

# Environmental Benefits of Estate and Urban Green Architecture across Locations in Port Harcourt Conurbation, Nigeria

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**Abstract:** - Port Harcourt metropolis is the only developing town in Rivers state Nigeria with quality agricultural soil and other natural endowment. The enriched environment for all systems of agricultural practices attract some urbanites in agricultural sector and the indigenes believed that their resource particularly the soil had been abandoned from agricultural uses and its environmental advantages owing to over concentration of industrial and commercial activities. This study was necessitated to actually verify the claim. Therefore, environmental benefits of urban agriculture and food crops visibility questionnaire were administered in different income locations of the fruitful soil region. The collected sample were analysed using principal component analysis method, standard deviation and Duncan multiple correlation coefficient. The result for determination of urban agriculture environmental advantages held that visibility of food (0.49) and improving air quality (0.50) were considered as the supreme environmental benefits of urban agriculture. However, tree product/medical herb (20%), urban sustainability (13%), agrarian development (12%), soil capacity/incubation (09%) and climate change resilience (10%) were the classified environmental benefits of urban agriculture. In respect to variation, the analysis detailed that the environmental values of urban agrarian for high and medium income communities are the same but differs for low income communities at ( $p < 0.05$ ). The increase of poor environmental quality recorded in different income communities or location of urban communities may be attributed to non-inclusiveness of agrarian practices in urban governance. It is our ultimate opinion that the governments should adopt the establishment and regular maintenance of crop farms across the urban communities to ensure uniformity, availability of open green belt and encouragement of environmental aesthetics for all the communities. So that the 5% per cent space allotted for agriculture in every individual proposed urban land space can serve as a buffer, wind control measure, enhancement of quality air, natural landscape element and as well as visibility of food crops.

**Keywords:** Environmental, architecture, benefit, metropolis, estate and nigeria

## I. INTRODUCTION

In various urban communities or areas, researches on environmental benefits of urban agricultural have been based on the analysis of food crop visibility, greenery building

and urban pollution moderation. In furtherance, the environmental benefit of urban agriculture have received much attention owing to less concern of developing nation's government towards planning, environmental management and earmarking of lands for urban agriculture as well as the inability of the urbanites to identify other spatial areas that can pave way for contemporary urban agriculture recognitions and its divers environmental advantages (Researchers Brainchild 2019).

The environmental assistances of urban agriculture are beyond the improvement of quality air, greenery building and physical aesthetics but a compendium or paradigm of environmental management tool. Any country that wishes to develop and abstain from insecurity of food and enhance its environmental security must therefore, places much attention on urban agriculture both at urban and peripheral levels (Authors Survey 2019). However, the reason is convincing as Leonie et al., (2010) [12] reported that the elements of urban agriculture are urban agriculture in isolation, the interface with the people and environment of its location, and contribution to the design of built form. In addition, they deliberated its scale (micro, meso and macro) and submit that yet to come important investigation should be anchored on (a) strategically identifying the uses of flood-prone areas for food and employment, and (b) operational zing different land taxes to support sustainable urban agriculture or payments for environmental services provided by urban agriculture such as carbon sequestration. Similarly,

Saverio et al. (2016)[19] opined that urban agriculture supposed to be adopted to incorporate traditional agriculture production which is no longer workable. They demonstrated that the execution of urban agriculture to evaluate the social gratitude articulated by the public as the study plans for the communal approval assessment was gained through a calculated evaluation formula.

Kathrin et al. (2014)[11] applied sustainability background to know the functions of green urban architecture in yet to manifest urban food production and to appraise the most important benefits and constraints. The intention of their work

was to integrate food, production, and design to produce food on a higher quantity in and on buildings in urban areas with rooftop gardens, rooftop greenhouses, indoor farms, and other building connected methods referred as green urban architecture or Z-Farming. Their investigation which relied on the examination of 96 official papers available in international resources, revealed that Z-farming or green urban architecture possess several purposes and yields a range of non-food and non-market goods which could have encouraging effects on the urban setting. The researchers added that the ecological welfares originating from the redeemable and recovering of resources decreased food loads whereas the social benefits comprises improving community food security, provision of educational facilities, linking consumers to food production, and serving as a design inspiration. Also the economic feature hammered on provision of likely public welfares and product productions. Finally, they identified non application of the required technologies, investment costs, exclusionary effects and lack of acceptance as the prominent challenges and concluded that Z-farming is never a solution to generate potential success—success situations in cities or sustainable practices but requires appropriate supervision. Catherine(2012) [1] proved that peri-urban agrarian provides ecosystem services, wildlife habitat, views heds, local heritage, and agricultural productivity. According to the work, The smallest benefits made available by land trusts was equated to an investigation obtainable from farmland amenity, agrictourism, farmland preservation, and ecosystems examination to show the variety of market values for different benefits of farmland. The study resolved that market value of farmland services differs from −\$37,541 to 124,000 per acre depending on the method of analysis and location of the farm.

In another research, Jane and Maya (2013)[9] examined the benefits of urban agriculture projects in Sea winds and Vrygrond in Cape Town. The study connected both northern and southern urban agriculture constructions while the integrated method of investigation empowers connections made urban agricultural practices known in different areas (north and south) without dropping the indigenous background. According to the authors, the adoption of combined methodological urban agriculture projects portrays more ecological and provides stronger social and economic profits.

Sarah (2010) [18] posited that the worries about economic and food security have emanated in growing steps to produce food in urban areas of developed nations including the United States. In respect to this part of the world, hemaintained that urban agrarian gives a first-hand edge for spatial engineers and landscape designers to be part and parcel of development and renovation of towns to support community farms, allotment gardens, rooftop gardening, palatable landscaping, urban forests, and other productive sorts of the township hemisphere.

Hynes and Howe (2004)[6] asserted that urban gardens in the United States of America are one of the food productions in

reply to war, economic downheartedness, and short-lived municipal improvement movements. , according to the authors, larger-based community garden steps has produced a bigger diversity of social, economic, health, and educational benefits in more than 250 urban areas across the country for the past thirty years. They added that acquaintance food security promote urban and rural relationship, urban agriculture, and farmers' markets. However, their investigation summarised that community gardens and closer green space in urban areas are significant answer to needs for nutritious and affordable food, emotional and physiological health, social cohesion, expelling of crime, recreation, and life satisfaction, specifically in high density neighbourhoods.

Jac and Joe (1992)[8] applied selected natural resources such as wastes or idle land and water bodies to evaluate urban agriculture. The research demonstrate that urban centres can easily be metamorphose from food and other agricultural product consumers arena to central resource-conserving, improvement of standard living and supportable initiators of these products.

Viljoen, and Bohn (2005) [20] noted that urban agricultural benefits related to food security and income. In furtherance, they explained that the benefits of urban food production are hypothetically appropriate to areas of widespread human population. They also maintained that the incorporation of urban farming into mixed land use policy may approach the possibility of important reduction of ecological footprint of a town and queried the reasons urban farming do not constitute high percentage of land uses in existing and proposed towns.

Isabel (2000) [7] reported that urban cultivation centred on farming practices such as animal husbandry, growing of fruit trees, crops of basic grains and horticulture that exist in a city with tree harvests, rearing of rabbits, poultry and other stock in concern to the palatable zone. The researchers added that urban open spaces and inner courtyard plots (home gardens) as well as smaller cultured strips found within and around town boundaries including fringe spaces should be used for urban farming while urban agriculture encompasses intra and peri-urban surfaces.

Leigh et al., (2014)[13] averred that the application of green roof technology in urban agriculture has the possibility to alleviate some of these problems without harmfully affecting the benefits provided by urban agrarian. Their study established that practice may not only enhanced the use of land for development and agriculture but can also smooth the realization of official space and water use agreements, and enable redistribution of ground-level resources among urban farmers. This could decrease the use of contaminated land and water at ground level and alleviate health concerns. Before green roof technology can be incorporated into urban agriculture on a larger scale, installation costs must be reduced, roof weight limitations should be assessed, and appropriate management practices should be developed which will ensure that the benefits of green roofs, such as energy

savings and storm water management, are still provided to urban communities.

Rogerson (1993)[17] identified improvement in the practices of urban food propagation and the tilling of fallow land on the outskirts of South Africa's municipal areas. He was of the view that green urban architecture stood for a subject of significant consideration in terms of South African strategy architects. A review is undertaken of research on informal agriculture in Asian and African cities. On the basis of this International review certain suggestions are offered for policy debates and research in South Africa. However, Gil (2005)[4] demonstrated that isolated issue such as horticulture continued to be major worries of present-day architects considered suitable through possibilities and fetching of countless environmental, financial and social benefits for the entire urbanites. The researcher further added that the weighbridge of window boxes, balconies or roof gardens or full-propelled farms, flora and agriculture are practiced in many urban zones across the world precise beneath our noses.

Zeeuw et al. (2011)[22] see the improvement of urban farming as an essential part of justifiable urban development. The work discussed the accessibility indication in respect to the probability of urban agrarian to answer numerous urban tasks and appraise the perceptions on urban agriculture practical in rural and national establishments.

In Cape Town, Rachel (2001)[16] used computable exploration practices to demonstrate the participation of urban agriculture of low-income group population. Her findings indicated that women practise urban agriculture in the courses of empowerment, creation of social networks, guarantee of security and community development booster. She added that urban agrarian must continue to be imperative to women of low-income class in a manner little directed to economic profit and connected areas. The study concluded that strategy designers have a duty to encompass their ideology of urban agriculture's assistances outside slight economic concepts in company of the optimistic social belongings.

Webb (1998)[21] gave an interpretation for the differences concerning the literature and practical answers connected to the environmental and ecological benefits of urban farming. The study also prayed that urban agriculture should be assumed in rapports of people who practise it. He maintained that the assumption would unavoidably involve concept and a detailed opinion of growth. The study forecasted for more address in linkage with the training, interpretations and targets of the farmers themselves. In Guguletu, Philippi et.al (2010)[3] utilized 30 small-scale residents to investigate informal urban agricultural practices. His findings illustrated that urban agriculture are proficient in different components of the area as earlier as the 20th epoch. The study also proved that the flats farmers obtained and continue to obtain a good number of benefits emanating from products and procedures of the practices of urban agriculture such as food safety, health and income improvement, together with valuable social

benefits. He resolved that urban agriculture remains the growing of crops and the husbandry of poultry and livestock within city confines.

Kate and Jameton (2000)[10] opined that some of the urban gardening beneficial includes food security, economic development, exercise, psychological and community well-being as well as environmental stewardship. They further discovered some of the public health problems connected with urban agriculture and indorsed leverages to reduce them and concluded that urban gardening has prospects as a significant component of urban public health.

Hans (2017) [5] established that the city of Mexico harvests about 20% of their food securities know to be essential in economic rapports understood as employment and income generator with constraints. The authors maintained that the role to organic arrangement of the city is equally in adequate but has prospects since the latest strategy confidently mix urban agriculture into the environmental plans of the metropolis. The author maintained that the most significant task is to increase urban farming to 22,000 m<sup>2</sup> of green rooftop greens newly formed in the city. Connecting to the social facets, the work detected that the city of Mexico strictly adopted international strategic approval method and capitalized on capability building that has plans to alleviate helpless sets and females. However, their study lastly reports the representative or symbolic aspect but discovered the importance in the city of Mexico and perceived urban agriculture as a step reinstate some of the pre-Hispanic practices of the Aztecs specially the uncontrolled gardens that have principally been lost.

Obadia and Shaldon (2018)[15] look at the prospects of urban agriculture aiming on vegetables and ornamental flowers production in the direction of poverty eradication and easing in the city of Dar es Salaam Tanzania. using observation, questionnaires, interviews and documentary reviews to implemented purposive sampling methods of 240 selected smallholder farmers and 16 local government officers. Their SPSS analysis demonstrated that production of urban vegetables and ornamental flowers had a substantial encouraging contribution in the direction of the proliferation in accessibility and convenience of food safety, nutrients and income generation for the development of indispensable social services like water, electricity, health, and education. Their work further added that the government and other participants should identify and afford extra provision to this segment for ecological development.

## II. METHODS AND PROCEDURES

The dominant source of data for this research was the primary method. However, a significant questionnaire was initiated for the entire study to draw reactions from the inhabitants and to relate questions on green urban architecture, visibility of food crops and environmental advantages across the income locations of Port Harcourt urban (low, medium and high income group) after which six neighbourhoods of dissimilar

income were selected for the analysis. The summative estimated population of households in the six neighbourhoods is 51,234. Putting on the known population of 51,234 households, the sample size of 750 was determined (2.5% of the total population). The investigation used the population of 51,234 and divided by the acquired sample of 750 and got a

ratio of 2/35. This time-honoured the interval in between the sample. Within the neighbourhoods the systematic sampling method was used where the second household was interviewed after which every other 35<sup>th</sup> household was interviewed. See the table below.

Table 1: Different neighbourhood/income classes sampled

S/N	Density	Neighbourhood	Projected population	Household population	Sample size	Percentage
1	High	Rumuokwurusi	76,006	14,334	192	30.00
2		Ikwere Road Area	101,295	18,549	278	42.00
3	Medium	Elekahia	30,878	6,813	90	12.00
4	Low	City council area	21,725	5,287	73	7.00
5		Forces Avenue	13,233	3,038	57	4.00
6		Willian jumbo	14,275	3,213	60	5.00
7		Total	257,412	51,234	750	100.00

Source: Researchers Survey (2019)

**Study Area**

The study was carried out in Port Harcourt metropolis Niger delta region of Nigeria. The metropolitan area comprises of Port Harcourt and Obiapor local government areas. It is one of the most popular and prominent larger metropolis in sub-Saharan African. Bounded on the north by Ikwere and Etche, on the east by Oyigbo and Eleme, of which parts are found in the affirmation metropolis; west by Emuoha, south Okirika and Degema local government areas. The metropolitan area is

highly congested as its rapid growth and urbanization was fuelled by the massive influx of people from the surrounding hinterlands purposely for white collar job in the various industries that sprang up as a result of oil exploration and responsible for insecurity of food, space competition and non-allotment of lands for urban agrarian. However, the region is also endowed with average temperature while climatic change such as flooding, increase in average temperature and others are confronting region nowadays.

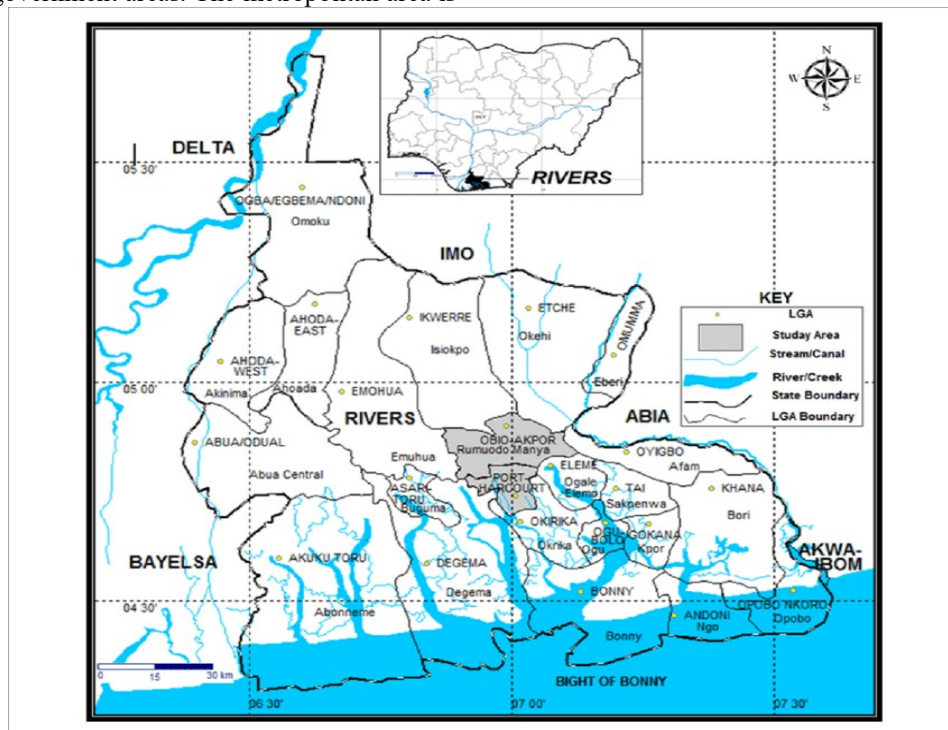


Figure 1: Map of Rivers State showing Port Harcourt metropolis.

### *Determination Of urban Agriculture Environmental Benefits*

The research analysis considered fifteen continuous environmental benefits of urban green architecture. The advantages was placed on 5 opinion rate capacity of research assessment ascending from 1 to 5, where 1 stood as the poor benefit and 5 the excellent environmental benefit or value score. The premier standard deviation mark indicates the supreme environmental benefit of urban agriculture. The standard deviation (S.D) was a resultant of sharing the overall reaction for each of the environmental benefit by the entire supreme score achieved. The standard deviation of every environmental benefit was beacons on 0.91. Nevertheless, the investigations adopted 0.81 as the standard deviation value or opinion for integrating or disintegrating any environmental variable by the scientist. The benefits with a standard deviation of 0.81 or beyond were considered environmental advantageous and highly adopted as an environmental benefit of urban agriculture. The adoption anchored on the point that every prudent researcher is duty band to agree or generate a standard bench mark higher than the scale.

### III. RESULT AND DISCUSSION

#### *Result*

The basis of the standard deviation values found in table 2 below shows the result of the 15 observed environmental benefits of urban agricultural practice in Port Harcourt metropolis. However, visibility of food crops for city dwellers recorded the first environmental benefit of urban green architecture which accounted (0.49) standard deviation score. The implication is that urbanites are demanding for food safety to lessen their food bills and increase dietary

irrespective of their income classes. That is why urban dwellers are eager for urban government to formalised urban agrarian and earmark lands for such practices to deter seasonal urban agriculture and encourage unseasonal food security and other environmental benefits deemed crucial. At the same Port Harcourt urban or location, improving air quality and heat reduction, increasing of urban farm population had the standard deviation of (0.50) and (0.50) respectively while aesthetics and micro farming was (0.51) and source of food supply for urban areas signifies (0.51). Also considered environmental advantageous of urban green architecture are supporting of biodiversity (0.61), community development (0.64), open green space and aesthetics (0.64), reducing storm water runoff (0.72) and water management (0.74). The environmental benefits identified by urban dwellers as being the least are self-consumption and micro farming (0.76), soil health improvement (0.78) improves environmental management (0.78), reduction of carbon footprints (0.80) and encouraged organic farming (0.81). However, the benefits obtained from the research were similar to those reported by Catherine (2012) who, proved that peri- urban agrarian provides ecosystem services, wildlife habitat, view sheds, local heritage, and agricultural productivity that the smallest benefits made available by land trusts was equated to an investigation obtainable from farmland amenity, agric tourism, farmland preservation, and ecosystems examination to show the variety of market values for different benefits of farmland. viljoen, and bohn (2005), who reported that urban agricultural benefits related to food security, important reduction of ecological footprint of a town and queried the reasons urban farming do not constitute high percentage of land uses in existing and proposed towns.

Table 2: Environmental Benefits of urban agriculture across Port Harcourt urban

S/N	environment Variables	X	SD	Ranking	Benefits Status
1	Supporting of biodiversity	4.1	0.61	6 <sup>th</sup>	Adequate
2	improving air quality and heat reduction	4.4	0.50	2 <sup>nd</sup>	Adequate
3	reducing storm water runoff	3.9	0.72	9 <sup>th</sup>	Adequate
4	visibility of food crops	4.5	0.49	1 <sup>st</sup>	Adequate
5	reduction of carbon footprints	3.4	0.80	14 <sup>th</sup>	Adequate
6	aesthetics and micro farming	4.3	0.51	4 <sup>th</sup>	Adequate
7	self-consumption	3.6	0.76	11 <sup>th</sup>	Adequate
8	Increasing of urban farm population	4.4	0.50	2 <sup>nd</sup>	Adequate
9	community development	4.2	0.64	7 <sup>th</sup>	Adequate
10	Source of food supply for urban areas	4.3	0.51	4 <sup>th</sup>	Adequate
11	water management	3.8	0.74	10 <sup>th</sup>	Adequate
12	soil health improvement	3.5	0.78	12 <sup>th</sup>	Adequate
13	open green space	4.2	0.64	7 <sup>th</sup>	Adequate
14	improves environmental management	3.5	0.78	12 <sup>th</sup>	Adequate
15	encouraged organic farming	3.3	0.81	15 <sup>th</sup>	Adequate

Source: Researchers field survey (2019)

*Classification of urban agriculture environmental benefits in Port Harcourt urban*

The results for classification of environmental benefits of urban agriculture across the metropolis were presented in table 3 below shows the result that classified urban agriculture and fig.2 is the component chart of their environmental benefits in the study region. From the analysis, it was discovered that the result classified the 15 identified environmental benefits into 5 components, thus collapsing them to fewer significant benefits with the aid of principal component analysis : Component 1 is significant and positively loaded on benefit of supporting of biodiversity(.89),improving air quality and heat reduction (.87), and reducing storm water runoff (.85), as obviously different from other environmental benefit of urban agriculture with eigen assessment of 7.50. It explicates 19.12 percent of variance in the environmental benefit of urban agriculture. Consequently, component 1 is an index of tree product/medical herb that Port Harcourt city benefit environmentally from urban agriculture. The central variable of the component is supporting of biodiversity (.89). Component 2 is significantly and positively loaded on visibility of food crops (.79), reduction of carbon footprints (.75) and reduction of carbon footprints(.67) with eigen value of 5.02. It elucidates 13.81 percent of inconsistency in the benefits of urban agriculture. Component 2 is therefore, an index of urban sustainability of urban green architecture benefits in Port Harcourt metropolis. The crucial variable of component 2 is food security for city dwellers with a benefit loading of (.79).

Component 3 is meaningfully and positively loaded on self-consumption and micro farming (.73), increasing of urban farm population (.64), and community development (.62), it has an eigen value of 8.67 and explains 11.27 percent of the observed variance in the environmental benefit of urban

farming. Component 3 is an index of agrarian development of urban farming environmental benefit in Port Harcourt. The describing capricious of the component is self-consumption and micro farming (.73)

Component 4 is significantly and positively loaded on source of food supply for urban areas (.76), water management (.73), and soil health improvement(.67). It has an eigen value of 4.967 but explains 9.784 percent of observed variance in the environmental benefits of urban farming in port Harcourt. Component 4 is an index of soil capacity/incubation gain from urban agriculture in Port Harcourt city. The prominent variable of the component is source of food supply for urban areas with the benefit loading of (.76)

Component 5 is suggestively and positively loaded on open green space and aesthetics (.73), improves environmental management (.60) and encouraged organic farming (.55) with the eigen value of 10.71: it explains 7.01 percent of the observed variance in the urban agriculture environmental benefit. Component 5 is an index of climate change resilience in Port Harcourt via urban agrarian. Open green space and aesthetics is the crucial variable of the component with factor loading of (.73)

The cumulative percentage of variance explained by the 5 component (tree product/medical herb, urban sustainability, agrarian development, and soil capacity/incubation and climate change resilience) is 65.88 percent .This leaves 34.12 percent unexplained variance of the environmental identified benefit of urban agriculture.

Based on this analysis, 5 environmental components namely: tree product/medical herb, urban sustainability, agrarian development, soil capacity/incubation and climate change resilience are the environmental benefits of urban agriculture in Port Harcourt. See table 4 for details.

Table 4: Defining Components of Urban Agriculture Environmental Benefits

Components	Percent	Environmental Benefits of Urban Agriculture(Variables Represented)	Rotated Component Factor Loading
1.Tree product/medical herb	20%	supporting of biodiversity	0.887
		improving air quality and heat reduction	0.871
		reducing storm water runoff	0.847
2.Urban sustainability	13%	visibility of food crops	0.790
		reduction of carbon footprints	0.747
		Aesthetics and micro farming	0.671
3.Agrarian development	12%	self-consumption	0.533
		increasing of urban farm population	0.529
		community development	0.500
4.Soil capacity/incubation	9%	source of food supply for urban areas	0.734
		water management	0.648
		soil health improvement	0.642

5.Climate change resilience	10%	open green space and aesthetics	0.618
		improves environmental management	0.600
		encouraged organic farming	0.762
Total	64%		

Researchers survey 2019.

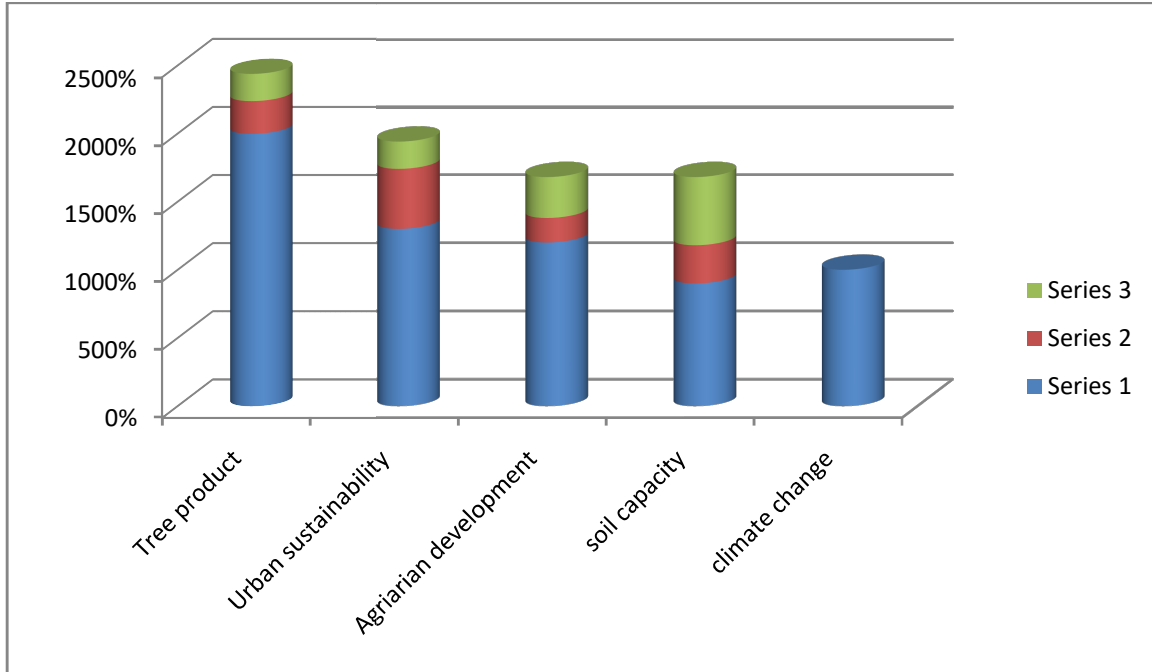


Fig 2: Component bar chart showing the environmental classification of urban agriculture

*Variation of urban agriculture environmental benefits across the urban locations*

The results for the environmental benefits dissimilarity of urban agriculture across the urban locations submit that there is a significant difference for the various income communities. The Duncan multiple analysis the research applied detailed that the environmental benefits are the same for higher and medium income neighbourhoods but varies for low income locations with the subset statistical value of 2.5659 and 2.6898 for higher and medium income communities respectively and 2.7397 for the low income communities at { $p < 0.05$ } alpha significant level. This implies

that environmental benefits of urban agriculture were not limited to any urban location but was highly felt in low income communities as the practices eradicate the wide spread of fallow and undeveloped lands that are commonly deface different land use activities in low income communities. However, the low income communities also gain open green space and aesthetics, environmental management tool and improving air quality and heat reduction via urban agriculture, unlike high and medium income communities characterised by planted tree without the innovations and practices of technological urban agriculture and its environmental advantage.

Table 5: Urban Agriculture and Environmental Benefits Dissimilarities

Income community	Number of Questionnaire	Subset for alpha = 0.05		
		1	2	3
high	470	2.5659		
medium	90		2.6898	
low	190			2.7397
sig.		1.000	1.000	1.000

Researcher’s survey 2019

#### IV. RECOMMENDATIONS

1. To resolve future environmental problems of Nigeria urban hemisphere, all land use proposed development (residential, commercial, transportation, industrial, recreation and institutional etc) seeking approval before the ministry of urban development, physical planning or area town planning authorities must mapped out at least 10% of its space for urban agricultural practices (for planting of annual, biannual and perennial crop farm or orchard etc) purposely for the boosting of environmental management tools and food crop visibility within the urban locations. The 10% per cent allotted space for growing of food crops in any proposed individual urban land use can serve as a buffer, wind control measure, enhancement of quality air, natural landscape element and as well as land use consumers food security.
2. Governments should adopt the establishment of crop farms across the income communities (low, medium and high) to ensure uniformity, environmental aesthetics, and availability of open green belt, visibility of food crops and encouragement of tree planting to battle climate across the communities.
3. It is also the utmost view of this research to recommend that government should establish a satellite town that should be known, called and addressed as agricultural layout so that 50% of its land uses will be earmarked for different urban agricultural practices purposely for environmental benefits as well as economic and social benefits that enhance urban food visibility and climatic change resilience.

#### V. CONCLUSION

The environmental aids of urban agriculture across the income locations in Port Harcourt metropolis Nigeria were held to quantify the outcome of environmental advantage of urban agriculture in Port Harcourt region. Verdicts from the study revealed that the environmental benefits of urban agriculture includes visibility of food crops for city dwellers, improving air quality and heat reduction, increasing of urban farm population and source of food supply etc for all the locations of Port Harcourt town. In classification of the environmental benefits, it was discovered that tree product/medical herb, urban sustainability, agrarian development, soil capacity/incubation and climate change resilience are the environmental benefits of urban agriculture which explained 64%. The variation of urban agriculture environmental benefits recorded that there is a significant difference for the various income communities but varies for low income locations with a statistical subset. Though, It is our utmost view for this research to recommend that government should establish a satellite town that should be known, called and addressed as agricultural layout so that 50% of its land uses will be earmarked for different urban agricultural practices

purposely for environmental benefits as well as economic and social benefits that will enhance urban food visibility and climatic change resilience.

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