ILO to regularly check the places where girls and boys may be working. The overall objective of the CLM was to ensure that, children and the young legally employed workers were protected from exploitation and hazards at work (ILO/IPEC, 2019).

Project sustainability on eliminating child labor in cocoa growing areas in Ghana has received less attention. According to Hanachor (2012), projects form part of the basis of assessing a country's development among other countries. The assessment is based on an improved well-being of citizens through projects. This assessment also does not leave out the welfare of children. GoG has been partnering with donor agencies and many non-governmental organizations in implementing projects toward poverty reduction and abolishing of child labor. However, confronting issues of sustainability have drawn most of the projects into not meeting project goals and needs of future generations (Egwemi, 2012). For example, the central tracking database of ex-working children project in Ghana was faced with sustainability issues of operations and maintenance (Hanachor, 2012).

There were several dimensions to the sustainability of projects. These include economic, social, environmental, cultural, political, ethical, security and institutional sustainability (Dalay-Clayton and Bass, 2002), technical and infrastructural sustainability (Ika et al., 2012). IPEC viewed the CLM systems (CLMS) as the system which is economically enhancing, technically necessary, institutionally anchored and socially acceptable and guarantees social justice in the rights (ILO/IPEC, 2007). The study therefore assessed sustainability of the project based on social, economic, technical, and institutional dimensions. Specifically, the study evaluates the sustainability of Oasis Foundation CLM Project among the beneficiaries, and analyze the levels of contributions of the dimensions toward the overall sustainability of the project.

2. Review of selected past studies

According to Steurer and Martinuzzi (2007), sustainable development scholars have developed several complementary and alternative indices in measuring sustainability of projects; with indices such as the Index of Sustainable Economic Welfare or the Ecological Footprint. Due to methodological problems, none of these combined indicators came out on top of the sustainable development discourse. Instead, countries and project managers began to develop and adopt sets of Sustainable Development Indicators (SDIs) that show selected social, economic, environmental, cultural, technical, political, and institutional aspects of project sustainability (Bell and Morse, 2008). SDIs are standards set to measure project progress toward sustainable development (Dalal-Clayton and Krikhaar, 2007).

In their study to determine the achievement levels of integration sustainability of coffee plantations and goat husbandry in Indonesia, Fofa et al. (2015) measure sustainability using aggregation method. The use of this method involves summation of positive or affirmative scores of the attributes of each respondent and divided by the total number of attributes across each sustainability dimension. Given an equal weight, a sustainability index for the various dimensions and a composite index of sustainability of a project are computed. The score range depends on the condition of each sustainability attribute. Based on an expert judgment method, the composite index for each sustainability dimension is computed in percentages using a sustainability index subscale. The sustainability index scale range from 0 to 100% (Fofa et al., 2015). Simane and Zaitchik (2014) also used a similar aggregation method to compute a composite index as the measure of project sustainability. In their study, equal weights were assigned to each sustainability dimension. This was calculated based on acceptance rate of each respondent for attributes of social, institutional, technical, and financial sustainability dimension and then divided by the total number of attributes for each dimension.

The sustainability index subscale used by Simane and Zaitchik (2014) was adopted for the study. This is because Simane and Zaitchik index subscale shows five levels, which provide a better variation in the sustainability status of a project than that of Fofa et al. (2015) index subscale with four levels for sustainability status variations.

3. Methodology

The study employs a cross-sectional survey design. According to (Creswell, 2014) survey is one of the best research designs that help provide accurate and current facts through data collection in human contexts. The study therefore considered cross-sectional survey design the most appropriate in establishing the sustainability of Oasis CLM system project. Cross-sectional survey designs help describe, observe and document situations as they naturally occur rather than just explaining them between locations.

3.1. Study population and sampling

The population consisted of household heads whose children were beneficiaries and involved in the Oasis CLMS project in Ankaako and Tweapease in the Twifo Hemang Lower-Denkyira District. In selecting the household heads, a sampling frame was obtained from social welfare officers at the communities. The list consisted of household heads, whose children were withdrawn, prevented and protected from child labor

activities, and had at least a woman in the household trained in the alternative livelihood skills within the Oasis CLMS project. One hundred and thirty-one household heads (131) names from Ankaako community and forty-nine (49) household heads names from Tweapease community were made available. The household heads were the primary decision-makers and were aware of their children's involvement in child labor activities. A census of the household heads from Tweapease was used, since the number was manageable.

To determine a household representative sample for population at Ankaako community, the formula for determining sample size by Yamane (1967) was used. The mathematical formula adopted for the sample size was indicated in Yamane as:

$$n = \frac{N}{1+N\,(e)^2} \qquad (1)$$

where n is sample size, *N* is sampling population and *e* is the margin of error. This was to ensure the minimum degree of error and accuracy of the research results. A 95% confidence level with a 5% margin of error was used to ensure the accuracy of the findings of the study. From the population of Ankaako, 30 households were used for the pre-testing and validation of the instrument and were therefore not included in the actual sampling frame. This is because Ankaako and Tweapease were the only beneficiaries of the project, and Ankaako had the highest beneficiaries. This left the sub-population at Ankaako to be 101 (131–30 = 101) and that of Tweapease to be 49. Using the mathematical formula, the sample size was derived from the one hundred and one beneficiaries of the project for Ankaako community as follows:

$$\text{The sample size } (n) = \frac{101}{1+101\,(0.05)^2};\ n = \frac{101}{1.2525};\ \text{n} = 81$$

A simple random sampling technique was the used to select the 81 household heads from the population at Ankaako. Random selection by replacement was employed to give equal chance to every member of the population. Before the random sampling, a unique number was assigned to the names of each household head on the sampling frame.

3.2. Data processing and analysis

Items on the instrument were coded and entered into IBM-SPSS, version 21, for windows software. To determine the social, economic, technical and institutional dimensions of sustainability, an aggregation method was used to compute positive responses of the attributes for each respondent and divided by the total number of attributes for each sustainability dimension (Pandey et al., 2011; and Simane and Zaitchik, 2014). Equal weights of 0 = disagree and 1 = agree were assigned and a composite index was then constructed across all four dimensions (Pandey et al., 2011). Equal weights were assigned to the sustainability dimensions to avoid bias in the results and to give equal importance to each sustainability dimension. The four sustainability dimension indices were summed and divided by the number of sustainability dimensions. A mean composite index for the sustainability of Oasis CLMS project was obtained. Expert judgment method was used to score the four sustainability dimension indices and the composite sustainability index by recoding into different variables on a subscale (Pandey et al., 2011; Simane and Zaitchik, 2014; and Fofa et al., 2015). The expert judgment is conducted by completing, validating, interpreting and integrating existing data, assessing the

impact of a change, predicting the occurrence of future events and the consequences of a decision, determining the present state of knowledge in a specific field. The expert judgment sustainability index subscale ranged from 1 ≤ 30% (unsustainable), 2 = 30–49% (less sustainable), 3 = 50–69% (fairly sustainable), 4 = 70–89% (sustainable), and >89% (very sustainable). The sustainability index subscale used was adapted from Simane and Zaitchik (2014).

Frequencies, percentages, means, and standard deviation were then computed for the analysis; and for the overall sustainability of the project. Friedman's rank test was also performed to compare and determine if there were significant differences among the mean ranks of the sustainability dimensions. A post hoc analysis using Wilcoxon Signed Rank test was also performed. A Bonferroni correction formula was adopted from McDonald (2014). Bonferroni adjusted *P*-value was performed by dividing the original α-value by the number of analyses on the dependent variable and computed as in equation (2).

$$\text{(alpha level) } a = \frac{Significance\ level\ (p{-}value\ 0.005)}{Number\ of\ comparisons} \quad (2)$$

$$= \frac{0.005}{6}; \quad a = 0.008$$

$$\text{Thus, } = \frac{0.005}{6}; \ a = 0.008$$

Bonferroni correction is 0.008 as the significance level cut-off. The alfa (a) value obtained from the Bonferroni correction calculation was used to interpret the results of the post hoc analysis with Wilcoxon signed-rank test.

Field et al. (2012) formula for calculating effect size was adopted. The effect size was calculated as:

$$r = \frac{Z}{\sqrt{N}} \quad (3)$$

where N is number of observations (130), Z is the value of the Z score in the Wilcoxon signed- rank test statistics and r is the effect size. According to Cohen (1988) effect size of 0.3 is "small," 0.5 is "medium" and above 0.8 is "large." The effect size values were then used to interpret the effect size of the social, economic, technical, and institutional dimensions on the overall sustainability of the Oasis CLMS project.

4. Results and discussion

4.1. Social sustainability of oasis CLM system project

The results on social sustainability presented in Table 1 revealed that most of the respondents agree they were responsible for Oasis the project (97.7%), and it is not Oasis that should be responsible for it and for that matter the beneficiaries and the communities were responsible for monitoring the progress of the child labor project (97.7%). According to Junne and Verkoren (2005) the high scores for project ownership attributes mean there is a change from community dependency to community responsibility. It is therefore worthy to note the high

proportion of respondents agreeing that the project belongs to the community. This has a positive implication for sustainability of the project, where ownership and efforts to maintain such project will be ensured by end beneficiaries.

Table 1. Level of agreement to the social sustainability of Oasis child labor monitoring system project

Social sustainability indicators	**Disagree**		**Agree**	
	Freq	%	Freq	%
Project ownership				
Responsible for Oasis child labor monitoring system project	3	2.3	127	97.7
Oasis organization is not responsible for child labor monitoring system project	3	2.3	127	97.7
Responsible for monitoring the progress of the child labor project	3	2.3	127	97.7
Attitudinal change				
Advise children on harmful effects of labor activities	-	-	130	100
Ensure children were not involved in harmful labor activities till the age of 18 years	-	-	130	100
Change in mind-set about child labor	-	-	130	100
Participation				
Involvement in planning Oasis child labor project activities	128	98.5	2	1.5
Provide labor to support the implementation of the child labor project	1	0.8	129	99.2
Involvement in handing over of educational facilities	1	0.8	129	99.2
Access to education				
Enrolled children in schools	6	4.6	124	95.4
Children miss school on health grounds	3	2.3	127	97.7
Improvement in children's academic performance	3	2.3	127	99.7
n=130				

Results from Table 1 also show attitudinal dimension of social sustainability. All the respondents agree they advise children on harmful effects of labor activities, ensuring children were not involved in harmful labor activities till the age of 18 years and change in mind-set about child labor were socially very sustainable. According to Salonen and Åhlberg (2013), the high score for attitudinal change to project sustainability is indicative of project approval. Responses from the interview schedule for Ankaako and Tweapease schools further perceived attitudinal change of parents sending their children to school leading to increased school enrolment.

On the participation aspects of social sustainability, the results reveal that almost all (99.2%) of the respondents provided some form of labor to support the implementation of the project. They were also involved in the handing over of the educational facilities (99.2%). On the other hand, most of the respondents (98.5%) disagree to the statement that they were involved in planning the project activities. According to Pretty et al. (1995), high involvement in project planning process could lead to active participation in the project implementation. Considering the disagreement on the premise of involvement in the planning process by the respondents, this could affect the attitudes of participants toward ownership and sustainability of the project.

On access to education, most of the respondents (95.4%) gave affirmative responses to the enrolment of their children in school, adding that their children could only miss school on health grounds (97.7%). The respondents claimed they have seen drastic improvement in the academic performance of their children (99.7%). United Nations Educational Scientific and Cultural Organization (2012) reports that high score for access to education, especially of a child, means lower levels of child labor. Thus, the ultimate objective of the project will be met if the project is sustained.

4.2. Economic sustainability of oasis CLM system project

Table 2 shows perceptions of investments and savings as subscale economic sustainability. The analyses showed that most (90.8%) of the respondents express their disagreements on the use of incomes to support other businesses or to purchase cloths (91.5%). Furthermore, more than 3 out of every 4 respondents disagree on the use of income from soap to support education of children and income to save. The results were not in consonance with Hartwick's (1977) observation that investment and income contribute to sustainability of projects.

On the respondents' perception of financial assistance on economic sustainability, almost all of the respondents (96.9%) disagree that they were able to access credit from financial institutions, let alone accessing any form of credit from non-financial organizations. This could have a dire implication on the economic sustainability of the project in terms of expansion of the enterprises. According to Bamberger and Cheema (1990) the inability of beneficiaries of a project to access financial assistance can detract a project to be sustained.

All respondents do not agree with the statement that there is access to market for soap produce. Reports from Ghana Statistical Service (2003) and Ministry of Manpower Youth and Empowerment (2008) show that inadequate income from goods and services were associated with lack of market accessibility. IFAD (2019) reported that effective market mechanisms help households gain adequate income, meet food requirements

and meet other needs. The inability of the respondents to get accessible market for their products will therefore hinder the sustainability of the project.

Table 2. Level of agreement to the economic sustainability of Oasis child labor monitoring system project

Economic sustainability indicators	**Disagree**		**Agree**	
	Freq	%	Freq	%
Investment and savings				
Income to support other businesses	118	90.8	12	9.2
Income from soap to support education of children	100	76.9	30	23.1
Income to purchase cloths	119	91.5	11	8.5
Income to save	111	85.4	19	14.6
Ability to access financial assistance				
Ability to access credit from financial institutions	126	96.9	4	3.1
Ability to access credit from non-financial organizations	130	100	-	-
Market opportunities				
Ability to access market for soap produce	130	100	-	-
n=130				

4.3. Technical sustainability of oasis CLM system project

Table 3 presents indicators used in eliciting information on technical sustainability of the Oasis CLM system project. All the respondents disagree that they received periodic skills training on soap making and marketing from Oasis organization or any other organizations. They respondents claim that it is only the first skill training that was provided before commencement of the business that they have been applying in their enterprises. According to Landale (2006) inadequate periodic skills training makes beneficiaries of such a project not to appreciate their inherent but untapped potentials in reinforcing self-confidence and sense of autonomy as opposed to dependency. This could also have negative effect on the sustainability of the project.

A higher number of the respondents (96.2%) claimed not receiving any periodic guidance on soap production from Oasis project staff. Responses from the project coordinator however revealed that five periodic visits have been made to the beneficiary communities to observe project progress but not necessarily on the purpose of giving guidance on soap production. According to Holder and Moore (2000) inability of

giving regular guidance on training programs for rural households could affect the sustainability of such projects.

Table 3. Level of agreement to the technical sustainability of Oasis child labor monitoring system project

Technical sustainability indicators	Disagree		Agree	
	Freq	%	Freq	%
Periodic skills training				
Soap marketing skills training	130	100	-	-
Soap making skills training from Oasis organization	130	100	-	-
Soap skills training from other organizations	130	100	-	-
Project staff involvement				
Guidance on soap production provided by Oasis project staff	125	96.2	5	3.8
Local capacity to maintain skills				
Easily produce soap with skills	109	83.8	21	16.2
Ability to minimize resources in production of soap	103	79.2	27	20.8
Operations and maintenance				
Ability to use soap equipment to produce soap	120	92.3	10	7.7
Ability to replace soap equipment at low cost	122	93.8	8	6.2
Ability to purchase soap materials locally	127	97.7	3	2.3
n=130				

Furthermore, at least 8 out of every 10 respondents disagree that they were able to easily produce soap with the skills they initially acquire. They were therefore not able to efficiently utilize resources in production of soap (79.2%). This will affect efficient resource allocation and use as the needed capacity and expertise to continue efficient production could diminish with time. As indicated by McCartan (2005) and Van der Kaay (2007), for local entrepreneur to maintain acquired skills, it is very important to give them continuous training support for some number of times to increase their capacity and sustain the business they are engaged in.

The operations and maintenance dimension of technical sustainability in Table 3 reveal that most of the respondents (92.3%) disagree that they were able to use soap equipment to produce soap, able to replace soap equipment at low cost (93.8%) or able to purchase soap materials locally (97.7%). Harvey et al. (2006) observed that high rate of disagreement with these statements give indications of beneficiaries' inability to manage skill and be innovative toward project sustainability.

4.4. Institutional sustainability of oasis CLM system project

Table 4 presents indicators used to measure institutional sustainability. Most of the respondents gave affirmative response that children benefit from labor policies (94.6%) and national health insurance scheme (98.5%).

Table 4. Level of agreement to the Institutional sustainability of Oasis child labor monitoring system project

Institutional sustainability indicators	**Disagree**		**Agree**	
	Freq	%	Freq	%
Government management structure				
Government educational materials for children	123	94.6	7	5.4
Child labor policies	7	5.4	123	94.6
National Health Insurance Scheme for children	2	1.5	128	98.5
Eat free in school	130	100		
Community management structure				
Satisfied with community child protection committee	66	50.8	64	49.2
Ability to access records of community child protection committee	124	95.4	6	4.6
Involvement in community child protection committee decision making	91	70	39	30
Communication and advocacy				
Ability to access information on the rights of children	29	22.3	101	77.7
Periodic child labor campaigns			130	100
Ability to talk to district child labor authorities	118	90.8	12	9.2
Ability to talk to community child protection committee members	67	51.5	63	48.5
Ability to talk to Oasis project staffs	102	78.5	28	21.5
Monitoring				
Visit household by district child protection committee	123	94.6	7	5.4
Visit work place by district child protection committee	130	100	-	-
Visit household by community child protection committee	66	50.8	64	49.2
Visit work place by community child protection committee	128	98.5	2	1.5
Visit household by Oasis project staff	106	81.5	24	18.5
Visit work place by Oasis project staff	125	96.2	5	3.8

n=130

According to National Development Planning Commission (2010) report, the high score is an indication of effective social policies. On the other hand, most of the respondents disagree that children receive government educational materials (94.6%), whilst all respondents disagree that children eat free in school. The overwhelming disagreements on the side of provision of free educational materials and feeding suggest that not all communities in the country are benefiting from policies on free books and school uniforms; and school feeding program to public schools. Again, large number of the respondents (95.4%) disagreed on being able to access records of community child protection committee. The finding is the opposite of IRC (2019) observation that community management structure has reached widespread acceptance for project sustainability all over Sub-Saharan Africa.

4.5. Sustainability indices of oasis CLM system project

Table 5 presents the results on overall sustainability indices. The mean social sustainability of Oasis CLM system project was perceived to be very sustainable (Mean = 4.9, SD = 0.43). The rating ranged fairly sustainable to very sustainable. A similar study by Fofa et al. (2015) found the social sustainability of coffee plantation and goat husbandry project to be socially very sustainable.

Table 5. Indices for sustainability dimensions of Oasis child labor monitoring system project

Sustainability dimensions	Minimum	Maximum	Mean	Std. Deviation
Social	3.00	5.00	4.9	0.43
Economic	1.00	3.00	1.12	0.43
Technical	1.00	3.00	1.12	0.39
Institutional	1.00	3.00	1.80	0.73
Overall sustainability	1.00	3.00	1.70	0.58

Scale: 1=Very Low (unsustainable), 2=Low (less sustainable), 3=Moderate (fairly sustainable), 4=High (Sustainable), 5=Very high (very sustainable)

The mean score of economic (Mean = 1.12, SD = 0.43) and technical (Mean = 1.12, SD = 0.39) sustainability were below 1.5 implying they were unsustainable. This result is similar to that of Li et al. (2016) who found economic sustainability of smallholder agriculture in semi-arid areas project to be economically unsustainable. Also, Pandey et al. (2011) found technical sustainability of ground water project to be technically unsustainable. This could be mainly due to the inability of mandated institutions to enhance the technical and economic dimensions by not organizing periodic skills training and ensuring the use of soap making skills for project sustainability.

This finding also supports the claim by Simane and Zaitchik (2014) who found the institutional sustainability of community-based adaptation projects to be institutionally less sustainable. This is because mandated stakeholders for supervision such as members of the district child protection committee and

members of the community child protection committee probably lack the necessary skills and capital resources to ensure project sustainability.

The overall sustainability of OASIS CLM system project was found to be less sustainable (Mean = 2.00, SD = 0.58). In their study, Martens and Monteiro de Carvalho (2013) found the overall sustainability of an evaluation in project management to be less sustainable. Similarly, Simane and Zaitchik (2014) found the overall sustainability of community-based adaptation projects to be less sustainable. This is because various sustainability dimensions such as social, economic, technical, and institutional have not been dealt with enough to meet the expectations of project sustainability.

4.6. Friedman ranked test for the sustainability dimensions

Friedman's non-parametric rank test was performed to compare social, economic, technical and institutional dimensions and how they contribute to the overall sustainability of the project. Table 6 shows that there were significant differences among the rank means of sustainability dimensions. Furthermore, Chi-square value of 327.722 was significant at p = 0.000. This implies that there were statistically significant differences between the mean ranks of the social, economic, technical, and institutional challenges.

Table 6. Statistics test for Friedman test

	Statistics
Sample size (n)	130
Chi-Squwere (X2)	327.722
Degree of freedom (df)	3
Significance level	0.000

In Table 7, the results show that social dimension had the highest mean rank of 3.98. By indication, the social dimension is very sustainable in contributing toward the sustainability of Oasis CLM system project. This finding shows an improvement in the social sustainability dimension as compared to the ranking results of ILO/IPEC (2019) that the social dimension of child labor projects was unsustainable.

The institutional dimension had a second mean rank score of 2.82. This indicates that the institutional dimension is fairly sustainable to the overall sustainability of Oasis CLM system project. This confirms various evaluations conducted by ILO (2010) on funded child labor projects which also ranked institutional dimension as fairly sustainable.

The economic dimension had a mean score ranking of 1.67. Economic dimension is placed third in contributing to the sustainability of Oasis CLM system project and is less sustainable.

The fourth ranked, with a mean ranking score of 1.54 was technical sustainability dimension. This indicates the technical dimension of Oasis CLM system project is less sustainable. This implies that the technical dimension needs the necessary attention. The interview guide response from the project coordinator also

confirms that the technical dimension is less sustainable due to inadequate finance and logistics to support the district assembly and committee members to provide periodic technical assistance to beneficiaries of the soap training.

Table 7. Rank means of the sustainability dimensions

Sustainability dimensions	Mean Rank
Social	3.98
Institutional	2.82
Economic	1.67
Technical	1.54

Scale: 1=Very Low (unsustainable), 2=Low (less sustainable), 3=Moderate (fairly sustainable), 4=High (Sustainable), 5=Very high (very sustainable)

In Table 8, there was a significant difference among the rank means of sustainability dimensions X^2 (3, N=130) = 327.722, p = 0.000. Specifically, the Wilcoxon-signed rank test indicated that all respondents (N=130) rated economic dimension (mean rank = 65.50) as less sustainable than the social dimension (mean rank = 0.00), Z = –10.269, p = 0.000.

All respondents (N=130) rated technical dimension (mean rank = 65.50) as less sustainable than the social dimension (mean rank = 0.00), Z = –10.375, p = 0.000. Almost all respondents (N=127) rated institutional dimension (mean rank = 67.00) as less sustainable than social dimension (mean rank = 2.00), Z = –9.935, p = 0.000.

In addition, few respondents (N = 26) rated technical dimension (mean rank = 22.04) as less sustainable than the economic dimension, and very few respondents (N = 13) rated technical dimension more sustainable than the economic dimension (mean rank = 15.92), Z = –2.557, p = 0.011. While more than half of the respondents (N = 91) saw significantly no differences in the technical and economic dimensions of the sustainability of the Oasis CLM system project.

A very few respondents (N = 15) rated the institutional dimension (mean rank = 31.80) as less sustainable than the economic dimension, and almost all respondents (N = 115) rated institutional dimension more sustainable than the economic dimension (mean rank = 69.90), Z = –8.807, p = 0.000).

Very few respondents (N=10) rated the institutional dimension (mean rank = 14.80) as less sustainable than the technical dimension, and almost all respondents (N=116) rated institutional dimension more sustainable than the technical dimension (mean rank = 67.70), Z = - 9.421, p = 0.000. While respondents (N = 4) saw significantly no difference in the institutional and technical dimensions of the sustainability of the Oasis CLM system project.

Table 8. Wilcoxon Sign-Rank test of the sustainability dimensions

Sustainability indicators	Ranking	N	Mean Rank	Sum of Ranks
Economic dimension index - Social dimension index	Negative Ranks	130	65.50	8515.00
	Positive Ranks	0	0.00	0.00
	Ties	0		
	Total	130		
Technical dimension index - Social dimension index	Negative Ranks	130	65.50	8515.00
	Positive Ranks	0	0.00	0.00
	Ties	0		
	Total	130		
Institutional dimension index - Social dimension index	Negative Ranks	127	67.00	8509.00
	Positive Ranks	3	2.00	6.00
	Ties	0		
	Total	130		
Technical dimension index - Economic dimension index	Negative Ranks	26	22.04	573.00
	Positive Ranks	13	15.92	207.00
	Ties	91		
	Total	130		
Institutional dimension index - Economic dimension index	Negative Ranks	15	31.80	477.00
	Positive Ranks	115	69.90	8038.00
	Ties	0		
	Total	130		
Institutional dimension index - Technical dimension index	Negative Ranks	10	14.80	148.00
	Positive Ranks	116	67.70	7853.00
	Ties	4		
	Total	130		

n=130

A Bonferroni correction result set at a significant level of $p < 0.008$ and presented in Table 9 revealed that social sustainability was significantly more sustainable than all the other sustainability indicators (economic: $Z = -10.269$, $p = 0.000$, $r = -0.90$; institutional: $Z = -9.935$, $p = 0.000$, $r = -0.87$; and technical: $Z = -10.375$, $p = 0.000$, $r = -0.91$). Institutional sustainability dimension was also significantly higher than economic ($Z = -8.807$, $p = 0.000$, $r = -0.77$) and technical dimensions ($Z = -9.421$, $p = 0.000$, $r = -0.83$). However, there was no statistically significant difference between economic and technical sustainability dimension ($Z = -2.557$, $p = 0.011$, $r = -0.22$) of the project. The indicators show large effect size on the sustainability of the project.

Table 9. Wilcoxon Sign-Rank test statistics for the sustainability dimensions

Sustainability indices	Z	Asymp. Sig. (2-tailed)
Economic – Social	–10.269	0.000
Technical - Social	–10.375	0.000
Institutional - Social	–9.935	0.000
Technical - Economic	–2.557	0.011
Institutional - Economic	–8.807	0.000
Institutional - Technical	–9.421	0.000

5. Conclusion

This study set out to assess beneficiaries' context of sustainability of CLM system project by Oasis Foundation International at Twifo Hemang Lower Denkyira District in the Central Region of Ghana. The findings showed that social dimension was perceived to be very sustainable. Technical and economic dimensions of the sustainability of Oasis CLM system project were perceived to be unsustainable. Furthermore, institutional dimension was found to be less sustainable. In general, overall sustainability of Oasis Foundation CLM system project was found to be less sustainable.

In addition, the Friedman Rank Test statistics showed that social sustainability dimension was the highest ranked by beneficiaries. The institutional sustainability dimension was ranked second. Economic sustainability dimension had the third rank. The technical sustainability dimension had the fourth rank.

The post hoc analysis using Wilcoxon Signed Rank test statistics showed that social dimension was significantly more sustainable than economic, institutional and technical dimensions. The results also showed that institutional sustainability dimension was significantly higher than economic and technical dimensions. However, there was no statistically significant difference between economic and technical sustainability dimensions of the project. The dimensions show large effect size on the sustainability of the project.

5.1. Recommendation

The study recommends that Oasis Foundation NGO, other development partners, and National Programm on the Elimination of Child Labour in Cocoa at the Ministry of Gender, Children and Social Protection should

upscale efforts with appropriate skills and resources to increase the sustainability status of the economic, technical, and institutional dimensions. This is because among the four sustainability dimensions analyzed, only social dimension appeared to be very sustainable.

The study also recommends, among other things, increased efforts of philanthropic and civil society organizations together with government parastatals to provide appropriate skills and resources to ensure social, economic, technical, and institutional sustainability of such interventions. This is because the statistics of the post hoc analysis using Wilcoxon Signed Rank test showed that the social, economic, technical, and institutional dimensions have a large effect size on the sustainability of the project.

This study adds to the area of sustainability of intervention in socio economic issues such as child labor, primary health care, and cash transfer programs, and methodology that gives an insight for such type of analysis using data in other fields as well. In line with the significant contribution of each of the dimensions of the study, it is important to include each aspect of sustainability indices when such studies are conducted.

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