Journal of Sustainable Development in Africa (Volume 14, No.1, 2012)
ISSN: 1520-5509
Clarion University of Pennsylvania, Clarion, Pennsylvania

HOME GARDENING: THE SURVIVING FOOD SECURITY STRATEGY IN THE NANDOM TRADITIONAL AREA - UPPER WEST REGION GHANA

Ernest Bagson and Alfred Naamwintome Beyuo
Faculty of Planning and Land Management, University for Development Studies, Wa, Ghana

ABSTRACT

The shorter rainy seasons and increasing dry spells reflect the effects of climate change in the Nandom Traditional Area with attendance up surge of food insecurity. Indigenes use traditional farming methods to cater this and the philosophy underpinning the siting, ownership and control of home gardens; the sustainability and contributions of home garden to food security is not ascertained. Five electoral areas were randomly sampled. Data was collected using interviews, observation and focus group discussion guides. Home garden site is determined by at least 12 months of traditional soil assessment. Home gardening is an organic farming practice in the incidence of high technology. It enhances: food security, viable seeds for cultivation and intercropping. The existence of home gardening is influence by the mode of housing. Agricultural extension officers need to support farmers on the production of compost; food storage, seed selection and crop compatibility in intercropping.

Keywords: Gardening, farming, food, intercropping, seasons, guide and Ghana.

INTRODUCTION

Many research findings have debunked the contributions of organic (alternative) agriculture to food security in the ever increasing population (Avery, 2007). The literature indicates that high level of management and labour requirements are stifling alternative agriculture. Nevertheless home gardening, based on organic or alternative farming method has successfully met varied human demands, preserved indigenous agricultural practices and satisfied human pleasure of closeness to nature (Schupp, 2009). This reflects the dual concept of sustainability: the ecological sustainability and socio-economic sustainability. It is for the adherence to the ecological balance among the producers, decomposers and the consumers within the ecosystem that ecological sustainability emerges in the ecologically friendly gardening methods. Moreover, the concept of socioeconomic sustainability focused on the cultural practices in home gardening that meets the social and economic needs of the people now and generations in the future.

Analysis of the impact of the use of alternative agriculture methods on small scale and subsistence farming indicates improvement of yield even without the adoption of high technology and chemical fertilizer but the use of ecologically friendly farming methods (IAASTD, 2009). Though practice in small scale, critical analysis portrays that alternative

agriculture produces high output levels per unit area than the technological dependent industrial farming system (Assuncao and Braido, 2007).

Home gardening based on alternative agriculture is still a dynamic livelihood strategy in the Nandom traditional area despite the massive intervening industrial farming systems that have been advocated over the years. This paper therefore seeks to examine the philosophy underpinning the siting, ownership and control of home gardens despite the infiltration of technology and the use of chemicals in gardening; the sustainability of home gardening on organic farming practices and the contributions of home gardening to food security.

METHODOLOGY

Description of the Study Area

The Nandom Traditional Area is within the guinea savannah zone; northwest, in the Lawra District, of the Upper West Region of Ghana. The district has an intense population density of 81 persons per km^2 (Ghana Statistical Service, 2000). Nandom Traditional Area has a relatively small parcel of land with an ever increasing population. This has increased the value of land and therefore incessant cultivation within the same area. Majority of the people are subsistence farmers. The research area shares borders with the Lawra Traditional Area to the south, the Hamile and Lambusie Traditional Areas to the north and east respectively and the Black Volta to the west (Figure 1).

Readily available coping strategies to increase or supplement household food needs are: migration and/or the application of chemical fertilizer to improve the soil fertility. However, the high cost of chemical fertilizer limits its accessibility. The thinly escape route to food security is the byproduct of the mud house construction process. The “dugout” (source of soil for mud house construction) becomes the point for the preparation of organic manure and the nucleus of home gardening.

Sampling Procedure

A high level of homogeneity within the traditional area informed a cluster sampling of five of the twenty two electoral areas. Each electoral area (cluster) consists of an average of two communities. Hence, one community was randomly sampled to represent an electoral area (Table 1). These five communities adequately represented the entire traditional area because of the common cultural background and farming practices. Purposive sampling

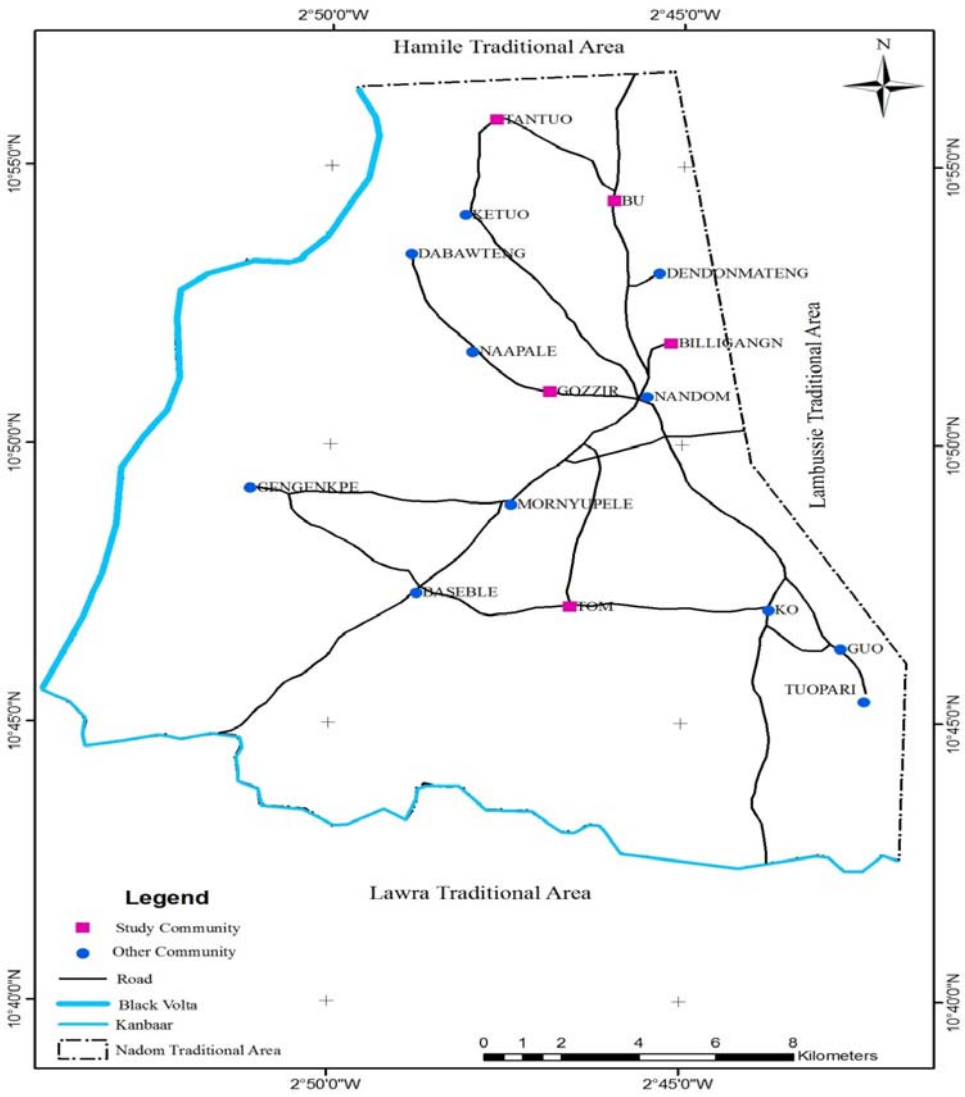


Figure 1: Map of Nandom traditional area

Source: UDS, DERS, 2012.

technique was then used to select ten key informants (who live in thatch/mud houses and actively practice home gardening) from each of the five electoral areas. Three Focus Group Discussion sessions (FGD) were held in each selected community. The discussants were purposively selected to capture opinions of the youth (ages: 14-25) and elders (ages: 26 and older) separately as well as a combined group of the youth and the elders as a filtering mechanism in the data collection. The researchers also observed physical effects of home gardening in the traditional area.

Table 1: Selected Electoral Areas, Communities and Key Informants

Study area	Electoral areas	Selected community	Key informants
Nandom Traditional Area	Tom	Tom	10
	Bu	Bu	10
	Gozzir	Gozzir	10
	Nanomkpee	Billigangn	10
	Tantuo	Tantuo	10
Total		05	50

Source: Author's construct, 2011.

REVIEW OF RELATED LITERATURE

Site, Ownership and Control of Home Gardens

Home garden is a small system of household plant production (Cherry and Di-Leonardo, 2010) and an unpopular aged-long food security strategy (Teitelbaum and Beckley, 2006) partly because of its wide variety of produce and its informal nature. Home gardening has become an important part of cultural heritage (Seaton, 1981) which denotes specific farming practices at different localities. It is therefore inappropriate to ascribe definite and effective cultural practices to the management, siting and ownership of home gardening because home gardening has been a way of life for centuries (Zerihun, Weyessa and Adugna, 2011).

Being culturally based, the origin of home gardening is an initiation of new settlers as a means of survival (De Wolf, 1992) and therefore normally sited very close to the house of residence. Becker (1984) indicated the wide spread of "kitchen" gardens adjacent dwelling places and commonly cultivated vegetables, medicinal herbs and a few flowers. Home gardens satisfied the immediate household food needs and the consumption of fresh farm produce as well as a direct transaction between the gardener and the consumer. The management of the garden is principally directed by the household head since the head locates the site and champions the construction of the house. However, the West Africa Regional Food for Peace Project (2004), funded by the US Aid indicated the dominance of women in West Africa in the management and ownership of home gardens.

Home Gardening and Organic Farming Practices

According to Emsley (2001), many researchers continue to doubt the capacity of organic farming or alternative agriculture on meeting the food needs of the growing population of the century. The researchers' conviction is on the huge potential and capacity of industrialized agriculture to contribute significantly to the food needs of the era. However, a window of hope exists for organic farming (IAASTD, 2009 and Rosset, 1999) especially in the fields of home gardening and small farm size resulting in higher output per unit area. The increase in output of home garden and small farm size could be attributed to keen attention in farm management, multiple cropping and the regular use of organic manure to enhance the soil fertility (Lamb, 2003). This therefore indicates that without increase in farm size; the increasing human population can still be food secured and soil fertility regularly enhanced because of the common use of the Integrated Plant Nutrient System (IPNS) Bruinsma (2003) in small farm size. These facts highlight a strong conviction that home gardening on organic farming practices is the nucleus to food security in the era of limited land for agricultural purposes.

Contributions of Home Gardening to Food Security

According to the Food and Agricultural Organization of the United Nations (FAO, 1996), food security is the physical and economic access by all people in a society at all times to enough culturally and nutritionally appropriate food for a healthy and active lifestyle. Recent food production strategies rely on industrialized practices and high yield food crop varieties (Bruinsma, 2003) undermining home gardening at the micro level and the culturally based farming practices on food security (Rosset, 1999). Home gardening has contributed to food security in ways, such as direct access to a diversity of nutritionally-rich foods; increased purchasing power from savings on food bills and income from sales of garden products, and fall-back food provision during seasonal lean periods (Akosa, 2011).

Indigenous farming practice enhances the natural link between humans and their natural environment. This farming practice adheres to the ecologically friendly farming systems and fostering sustainability in ecological succession (IAASTD, 2009). The practice is viewed as a management strategy employing reduction in the cost of farm inputs and protecting the natural environment (National Research Council (NRC) 1989; Bruinsma, 2003). An appreciable level of environmental protection by way of reduction in the level of pollutant release in the transportation of agricultural inputs and haulage of conventional farm produce adhering to the "nearness principle" (Danish Research Centre for Organic Farming, 2000).

Locally based food crops furthermore bridge the gap between the producer and the consumer and facilitate direct interaction between the farmer and the consumer. This system of farming also eliminates the issues of social justice and equity that is associated with the production and distribution of food beyond the locality (Batterbury and Fernando, 2006) and therefore enhances food sovereignty. Individual farmers spend quality time in the gardens, paying particular attention to the survival of individual crops; maximizing each crop yield and the total farm output. On conventional or industrial food crop cultivation, individual crop care is not given hence home gardens, even on small scale, produce high quality and quantity crop yield than in the conventional farming system (Pimentel, 2006). Consequently, alternative farming system is energy efficient as compared to the use of synthetic chemicals and food crop yield enhancing farm inputs (Heller and Keoleian, 2000).

Ecological and Socioeconomic Sustainability in Home Gardening

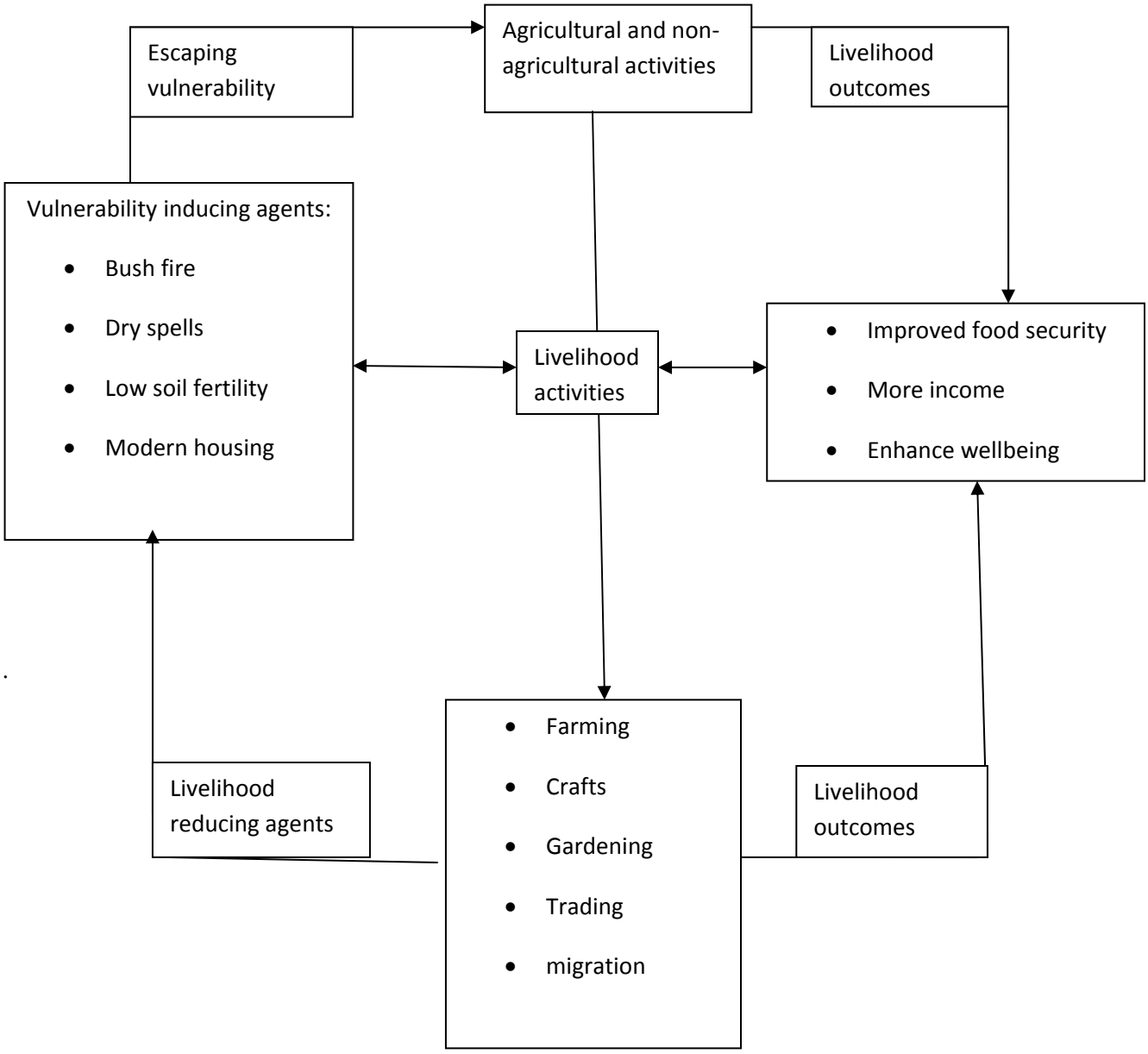
Sustainability in the context of home gardening is within the meaning of sustainability as posited by the World Commission on Environment and Development (1987): “meeting the needs of the present without compromising the ability of the future generation to meet their own needs.” In home gardening, sustainability extends to maintaining equilibrium between the biotic and abiotic components of the immediate environment. Cultural practices within the home garden enhance soil fertility while harmonizing the interaction among the producers, the decomposers and the consumers to continuously establish a stable ecosystem.

A stable ecosystem in the home garden portrays the dual concept of sustainability: ecological sustainability and socioeconomic sustainability. A home garden is ecologically sustainable if it production levels (output per unit area) is relatively adequate for the present and future generations without reducing the ecosystem potentials in the garden. This indicates that the continuous interaction between the living and non-living components should result in a stable and productive system. However, the socioeconomic sustainability in a home garden refers to the effective use of the indigenous knowledge system to continuously enhance output per unit area. In other words, increasing or maintaining output to meet the social and economic needs of the actual and future generations. Cultural practices within the garden via the multiple cropping and the application of organic material push high the ecological and socioeconomic sustainability in home gardens.

CONCEPTUAL FRAMEWORK

The very common livelihood activities in the Nandom traditional area are: farming, craft, trading, migration and gardening (Figure 2). These enhance the lives of the people and improve the food security situation in the traditional area.

However, there are possible vulnerability inducing agents that can negatively affect these lives enhancing activities. The livelihood reducing agents include: bush fires, dry spells, low soil fertility and modern housing. In order to escape or reduce the level of vulnerability the indigenes engage in both agricultural and non-agricultural activities through the livelihood activities (Figure 2). It is therefore in this vein that the people improve their food security, have more income and an enhanced wellbeing.



.

Figure 2: Conceptual framework

Source: Authors' construct: 2011.

FINDINGS AND DISCUSSIONS

Site, Ownership and Control of Home Gardens

An overwhelming 100% of the key informants indicated that home gardening has been a way of life in the traditional area as posited by Zerihun et al (2011) and owned and controlled by the household head. The survey revealed 91% and 9% of male and female household heads respectively. The dominance in control and ownership of home garden by males contradicts the findings of West Africa Regional Food for Peace Project (2004) which indicates women dominance in home gardens in West Africa. The male dominance reflects the cultural intuition that women do not own lands and in very rear cases where women own and control farm lands men select the most fertile lands, for their control and use. This was fully complemented during the FGDs and emphasized the fact that the household head was permitted to construct the house of residence and should therefore control the home garden which is sited very closed to the house of residence (Plate, 1) as in consonance with Becker (1984). However, the minority (9%) women home garden owners are widows with children.

Plate 1: Home garden behind a mud house
Source: Field data, 2011.

In siting the home garden, the key informants indicated that the potential household head is temporally permitted (by the "Tengan sob" (land owners)) to assess the suitability of the soil for the construction of a house of residence. The FGD further indicated that, the soil is assessed by moulding an average of three round shaped soils at different locations. These moulded soils are exposed to the weather and observed for at least 12 months to assess the level of resistance of the moulded soil to the weather conditions. The FGD indicated that a very good soil, for construction, will withstand the hazards of the weather by relatively maintaining its shape throughout the 12 months.

The potential household head decides on the site based on the assessment and again asks for permission now to start construction of the mud house. Interaction with the key informants revealed the need to appease the gods before any construction at the sited area. An informant indicated the request from the "Tengan sob" as unusual: excreta of a child and

domestic animals. The FGD confirmed the "Tengan sob" request and further indicated that the excreta are to permit the healthy growth and development of children and domestic farm animals in the new settlement. It is on this ground that the soil is dug and used for the constructions.

The source of the soil for the constructions is gradually filled with domestic waste and becomes the nucleus of the home garden. This indicates that in so far as mud houses are built, home gardens will exist in the traditional area. This is the cultural basis on which home garden is sited as posited by De Wolf, (1992) and Rosset (1999). The dumped domestic wastes gradually decompose and become rich compost for the cultivation of crops. However, in some cases the dugout is not filled and becomes the source of suitable soil for building for the extended family and not a house hold, the key informants indicated diverse benefits that residence derived from the unfilled dugout. Some of the benefits include: source of surface water for domestic animals and some domestic chores such as washing of cloths, soaking of fibre and elephant grass for weaving baskets, mats, and thatch. However, the threat to home garden is the recent interest for modern houses with the use of sand and cement. This has resulted in reducing the incidence of dugout; the product of mud houses and the nucleus for home gardens in the traditional area.

Home Gardening and Organic Farming Practices

The FGD revealed that immediately the construction of the mud house is complete, food crops and vegetables are cultivated the next available farming season because home gardening in the traditional area is rain fed. The discussants demonstrated adequate knowledge of the positive influence of organic manure on food crop yield and vegetables cultivation in consonance with IAASTD (2009). Seeds for future cultivation are selected from the high quality produce of the home garden. The produce is usually of very good quality because of the intense individual crop care and the rich soil on which home gardens are sited as posited by Lamb (2003). The key informants indicated three ways of maintaining soil fertility through compost. In the first instant, domestic waste is continuously dumped in the home garden to improve the soil fertility. Secondly, all domestic waste and animal excreta are humped during the dry season (November to April) and spread out into the garden during the rainy season to equally boost the level of the soil fertility. The third case is that when the crops are harvested in the garden; the remains of the harvest are left in the garden to decompose to enhance the fertility of the soil. These have improved crop yield in the gardens over the years and the sustainability of home gardens in the traditional area. Moreover, the high cost of chemical fertilizer motivates farmers to prepare compost to improve the fertility of the soil in their gardens.

Contributions of Home Gardening to Food Security

The average size of the home garden within the Nandom Traditional Area is 15m × 15m. The FGD revealed a wide variety of food crops and vegetables that survive well in the organic manure rich home gardens in the area; indicating that home gardening currently plays a significant role in household food security and would do so now and in the future (Zerihun et al, 2011). The household head determines the major crop to be cultivated and gives approval of any other crop(s) planted. The major crop is the dominant crop in the garden. Majority of the key informants (85%) indicated that the dominant crops cultivated included: maize, millet, guinea corn, yam and rice. In ranking the yields of food crops per 225m^2 of land, maize was ranked the highest and rice the least cultivated food crop in the home garden (Table 2).

The majority of the key informants (40%) indicated that the commonly cultivated crop was maize. Maize gives very good yield as compared to the other common crops cultivated per $225m^2$ (Table 2). Farmers have access to very viable and early maturing maize seeds from the seed growers in the region. The FGD complemented the dominance of maize citing the high demand for maize for preparing Tuo Zaafi (TZ). TZ is the most common staple food within the Traditional Area. Other uses of maize include: roasting and cooking of fresh maize for consumption and the use of its flour for the preparation of varied local dishes.

Table 2: Dominant Crops and Average Yield per $225m^2$ of Land

Food Crops	Frequency	Percentage	Average Yield ($Kg/225m^2$)
Maize	20.00	40.00	200.00
Millet	12.00	24.00	125.00
Guinea corn	10.00	20.00	100.00
Yam	5.00	10.00	50.00
Rice	3.00	6.00	25.00
Total	50.00	100.00	

Source: Field data, 2011.

The FGD also revealed the least cultivated as rice because it was considered cheaper to buy foreign rice in the market than to cultivate it since it is a late maturing crop. Also rice is not considered a staple crop in the area; hence not much attention is paid to the cultivation of the crop. Lastly, rice hardly survives in the home garden because; settlements in the traditional area are sited on high land areas and therefore limited water supply in the home garden. Home gardens in the area are rain fed and cultivated once in a year. This ignites the maximum use of limited land for home gardening.

Women emphasized their regular desire to cultivate vegetables in the home garden to support their domestic food needs and sale of the surplus to neighbours. Commonly cultivated vegetables include: okro, tomatoes, pepper, garden eggs, pumpkin etc. The findings revealed a high sense of multiple cropping (Plate 2) within the traditional area as indicated by Lamb (2003) but little is demonstrated in plant compatibility mechanism as an enhancing strategy in multiple cropping.

However, the FGD indicates that within the first two months of the rainy season food crops and vegetables are ready for household consumption from the home garden. This boosts the food security level of the people after the routine lean season in confirmation with Akosa (2011). Food then becomes available and accessible in its natural and fresh form as indicated by the FAO (1996).

Plate 2: Wide variety of food crops in a home garden

Source: Field data, 2011.

CONCLUSIONS

It is evidenced from the findings that the source of the soil for the construction of mud houses in the Nandom Traditional Area (when filled with domestic waste) becomes the nucleus of the home garden. The particular site is determined after a minimum of twelve months of local soil assessment process. Home gardens are mainly owned and controlled by men because of the high soil fertility level within the sites and consequently, there is the local intuition that women do not own farm lands and even if women own lands not the most fertile areas. However, the wide variety of vegetables cultivated in the home garden are owned and controlled by the women. The high soil fertility level fosters mixed cropping. Commonly cultivated food crops are: maize, millet, guinea corn, yam and rice respectively. Healthy and very viable food crop seeds from home garden are stored for future cultivation within and/or outside the garden especially by new settlers.

The home garden therefore becomes a viable means for the continuity of indigenous food crops seeds for cultivation now and in the future. Sustainability in the practice of home gardening in the Nandom traditional area is guided by ecological sustainability and socioeconomic sustainability. The repeated deposit of domestic waste in the home gardens and the application of environmentally friendly cultural based practices in the gardens enhance ecological sustainability. In addition, the timely availability of produce from the garden at the threshold of the lean season meets the social and economic needs of the people. The socioeconomic sustainability emerges from the use of the indigenous knowledge system to ignite growth and development in the community.

Deriving from the findings, the paper further concludes that home garden strives so well in the traditional area because of the effective and continuous use of compost to enrich the soil fertility. The study revealed three ways of maintaining high soil fertility in the traditional area: the continuous dumping of domestic waste in the home garden; humping of domestic waste and animal excreta during the dry season to make compost and gardeners purposively leaving the waste from the harvest to completely decay in the garden enhance soil fertility. Also maximum crop yield is obtained via the intense care given to individual crops within the garden as well as the collective labour force from the entire members of the house hold.
Despite the fact that home gardens are relatively small in size; the first harvest following the lean season is from the home garden hence at that material moment, home garden enhances the food security level since food then becomes available, accessible, and nourishing.

RECOMMENDATIONS

Following the conclusions drawn from the findings, the study recommends the need for agricultural extension officers in the district to enhance farmers' skills in compose preparation so that the fertility of large expanse of land can be improved. By so doing crop yield will be improved on a large scale and therefore placing the rural folk in a better food secured state.

To enhance food security in the traditional area, there is the need to expose farmers to improved variety of food crop seeds and appropriate technology to translate small scale cultivation in home gardening to large scale food crops cultivation.
Also farmers need to adopt better food storage and viable seed selection techniques. Furthermore, the agricultural extension officers need to educate farmers on crop compatibility to enhance crop yield in the commonly practice mixed cropping in the traditional area.

The study also recommends an intervention by the government and/or non-governmental organization to construct dams to induce all year round home gardening in the traditional area.

REFERENCES

Akosa, A. N. A. (2011) Feeding Ghana's Growing Urban Population – Is Home Gardening the Answer? Retrieved 03/01/2012, From: htt//www.Ghanabusinessnews.Com**.**

Assuncao, J.J., & Braido L.H.B. (2007). Testing Household-Specific Explanations for the Inverse Productivity Relationship. *American Journal Of Agricultural Economics 89(4): 980–990.*

Avery, A. (2007). 'Organic Abundance' Report: Fatally Flawed. *Renewable Agriculture and Food Systems 22(4): 321–323.*

Batterbury, S.P.J., & J.L. Fernando. (2006). Rescaling Governance and the Impacts of Political and Environmental Decentralization: An Introduction. *World Development 34(11): 1851–1863.*
Becker, R. F. (1984). Vegetable Gardening in the United States: A History, 1565 - 1900. *Hortscience*, 19: (5), 624-629.

Bruinsma, J. (Ed.). (2003). *World Agriculture: Towards 2015/2030; An FAO Perspective.* London: Earthscan Publications Ltd.

Cherry, A. M., & Di Leonardo, M. (2010). Gardening, Migration, and Women's Agency: Stories From Rogers Park. Retrieved 03/01/2012, From: *Groups.Northwestern.Edu/Nurj/Files/Articles/Full/Cherry.Pdf.*

Danish Research Center for Organic Farming (DARCOF). (2000). Principles of Organic Farming: Discussion Document Prepared for the DARCOF Users Committee. Retrieved 06/01/2012, From: Http://Www.Darcof.Dk/Organic/Princip.Pdf.

De Wolf, G. (1992). *Keeping Eden: A History of Gardening in America*. Boston: A Bulfinch Press Book.

Emsley, J. (2001). Enriching the Earth: Fritz Haber, Carl Bosch, and the Transformation of World Food. *Nature 410(6829): 633–634.*

Food and Agriculture Organization of the United Nations (FAO) (1996). The Rome Declaration on World Food Security and World Food Summit Plan of Action. Retrieved 31/01/2012, From: Http://Www.Fao.Org/Docrep/003/W3613e/W3613e00.Htm.

Ghana Statistical Services (2000). *Population and Housing Census, Provisional Results.* Accra: Ghana Statistical Service.

Heller, M. C., & Keoleian G. A. (2000). *Life Cycle-Based Sustainability Indicators for Assessment of the U. S Food System.* Ann Arbor, MI: University of Michigan.

International Assessment of Agricultural Knowledge Science and Technology for Development (IAASTD). (2009). Agriculture at a Crossroads: International Assessment of Agricultural Knowledge, Science and Technology for Development. Retrieved 31/01/2012, From: Http://Www.Agassessment.Org/.

Lamb, R.L. (2003). Inverse Productivity: Land Quality, Labor Markets, and Measurement Error. *Journal of Development Economics 71(1): 71–95.*

National Research Council (NRC). (1989). *Alternative Agriculture/Committee on the Role of Alternative Farming Methods in Modern Production Agriculture.* Washington, DC: National Academy Press.

Pimentel, D. (2006). *Impacts of Organic Farming on the Efficiency of Energy Use in Agriculture: An Organic Center State of the Science Review*. Foster, RI: The Organic Center.

Rosset, P. (1999). *Policy Brief Number 4: The Multiple Functions and Benefits of Small Farm Agriculture in the Context of Global Trade Negotiations*. Oakland, CA: Institute for Food and Development Policy.

Schupp J. B. S (2009). *Exploring the Social Bases of Home Gardening: A Thesis Presented in Partial Fulfillment of the Requirements for the Degree Master of Science in the Graduate School.* Ohio State University.

Seaton, B. (1981). "Idylls of Agriculture: Or, Nineteenth-Century Success Stories of Farming And Gardening." *Agricultural History*. *55: (1), Pp. 21 - 30.*

Teitelbaum, S., & Beckley T. (2006). "Harvested, Hunted and Home Grown: The Prevalence of Self-Provisioning in Rural Canada." *Journal of Rural Community and Development*. 1: (2), P. 114 - 130.

West Africa Regional Food for Peace Project (2004). Evaluation of the ADRA/Guinea Title II Funded Women's Gardening Project In Siguiri. Retrieved 31/01/2012, From: Http//Www.Usaid.Gov/Westafrica/Ffp/Pp/Ppl.Doc.

World Commission on Environment and Development (WCED), (1987). *Our Common Future*. New York: Oxford University Press.

Zerihun K., Weyessa G. & Adugna D., (2011). Understanding Home Garden in Household Food Security Strategy: Case Study Around Jimma, Southwestern Ethiopia. *Research Journal of Applied Sciences, 6: 38-43.*

ABOUT THE AUTHORS:

Ernest Bagson and Alfred Naamwintome. Beyuo: Department of Community Development, Faculty of Planning and Land Management, University for Development Studies, Wa, Ghana.