Developing Country Studies
ISSN 2224-607X (Paper) ISSN 2225-0565 (Online)
Vol.4, No.1, 2014

Social and Economic Implications of Home Gardening on the Livelihood of Farm Households in Abia State, Nigeria

Kelechi Igwe[1*] Fortune Agu-Aguiyi[2] Gloria Nwazuruoke[3]

1. Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, P. O. Box 2, MOUAU Post Office, Umudike, Nigeria
2. Department of Rural Sociology and Extension, Michael Okpara University of Agriculture. Umudike, P. M. B. 7267, Umuahia, Abia State, Nigeria

* E-mail of the corresponding author: kayceigwe@gmail.com

Abstract
The study examined the social and economic implications of home gardening on farm households in the study area. It specifically assessed the various plants and enterprises undertaken under home garden in the area, established the pattern of home garden production, elucidated the social and economic benefits of home gardening and examined the factors that affect home garden production. The readily available land and capital inputs were the basic factors that significantly determined home garden production and thus contribute to improved household income of the gardeners. The study recommends increased research intervention in home gardening which could be stimulated by creation of platform to discuss home garden issues and encouraging all households to engage every fallow land around them to the practice of home gardening. This will in addition to helping household members keep fit which provide a meaningful non monetized return to the household would also contribute in terms of better nutrition and improved income.
Keywords: Home garden, social, medicinal, economic, livelihood, Abia State

1. Introduction

There is no universal definition of home garden (Gautam *et al*., 2004). However, Kumar and Nair (2004) defined home gardens to mean the intimate, multi-storey combination of various trees and crops in association with domestic animals around homestead. From an ecological and land use perspective, home gardens involve the management of multipurpose trees, shrubs, annual and perennial agricultural crops, herbs, spices, medicinal plants, fish prices and animals on the same land unit, in a spatial arrangement or on a temporal sequence (Eyzaguirre and Linares, 2004). Home gardening as a concept refers to the cultivation of small portion of land which may be at the back of a home or within a walking distance from home (Odebode, 2006). It is this concept of cultivation of land at the back of home or within a walking distance for the purpose of meeting multipurpose family and households needs that gave the research its focus.

Landon-Lane (2004) in tracing the origin of home gardens noted that people have had gardens near homes for thousands of years. It is not hard to imagine: fruit, vegetables and grains gathered from the wild were taken to family huts for meals. Some seeds fell to the ground; other seeds were released after the fruit had been eaten. The seeds germinated and grew and were cared for by those in the family who knew what the plants were. This was the quiet arrival of home garden (Landon-Lane, 2004). Over the years therefore home gardens have become an integral part of the livelihood systems, and could contribute to the family food, income and the conservation of biodiversity (Shrestha *et al*., 2004). The need to develop home gardening is becoming pertinent.

Globally, famine and starvation are becoming severe. As the world population expands, the food problem on the other hand continues to become increasingly severe, with the number of those malnourished reaching 3 billion (Olajide-Taiwo *et al*., 2010). Within the last two decades, Africa's rate of population growth has been higher than the rate of food production though food security has been identified as an important policy goal of many African countries. It therefore means that policy goal is far from being accomplished in developing countries of Africa. Diakalia (2007) had validated the claim when he observed that too many African countries have continued to be food insecure especially among the rural-poor. He opined that curbing this can only be achieved by conscious integration of home gardening strategy into the rural and urban development plans of nations.

Micronutrients deficiency is inevitable in many developing countries where the challenge of meeting the household dietary requirements is onerous. Kennedy *et al*., (2003) observed that lack of diversified diets with limited amounts of fruits, vegetables, or animal source foods that contain large amounts of micronutrients deficiencies has affected the developing world inevitably. There are three main strategies identified for addressing micronutrient malnutrition: dietary diversification, fortification and supplementation (Kennedy *et al*., 2003). These strategies that are better explained as crucial livelihood strategies seem not to have been considered by farmers, researchers and policy makers in a manner desperate enough to contribute significantly to improved farm management with the aim of achieving increased source of family nutrition.

Dietary diversification through home gardening particularly has been identified to effectively address most of the

micronutrient deficiencies in the developing world (Tucker, 2001; Johns, 2003). Diversified food, which includes fruits and vegetables in diet, increases longevity and reduces the rates of chronic degenerative diseases (Tucker, 2001; Johns, 2007) and also could improve the nutritional quality of the child growth in developing countries (Johns, 2003; Ruel, 2003). Home gardening can thus improve nutritional status more specifically on micronutrients status of women and children and poverty reduction, which is one of the appropriate food-based approaches that could be an essential part of the long-term global strategy to alleviate vitamin A and iron deficiencies which their potentials are yet to be fully explored (Krishna, 2004).

Farmers have been reported to use home gardens as site of experimentation, introduction and domestication of plants that farmers like (Engels, 2002; Shrestha *et al*., 2002; Shrestha *et al*., 2004). Studies done in Nepal have showed that home gardens have multiple uses: as a source of livelihood, firewood and timber, spices and medicinal plants, green manure and pesticides; they are closely associated with the farming practice and are considered to be one of the key components of farming systems. Home gardens are considered to be one of the major contributors of rural livelihoods (Shrestha, *et al.*, 2002; Regmi *et al*., 2004). In rural areas of Nepal for instance where about 90 percent of the total population lives, home gardens are an important source of food, supplying most of the vegetables and fruits required by the family (Shrestha *et al*., 2002).

Beside the nutritional benefits, home gardening has aesthetic as well as physical fitness benefits because it gives household members opportunity for recreation and relaxation as they exercise their muscles in the bid to provide family nutrition. It appears obviously that home gardening relative to countries like Nepal has not been well developed in Nigeria. Focussing on Abia State, the study therefore seek to investigate the implications that home gardening has had on the livelihood of farm households particularly in social and economic dimensions with the view to create awareness on the potentials of home gardening in the growth of the economy. This would position researchers, scientists, policy makers and other stake holders in the economy to explore this relatively neglected area in agriculture in the study area.

2. Methodology

2.1 Study Area

The study was carried out in Abia State. Located in south eastern Nigeria, the capital of the state is Umuahia. The state was created in 1991 from part of Imo state and its citizens are predominantly Igbo people. The name Abia originally is an abbreviation of Aba, Bende, Isiukwuato and Afikpo. It has a population of 2,833,999 as of 2006 Census estimate (Igwe, 2012). The state shares common boundaries to the north with Ebonyi state; to the south and south west with Rivers state; to the East and south east with Cross River and Akwa Ibom states respectively; and to the west with Imo state. The state occupies an area of about 6420 km^2 with about 2.6 percent of the population of Nigeria; has an average population density of 364 persons per square kilometre with 63 percent (63%) involved in agricultural production and an average household of 6 persons per family (NPC, 1991; World Bank, 2000; NPC, 2006). Agriculture is the major occupation of the people of Abia state and about 60% of the state's population engages in one form of farming activities or another due to the relative rich nutrient of her soils.

2.2 Sampling Procedure

A combination of purposive and multistage sampling techniques was applied in selecting sixty farm households, drawn from two communities of sub-urban and rural settings respectively. Three villages were selected making a total of six villages and ten farm households that engage in home gardening were selected in each village for the study. Two sets of questionnaires were used to solicit information for the study. The first set of questionnaire was used to generate intra household views and participation in home gardening while the second set was to generate farm production data on the vegetable and fruit farms located either at the farm households' backyard or around their residential house. In the second set of questionnaire, the information derived from the household head who is the major decision maker on the farming activities in the household was used for the analysis.

2.3 Method of Data Analysis

Descriptive statistics was the major instrument for data analysis, though multiple regression analysis fitted by means of the ordinary least squares was used to examine the factors that affect the returns that households make from vegetable gardening. The multi-regression analysis was fitted by means of the ordinary least squares (OLS). The model for the OLS is specified implicitly as:

$Y = f(X_1, X_2, X_3, X_4, X_5)$ ... 1

Where Y = Output from the Garden in naira; X_1 = Size of garden in hectare; X_2 = Labour in man days; X_3 = Cost of inputs in Naira; X_4 = Capital inputs; and X_5 = Quantity of manure in Kg

The four functional forms namely linear, exponential, semi log, and double log were tried and the model with the best fit was chosen based on known econometric criteria.

3. Results and Discussion

3.1 Plants and Enterprises Undertaken in Home Gardening

The plants and enterprises usually undertaken by farmers in their home gardens in the study area are as indicated in Table1. Respondents cultivated in their home gardens over seventeen enterprises. The result proves that the most preferred produce of the home garden is maize with 96.67%.

Table 1: Distribution home garden crops/Enterprises among farm household

Home garden crops Cultivated	Frequency	Percentage	Ranking
Yam	45	75.00	6th
Cassava	2	3.33	16th
Amarantus	26	43.33	12th
Okra	46	76.67	5th
Maize	58	96.67	1st
Fluted pumpkin	50	83.33	3rd
Tomatoes	5	8.33	15th
Pepper	52	86.67	2nd
Water leaf	42	70.00	7th
Pineapple	37	61.67	9th
Cocoyam	29	48.33	11th
Utazi	37	61.67	9th
Ukazi	32	53.33	10th
Bitter leaf	39	65.00	7th
Potatoes	6	10.00	14th
Mellon	47	78.33	4th
Spinach	1	1.67	17th
Uziza	1	1.67	17th
Medicinal Enterprise	23	38.33	13th

Source: Field survey, 2013

Apart from yam, the first ten crops cultivated were majorly leafy vegetables and fruits, two of which belong to the neglected and underutilized (NUS) species of crops. All the crops identified by respondents to be cultivated for medicinal purposes were categorized as medicinal enterprise. They are presented under a separate discussion in Table 4.

3.2 Labour Usage for Home Gardening

Table 2 shows the use of labour among home garden users. The result indicate that although all the respondents use family labour, that about 26 percentage of those who do also employed hired labour for their home gardening activities. This has great economic implication for such farm households. No farmer would rationally engage in the services of paid labour if there were no anticipated benefit to the household.

Table 2: Use of Labour by the Home Garden Practitioners

Use of Labour	Frequency	Percentage
Family	60	100
Hired	26	43.33

Source: Field survey, 2013

3.3 Social and Economic Derivatives from Home Gardening by Farm Households

Keeping of gardens at home has social benefits although this culture has not been properly integrated among the farming system of the area. The social as well as the economic benefits are presented in Table 3.

Table 3: Farm Households Perception of Social Benefits in Keeping Home Gardens

Benefits	Frequency	Percentage
Social		
Recreation(Pleasure/hobby)	27	45.0
Easing of emotional Stress	12	20.0
Relief of Mental fatigue	18	30.0
Environmental benefits/beautification	23	38.3
Economic		
Better nutrition	35	58.3
Easy source of fresh vegetables	49	81.7
Income Generation	17	28.3
Reduction in family food budget	42	70.0
Conservation of medicinal plants	23	38.3

Source: Field survey, 2013

N/B: Multiple responses were received

There were about four variables of interest for social benefits and five for the economic benefits. This was

patterned following Olajibe-Taiwo (2010). The findings of this study closely corroborated with that of Olajibe-Taiwo et al. (2010) for economic benefits in respect of reduction in family food budget. Easy source of fresh food was about 35.7% for a study done by Olayide-Taiwo (2010) in Oyo State but 81.7% was observed in the study area. This implies that nearness of the garden encourages farm families to process their foods without delay much more in the study area than was the case with home gardens for a study done in Oyo State. Fresh food processing and accessibility for farm families is a key motivator for home gardening in Abia State. It necessary to sustain and deepen this concept in any developed package for improving home gardening for the study area.

Income generation was not vividly the reason for home gardening in the study area. If for anything else households go into home garden to guarantee and have the feel of having a nearby source of meeting emergency dietary needs of the household and to satisfy an inherent household farming spirit.

Olaide-Taiwo *et al*., (2010) credited to USDA (2008) that gardening can be a great exercise for individual suffering from arthritis (joint pain) and a stress reducer when done correctly, for maintaining joint flexibility and quality of life. Thus, the consciousness of incorporating exercise as a need to own a home garden during extension services for the farming communities and the generality of the people in the study area is imminent. This is because many people are yet to cultivate daily exercises as a habit. While emphasis on daily exercises should persists during extension, encouraging many persons to own home gardens for the singular reason of keeping fit in health among other things is beneficial to the farm families. This is because gentle exercises strengthens the muscles and damaged joints and can improve quality of life in the long run. Predny (2009) observed that for individuals suffering from arthritis, gardening can be a great exercise and stress reducer when done correctly, being an excellent activity, maintaining joint flexibility, range of motion and quality of life. This means that educating households on benefits derivable cannot be overemphasized.

From the economic point of view, farm households are majorly motivated to always get involved in home gardening because of better nutrition, ease in assessing fresh foods and a reduction in family food budget. However, it was only for recreational purposes were the respondents observed to have the highest reason (45%) for engaging in home gardening. Torkidsen (2013) has reported that there is a growing popularity of gardens for growing things or relaxing as reflected in the growth in the number of gardening books, programmes on television and garden centres. Demand for more updated board games among others has stimulated commercial investment in recent times. This is commendable and should drive policies for home gardening to favour the global trend. With respect to the study area, there is yet need for reorientation of households on the recreational purposes of home gardening. Enlightenment campaign by non-governmental bodies could be beneficial because there is yet need for these cliental to emerge in the study area appreciably.

3.4 Medicinal Plants Cultivated under Home Gardening Practices

Table 4 shows the distribution of respondents according to the plants cultivated solely for medicinal purposes in their home garden. The results indicate that some of the garden users had one medicinal plant or the other in their home garden beside their other possible uses. It also goes to emphasize that households in the study area have capacity for alternative medicine, which is globally being advocated for even by leading experts in orthodox medicine. There is a new approach of eating vegetables and fruits in as natural a state as possible to restore the body's natural insulin sensitivity, or as close to it as we can get. Vegetables and fruits can prevent the likelihood of adult onset diabetes; they can reduce use of medicine and could help most people get off their drugs completely (Barnard, 2003; Malkmus *et al*., 2006).

With respect to ginger for instance, there are documentation of its established long history of serving as an alternative medicine to prevent motion sickness although the mechanism of its action is yet unknown (Goel and Sairam, 2002).

Table 4: Distribution of respondents according to medicinal plants

Medicinal plants	Frequency	Percentage
Utazi	8	13.33
Oda-opue	1	1.67
Lemon grass	1	1.67
Bitter leaf	3	5.00
Garden egg leaf	2	3.33
Neem	1	1.67
Water leaf	2	3.33
Okpe nkwu	1	1.67
Scent leaf	2	3.33
Alovera	1	1.67
Uleke	1	1.67

Source: Field survey, 2013

3.5 Determinants of Home Garden Production

The factors that affect home garden production were examined using the vegetable/crops cultivated under home garden production as a proxy for the entire home garden production system. Table 5 shows the coefficients of the various factors of production and their level of significance.

The estimated determinants of the factors that affect the output from home garden were investigated and result of findings presented in Table 5. The explanatory variables solicited for were fitted to the model against the output as dependent variable by OLS multiple regression analysis. Four functional forms were tried namely: semi-log, Cobb Douglas, exponential and linear. Using statistical and econometric criteria of relative higher value of the R^2, the F-ratio and significant levels, the numbers and signs of the significant variables, the exponential form was chosen as the lead equation for the study. The function showed a coefficient of multiple determinations (R^2) of 0.74 which showed that 74% of the variations in the output from home garden was explained by the included variables.

The coefficient of size of garden was highly significant at 1% level and has a direct relationship to output from home garden. This implies that the more size of home garden the higher the output from home garden and vice-versa. Households with larger size of garden will utilize their space to raise more garden and so would produce more and invariably make more income to meet their nutritional and other household needs. The finding on the relationship between farm size and output agrees with the findings of Ndukwu (2010).

Table 5: Factors of Home Garden Production

Variables	Linear	Exponential	Semi log	Double log
Constant	1.939	1.300	-2.009	.807
	(1.248)	(6.743)^{xxx}	(-.822)	(2.673)**
Size of farm land (X_1)	.492	.508	.417	.418
	(2.916)***	(3.073)***	(3.113)***	(3.191)***
Labour (X_2)	.009	.011	.048	.047
	(.089)	(.115)	(.473)	(.479)
Cost of I inputs (X_3)	-.170	-.184	-.148	-.144
	(-1.080)	(-1.187)	(-1.145)	(-1.142)
Capital inputs (X_4)	-.589	.589	.594	.599
	(5.353)***	(5.464)***	(5.138)***	(5.302)***
Quantity of manure (X_5)	-.049	.046	.059	.058
	(-.590)	(.566)	(.894)	(.703)
R^2	0.730	0.741	.716	0.729
R^2 Adjusted	0.699	0.711	.684	0.698
F-ratio	23.759***	25.130***	22.209***	23.657***

Source: Field survey, 2013

N/B: *** Significant at 1%; ** Significant at 5%; * Significant at 10% The figures in parenthesis are t-ratio

Capital input was also significant at 1% level and was positive in its sign. This implies that the higher the cost of capital inputs, the higher the output from home garden. Given that the farm holdings are usually not too large, the household capital for farm work is best used in the home garden before any distant farm, thus, the high cost of the equipments etc. would not reduce the output rather, it enhances it. This however is not inconsonance with *apriori* expectation, but also agrees with the findings of Ndukwu (2010) and Okoye (2006). The farm equipments used in the farm also serve the household in many other ways and so the cost is not usually worrisome to the home garden owners.

4. Conclusion

Home gardening is an age long practice although it has not been properly developed among farm households and is yet to be given the needed policy attention in Abia State. Findings from sixty households in the study area indicate that it has economic as well as social implications on the livelihood system of the farm households. Size of garden and capital input are the most significant factors to consider for improved home garden production system in the study area. Enlightenment campaign is needed for the farming communities in the area to have a good understanding of home garden and integrate it properly in their family life given its numerous benefits. More researches in home gardening to boost nutrition of farming communities are necessary particularly since the culture of daily exercises is yet to be inculcated by the generality of the citizenry in the study area

References

Barnard, N. (2003), Video Interview by George Malkmus, November 2013 at Physicians Committee for Responsible Medicine, Washington, DC

Diakalia, S. (2007), ‘’Africa’s Food Status: Implications and Challenges in a Changing World in facing up to

Food Crisis in Sub Saharan Africa: The Challenges, Gaps and Role of Agricultural Policies'', *Proceeding of the 12th Annual Symposium of the International Association of Research Scholars and Fellows*

Engels, J. (2002), ''Home Gardens – A Genetic resources Perspective''. In: Watson J. W. and Eyzaguirre, P. B. (eds). Home Gardens and in situ Conservation of Plant Genetic Resources in Farming Systems. *Proceedings of the Second International Home Garden Workshop, 1*7-19 July, Witzenhasen, Germany. DSE/ZEL, GTZ, IPGRI

Eyzaquirre, P. B. and Linares, O. F. (2004), Home Gardens and Agro biodiversity. Smithsonuan Books, Washington, DC

Goel, R. K. and Sairam, K. (2002), ''Anti-Ulcer Drugs from Indigenous Sources with Emphasis on *Musa Sapientum, Tamrabhasma, Asparagus Racemosus, and Zingiber Officinale,*'' *Indian Journal of Pharmacology* 34: 100-110

Guatam, R., Suwal, R. and Sthapit, B. (2004), Assessment of Dietary Diversity: A Basis for Promoting Plant Genetic Species in Home Garden. Home Gardens in Nepal, Proceedings of a National Workshop, 6-7 August, 2004. Pp. 99-104

Igwe, K. C. (2012), ''Optimum Combination of Arable Crops and Selected Livestock Enterprises in Abia State, Nigeria: A Linear Programming Approach'', *PhD Dissertation* Submitted to Post graduate School, Michael Okpara University of Agriculture, Umudike, 112p

Johns, T. (2003), ''Plant Biodiversity and Malnutrition: Simple Solutions to Complex Problems'', *African J. of Food Agric. Nutrition Development* 3: 45-52

Kennedy, G., Nantel, G. And Shetty, P. (2003), "The Scourge of hidden hunger: Global Dimensions of Micronutrient Deficiencies'', *Food, Nutrition and Agriculture* 32: 8-14

Krishna, G. C. (2004), Home Gardening as a Household Nutrient Garden. In: Guatam, R., Sthapit and B., Shrestha, P. (eds) Home Gardens in Nepal, Proceedings of a National Workshop, 6-7 August, 2004. Pp. 48-52

Kumar, B. M. and Nair, P. K. R. (2004) The Enigma of Tropical Home Gardens. *Agro-forestry Systems* 61: 135-142

Landon-Lane, C. (2004) Livelihoods Grow in Gardens, Diversifying Rural Income through Home Gardens, Diversification Booklet 2, Food and Agriculture Organization of the United Nations, Rome

Malkmus, G., Shockey, P and Shockey, S. (2006) The Hallelujah Diet Experience the Optimal Health You were meant to have, Destiny Image Publishers, Inc., USA, 381p

National Population Commission (1991). 1991 Population Census of Federal Republic of Nigeria, Report Phase 11: 29-30

National Population Commission, NPC (2006). National Census. National Population Commission's Report, October, Abuja, Nigeria

Ndukwu, P. C. (2010), Gender and Relative Efficiency in Sweet Potato (*Ipomea batas*) Production in Imo State, Nigeria. *MSc Thesis*, Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike

Odebode, S. O. (2006), ''Assessment of Home Gardening as a Potential Source of Household Income in Akinyele Local Government Area of Oyo State, Nigeria'', *Journal of Horticultural Science* 2: 47-55

Olajide-Taiwo, F. B., Adeoye, I. B., Adebisi-Adelani, O. and Odeleye, O. M. O. (2010), ''Assessment of the Benefits and Constraints of Home Gardening in the Neighbourhood of the National Horticultural Research Institute, Ibadan, Oyo State'', *American-Eurasian Journal of Agricultural and Environmental Science* 7 (4): 478-483

Predny, M. (2009), ''Gardening and Your Health: Arthritis,'' *Publication 426-062*, Virginia Cooperative Extension, Virginia Polytechnic Institute and State University, 2p

Regmi, B., Aeyal, K., Tamang, B., and Shrestha, P. (2004), Home Gardens: An Opportunity to Minimize Pressure on Slash and Burn System and Option for Improving Dietary Diversity of Chepang. In: Guatam, R., Sthapit and B., Shrestha, P. (eds) Home Gardens in Nepal, *Proceedings of a National Workshop, 6-7 August, 2004* , Pp. 35-47

Ruel, M. T. (2003), Operationalizing Dietary Diversity: A Review of Measured Issues and Research Priorities, *Journal of Nutrition* 133: 3911-3926

Shrestha, P., Gautam, R., Rana, R. B. and Sthapit, B. R. (2002), Home Gardens in Nepal: Status and Scope for Research and Development. In: Watson, J. W. And Eyzaguirre, P. B. (eds) Home Gardens and in situ Conservation of Plant Genetic Resources in Farming Systems, 17-19 July, 2001, Witzenhausen, Germany/IPGRI, Rome, pp. 105-124

Shrestha, P., Gautam, R., Rana, R. B. and Sthapit, B. (2004), Home Gardens in Nepal: Status and Scope for Research and Development. In: Eyzaquirre, P. B. and Linares, O. F. (eds). Home Gardens and Agro biodiversity. Smithsonian Books, Washington, DC

Torkidsen, G. (2005), Leisure and Recreation Management, 2nd Edition, Routledge 592p

Tucker, K. L. (2001), ''Eat a Variety of Healthy Foods: Old Advice with New Support'', *Nutrition Review* 59:

157-158
World Bank (2000). World Bank Development Report 2000/2001: Attacking Poverty. World Bank, Washington D.C, USA.