JESD **Journal of Environment and Sustainable Development**

jesd@uesd.edu.gh

URBAN AND PERI-URBAN VEGETABLE PRODUCTION EFFECTS ON FARMERS' LIVELIHOODS IN LAGOS STATE, NIGERIA

Peter Sanjo **Adewale** [1*], Sunday Clement Olubunmi **Makinde** [2] & Victor Owolola **Kusemiju** [3]

[1] Centre for Environmental Studies and Sustainable Development, Lagos State University, Lagos State, Lagos, Nigeria
[2] Department of Botany, Lagos State University, Lagos State, Lagos, Nigeria.
[3] Department of Zoology, Lagos State University, Lagos State, Lagos, Nigeria

***Corresponding author**: sanjoadewale@gmail.com

Article Info

Article history:
Received: 14 January 2023
Revised: 24 February 2023
Accepted: 24 March 2023
Published: 30 June 2023

DOI:
https://doi.org/10.55921/VGET1906

Abstract

Purpose — This study examined the effects of Urban and Peri-urban Vegetable Production (UPVP) on local livelihood subscales of farmers in Lagos State.
Methods — The study employed a mixed method involving a Household Livelihood Survey and Focus Group Discussion. Data were analyzed using Means, Analysis of Variance and Eta squared.
Findings — All livelihood subscales were positively impacted (Physical=3.65±0.41, Natural=3.64±0.54, Financial=3.60±0.44, Social=3.58 ±0.39, Human=3.33±1.29 and they all differed significantly($P<0.05$). Impact of UPVP on farmers' livelihood subscales was moderately high.
Conclusion & Recommendation — The study concluded that UPVP can serve as a resilient sector for Nigeria's economy and sustainable development. Support groups and financial resources can improve farmers' well-being. Physical capital, directly and indirectly, affects the performance of work by farmers and therefore productivity. The study recommends that farmers should invest more in human capital to boost their production capacity and enhance sustainable livelihood.

Keywords — Environment, Sustainable Livelihood, Urban and peri-urban Agriculture, Food security, Vegetables.

Introduction

Urbanization is a growing trend worldwide! It is one of the defining phenomena of the 21st century. Key statistics show that more people now live in cities (urban) and places proximate to cities (peri-urban) today than ever before in history (Iaquinta and Drescher, 2000). According to the World Bank (2022), 7 out of 10 people in the World are expected to live in cities by 2050 with close to 90% of this increase occurring in Africa and Asia. A similar prediction was given by Bloch *et al.* (2015) that by 2050, the number of people living in cities in Nigeria will likely double.

As the number of urban dwellers increases, the food needs of families and the scramble for environmental resources (Alliance for Green Revolution in Africa, 2017; Resource Centre for Urban Agriculture and Forestry, 2018) leading to urban poverty and food insecurity will also increase (Food and Agriculture Organisation, 2016). As a panacea for this problem, urban vegetable production has been suggested as an

alternative in response to market demand to minimize urban food insecurity (Darkey *et al.,* 2014). For many years urban vegetable farmers have been actively engaging in the production of many vegetable varieties ranging from *Corchorus olitorius* (L), *Abelmoschus esculentus* (L. MOENCH) (Okra), *Amaranthus hybridus* L (Amaranth) to *Celosia argentea* (Cocks comb). These vegetables are known to enrich diets with nutrients including crude protein, crude fibre and minerals (Houngla *et al*., 2020; Aletor and Adeogun, 1995). Recently, urban and peri-urban leafy vegetable production of *Amaranthus hybridus* L. (African Spinach commonly called *Efo Tete* in Yoruba), *Celosia argentea* L. (Lagos Spinach commonly called *Efo Soko*), and *Corchorus olitorius* L. (Jute Mallow commonly called *Ewedu*) which are commonly consumed in Lagos State, Nigeria have become important activity impacting farmers' livelihood (Adewale *et al.,* 2022).

Farmers' livelihoods include physical, financial, social, natural and human capital (Yuliati and Isaskar, 2018). Farmers' livelihoods are said to be sustainable when they can cope with and recover from stresses and shocks (Olutegbe, 2021). Local sustainability has three dimensions that are important to all stakeholders namely: Social, economic and environmental. Schreinemachers *et al.* (2018), describe them as the three pillars of local sustainability. The economic benefit refers to the gain farmers make from farming activities. It is central to farmers' livelihood sustainability. The farmers are into production activities because of gain and increased ability to feed their households.

Researchers like Hallett *et al.* (2016); Yang (2016), proposed that local sustainability is achieved when farmers earn a decent living from their activities in such a way that they have a decent life. Past studies (Darkey *et al.,* 2014; Martin *et al.,* 2016) showcased great economic success on small hectares of land cultivated by farmers in urban and peri-urban areas. They have equally identified the benefits of growing food in cities. However, an insight to determine the contributions of vegetable production on farmers' livelihood subscales along urban and peri-urban gradients of Lagos State appears not to have gained prominence. This study, therefore, examined the impact of UPVP on farmers' livelihood subscales in Lagos State.

Material and Methods

The study focused on the effects of UPVP on livelihood in Lagos state and was investigated using a descriptive survey research design. Lagos State is located in southwestern Nigeria with a total landmass of 356,861 hectares of which 75,755 hectares are wetlands (Adedeji, 2009). Five study locations were selected in Lagos State as shown in Table 1. A mixed method involving a Household Livelihood Survey Questionnaire, Focus Group Discussion and In-depth Interviews with the farmers was used to collect data from respondents. Purposive and snowball sampling techniques were used because needed records of target respondents were not readily available (Naderifar *et al.,* 2017). Purposeful sampling with snowballing has been used in a similar study conducted by Oyesola and Obabire, (2011); when needed records of respondents were not readily available. Seventy farmers each were selected from Ikeja, Badagry, Ikorodu, Lagos Island and Epe) making a total of three hundred and fifty (350) vegetable farmers. However, due to inconsistencies in response by some respondents to survey questions, 69 and 68 samples were considered appropriate for analysis from Badagry and Ikorodu respectively. This gave an effective sample size of 347 respondents. Livelihood survey questions were administered to these 350 vegetable farmers whose primary occupation was vegetable farming.

Analysis of variance (ANOVA) was computed using Statistical Package for the Social Sciences (SPSS) to determine if statistically significant differences existed among the farmers' mean livelihood subscales along the urban and peri-urban gradients of the state. Eta Squared was used to determine the strength of association between the means of farmers' livelihood subscales.

Table 1: Sample Collection Locations

S/N	Division/Location	No of Participants
1	Ikeja	70
2	Badagry	70
3	Ikorodu	70
4	Lagos Island	70
5	Epe	70
Total		**350**

Results and Discussion

Impact of UPVP on Livelihood Subscales

Human capital is the most important livelihood asset for households. The mean perceived impact of UPVP on access to labour was observed to be moderately high (Mean = 3.75 and S.D = 1.45) while the mean of perceived impact on access to extension agents in the state was found to be very low (Mean = 1.87 and S.D = 0.90) (Table 2). However, the mean perceived level of impact on various aspects of farmers' human capital as well as "overall" human capital was found to be moderately high (Mean= 3.16 and S.D= 0.87) as shown in Table 2.

Farmers' social capital includes the ability to feed family members, payment of children's school fees, membership of associations and meeting other social obligations. For social capital, an increase in the ability to feed the family member has the highest mean (Mean = 3.83; S.D = 0.66) while the increase in the ability to pay children's school fees, meet other family obligations, support friends in terms of financial assistance have means of 3.70, 3.66, 3.65 respectively. Membership in an association or farmers' group has the least mean (Mean = 2.94 and S.D = 0.74) (Table 2). The overall impact on farmers' social capital was found to be having a 'moderately high' mean of 3.57 (Table 3).

Natural capital includes farmers' access to land and irrigation water. Table 2 depicted the mean perceived impact of the programme on various aspects of farmers' natural capital. The various aspects of natural livelihood in Table 2 showed that the impacts of UPVP on both accesses to land and irrigation water were 'moderately high' with mean of 3.63 and 3.65 for increased access to land and increased access to irrigation water respectively.

Physical capital includes access/ownership of watering cans, hoes, cutlasses, mobile phones, comfortable shelter and potable water supply. Table 2 showed the recorded mean impact of UPVP on access to the watering can, hoes and cutlasses. The impact was found to be 'moderately high' (Mean = 3.83; SD = 0.73) the mean impact on the ownership of mobile phones was also found to be 'high' (mean =3.60; SD = 0.73). The mean impact on access to a comfortable shelter was 'moderately high' (mean = 3.64; SD = 0.77). The mean impact on access to the adequate water supply was found to be 'moderately high' as well (Mean =3.58; SD = 0.71). Although the overall mean for all physical capital was found to be 'moderately high', the mean for access/ownership of basic tools was found to be the highest. Next to this is access to comfortable shelter then ownership of mobile phones for communication and the least impacted was the potable water supply.

The financial status of a farmer may include his gross income per month or annually, debt level and savings. Results from the study in Table 2 showed that the UPVP increased the levels of income of UPVP vegetable farmers in the study locations. The mean perceived impact on the income level of the vegetable farmers was 3.64 with a standard deviation of 0.65 as shown in Table 2. The mean decreases in the share of income spent on food were found to be 3.64 with a standard deviation of 0.74 while the mean and standard deviation of debt levels were found to be 3.54 and 0.83 respectively. Savings have a mean of 3.56 and a 0.69 standard deviation. Overall, the mean (3.60) and standard deviation (0.07) on various aspects of financial capital was found to be 'moderately high' (Table 3).

Mean Perceived Level of Impact of UPVP on Various Aspects of Vegetable Farmers' Livelihoods

Table 3 showed the means and the standard deviations of impact on the five (5) main facets of the vegetable farmers' livelihood examined in the study. The various categories of livelihood in Table 3 have been arranged in descending order of means of responses. The result from Table 3 showed that impact on natural, physical, financial and social and human capitals of farmers was ' moderately high' with means of 3.65 ± 0.41, 3.64 ± 0.54, 3.60 ± 0.07, 3.58 ± 0.39 and 3.33 ± 1.29 respectively. Standard deviations of various categories generally revealed high consistency in farmers' views except for the human capital where farmers' views were quite inconsistent (SD = 1.29).

Table 2: Mean perceived level of impact UPVP on livelihood subscales of respondents

	N	Mean	S.D
Human Capital			
Access to labour	342	3.75	1.45
Access to Extension Agents	155	1.87	0.90
Social Capital			
Membership of an association or farmer's group	165	2.94	0.74
Support from association /group	151	2.97	1.28
Increase ability to feed family members	347	3.83	0.66
Meet other family obligations (dues and rent)	333	3.66	0.73
Support of friends in terms of financial assistance	305	3.65	0.63
Increase the ability to pay children's school fees	341	3.70	0.63
Natural Capital			
Increased access to land	343	3.63	0.76
Increase in access to irrigation water	345	3.65	0.59
Physical Capital			
Access to watering can, hoes and cutlasses	333	3.83	0.73
Ownership of mobile phone for communications	335	3.60	0.70
Access to comfortable shelter	316	3.64	0.77
Access to adequate portable water supply	341	3.58	0.71
Financial Capital			
Increase in income levels	347	3.64	0.65
Decrease in the share of income spend on food	347	3.64	0.74
Decrease in debt levels	343	3.54	0.83
Increase in savings	335	3.56	0.69

N = 350. Scale: 5- Very High (VH).4 = High (H). 3=Moderately High (MH). 2 = Low (L). 1= Very low (VL)

Table 3: Impact on Various Aspects of Vegetable Farmers' Livelihoods along Lagos urban and peri-urban gradient

	N	Mean (X)	SD
Physical Capital	335	3.65	0.41
Natural Capital	345	3.64	0.54
Financial Capital	347	3.60	0.44
Social Capital	347	3.58	0.39
Human Capital	342	3.33	1.29

N= 350. Scale: 5- Very High (VH).4 = High (H). 3=Moderately High (MH). 2 = Low (L). 1= Very low (VL)

Table 4: Strength of Association between Farmers' Mean Livelihood Subscales

Mean Value for Livelihoods Subscale	Sum of Squares	df	Mean Square	F	Sig.

Between Groups	6.086	4	1.52	25.92	0.00
Within Groups	20.074	342	0.06		
Total	26.161	346			
Eta Squared	0.23				

N=350

Discussion

UPVP has a 'moderately high' impact on Lagos vegetable farmers' livelihood subscales. It improved all the five (5) main facets of their livelihoods examined in this study namely: physical, natural, financial, social and human capital. Human capital is an important livelihood asset for households. It relates to the availability of labour (family or hired) and extension agents and agricultural technical officers who have the skills, knowledge and ability needed for the farmers to undertake vegetable production as their livelihood option. The current study revealed that the majority of the farmers have access to labour and UPVP has impacted their access to labour but not as much for extension workers.

The majority of the farmers do not have access to extension agents. Most of them are operating on their personal knowledge and experience. The observation is in line with that of Mumuni and Oladele (2016); Halloran *et al.* (2016). The observed 'moderately high' impact of UPVP on social capital implies that being a member of a vegetable farmer group impacts the farmers' livelihood positively.

UPVP promotes social interactions, increases sharing of values enables the identification of common aims, and promotes social bonds and support. This observation is in line with that of Kingsley and Townsend (2006); Gallaher *et al.* (2013) and Kirkpatrick and Davison (2018). The majority of the vegetable farmers in the study were able to feed their families very well. This implies that urban vegetable production enhances household food security. This finding is similar to that of Chagomoka (2015); Onismo, (2015); Kyelu (2016) and Diekmann *et al.* (2018).

Natural capital is one of the most impacted livelihood assets in vegetable production in Lagos State. Farmers have access to water for irrigation and land and the impact was found to be high. UPVP increased the farmers' access to land as a natural resource. Farmers are allowed to use abandoned land and road setbacks around Lagos. This can be attributed to the aesthetic value that vegetable production adds to the environment. The current study revealed that vegetable farmers have access to physical capital and they spend more on acquiring tools for further vegetable production than they spend on other aspects of physical capital. This observation agreed with that of Darkey *et al.* (2014). The financial status of a farmer may include his gross income per month or annually, debt level and savings. The impact of UPVP on farmers' income depicts a considerable 'high" impact. This implies that UPVP has elevated the farmers from poverty. This result is in line with the findings of Leone *et al.*, (2016) but deviated from the findings of Okoro *et al.* (2017).

Conclusion and recommendations

UPVP has a 'moderately high' impact on Lagos vegetable farmers' livelihood subscales. Physical capital was the highest impacted while human capital was the least impacted. The level of perceived impact of the UPVP on the livelihood of farmers varied. Significant differences existed among the means impact on livelihood subscales at 0.05 alpha. Subsistence agriculture is touted as a resilient sector of Nigeria's economy. Physical capital, directly and indirectly, affects the performance of work by farmers and therefore productivity. Farmers should invest more in human capital, especially private extension agents and equally form farmers' associations to pursue their common interests. Lagos State Ministry of Agriculture should provide extension services to all vegetable farmers as the study has shown that they contribute efficiently to the nation's economy through food security. Doing this will boost their productive capacity and adoption of technology. They should also consider proper documentation of the vegetable farmers. Having this record could also contribute to an increased internally generated revenue (IGR) of the state.

Acknowledgments

This work is funded by Tertiary Education Trust Fund (TETFUND), Institutional–Based Research (IBR). Opinions, findings, conclusions, and recommendations herein expressed in this article are those of the authors and do not necessarily reflect the views of TETFUND.

Conflict of interest

The corresponding author states that there is no conflict of interest.

References

Adedeji, O., (2009). Urban agriculture and urban land use planning: Need for synthesis in metropolitan Lagos, Nigeria. *Journal of Geography and Regional Planning* Vol. 2(3), http://www.academicjournals.org/JGRP ISSN 2070-1845. p. 043-050

Adewale, P.S., Makinde, S.C.O., Kusemiju, V.O. & Obembe, O.O. (2022). Determination of Heavy Metals Concentration in Soil and Leafy Vegetables in Urban Expressway and Peri-urban Road Farms of Lagos State, Nigeria. *Journal of Sustainability and Environmental Management*, 1(2), 241-246.https://doi.org/10.3126/josem.v1i2.45372

AGRA. (2017). Africa Agriculture Status Report.The Business of Smallholder Agriculture in Sub-Saharan. *Alliance for a Green Revolution in Africa (AGRA).* Issue No. 5, 1-180.

Aletor, V. A., and Adeogun, O. A. (1995). Nutrient and anti-nutrient components of some tropical leafy vegetables.*Food Chemistry, 53*(4), 375–379. https://doi.org/10.1016/0308-8146(95)99830-s.

Olutegbe, N. (2021). Livelihood and Well-being of Rural Households around Oyan Dam, Nigeria: The Sustainable Livelihood Approach. *Journal of Sustainable Development*. 19.

Bloch R., Fox S., Monroy J., and Ojo A. (2015). Urbanization and Urban Expansion in Nigeria. *Urbanisation Research Nigeria (URN) Research Report.*London: ICF International. 1-73.

Chagomoka, T.,(2015). Food and nutrition insecurity risk mapping (FNIRM) in urban and periurban areas in West African cities. *Unpublished Ph.D. Thesis Submitted to Freiburg im Breisgau, Germany.* 1-193

Darkey, S.K., Dzoemku B.M., Okorley E.L., Gyimah N.A., Bluwey F.A. (2014). Contribution of Urban Vegetable Production to Farmers' Livelihood: A Case of The Kumasi Metropolis of Ashanti Region of Ghana. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, 14*, 77-82

Iaquinta, D. L., & Drescher, A. W. (2000). Defining the peri-urban: rural-urban linkages and institutional connections. Land reform, 2, 8-27.

Diekmann, L. O., Gray, L. C., and Baker, G. A. (2018). Growing 'good food': urban gardens, culturally acceptable produce and food security. *Renewable Agriculture and Food Systems*, *35*(2), 169–181. https://doi.org/10.1017/s1742170518000388

FAO. (2016). The state of food and agriculture, climate change, agriculture and food security. Food and Agriculture Organization of the United Nations Rome.http://www.fao.org/3/a-i6030e.pdf

Gallaher, C.M., Kerr, J.M., Njenga, M. et al. (2013). Urban agriculture, social capital,

and food security in the Kibera slums of Nairobi, Kenya. Agric Hum Values 30, 389–404.https://doi.org/10.1007/s10460-013-9425-y

Google Map (2019). Nigeria Map. http://googlemap.ng

Hallett, S., Hoagland, L., and Toner, E. (2016). Urban Agriculture: Environmental, Economic, and Social Perspectives. Horticultural Reviews.https://doi.org /10.1002/9781119281269 .ch2. 65–120.

Halloran, A., Roos, N., Flore, R., and Hanboonsong, Y. (2016).The development of the edible cricket industry in Thailand. *Journal of Insects as Food and Feed*, *2*(2), 91–100. https://doi.org/10.3920/jiff2015.0091

Houngla, E.J.H, Gbankoto, A., Mizehoun-Adissoda, C., Anani, C.B. L., Edorh, P.A., Moutaïrou, K. and Sohounhloué, D.C.K. (2020). "Nutrient Composition and Heavy Metals Content of Three Leafy Vegetables (*Amaranthus Cruentus* L., *Lactuca Sativa* L., *Solanum Macrocarpon* L.) in Porto-Novo, Republic of Benin." *Journal of Food and Nutrition Research, 8*(2) 80-86. https://doi.org/10.12691/jfnr-8-2-2

Kingsley, J., and Townsend, M. (2006). 'Dig In' to Social Capital: Community Gardens as Mechanisms for Growing Urban Social Connectedness. *Urban Policy and Research*, *24*(4), 525–537. https://doi.org/10.1080/08111140601035200

Kirkpatrick, J. B., and Davison, A. (2018). Home-grown: Gardens, practices and motivations in urban domestic vegetable production. *Landscape and Urban Planning*, *170*, 24–33. https://doi.org/10.1016/j.landurbplan.2017.09.023

Kyelu, A. (2016). Analysis of Socio-Economic and Environmental Effects of Urban Fish Farming in Dar Es Salaam, Tanzania Unpublished Master Thesis of Sokoine University of Agriculture. Morogoro, Tanzania.

Leone, S., Ngegba, M., Sesay, M. and Bangura, E. (2016).The Impact of Vegetable Farming on the Livelihood of Small-Scale Farmers in Koinadugu District Northern. 5. 42-49.

Martin, G., Clift, R., and Christie, I. (2016). Urban Cultivation and Its Contributions to Sustainability: Nibbles of Food but Oodles of Social Capital. *Sustainability*, *8*(5), 409.https://doi.org/10.3390/su8050409

Mumuni, E., and Oladele, O. I. (2016).Access to livelihood capitals and propensity for entrepreneurship amongst rice farmers in Ghana. *Agriculture and Food Security*, *5*(1), 3. https://doi.org/10.1186/s40066-015-0049-x

Naderifar, M., Goli H. and Ghaljaei F.,(2017). Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research. *Strides in Development of Medical Education*. https://doi.org/10.5812/sdme.67670

Okoro, O., Nyainbau, I., Agunanna, I. and Ndulaka, M. (2017). Environmental and Economic Perception of Urban Farming in Aba, Nigeria. *International Journal of Environmental Chemistry, 2*(5): 73-80.https://doi.org/10.11648/j.ijec.20170205.14

Onismo, M. (2015). *An assessment of household food security in urban and peri-urban areas; a case study of Bindura Municipal area*, Mashonaland central, Zimbabwe School of Agricultural, Earth and Environmental Sciences. College of Agriculture, Engineering and Science unpublished University of KwaZulu-Natal

Oyesola, O and Obabire, I.E.. (2011). Farmers perceptions of organic farming in selected local government areas of Ekiti State, Nigeria. *J. Org. Syst.*. 6. 20-26.

RUAF Foundation (2018). Urban Farming Work Book: An introduction to urban farming, from types and benefits to strategies and regulations. *Policy Brief: International Network of Resource Centres on Urban Agriculture and Food security.* 1-76

Schreinemachers, P., Simmons, E. B., and Wopereis, M. C. S. (2018).Tapping the economic and nutritional power of vegetables. *Global Food Security*, *16*, 36–45. https://doi.org/10.1016/j.gfs.2017.09.005

The World Bank (2022). *Urban Development*. https://www.worldbank.org/en/topic /urban development/overview#1

Yang, T. (2016). A Comparative Study of Two Cases of Urban Agriculture in the Netherlands and China. Impacts of Urban Agriculture on Local Sustainability. *Unpublished M.Sc. Thesis, Land use planning group, Wageningen University Wageningen*. 1-91

Yuliati, Y. & Isaskar, R., (2018). Social Capital and Sustainable Livelihood Strategies in Downstream Area of Bengawan Solo. River, East Java, Indonesia. *Journal of Sustainability Science and Management*. 13. 201-209.