

HOUSEHOLDS' SOCIO-ECONOMICS AND URBAN FOOD SECURITY: THE CASE OF BACKYARD CROP PRODUCTION IN PERI-URBAN AREAS OF OSUN STATE, NIGERIA.

¹Omodara, O. D., ²Baruwa, O. I., and ³Tanimonure, V. A.

^{1,2,3}Department of Agricultural Economics, Faculty of Agriculture, Obafemi Awolowo University, Ile-Ife, Nigeria
Corresponding Author: omodarao@oauife.edu.ng; omodaraolabisi@yahoo.com

ABSTRACT

In the wake of expanding urbanization and increased urban unemployment, backyard crop production has become an important approach to urban food security. In view of this, the paper examined households' socio-economic characteristics that affected backyard crop production in Osun State, Nigeria with a view to identifying the factors driving backyard cropping as well as the constraints to its extension among urban households. Data were collected from 105 respondents with the aid of structured questionnaire across the major urban communities in the four geo-political zones in the State. The result showed that average age of backyard farmers was 49±29 years with 6 years farming experience. Both the male and female headed households were involved in the practice and have average household size of 6±2 members. The practice is observed mostly among the self-employed households and mainly done to provide food supplements (63%) as well as fresh vegetables (37%) for the households. Regression analysis showed that age, sex, educational status, household size, economic status of children, land acquisition method and membership of association, significantly affected backyard crop production. Vegetative destruction of crops by goat and livestock (50.0%), lack of sufficient farmland (20.0%) and low soil fertility (15.7%) were constrained backyard crop production in the study area. Policies that abrogate communal extensive livestock and goat rearing, sensitize the social associations about the benefits of backyard cropping, and ease the process of land access among households in the urban communities are necessary to improve the practice of backyard crop production in the Osun State.

Keywords: backyard farming, public policy, urbanization, household nutrition, vegetable production, community, poverty alleviation.

INTRODUCTION

In a world besieged with challenges of food insecurity, one of the new dimensions globally adopted in meeting food requirements in the urban communities of today is urban farming. Farming in the cities is from the time immemorial, but this practice has received tremendous recognition in recent time when food insecurity challenge became global concern.

Peri-urban farming is the cultivation or/and rearing of farm animals within residential environment at the peripheral (outskirt) of the city for the purpose of producing food, meat and other animal products for household use. Globally, about 800 million people engaged in urban farming with not less than 200 million producers cultivating at marketable surplus, creating about 150 million full time jobs (UNDP, 1996 and Vagneron, 2006). This means that urban farming contributes to both economic development and human empowerment of the urban communities. Apart from greening the nature, this practice plays several other

roles in the process of meeting the objective of food security in the developing nations. Urban farming contributes to household-made food in the urban communities; creates job opportunities for many; and at the same time supplements and/or complements households' food requirements for survival as well as the income needed to support sustenance of a sizable proportion of the urban dwellers (FAO, 2001; Vagneron, 2006; Lewis, 2011; Berhanu, 2011; Todaro and Smith, 2012).

One of the most effective methods to farm in the cities is the backyard farming. According to Olawepo (2012), backyard farming is a system of putting piece(s) of land located around and/or close to the residential buildings or within the vicinity of residence into agricultural use. This crop production unit could be a garden, an orchard, a piece of land cultivated within a fenced residential building (yard) or an open space outside the residence. In Nigerian cities, crops such as plantain, banana, vegetables, grains, roots and tubers as well as livestock rearing: goat, sheep, cattle, poultry, pig, rabbits and

aquaculture are mostly associated with backyard cropping (Cofie et al., 2003; Badmus and Yekini, 2011; Olawepo, 2012). In other words, backyard farms provide both nutritional and economic benefits to the practicing households. These crops and animals are either managed intensively or extensively depending on farmers' socio-economic attributes. In most times, farms are managed by the members of the household (Salau and Attah, 2012). The combinations of livestock and crop husbandries in backyard farms can supplement input needs of one enterprise by the other (Lee-Smith, 2010). The activities of one enterprise, however, could constitute threat to the growth of another enterprise and as well, pose danger to the overall community well being leading to inhibitive outcome. For instance, extensive husbandry of goat and poultry enterprises could result into negative environmental impacts (Moustier, 2007), and make poor reflections on the production cost, quantity of crop produce and yield.

Nigeria population is burgeoning and consequently, mouths to feed are multiplying. On daily basis, Nigeria's population increases and already reached 170 million in 2014 (NPC, 2014). The increasing population coupled with persisting income inequality, inefficient resource use and characteristic rural economy repositioned the nation to be re-dominated with resource-poor households, making the number of impoverished households in the cities more than those who are food secure. According to National Urban Development Policy (NUDP), the proportion of urbanized communities in Nigeria increased from 10% in 1960 to 48% in 2012 while urban population rose by about 50% (NUDP, 2012; Salau and Attah, 2012). Consequently, new urban communities created while the existing ones expanded. Rural-urban migration transferred poverty to urban centers gradually as poor people reside more and more in the cities and poverty becomes urbanized without any substantial increase in the newly created jobs to absorb the unemployed people (Henderson, 2002; Todaro and Smith, 2012). In cases where new institutions are planted, urban population rise undermines income inflow from such establishments while some other make urban dwellers worse-off due to the peculiar high standard of living. By so doing, increase in the competition for limited urban resources worsen food access in the cities (Mougeot, 1999 and 2006; Lewis, 2011; Berhanu, 2011). The growing competition dispossesses the capacity of the poor and magnifies social problems (Berhanu, 2011; Todaro and Smith, 2012).

The challenge of urban food insecurity in Nigeria has

changed from just "feeding the cities" (or maintaining aggregate supply) to that of access at household and individual level (Olawepo, 2012; Salau and Attah, 2012). Increase in demand for food had not only been met by limited food supply but also price hike. This is because there is a decline in the marketable surplus coming from the few people that remain in the rural communities to urban markets as more people move to the cities (Lewis, 2011; Salau and Attah, 2012). These high staple prices made basic food items inaccessible to the urban poor (Berhanu, 2011). Congruently, feeding the urban communities becomes a serious issue as poor urban households result to other available practices to mitigating urban food insecurity.

Urban farming as a practice has gained grounds tremendously in Nigeria. Studies by Salau and Attah (2012) reported about 66% of urban families in Nassarawa State to survive on self-produced food. Similarly, Olawepo (2012) noted that 16% households in the towns and Nigerian cities have gardens where food crops are cultivated. Similarly, findings by Badmus and Yekini, (2011); Hororka and Lee-Smith (2005) and Fiona (2000) showed that urban farming is mainly associated with horticultural crops and gender plays a vital role in the practice. From the foregoing, the need for backyard farming for survival in the face of food shortage and price hike is obvious. Therefore, it is imperative to identify the socio-economic characteristics of household involved in backyard crop production in order to determine the household's socio-economic factors that affect the practice; identify food crops that are supplemented through backyard crop production with a view to determining the policies that are necessary to encourage backyard crop production in Nigeria.

METHODOLOGY

The study was carried out in Osun State, southwest Nigeria. The state is bounded in the west by Oyo State, East by Ondo and Ekiti States, North by Kwara and South by Ogun State. It is located at longitude 40 and 50°E of the equator and latitude 70 and 80°N. Osun State has a population of over 2 million with more than one third of the population living in the urban communities. It has a total land area of 888,250 hectares (8882.5km²) (OSSADEP, 2000). More than 40% of her major towns are fully urbanized and account for about a quarters of the 30 LGA in the State. This is because the State is domiciled with many tertiary educational institutions, federal government agencies and public establishments that attract people from various works of life for residence.

Osun State is geo-politically divided into four regions. These are Ife/Ijesha, Iwo, Ede and Oshogbo regions. Farming and agricultural trading dominate the occupation of the people with the production of both the permanent and arable crops. A multistage sampling technique was employed. Firstly, a purposively selection off our LGA mainly due to prevalence of urban communities in the areas. These include Ife Central, Ilesha West, Oshogbo and Iwo LGAs. From each of the LGAs, two peri-urban areas were purposively selected and third stage involved random selection of 15 farmers per LGA for interview totaling 120 respondents in all. Out of the 120 respondents interviewed, only 105 provided information found analyzable. Structured questionnaires were administered to elicit information on the socio-economic characteristics and outputs of backyard crop farmers. Descriptive statistics and regression model were employed to analyse the data. Descriptive statistics was used to describe the socio-economic characteristics of the respondents, reasons for backyard cropping and the constraints associated with the system. Ordinary Least Square (OLS) Regression model was used to determine the household's socio-economic factors affecting backyard crop production in the study area. Three functional forms of the model were considered: linear, semi-log and double log. The lead equation was chosen based on the compliance of the result with the underlying economic theory, number of significant variables and fitness of the coefficient of determination (R^2). Among the three models, parameter estimates of the linear model had the best attributes that met these criteria and was chosen as the lead equation.

The model is implicitly specified as

$$Y_i = f(X_i \dots X_m) \dots \dots \dots (1)$$

Where m is the total number of explanatory variables (X).

The mathematical specification of the model is

$$Y_i = \alpha_0 + \sum_{i=1}^m \beta_i X_i + \varepsilon_i \dots \dots \dots (2)$$

The three functional forms are given as

$$Y_i = \alpha_0 + \sum_{i=1}^{10} \beta_i X_i + \varepsilon_i \dots \dots \dots (3) \text{ (Linear model)}$$

$$\text{Ln}Y_i = \alpha_0 + \sum_{i=1}^{10} \beta_i X_i + \varepsilon_i \dots \dots \dots (4) \text{ (Semi-log model)}$$

$$\text{Ln}Y_i = \alpha_0 + \sum_{i=1}^{10} \text{Ln}\beta_i X_i + \varepsilon_i \dots \dots \dots (5) \text{ (Double log model)}$$

Where Y_i = value of crop output (naira) and X_i range from 1-10.

X_1 : X_1 =age (year), X_2 =sex (1=male, 0=female), X_3 =marital status (1=single, 2=married, 3=separated), X_4 =education qualification (years spent in school), X_5 =household size (number of people), X_6 =occupation (categorical), X_7 =farm acquisition method (1=personal, 2=lease, 3=gift), X_8 =farming experience (years), X_9 =membership of cooperative society (1=member, 0=otherwise), X_{10} =economic status of children (1=working, 0=schooling), ε_i = disturbance error.

RESULTS AND DISCUSSION

Socio-economic characteristics of backyard crop producers

In Table 1a, majority (36%) of the respondents were within the age range of 41-50 years. The mean age (49.33±29.13 years) of the respondents indicated that alongside of being productive, substantial numbers of backyard farmers are within their economic-productive years. This result is in line with findings of Chah *et al.* (2010); and Salau and Attah (2012). About 87% of the respondents were married with mean household size of 6 members. This informs that backyard farming households are averagely populated and possess common demographic characteristics of urban households that is not more than 6 members per household. This emphasized that backyard farmers have home responsibilities to cater for. Gender distribution revealed that both male (49.5%) and female (50.5%) headed households were equally involved in the practice. The finding disagreed with Hovorka and Lee-Smith (2005) that women tend to dominate urban cultivation because they are marginalized in other forms of employments in the formal sector of urban economy. The current economic status of the children revealed that about 66% of these children were schooling, 11% were working while 23% were both schooling and working. The implication is that majority of these household members were fully dependent.

Majority (59%) had less than 6 years of farming experience wherein most households were newly resident with an average farm size of 0.39±0.12 ha and about 51% cultivated between 0.2 and 0.4 ha. This average farm size is equivalent to 2.3 plots of land which is larger than average plot for residential building in most peri-urban communities in Nigeria. This implies that majority of the households involved in this practice did not limit themselves to personal plots alone but also accessed other unused plots for crop production. The

result was in agreement with Moustier (2007) and Olawepo (2012) who observed that urban farmers cultivate small farms at subsistent level in Nigeria due to constraints of land accessibility.

In terms of occupational distribution, backyard farmers were majorly self-employed. Result from Table 1b showed that 13% were schooling, 13% were in civil service, 21% were into craft and handiworks (artisans) while 53% were into trading and retired. This result agreed with findings of Salau and Attah (2012) and Foeken and Mwangi (2000) that most of the farming activities in the urban areas were carried out on part-time basis by people engaged in other occupations. This implies that backyard farming is peculiar in attribute to people of certain economic status, showing the peculiarity of the economic class involved in backyard farming (Table 1b). This was mainly identified to be artisans, traders and retirees. Therefore, this practice could be significant in meeting nutritional and financial needs of this economic class among the peri-urban households. Moreover, the education level of the respondents revealed that majority of the backyard crop farmers were literates with frequency distribution of 12% for those who did not go to school and 49% had tertiary education. It became obvious that backyard crop production has gained ground even among the city elites. In terms of cooperative associations, backyard crop farmers in peri-urban areas were found wanting. In all, only 25% belong to cooperative association while 75% did not. Those that belonged to associations were motivated by the numerous benefits the association

offered including information on access to seed and other farm inputs. This result supports the finding by Salau and Attah (2012) that urban farmers are not socially inclined.

More than half of the households (50%), cultivated backyard farms to augment households' food needs. About 28% of the households engaged in the practice in order to access fresh spices and vegetables for family consumption while only a few (16.5%) generated cash from backyard farm outputs. This indicates that the capability of the households to explore additional food sources was partially met through the practice of backyard crop production. This is in line with the finding by Henderson (2003) and Hovorka *et al.* (2009) that urban agriculture has important and positive effects on poverty alleviation, local economic development, food security, nutrition and health of the urban poor. In terms of land acquisition, about 24% of the respondents inherited farmland, 57% purchased, and 8% obtained farmland by lease while 11% were given the farmland used for backyard crop production. This suggests that homestead crop farming is a common practice mostly among the house-owners in the peri-urban areas of Osun State while the poor who live in rented apartments were less involved in the practice. Apart from backyard crop production, only 24% of the respondents have other distant farms. In all, about 76% of non-farming households in the peri-urban areas were part-time farmers as a result of participation in backyard crop production.

Table 1a. Socio-economic characteristics of backyard crop farmers

Parameter	Frequency	Percentage	Mean
Age (years)			
21-30	13	12.4	49.33(29.13)*
31-40	24	22.9	
41-50	38	36.2	
51-60	15	14.3	
61-70	15	14.3	
Marital status			
Single	7	6.7	
Married	91	86.7	
Separated	7	6.7	
Sex			
Male	52	49.5	
Female	53	50.5	

Religion

Christianity	63	60.0	
Islam	35	33.3	
Traditional	7	6.7	

Household size

1-4	18	17.1	
5-9	74	70.5	6.33(2.01)*
10 and above	13	12.4	

Children's current economic status

Schooling	60	65.9	
Working	16	11.0	
Working and schooling	21	23.1	

Farm size (hectares)

<0.2	51	48.6	
0.20-0.4	54	51.4	0.39(0.12)*

Experience in backyard farming

1 – 5	62	59.0	
6 – 10	28	27.0	
11 – 15	8	26.7	
Above 15	7	6.7	

Source: Field survey, 2016. Standard deviation*

Table 1b: other socio-economic Characteristics of the backyard farmers

Parameter	Frequency	Percentage	Mean
Occupation			
Schooling	14	13.3	
Artisan	22	20.9	
Civil service	14	13.3	
Trading and retiree	55	52.4	
Education level			
No formal education	13	12.4	
Primary school	26	24.8	
Secondary school	17	16.2	
Tertiary education	49	46.7	
Cooperative society			
Not belong	79	75.2	
Belong	26	24.8	
Purpose of backyard crop production^(MCR)			
Complement household food budget	58	50.43	
To get fresh vegetables without fertilizer	32	27.8	
To augment household income	19	16.5	
Unable to purchase farmland	6	5.2	

Land acquisition method

Inheritance	25	23.8
Purchase	60	57.1
Lease/rent	8	7.6
Gift	12	11.4

Type of farm owned

Backyard farm alone	80	76.2
Other distant farms	25	23.8

Source: Field survey, 2016. (MCR)-Multiple Case Responses

Importance and uses of backyard crops to household's food augmentation

Figure 1 show in descending order, the importance of backyard crop production to the households. The following food crops are produced in the backyard farms: vegetables and spices (37%), Maize (28%), Banana/Plantain (27%) and Cassava (8%). Households rated spices and vegetables to be of uttermost importance to their food augmentation, followed by

maize and plantain. The result is in line with Salau and Attah (2012) and Badmus and Yekinni (2011) who identified cassava, maize and vegetables as the backyard crops majorly cultivated in Benue and Oyo States. In general terms, Figure 2 shows that 64.0% of these crops were consumed while 36.0% sold. This is an indication that majority of practicing household augments their food needs with the produces from homestead farming while some were as well generated additional income through the practice.

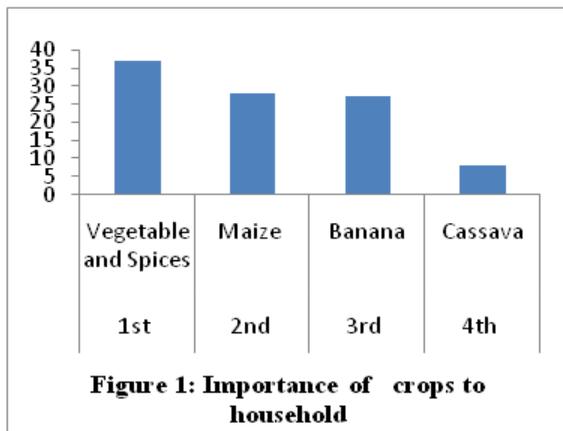


Figure 1: Importance of crops to household

Source: Field survey, 2016

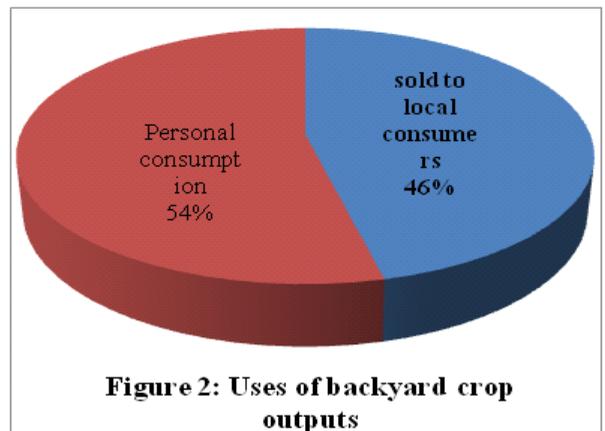


Figure 2: Uses of backyard crop outputs

Socio-economic factors affecting backyard crop production

From Table 2, linear form of regression analysis met the criteria for consideration with parameter estimates including R²(84.9%) and adjusted R²(81.8%), F-value (32.327) and DW statistic (2.240). The result showed that age, sex, household size, education status, economic status of children, membership of association and land acquisition method were statistically significant.

The coefficient of the age was positively correlated with value of food crop and in conformity with thea priori

expectation. The variable was statistically significant at P<0.05. This revealed that 1.0% increase in the age of backyard crop farmers will lead to a corresponding 29.0% increase in value of crops from backyard production. This implies that backyard crop production is age responsive and therefore suggestive that older families are more likely to be predisposed to cultivating food crops around the house than younger ones. In the same manner, the coefficient of economic status of the children was positive and significant. One percent increase in the number of schooling children will cause about 84.0%increase in the value of crops obtained from backyard crop production. Clearly, household dependency has a strong influence on the intensity of

homestead food cropping. This is because rise in the degree of dependence can pressurize urban households to seek complementary food sources for the households.

Sex of household head had a negative but significant coefficient. Table 2 shows that a percent change in household head would lead to about 41.0% decline in the value of crops from backyard production. This implies that female headed households are most likely to earn more from backyard farms than male headed households. This result is in agreement with finding by Hovorka and Lee-Smith (2005). In the same way, household size was a disincentive to backyard crop production. The coefficient of household size was negatively significant and not in line with *a priori* expectation. A percent increase in number of household members would lead to a corresponding 51.0% decrease in value of crops from backyard production. In other words, families with small household sizes are most likely to be inclined to practice backyard cropping. The result is an indication that household involvement in backyard crop production may not always be influenced by the need to supplement household food requirements. This result agreed with finding by Cofie *et al.* (2003) that in most cases, city dwellers embrace backyard crop production to maintain quick and direct access to fresh vegetables. Also, coefficient of education status was negative but significant at 1.0% level ($P<0.01$) and showed that 1.0% increase in the education level of the household head would likely cause about 98% decrease in the value of crops from backyard production. This means that the more educated is the household head, the less likely the interest to practice backyard cropping. This is quite understandable since education increases personal disposable income of the people and the households with higher degree of education may not necessarily need assistance with respect to household food security.

Therefore, it is not a gainsaying that backyard crop production is a common practice among the less educated households and it is associated mostly with the households with low level of literacy. This submission is supported by the findings of Ashebir *et al.* (2007) that urban farmers generally have low educational status.

Method of land acquisition was positively significant at 1.0% level ($P<0.01$). The coefficient showed that 1.0 % change in land acquisition method from purchase to lease or gift would increase the value of crops obtained by 115.0%. This implies that homestead crop production in peri-urban centers will become more responsive and well pronounced if households have direct and easy access to land. By providing land either free or at a lease to non-farming households, there is likelihood that food insecurity challenges would decline in the urban communities. Association membership which is a measure of social inclusiveness among the practicing households showed that the coefficient was also positive and significant at 1.0% level ($P<0.01$). The result revealed that 1.0% increase in association membership would increase the value of crop production at backyards by 69.9%. In other words, social integration and inclusion will provide cheap sources of information necessary to encourage practice of backyard crop production among households in the peri-urban areas.

The R^2 obtained showed that about 82% of the variations in the dependent variable (value of food crops) were explained by the explanatory variables considered in the model. Moreover, DW statistic of 2.240 revealed that the explanatory variables were not serially correlated and the regression analysis was significant at $P<0.01$ ($F=32.327$) which proved that household socio-economic characteristics affects backyard crop production in the peri-urban areas

Table 2: Regression analysis of socio-economic factors affecting value of crop from backyard production

COEFFICIENT	LINEAR	SEMI-LOG	DOUBLE LOG
Constant	14.463 (1.344)	2.904 (0.048)	3.241 (0.175)
Age	0.292 (2.746)**	0.021 (18.494)*	-0.125 (-0.021)
Sex	-0.417 (-1.960)**	-0.025 (-1.016)	-0.627 (-0.312)
Household size	-0.510 (-4.300)*	0.002 (0.396)	-
Education qualification	-0.980 (-2.800)*	0.002 (0.454)	3.991 (2.669)*
Occupation	0.540	0.003	-0.133

	(0.378)	(0.460)	(-0.029)
Economic status of children	1.337 (7.848)*	-0.008 (-0.777)	4.168 (0.982)
Farm size	0.143 (1.185)	0.006 (0.309)	-0.911 (-0.257)
Farming experience	-0.166 (-1.089)	0.56 (1.740)	-0.194 (-0.273)
Land acquisition method	1.155 (5.136)*	-0.018 (-1.778)*	-0.287 (-0.065)
Membership of association	0.699 (4.957)*	0.004 (0.241)	-1.026 (-0.385)
Operating other farms	0.109 (1.190)	-0.015 (-0.664)	-2.869 (-1.346)
Crop sales	4.401 (0.012)	0,008 (0.490)	3.303 (1.087)
R ²	0.849	0.987	0.669
Adjusted R ²	0.818	0.980	0.264
F-calculated	32.327*	146.534*	1.652
Durbin-Watson	2.240	2.293	1.538

Source: Author's field survey, 2016

-the coefficients of regression (β) are in unstandardized forms

* Significant at 0.01 level ** significant at 0.05 level.

- Variable eliminated from the analysis due to collinearity.

Constraints facing the practice and Policies to improve backyard crop production

The practice of backyard crop production is constrained by many factors which include livestock interference and destructive activities of goats (50%), inadequate farmland (20.0%), low soil fertility (15.7%), and diseases and pest (10.7%). The result is in conformity with Egbuna (2008); Saliu and Attah (2012) who identified the constraints to urban farming to include poor access to land. The remedies suggested by the respondents to the constraints were that the government

should establish law on livestock management in urban areas (47%), fencing (21.0%), expansion of farm land (18%), and farm chemicals - fertilizers (9.6%) and pesticides (13.5%). In terms of policy to improve backyard farming, the need for law against indiscriminate livestock husbandry was supported massively by the households. This is contrary to a statement by Food and Agriculture Organization (2001) that restrictive legislations hamper urban agriculture. This is not true at all cases as legislation to abrogate livestock free range will enhance backyard farming.

Table 3: Constraints and Policies to improve backyard crop production

Parameter	Frequency	Percentage
Constraints to backyard crop production^{MRC}		
Pests and diseases	15	10.7
livestock interference/destructive activities of goats	70	50.0
Poor land/soil fertility	22	15.7
Inadequate space for farming	28	20.0
Stealing/theft/pilfering	05	3.6
Suggested Remedies^{MRC}		
Fencing	21	11.8
usage of pesticide	24	13.5
Provision of more farm land (land expansion)	32	18.0
Legislation on livestock management in urban areas	84	47.2
Provision of fertilizer	17	9.6

Source: Author's field survey, 2016.MRC=Multiple Response Case

CONCLUSION AND RECOMMENDATIONS

The practice of backyard crop production in the peri-urban areas has shown to be peculiar to the urban low income earners wherein, the capability of the households to explore additional food sources and augment nutritional and financial needs were significantly enhanced. Thus, increasing the number of households cultivating crops at backyard level would be relevant in the fight against food insecurity in the urban communities.

It is noteworthy that to encourage the practice of backyard production among households as well as stimulate the interest of potential non-practicing households (mostly among the urban poor),

- i. there is a serious need for outright banishment of extensive livestock management and free range of farm animals in the urban communities. To this effect, State, Local Governments and Community leaders as well must come to terms in support of this enforcement.
- ii. It is imperative that association formation is strengthened among backyard farmers. Such associations (pensioner's associations, trade unions and landlord associations) can then serve as an avenue to share information about the huge rewards attached to the practice of backyard farming in Nigeria.
- iii. Similarly, inclusive land use policies where in a platform is created for the non-house owners (tenants) to tap from backyard cropping potentials through the use of the abandoned buildings and fallow lands for crop production in urban communities should be encouraged,
- iv. awareness about the importance of backyard farming to food security must therefore be taken to the communal level. For urban agriculture to be sustained in urban communities and cities, it is imperative that all the stakeholders (including the land-owners and non-land owners) in the community come to term on better ways by which land access for backyard crop production could be improved, and
- v. more female-headed households should be encouraged to venture into backyard crop production due to its capacity to augment household food and in come need especially among the old aged group.

Area of Further Study: More study should be undertaken to investigate the impact of backyard

farming on household food security in Osun State.

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