

# Impact of Non-Governmental Organisation in Poverty Alleviation-A Case of Zabzugu Tatale in the North of Ghana

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#### Abstract

Ever since Ghana had its independence in 1957, its economy has seen steady economic growth, rapid expansion of small-scale agriculture and impressive development of a variety of social services. Fine, B., and Rose,P. (2001) That notwithstanding it needs to be said that there is a wide income disparities and wealth distribution resulting in extensive poverty and general malnutrition in mostly the rural communities. Following independence from the British, there has been a wide spread of NGO activity like wildfire. Chowdhury, A.F. and Rose, P. (2014).

Many NGO's were already present in the country, as well as steady growth of both nationwide and more locally- based indigenous NGO's. Around the early 1980's there was a change from welfare to a more development-oriented form of NGO intervention in the country which centered around groups and usually aimed directly or indirectly at alleviating the local people from the poor state in which they found themselves. Massive awareness creation formed a major composition of an increasing number of NGO intervention .With all this developments little is still known about the overall impact NGO have on the topic of poverty and also very few details of certain projects have been made known to the public as



most of the NGO's are not accountable to any major body as in the case of certain big multinational corporation that are answerable to their shareholders. Jones, P. (2011). The major part of this Working Paper reports on the evaluation of four rural NGO interventions aimed, broadly, at poverty-alleviation, and undertaken during 1990. This case study throws more light on the fact that with all these interventions that were brought as a way of changing the life of people, there is still room for improvement even till this day in the 21st century dispensation. It needs to be noted that just recently the Zabzugu-tatale district was a beneficiary of such alleviation programs formed by the UNICEF which was themed integrated community development fund. Zabzugu-tatale is a district in the north region of Ghana and for the purpose of this academic research it has been chosen and findings would better help us understand the impact NGO's actually have in these communities. Hossain, N., Subrahmanian, R., and Kabeer, N. (2012).

#### Introduction

Ghana currently has a population of just under 30 million, and as of 2019 its gross domestic product (GDP) per capita was estimated at approximately \$48 billion, placing it among the least wealthy countries in the world and thus 'lower middle-income economies' of the world (World Bank, 2019). Ghana has experienced moderate but steady rates of economic growth, although, in comparison with most other countries of the world, its growth rate has been lower in the last decade. Non-governmental organizations(NGO) play a very big part in the day to day activities in every country in today's world especially in the case of the Africa as more and more countries have been thrown into either a state of instability or civil war which has had adverse effect on the general life in most African countries but in this paper we are going to take keen interest in the education . Hartwell, A. (2013). Over the last one and half decade NGO's have now come to be acknowledged as one of the major players in the development agenda on a global scale and they have gradually become the key centre of attention and constitute important strategy in development today. You will be taken aback if you get to know the amount of funds that has been pumped into the activities of these NGO bodies. Most NGO activities have received funds from various donors and corporate world including the United Nations (UN) and International Monetary Fund (IMF). It has been stated in various findings that the world bank alone has spent over 46 billion USD from 1989 in developing countries and this constituted 12% of all western aid and more than what the World Bank disbursed in the same year in developing countries (Clark, 2011). In 2010, it was estimated that NGO's were responsible for about \$US23 billion of total aid money. Current figure suggests that official development assistance provided through NGO's had increased from 4.6% in 2009 to 13% in 2011, and that the total aid volume had increased from US\$59 to US\$78.6 billion in the same period (Riddell, 2011). The huge budgetary allocation to Non Profit making organizations and the ready support given to NGOs vindicate the commitment of development partners in the activities of NGOs. The World Bank (2009) defines NGOs as private organizations that pursue activities to relieve suffering, promote the interests of the poor, protect the environment, provide basic social services or undertake community development. This definition clearly defines the core functions of NGOs and place man at the centre of its development agenda. Looking at the greater attention that has been given to the



under privileged in society through gender and general policy advocacy, improvement in the human right of the people ensuring that people are held accountable for their actions that have effects on the society and finally being open about how the system works and making sure that everyone gets a fair share of the national cake and how laws are made. The efforts that have been put in by the various non-profit organizations can never be under stated in alleviating poverty. Globally we can say that NGO's have been in existence since time immemorial and have taken various forms and they have rendered various forms of help to us for many centuries but it can stated emphatically that they rose to international prominence in the late 1980's and 90's after the various development targets were achieved.(USAID)

#### **Research Objectives**

This research aims at finding answers to the following

- 1. To assess the social impact of the education as a tool for poverty alleviation.
- 2. To identify challenges affecting the various alleviation programs
- 3. Examine the sustainability of the already existing programs

#### Literature Review and Hypothesis Development

Many concerns and questions have been raised about the activities of NGOs in the world most especially in Africa. Some scholars hold the view that some NGOs show genuine concerns about the marginalized in society and others also hold the belief that some NGOs pretend to show similar commitment in other to generate funds from donors to pursue their personal interest, neglecting the marginalized in society. Example is the findings made by Addo (2014), who conducted research on the role of NGOs in promoting girl child education using Offinso District as case study. He came out with the findings that the concerned NGOs only generated funds from donors without undertaking the main purpose of their project. Some research work reveal that some NGOs exaggerate the problems of the marginalized in society to attract big funds from donor agencies which turns to tarnish the image of the beneficiaries which leads to the loss of dignity and self-respect. This made Ansah Ababio (2016) to conclude in his findings on the role of NGOs in poverty reduction that NGOs leave no change in the life of beneficiaries but seek for their personal interest.

On the other hand, other research findings have praised the roles played by NGOs in reducing poverty through improvement in health, education, shelter, food, skill training, capacity building among women and other activities or elements that affect life. Asamoah et al, (2015) in their research work on the role of NGOs in capacity building among women, choosing Drobonso as a case study, found that NGOs through diverse ways such as vocational training and gender equality advocacy have empowered women which has gone a long way to ease the livelihood of the beneficiaries thereby giving them a little life line . Complementing the effort of government, NGOs seek for funds and grants from the elite in society to support the less privileged. In other words, NGOs play the role of middlemen, by taking from the rich to the less privilege in society (Mundy, 2001).

Studies show that NGOs play different roles in promoting effective educational system as a means of alleviating the rural populace from poverty. Some NGOs like World Vision International are primarily involved in advocacy aimed at putting pressure on governments to



fulfil their commitment to ensuring access to education of acceptable quality for all children (Mundy, 2011). Some NGOs are involved directly in providing education to the excluded (Sayed, 2014). Educational exclusion can take many forms, including those 'hard-to-reach' with respect to gender, street children, orphans, child soldiers demobilized children in post-conflict areas, pastoralists, indigenous groups, language, faith, disability, refugees, child laborers (Sayed and Soudien, 2013; UNESCO, 2014). These forms of exclusion may interact with income-related poverty, but can also result from children not being able to go to school for socio-cultural and other demand-side related reasons (Colclough et al., 2013). Inadequate supply of schooling in remote, rural areas can further exacerbate these constraints. As a result, even in countries where overall enrolment appears reasonably high, there are often pockets of exclusion, which may be sizeable in some rural parts of the country, and also evident in urban areas. Such provision is usually localized on a small scale, with the intention of developing innovative approaches to reach those otherwise excluded from the conventional state system (UNESCO, 2014).

Clark (2015) stressed that the avowed aim of NGOs is often to represent the voice of the weak and oppressed and help them organize themselves.

## **Poverty Alleviation through Education**

Since coming into existence in Ghana, it has become relatively very clear that government have not been able to categorically state how these various NGO's have been able to impact that education sector itself but that is not to say that they haven't done anything. As time role by time is increasing becoming clearer that these bodies have channelled much effort in identifying which of the basic form of education have NGO focused much attention to and it was discovered that much efforts were focused on the basic education which was not captured in the earlier report of both NNED and ISODEC. According to the report by the aforementioned bodies the organizations are divided into groups such as the Community based organization (CBO's) and volunteer based organization, with majority of it being NGO's. Over here it can be said that the main focus of the support of education was through advocacy and the provision of basic learning materials or through the combination of both. Many NGO's located in the northern region of Ghana have focused their attention on training teachers and the staff of the school as a way of supporting the education sector and a typical example of this NGO is The World Vision International. According to a report (2015) released by this particular organization the rationale behind training the teachers is that as government is focused on investing in the provision of infrastructure towards the affective learning then it is very important as NGO's on the other hand to provide the fluid needed to lubricate the sector ie provision of qualified teachers. Another aspect where NGOs provide support is the provision of textbooks and learning aids such as pens, pencils and exercise books for students to promoting effective learning. Some NGOs invest resources for paying pupils' school fees in the provide sector. The categories of pupils who benefit from this offer are pupils with single parent and orphans. Akyeampong, K. (2010).

## Factors That Hindered Ngo in Executing Its Goals to the Maximum Capacity

Indeed, funding is the main problem leaving NGOs with poor provision for logistics or office accommodation. the changing amounts of funding over 3 years previous to the report demonstrated a shifting emphasis from material support and infrastructure projects to training



of teachers and members of PTA's and SMC's. This may because such projects are cheaper to run and are not as capital intensive. Another challenge reported by NGOs is the lack of support be the local people (the beneficiaries). Addo and Ansah, 2010, citing Adadieso, a community based in Eastern Region found out that beneficiaries usually want to be spoon-fed without contributing little effort in the process of project implementation. On the contrary, Adusah and Razak, 2006 conducted a research in the Wa municipality and came out with the findings that, the local people are very supportive in project implementation and that play an active role in most of the projects implemented by NGOs. Low incentives and motivation received by NGO workers is conceived to a challenge. For example, in Bangladesh estimates indicate that teachers in government schools receive around \$70 per month, compared with \$9 for those working in NGO centres (Groundwork Inc. 2002). Political instability and interferences may also disturb the activities of NGOs (UNESCO, 2006). NGO-provided education often involves little external monitoring, with learning limited to basic literacy and numeracy. In effect it we developed 2 hypothesis to demonstrate the intimidating function of the NGO

1. Exponential strategy has improved the lives of the beneficiaries of NGO programs to alleviate poverty.

2. Exponential strategy has not improved the lives of the beneficiaries.

# **METHODOLOGY**

The research will follow qualitative and quantitative design. The qualitative data will be collected through structured interviews while the quantitative data will be collected by the use of questionnaires and structured interview.

# POPULATION SIZE AND GROWTH RATES

According to 1960, 1970 and 1984 census reports, the District's population were 43,328, 56,313 and 78,923 respectively. The 2010 Population and Housing Census put the entire population for the District at 115,556 with males comprising 47.7% and female 52.3%. Comparing 2010 censures report to preceding censure reports indicates progressive increase in the population size of the District.

# DATA GATHERING INSTRUMENT AND MODE OF COLLECTION

Structured interview guides and questionnaires containing both closed and open ended questions will be employed for data collection. Focus group form an integral part of the date needed to be gathered.

## SAMPLE SIZE AND SAMPLE TECHNIQUE

The study used both purposive and convenient sampling techniques. Purposive sampling was used to select the beneficiaries (Zabzugu - Tatale locals) from the population with a specific set of characteristics for the research study. Convenient sampling technique was also used to select the respondents due to the nature of the study and time constraints.

## DATA ANALYSIS

It needs to be noted that the raw data that is gathered from the field has no meaningful use unless it's transformed and into meaning informations for the purpose of the study. Through interviews, the views of the respondents on issues pertaining to exponential education strategy in the area of study were cautiously been examined. Quantitative data involving



coding and keying in of data was analyzed by using computerized software called Statistical Package for Social Solution (SPSS). The data will be processed into graphs, charts and tables for explanations and discussion. The SPSS software will be used to coordinate the findings of the survey and to cross-tabulate the relationship between variables.

## Discussion

#### Demographic characteristics of respondents

In table 1, the major demographic characteristics of the respondents is presented. Out of the total of 300 respondents, 112(37.3%) were males and 188(62.7%) were females. This indicate that majority of the respondents were female. Also, with regards to the age category of respondents, 55% of the respondents were between 30 to 34 years; 28.7% were between 18 to 29 years; 12.3% were between the ages of 45 to 59 years; and 4% were above 60 years. This means that majority of the respondents were in the age group 30-44 years. On the issue of marital status, 48% are married; 11.7% are divorced; 18.7% are widows; 21.7% are single. With regards to the level of education, 4% have Tertiary education qualification; 27.3% Secondary education qualification; 40.7% Basic level education; and 28% no formal education. Majority of the respondents thus had Basic level education. Also, with regards to employed; 39.3% are self-employed; 28.3% are unemployed; and 25% are students. This means that majority of the respondents in this category are self-employed (see Table 1).

Variable	Category	Frequency	Percentage %
Gender	Male	112	37.3
	Female	188	62.7
Age (years)	18 - 29	86	28.7
	30 - 34	165	55
	45 - 59	37	12.3
	60 +	12	4
Marital status	Married	144	48
	Divorced	35	11.7
	Widow	56	18.7
	Single	65	21.7
Level of education	Tertiary	12	4
	Secondary	82	27.3
	Basic education	122	40.7
	No formal education	84	28
Employment status	Employed	22	7.3
	Self-employed	118	39.3
	Unemployed	85	28.3
	Student	75	25

#### Table 1. Demographics of respondents



-	which of these activities does the 1000 perform									
				Valid	Cumulative					
		Frequency	Percent	Percent	Percent					
Valid	Health	27	9.0	9.0	9.0					
	Education	50	16.7	16.7	25.7					
	Shelter	42	14.0	14.0	39.7					
	Food	64	21.3	21.3	61.0					
	women empowerment	65	21.7	21.7	82.7					
	skills training	32	10.7	10.7	93.3					
	Others	20	6.7	6.7	100.0					
	Total	300	100.0	100.0						

 Table 2. Poverty alleviation Activities by NGOs

which of these	e activities	does the N	GO j	perform

Table 2 shows the major poverty alleviation activities covered by the NGOs in the district under study. Women empowerment constitute the top most poverty alleviation programmes of the NGOs according to the respondents (21.7%). This is followed by Food distribution (21.3%); Education (16.7%); Shelter (14%); Skills training (10.7%); and other activities (6.7%). This indicate that NGOs in the region put empowerment as the topmost priority in their quest to mitigate and eradicate poverty in the study area. Also, the other activities like education and skills training would go a long way to help in poverty alleviation by offering the community the needed skills and training needed to fend for themselves and to get out poverty.

Table 3.

		-		Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	not at all	31	10.3	10.3	10.3
	neutral	127	42.3	42.3	52.7
	to some extent	58	19.3	19.3	72.0
	to a large extent	84	28.0	28.0	100.0
	Total	300	100.0	100.0	

Do NGOs help in poverty alleviation

From Table 3, it is evident that majority of the respondents are not sure if the poverty alleviation strategies undertaken by the NGOs are really yielding results. 42.3% of the respondents indicated "Neutral" and 10.3% indicated "Not at all" to the question of whether or not NGOs help in poverty alleviation. However, about 47% of the respondents are of the view that NGOs are helping in poverty alleviation. This result is inconclusive and therefore further studies might be needed in that regard to find out if the poverty alleviation strategies adopted by NGOs are really bearing fruits.



	······		· · ·	Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	Health	4	1.3	1.3	1.3
	Education	24	8.0	8.0	9.3
	Shelter	45	15.0	15.0	24.3
	Food	61	20.3	20.3	44.7
	women empowerment	100	33.3	33.3	78.0
	skills training	66	22.0	22.0	100.0
	Total	300	100.0	100.0	

 Table 4. Poverty alleviation strategies with the highest impact

which of the strategie	s impacts	positively	on v	poverty	alle	viatio	n
						~	-

Respondents were also asked to mention the strategies that impacts positively on poverty alleviation. From Table 4, majority of the respondents (33.3%) indicated "women empowerment"; 22.3% indicated "skills training"; 20.3% indicated "food"; 15% indicated "shelter"; and 8% and 1% indicated "education" and "health" respectively. From Table 4, it means that the strategy or programme that impacts positively on poverty alleviation according to the respondents in women empowerment and skills training. This result could be true as most women in the region are the breadwinners of their families. Some NGOs are also able to provide some sort of skills training to the women folks who are mostly in groups on shear butter extraction, sewing, basketry, and other crafts to help the women fend for their families.

 Table 5. Preferred Poverty alleviation strategies

	1 0	T	- <sup>-</sup>	88	
				Valid	Cumulative
		Frequency	Percent	Percent	Percent
Valid	Health	30	10.0	10.0	10.0
	Education	35	11.7	11.7	21.7
	Shelter	32	10.7	10.7	32.3
	Food	64	21.3	21.3	53.7
	women empowerment	67	22.3	22.3	76.0
	skills training	72	24.0	24.0	100.0
	Total	300	100.0	100.0	

which of the above poverty alleviation do you suggest NGOs focus more on?

The respondents were also asked to choose which poverty alleviation programme they would prefer the NGOs to engage in. majority of the respondents (24.3) indicated "skills training"; women empowerment (22.3%); food aid (21.3%); education (11.7%); shelter (10.7%) and education (10%). This goes to say that skill training which makes up for the informal educational sector. From this result, it appears majority of the respondents prefer that NGOs



provide them skills training to be able to earn some income for their families.

Hypotheses

H1: NGOs poverty alleviation strategies have improved the lives of the beneficiaries of NGO programs to alleviate poverty.

H2: There is positive relationship between the poverty alleviation strategies and poverty eradication

Table 6. Model summary

	Model Summary									
				Std.	Change Statistics					
		R		Error of		F				
Mo		Squar	Adjusted	the	R Square	Chang			Sig. F	
del	R	e	R Square	Estimate	Change	e	df1	df2	Change	
1	.123 <sup>a</sup>	.015	.008	1.68303	.015	2.271	2	297	.105	

a. Predictors: (Constant), would you say NGOs have been able to eradicate poverty in your community?, would you say the poverty mitigations strategies have improved your life?

Table 7. ANOVA

			ANUVA			
		Sum of				
Model		Squares	df	Mean Square	F	Sig.
1	Regression	12.867	2	6.434	2.271	.105 <sup>b</sup>
	Residual	841.279	297	2.833		
	Total	854.147	299			

# ANOVA<sup>a</sup>

a. Dependent Variable: which of these activities does the NGO perform

b. Predictors: (Constant), would you say NGOs have been able to eradicate poverty in your community?would you say the poverty mitigations strategies have improved your life?



Table 8. Hypothesis tes	st
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	Coef	ficients <sup>a</sup>			
	Unstand	lardized	Standardized		
	Coeff	icients	Coefficients		
Model	В	Std. Error	Beta	Т	Sig.
1 (Constant)	4.390	.427		10.279	.000
would you say NC have been able eradicate poverty in y community?	to	.098	.044	.766	.444
would you say NG have been able eradicate poverty your community?	Ds to in 421	.207	118	-2.038	.042

a. Dependent Variable: which of these activities does the NGO perform

We tested 2 hypotheses between the dependent variable (poverty alleviation) and two independent variables (poverty alleviation strategies and poverty eradication). The results in Table 7 shows that out of the two hypotheses only one was supported (H2; p < .05). First and foremost, in the first hypothesis, H1 had a positive but insignificant effect on the dependent variable ( $\beta = 0.075$ ; t = 0.766, p > .05). This means that although there is a relationship between the independent variable (poverty alleviation strategies) and poverty alleviation the nature of the relationship does not mean the independent variable has any significant influence on the dependent variable. That is, we fail to accept H1 which suggests that NGOs have been able to eradicate poverty from the community. This finding supports earlier findings by Addo (2014) and Ababio (2016) who claim that NGOs are not doing enough in terms of alleviating poverty. Addo (2014) for instance claimed in his study that NGOs only generated funds from donors without undertaking the main purpose of their project. Also, Ababio (2016) concluded that NGOs leave no change in the life of beneficiaries but seek for their personal interest.

However, the second hypothesis H2, had a negative but significant effect on the dependent variable ( $\beta = -0.421$ ; t = -2.038, p < .05) this led to the acceptance of H1. The result of the hypothesis shows poverty alleviation strategies have improved the lives of the people in the community even though it is not that much. Some of the activities like women empowerment, skills development and education would go along way in building the capacity of the people in the community to fend for themselves in the long run. As such a lot more of these activities should be embarked on in order to eradicate poverty totally in these communities.

# Conclusion

This study examined the role of NGOs in poverty alleviation in Zabzugu - Tatale on of the communities in Northern Region of Ghana with high incidence of poverty rate. Respondents



were sampled using the convenient sampling technique. The findings from this study shows that NGOs are engaging in some activities in this region to alleviate the poverty in the community. Some of these programs are women empowerment, skills training, health, and education among others. Although, the inhabitants are of the view that these programs are important and are geared towards providing some livelihood to cater for themselves, they feel NGOs are not doing enough to eradicate poverty. The role of NGOs is to alleviate poverty in their target communities and this result is evidence of that role. Again we can say that looking at this analysis from a broader point of view, given a huge number of people living in this country find themselves most likely on the poverty lining however contributions in are for some reason limited however they give the chance or set a pace through which these people can raise their standard of living through various models. The work of most NGO bodies actually make up an array of excellence in the context of slow progress in alleviating world poverty in general. In order to address the limitations and to boast their performance ,NGO's have to deal with some challenges that is faced by almost other institution you find yourself in: enhancing local institutions and connecting them with supra-local level of development agencies, scaling up their innovative development program, building synergy with the government and private sector as the serve as the key pillars in development of any country and finally engaging in advocacy for pro-poor development policy. The NGO capacity in dealing with these challenges will determine contributions to a larger extent alleviating poverty.

## References

Akyeampong, K. (2010). Complementary education in Northern Ghana: A case study of aid for self-reliance, Journal of International Co-operation in Education, 41-52.

Balwanz, D. A., Schuh, M., & DeStefano, J. (2006). Complementary education programs In ADEA countries

http://www.adeanet.org/biennial-2006/Ecoles/vo/Word/B5\_1+\_balwanz\_en.doc.

Bowles, S., & Gintis, H. (1976). Schooling in capitalist America. Education reform and the realities of economic life. London: Routledge and Kegan Paul. (66-90)

Carron, G., & Carr-Hill, R. (2011). Non-formal education: Information and planning issues. Paris: IIEP, UNESCO. (20-39)

Chowdhury, A. F., & Rose, P. (2014). Non-state provision of basic services: Education in Bangladesh. Mimeo, University of Birmingham, UK (Press)

Coombs, P., & Ahmed, M. (2004). Attacking rural poverty. How non-formal education can help. Baltimore, MD Johns Hopkins Press.

Destefano, J., Schuh, M., Balwanz, D., & Hartwell, A. (2006). Meeting EFA: Reaching the under-served through complementary Models of effective schooling. http://www.equip123.net/docs/e2-MeetingEFASynth\_WP.pdf

Dore, R. (2012). The diploma disease. Education, qualification and development. Berkeley: University of California Press.



Edwards, M., & Hulme, D. (2013). Non-governmental organisations—Performance and accountability: Beyond the magic bullet. London: Earthscan Publications. https://doi.org/10.4324/9781315070704

Fine, B., & Rose, P. (2001). Education and the post-Washington consensus. In Development policy in the twenty-first century: Beyond the post-Washington consensus.

Government of Ghana. (2011). 2011–2015 education strategic plan. Accra. Government of Ghana.

Government of India, Ministry of Human Resource Development.(2012). Sarva Shiksha Abhiyan, a programme for universalization of elementary education. http://ssa.nic.in/altsch/egs.asp#Background%20: The%20Current%20NFE%20Scheme (accessed January 18, 2012).

Groundwork Inc. (2012). Bangladesh education sector review no. 3. NGOs as deliverers of basic education. Paper prepared for Basic Education and Policy Support Activity, USAID.

Hartwell, A. (2013). Meeting EFA: Ghana School for Life, USAID EQUIP2 case study. http://www.aed.org/ToolsandPublications/upload/GhanaCaseStudy.pdf

Hoppers, W. (2014). Non-formal education and basic education reform: A conceptual review. Paris: IIEP, UNESCO.

Hossain, N., Subrahmanian, R., & Kabeer, N. (2012). The politics of educational expansion in Bangladesh. IDS working paper no. 167, Institute of Development Studies, Brighton.

Jones, P. (2011). International policies for Third World education: UNESCO, literacy, and development. New York: Routledge.

World Bank Annual Report (2019). Press release.

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