

Factors Influencing Food Security among Small Holder farmers in the Upper West Region of Ghana

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Received May 11, 2022; Revised June 17, 2022; Accepted June 26, 2022

Abstract Ghana's food security situation is acknowledged to have improved in recent years, nonetheless, food insecurity still persists in some parts of Ghana, with the northern regions including the Upper West hosting the highest proportion of food insecure households. This situation is due partly to domestic agricultural production. As such, study sought to find out the major factors influencing agricultural production and consequently food security. Five sampled communities out of fifteen were randomly selected for Focus Group Discussion (FGDs) to gather data. These communities were: Tokaali, Manwe, Jeffisi, Sakai and Lawra-Yagtuuri. Furthermore, Kredjcie and Morgan's (1970) sample size determination Table was used to select a total of 341 smallholder farmers based on each community's population. From the study, all the respondents (100%) in the study indicated that food security is influenced by the weather/climate conditions of the area, whereas farming methods were identified as the next major factor influencing food security in the region according to smallholder farmers (98.5%) in the study. In addition, land allocation (85.0%) and government policies (74.8%) were also revealed to be contributory factors to food security by smallholder farmers in the region as well as some other factors including infestation representing 2.6 percent of respondents.

Keywords: *food security, smallholder farmers, agricultural production*

Cite This Article: Emelia Guo, Joseph Saa-Dittoh, and Agnes Atia Apusigah, "Factors Influencing Food Security among Small Holder farmers in the Upper West Region of Ghana." *World Journal of Agricultural Research*, vol. 10, no. 1 (2022): 30-35. doi: 10.12691/wjar-10-1-5.

1. Introduction

In November 1996, heads of state and government representatives gathered in Rome, Italy, for the World Food Summit to reaffirm everyone's right to safe and nutritious food, consistent with the right to adequate food and the fundamental right to be free from hunger [1]. According to the United Nations' Food and Agriculture Organization (FAO), the delegates agreed to ensuring food security for everyone and continuing efforts to eradicate hunger in all nations, with the immediate goal of halving the current number of undernourished people by 2015 [1].

However, Data from the World Bank suggests that the share of the population in agriculture keeps declining as countries develop, and that while about 70 percent of the population in less developed countries are directly employed in the agricultural sector, there is little to prove in terms of productivity [2,3]. Hence, maintaining food security at the country level and household level is still a major challenge for many developing countries [4] which has deeper historical roots, since colonial agricultural

policies of the past were such that food production was not given a priority at central government level [5].

While the absolute number of people suffering from hunger, continues to increase, albeit slowly with more than 820 million people in the world still hungry, underscoring the immense challenge of achieving the Zero Hunger target by 2030 [6], marked differences exist across regions [7,8]. Sub-Saharan Africa (SSA) remains the world's most food-insecure region, with almost one-fourth of the people – over 230 million – being undernourished [6,9], thus, agriculture production in the region lags behind globally, and is below the required standards of achieving food security and food sufficiency [10]. Therefore, feeding the increasing population of Sub-Saharan Africa is becoming a critical challenge for most of the countries in this area [11]. Though Smallholder farmers provide over 70% of the food consumed in Sub-Saharan Africa, signifying their decisive role in terms of facilitating food security on the local, national and global level [12,13], their account for the largest share of agricultural production in Sub-Sahara Africa (SSA) is almost unbeneficial, as they are frequently the most food insecure due to an array of challenges [12].

According to the 2017 Global Food Security Index, Ghana is among the most food secure countries in Sub-Saharan Africa (South Africa and Botswana are the only others to top Ghana) [15] and over the past two decades the country's poverty rate has fallen from 56.5% in 1991 to 24.2% in 2013, thereby achieving the Millennium Development Goal target of halving poverty [16]. In this regard, Ghana in no doubt can be considered as an agriculture-dependent nation and generally food secure [17].

Despite an overall increase in Ghana's food security situation in recent years, food insecurity persists in some parts of Ghana [18], and the then three (now five) northern regions have been pronounced the most food insecure since the highest proportion of food insecure households are found in the Upper East Region, Upper West Region and Northern region where 28 percent, 16 percent and 10 percent of households respectively are either severely or moderately food insecure [19]. The food insecurity problem according to Adom [20] is fundamentally influenced partly by domestic agricultural production. This study therefore sought to find out the major factors that influence agricultural production which consequently influence food security.

2. Methodology

2.1. Profile of the Study Area

The Upper West Region covers a geographical area of approximately 18,478 square kilometres. It constitutes about 12.7 percent of the total land area of Ghana. The Region is bordered to the North by the Republic of Burkina Faso, to the East by Upper East Region, to the South by the Savanna and Northern regions and to the

West by Cote d'Ivoire. Below in [Figure 1](#) is a map showing the geographic position of the UWR of Ghana.

Agriculture in the Upper West Region is highly dependent on rains therefore, the rainy season is the busy period where agricultural activities are activated [21,22]. According to GSS [22], largely, farmers in the UWR are peasant farmers with about 25 acres for farming; their output used for subsistence or commercial purposes

2.2. Research Design

Cross-sectional survey design was adopted using the mixed methods approach in this study. Both questionnaires and an FGD guide were used to collect data. The study area has eleven (11) administrative units; ten districts and one municipality. However, because of the dispersed nature of the districts coupled with the cost and time constraints in writing this paper, the researchers put the study area into 8 clusters. Out of the 8 clusters, 5 clusters were selected using simple random sampling. Four districts and one municipality were sampled from the 5 clusters. While Wa East, Wa West, Sissala East and Sissala West were selected purposively, Lawra was selected using simple random sampling. Simple random sampling was again used to select 3 communities in each district using the lottery system, thus 15 communities in all. Five sampled communities out of fifteen were randomly selected for Focus Group Discussion (FGDs) to gather qualitative data. These communities were: Tokaali, Manwe, Jeffisi, Sakai and Lawra-Yagtuuri. Furthermore, [23] sample size determination table was used to select a total of 341 smallholder farmers based on each community population. The number of the districts, communities and sample size of the smallholder farmers (both males and females) are illustrated in [Table 1](#) below.

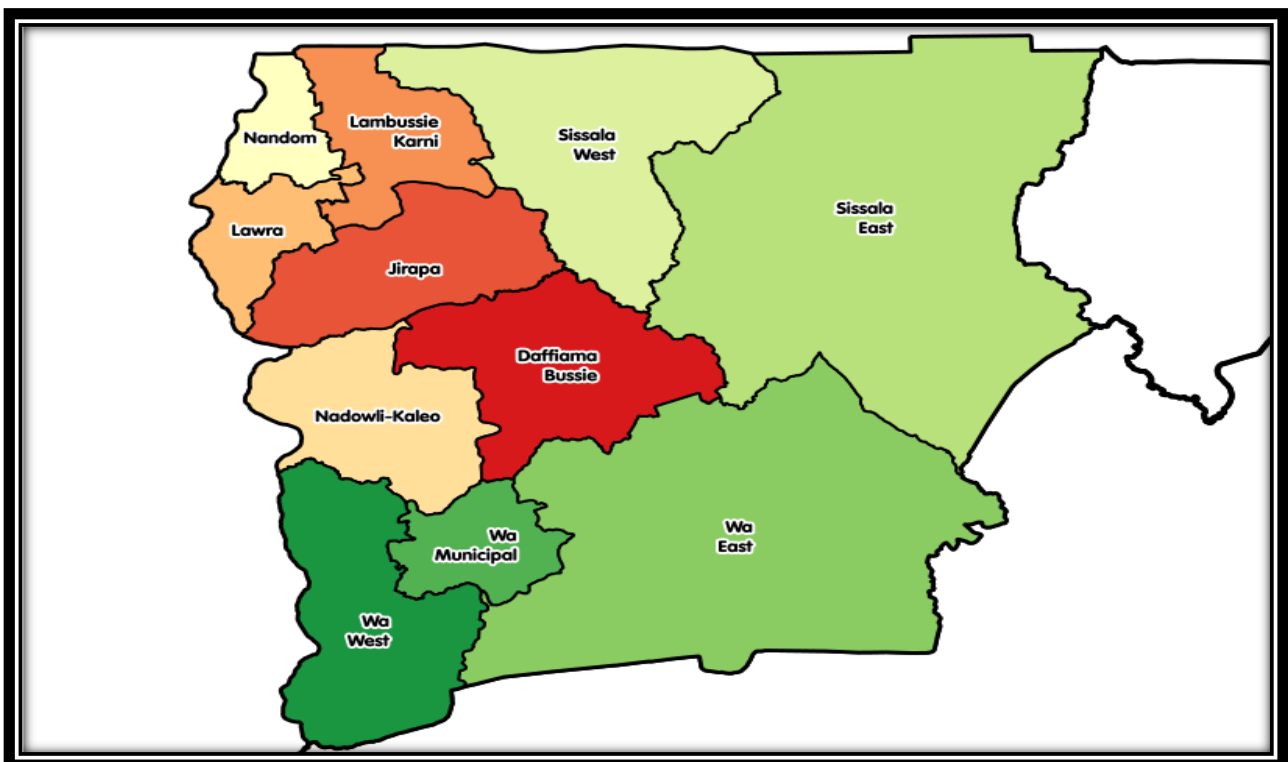


Figure 1. Map of Upper West Region of Ghana (Source: Wikipedia (2012))

Table 1. Districts, Communities and Sample Size of Smallholder Farmers

Selected District	Selected Communities	Sample Size	Male	Female
Wa West	Tokaali	26	12	14
	Naaha	28	14	14
	Tanina	24	7	17
Total		78	33	45
Wa East	Kpagalahi	18	12	6
	Manwe	27	17	10
	Goripie	23	16	7
Total		68	45	23
Sissala West	Jeffisi	20	11	9
	Pulima	18	9	9
	Bullu	10	4	6
Total		47	24	24
Sissala East	Sakai	23	14	9
	Kulfuo	15	8	7
	Bugubelle	15	10	5
Total		53	32	21
Lawra District	Yagtuori	40	21	19
	Kunyukuo	35	20	15
	Bagri	20	8	12
Total		95	49	46
Grand Totals	15	341	182	159

Source: (Field survey, 2016).

3. Results and Discussion

3.1. Socio-Demographic Characteristics of Respondents

The socio-demographic characteristics in this study presents the age, sex and farmers methods of farming of respondents. Below are the results in [Table 2](#), [Table 3](#) and [Table 4](#).

Table 2. Age of Smallholder Farmers

Respondents Age	Mean	Maximum	Minimum
Years	40	80	18

Source: (Field survey, 2016).

The average age of respondents was 40 years with the minimum and maximum ages being 18 years and 80 years respectively. This implies that the usual age of respondents engaged in small holder farming was around 40 years.

Table 3. Sex of Smallholder Farmers

Sex	Response	Frequency	Percent
	Male	182	53.4
	Female	159	46.6

Source: (Field survey, 2016).

In the [Table 3](#) above, majority of the respondents (53.4%) were males while 46.6 percent were females. Thus, males constituted the majority of small holder farmers in the Upper West region of Ghana.

Table 4. Smallholder Farmers Methods of Ploughing

Methods of Ploughing	Response	Frequency	Percent
	Manual	153	44.9
	Tractor	181	53.1
	Animal traction	7	2.0
	Total	341	100

Source: (Field survey, 2016).

The study, as found in [Table 4](#) above reveal that the main methods of ploughing farmlands by respondents were the use of tractors (53.1%) and manual ploughing (44.9%) although a few (2.0%) used animal traction.

3.2. Factors influencing Food Security among Smallholder Farmers

In assessing the factors that influence food security of smallholder farmers, an assessment of the status of major food security crops in the study area was first conducted to find whether the major crops cultivated in the study area have either increased, decreased or remained same over the years. Primarily the study revealed that maize, yam and millet were the major food crops smallholder farmers rely on to ensure food security among themselves. [Table 5](#) presents the results on the status of major food crops of smallholder farmers in the study area.

Table 5. Status of Major Food Security Crops Cultivated by Smallholder Farmers

Major crop	Same		Increase		Decrease		Row Total	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Maize	60	17.6	180	52.8	101	29.6	341	100
Yam	79	23.2	165	48.4	97	28.4	341	100
Millet	44	12.9	231	67.7	66	19.4	341	100

Source: Field Data, 2020.

In [Table 5](#), the finding shows that smallholder farmers generally recorded an increase in harvest relative to their previous harvest. Most of the respondents recorded an increase in the cultivation of maize (52.8%), yam (48.4%) and millet (67.7%). The findings as revealed in the [Table 5](#) could be as a result of the various governments' implemented policies, strategies, and programmes aimed at achieving food security indicators as well as poverty reduction in the country [24] since programmes on food security will lead to an increase in productivity and total production and will improve food distribution to vulnerable groups and enhance nutrition to the people of Ghana, particularly the people of Northern of Ghana [25].

Table 6. Relationship between Smallholder Farmers Districts of Origin and Methods of Ploughing, and Status of Major Crops

Variables	Methods		Districts	
	Value	Asymp. Sig. (2-sided)	Value	Asymp. Sig. (2-sided)
Maize	167.492 ^a	.000	550.921 ^a	.000
Yam	185.523 ^a	.000	656.401 ^a	.000
Millet	128.619 ^a	.000	363.801 ^a	.000

Source: Field Data, 2020.

In Table 5, there is evidence of relationship between smallholder farmers' methods of ploughing as well as districts of origin and the status of major food security crops cultivated by smallholder farmers in the Upper West Region of Ghana (Chi-square = 167.492^a, 185.523^a and 128.619^a, $p < .05$) for Maize, Yam and Millet respectively in the case of smallholder farmers methods of ploughing, likewise their districts of origin

(Chi-square 550.921^a, 656.401^a and 363.801^a, $p < .05$) for Maize, Yam and Millet respectively.

Regarding the factors influencing food security in the study area, weather/climate conditions of the area, modern technology/farming methods, land allocation and government policies as well other factors were identified in the study. Below are the results.

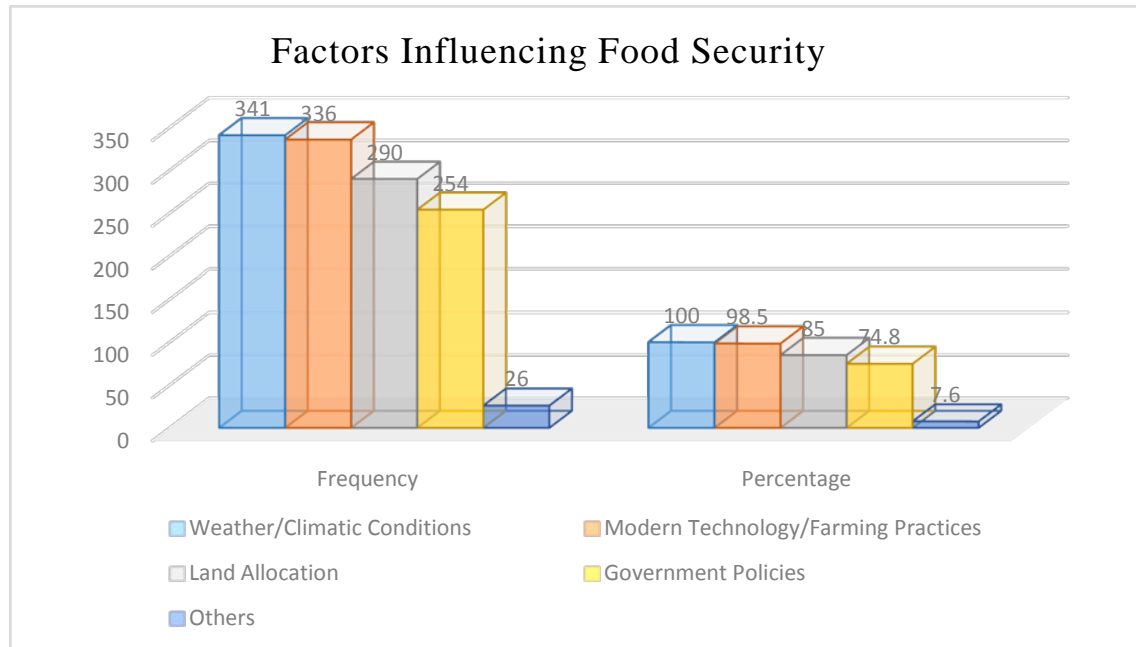


Figure 1. Factors Influencing Food Security among Smallholder Farmers in the UWR (Source: (Field survey, 2020))

In the Figure 2 above, all respondents (100%) revealed that food security is dependent upon the weather/climatic conditions of the area similar to [26-30] who reported that food security relies on the climate condition. To complement the results as gathered from the questionnaires of this study, FGDs participants in the study were of the view that the consequences of unfavourable weather/conditions were very dire and could plunge a whole community or area to famine and severe hunger. For instance, below is what one of the male group participants in Jeffisi had to say:

You see, when rains do not fall, crops will not grow. This will mean no food to be fed on. Even in the event that there is food as a result of previous seasons' storage, the lack of rains often results in increases in the prices of such food products and therefore making it difficult for some rich people to acquire talk less of the poor.

This finding is similar to the finding of [26] that in drought situations food prices increase.

In addition, the study found that introduction of modern agricultural practices and technologies as well as farming methods by a significant majority of respondents (98.5%) have the tendency to facilitate food crops productions and resulting in the increasing availability of foodstuffs at the households' levels. This confirms [27,31] who indicated that adopting good farming practice influences agricultural production and consequently food security. From the FGDs, majority of the smallholder farmers indicated that there is no doubt that good agricultural practices influence positively on agriculture. In the course of a FGD, below is a view shared by of one of the male participants in Jeffisi:

As for farming practices now, a lot has changed and it is helpful. Most of us in farming now use seeds from the Agric ministry.

This conform to [3,32] observation that modern science and technology have helped increase food security and agricultural production globally through the production and propagation of high-yielding crop varieties (HYVs).

The role of policy regulation is to provide guidance and actions to combat food insecurity [33]. This implies that government policies can influence food security hence it was considered as a factor that influences food security and poverty alleviation by 74.8 percent of respondents. According to respondents, the government has a role to play in ensuring that there is food security not only in the UWR but the country as a whole. Below is what one of the male participants in Tokaali in the Wa West district had to say regarding how government policies influence food security:

... You need to buy fertilizer and apply to your farm before you can have any hope of harvesting something at the end of the season. Having identified this, the government through some of its policies has subsidized fertilizer for us to be able to acquire and further apply to our farms.

The view as revealed above can be likened to the comprehensive agricultural support policies by government or donors such as fertilizer subsidies, credit subsidies, public irrigation schemes etc. which accounted for the Asian Green Revolution of the 1970s [34].

Furthermore, According to [35], "food security is the ultimate manifestation of who wields power, and who

does not.” Therefore, if land is allocated in an inequitable way by those in power, then food security could be endangered, confirming the findings in this study which revealed 85 percent of total smallholder farmers indicating that land allocation is a factor that influences food security. Likewise, this study finding is in line with other existing literature such as [27,36] who found that land allocation is fundamental in ensuring food security.

Below is a narration of a female discussant in Pulima in the Sissala West district on her experience regarding land allocation:

...In the past women were not allowed to own lands. But as I speak to you now, I have my own farm and I use the proceeds I get from the farm to support the family. Because my husband is the caretaker of the family, sometimes he sells some of his farm produce to pay some bills meaning there will be little left, so the small I have would be used to feed the family.

Then again, last but not least, about 2.6 percent of respondents revealed that there were other factors that possibly could influence food security and poverty reduction among smallholder farmers. These factors include, conflict, poverty and infestation. Below is what a participant in a focus group discussion in Sakai had to say:

My brother, very recently we all saw and experienced the fall army worm causing havoc in the country and outside the country. People lost their crops and farms. I personally did not suffer from the infestation but that does not mean it can't or it did not cause food insecurity or increase poverty.

4. Conclusion

It is revealed in the study that the major factor influencing food security was the weather/climate conditions of the area, whereas modern agricultural practices and technologies were identified as the next major factor influencing food security in the region. Land allocation and government policies were also revealed to be contributory factors to food security by smallholder farmers in the region.

5. Recommendation

For sustained food security and poverty reduction, irrigation schemes and irrigation equipment should be made available by the Government of Ghana and other stakeholders to enable smallholder farmers to have all-year-around farming activities. This would go a long way to ensure food security and poverty reduction in the country.

Also, climate smart technology adoption to food security should be encouraged particularly in the production of high-yielding seed or grains to provide food security.

Furthermore, government policies should continue to empower the production capabilities and capacities of small holder farmers through subsidizing fertilizer, provision of technical and extension services etc.

References

- [1] FAO (1996). Rome Declaration on World Food Security and World Food Summit Plan of Action. World Food Summit, Rome, November: FAO. Retrieved from: <https://www.fao.org/3/w3613e/w3613e00.htm> on 6th October, 2020.
- [2] Roser, D. (2017). The irrelevance of the risk-uncertainty distinction. *Science and Engineering Ethics*. 20th February, 2019.
- [3] Mozumdar, L. (2012). Agricultural Productivity and Food Security in the Developing World. *Bangladesh J. Agric. Econ.* xxxv, 1&2, 53-69.
- [4] Gassner, A., Harris, D., Mausch, K., Terheggen, A., Lopes, C., Finlayson, R. F., & Dobie, P. (2019). Poverty eradication and food security through agriculture in Africa: Rethinking objectives and entry points. *Outlook on Agriculture*, 48(4), 309-315.
- [5] Abdalla, Y.I. (2007). Causes Of Food Insecurity in Southern Africa: An Assessment. Thesis presented in partial fulfilment of the requirements for the degree of Master of Science in Agriculture at Stellenbosch University. Retrieved from <https://core.ac.uk/download/pdf/37319951.pdf> on 15th May, 2022.
- [6] FAO, IFAD, UNICEF, WFP & WHO (2019). The State of Food Security and Nutrition in the World 2019. Safeguarding against economic slowdowns and downturns. Rome, FAO.
- [7] International Food and Policy Research Institute (IFPRI). (2014). Global Hunger Index: The Challenge of Hidden Hunger. Washington, D.C.
- [8] FAO, IFAD, UNICEF, WFP & WHO (2014). The state of food insecurity in the world (2014): Strengthening the enabling environment for food security and nutrition. Rome: FAO
- [9] World Bank (2016). Poverty and shared prosperity 2016: Taking on Inequality. Washington, DC: World Bank.
- [10] Fuglie K. (2013). Agricultural Productivity in Sub-Saharan Africa, in the Food and Financial Crisis in Africa, D. Lee and M. Ndulo, eds. Oxford shire, CAB International: UK.
- [11] Abdullah, Zhou, D., Shah, T., Ali, S. Ahmad, W., Din, I. U. & Ilyas, A. (2019). Factors affecting household food security in rural northern hinterland of Pakistan. *Journal of the Saudi Society of Agricultural Sciences*. Vol. 18, 201-210.
- [12] IFAD (2005). Proceedings of the validation forum on the global cassava development strategy: A review of cassava in Africa with country case studies on Nigeria, Ghana, the United Republic of Tanzania, Uganda and Benin. (Vol. 2). Rome, Italy.
- [13] Graeub, B. E., Chappell, M. J., Wittman, H., Ledermann, S., Kerr, R. B. & Gemmill-Herren, B. (2016). The state of family farms in the world. *World Development*, 87, 1-15.
- [14] Riesgo, L., Louhichi, K. & Paloma, G. S., Hazell, P., Ricker-Gilbert, J., Wiggins, S., Sahn, D.E. & Mishra, A. (2016). Food and nutrition security and role of smallholder farms: challenges and opportunities.
- [15] Feed the Future (2018). The Global Food Security Strategy (GFSS) Ghana Country Plan. Retrieved from https://www.usaid.gov/sites/default/files/documents/1867/Ghana_Country_Plan_Public_Version_WS_Edits.pdf on 4th October, 2020.
- [16] UNICEF (2016). The Ghana Poverty and Inequity Report: Using the 6th Ghana Living Standards Survey. Retrieved from [https://www.unicef.org/ghana/Ghana_Poverty_and_Inequality_Analysis_FINAL_Match_2016\(1\).pdf](https://www.unicef.org/ghana/Ghana_Poverty_and_Inequality_Analysis_FINAL_Match_2016(1).pdf) on 6th October, 2020.
- [17] Darfour, B. & Rosentratter, K. A. (2016). Agriculture and Food Security in Ghana. Retrieved from https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1482&context=abe_eng_conf on 4th October, 2020.
- [18] Nkegbe, P. K. Abu, B. M. & Issahahu, H. (2017). Food security in the Savannah Accelerated Development Authority Zone of Ghana: an ordered probit with household hunger scale approach. *Agriculture & Food Security*, 6:35.
- [19] World Food Programme. (2012). Comprehensive Food Security & Vulnerability Analysis. Focus on Northern Ghana. Retrieved from <https://documents.wfp.org/stellent/groups/public/documents/ena/wfp257009.pdf> on 4th October, 2020.
- [20] Adom, P. K. (2014). Determinants of food availability and access in Ghana: what can we learn beyond the regression results? *Studies in Agricultural Economics* 116, 153-164.

- [21] Nsiah-Gyabaah K (1994). Environmental Degradation and Desertification in Ghana. A Case Study of the Upper West Region. Avebury: Aldershot.
- [22] Ghana Statistical Service (GSS) (2013). 2010 Population and Housing Census Regional Analytical Report: Upper West Region. Ghana Statistical Services. Retrieved from http://www.statsghana.gov.gh/docfiles/2010phc/Regional_Analytical_Reports_Upper_West_Region.pdf on 4th October, 2020.
- [23] Krejcie, R. V. & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and psychological measurement*, 30(3), 607-610.
- [24] Ayifli, R.A. (2017). Food Security and Sustainability. Food security challenges in Ghana. *Food Process Technol*, 8: 5.
- [25] Ministry of Food and Agriculture (MOFA) (2014). Agric. Sector Annual Progress Report, Monitoring and Evaluation Directorate. Accra, Ghana: Ministry of Food and Agriculture.
- [26] Zakari, S., Ying, L. & Song, B. (2014). Factors Influencing Household Food Security in West Africa: The Case of Southern Niger. *Sustainability*, 6, 1191-1202.
- [27] Karplus, L. (2014). Post-Development Theory and Food Security: A Case Study in Swaziland. Retrieved from <https://ir.library.illinoisstate.edu/cgi/viewcontent.cgi?article=1020&context=cppg> on 4th October, 2020.
- [28] Yaro, J. A. (2010). The Social Dimensions of Adaptation to Climate Change in Ghana. The World Bank Discussion paper no.15. Washington: The World Bank.
- [29] Adu-Boahen, K., Dadson, I. Y. & Halidu, M. A. (2019). Climatic Variability and Food Crop Production in the Bawku West District of the Upper East Region of Ghana. *Ghana Journal of Geography* Vol. 11(1).
- [30] Praveen & Sharma (2019). A review of literature on climate change and its impacts on agriculture productivity. *J Public Affairs*; 19:e1960.
- [31] Kalugu, J. W., Filho, W. L. & Harris, D. (2013). Smallholder Farmers' Perception of the Impacts of Climate Change and Variability on Rain-fed Agricultural Practices in Semi-arid and Sub-humid Regions of Kenya. *Journal of Environment and Earth Science*. Vol. 3, No.7.
- [32] OECD (2010). African Economic Outlook-AEO's (2010). Retrieved from <https://www.afdb.org/en/documents/document/african-economic-outlook-aeo-2010-99863> on 6th October, 2020.
- [33] Premanandh, J. (2011). Factors affecting food security and contribution of modern technologies in food sustainability. *J Sci Food Agric*, 91: 2707-2714.
- [34] Bahiigwa, G., Mdoe, N. & Ellis, F. (2005). Livelihoods research findings and agriculture-led growth. *IDS Bulletin* 36 (2)
- [35] Smith, J. (2003). Poverty, sovereignty and resistance in southern Africa. *Africhee Orienti. Rivista ai confinitra Africa, Medio-Orientee Mediterraneo*, Bologna, 2.
- [36] Garba, G. (2013). Towards Poverty Reduction in Northern Ghana: Contribution of the Northern Rural Growth Programme in Nadowli and Wa West Districts in Upper West Region. A Research Paper presented to in partial fulfilment of the requirements for obtaining the degree of Master of Arts in Development Studies.



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