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Economic Importance of Urban Tree Planting in Idi-shin, Oyo State, Nigeria

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ABSTRACT

Urban tree planting (UTP) plays an important role in human existence, it provides raw materials, food, shelter, clothing, medicine, etc. Therefore, this study aims to investigate the economic benefits of UTP in Idi-shin area of Oyo State. Idi-shin was specifically selected for this study. Sampling intensity (2.5%) was used to select 142 respondents. Primary data was collected using a structured questionnaire. Data were analysed using descriptive statistics and logistic analysis. The result shows that most (63.4%) of the respondents had information about tree planting; of which (26.8%) had it online. Many (77.5%) of the respondents were interested in planting trees but those who are not interested gave reasons such as lack of space (26.1%), difficulty in planting trees (21.4%) and lack of technical knowledge (21.4%). *Mangifera indica* was the most widespread tree species with about 27 stands in the region. Provision of Shade was the most important socio- economic benefit of trees with odds-ratio of 22.14. Enlightenment campaign should be encouraged while participation in UTP is important for sustainable management of the area.

1. Introduction

Urban forests include trees and forests located in cities, ornamental trees, street and park trees, protected forest and green spaces (Locke *et al*. 2024). Trees and forests protect urban areas from pollution as well as feature in other beautiful environmental functions. In Nigeria, most cities suffer from tremendous spatial expansion that is mainly due to structural development such as residential neighbourhoods and related structures which has resulted in the removal of planted trees and deforestation of reserved areas (Alonzo *et al*., 2021). Unfortunately, the problem related to the loss of greenery seems to have involved the statutory agencies responsible for the control and management of trees planted in urban areas. That is why Herbert *et al*., (2024) confirmed that urban trees are under pressure not only from pollution but also from heat, drought and the basis of arid environments. Urban trees plays so many numerous roles. These includes: filtering of air and water, providing shelter for animals and recreation areas for people. They also play an essential role in cooling the urban thermal effect (Wong *et al*. 2021). In addition, the benefits of planting urban trees include beautification, reduction of rainwater, reduction of air pollution, reduction of energy cost due to increased shading of buildings, improvement of wildlife habitat, mitigation of urban environmental impact, reduction of stress and contribution to the healthy lifestyle of urban residents (Locke *et al.* 2024). As a way of

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projection, the United Nations (2019) stated that by 2050, more than 68% of the world's population will live in urban areas implying global temperatures increase. With this, urban residents will experience higher average temperatures and more frequent extreme heat events due to the relatively low urban availability of breathable vegetation and the prevalence of impermeable heat-absorbing materials (Alonzo *et al,.* 2021). Considering this, the planting of urban trees which is one of the key factors in urban forestry that improves the urban ecological balance cannot be overemphasized (Hastre *et al*., 2006). However, it must be emphasized that it is necessary for the residents of the city to be well informed. Therefore, this study aims to investigate the economic benefits of urban tree planting in Idi-shin, Oyo State with a view to encouraging participation in urban tree planting in the area.

2. Literature review

Urban forests offer a diverse range of economic opportunities, serving as essential resources that support the livelihoods of many communities. As a crucial natural resource, it offers a multitude of income-generating opportunities. Beyond extraction of timber, it provides various ecosystem services and products that are becoming increasingly significant for both local communities and the global economy. Income generation from the forests include the extraction and sale of timber, as well as non-timber forest products (NTFPs) such as medicinal plants, fruits, fibers, and resins. According to the International Tropical Timber Organization (ITTO), NTFPs account for an increasing share of the forest economy, particularly in Africa and Southeast Asia, where reliance on diverse forest ecosystems remains critical (FAO, 2021). These products have been increasingly recognized for their economic value, providing alternative sources of income, particularly in rural areas where reliance on forest ecosystems is high (Smith, 2020).

Urban forest also offers a variety of income generation opportunities that support both local communities and broader economies. It is a major revenue source through extraction of products such as Non-timber forest products (NTFPs), herbs for medicinal purposes, fruits, and fibers, provide additional income, particularly for local populations reliant on forest resources (Adams, 2020). Furthermore, urban forest reserves are increasingly involved in carbon sequestration which had helped in ameliorating harsh environmental conditions, protection of homestead while generating income (Green, 2021). It also offers a sustainable means of farming that enhances biodiversity and reduces deforestation, thereby generating income while preserving forest health (FAO, 2021). Urban forestry enhances sustainable livelihoods by providing essential ecosystem services, income opportunities, and improved well-being for urban residents. It serves as a nature-based solution, contributing to health, economic development, and environmental justice as well as manage natural habitats and improve air quality (Locke et al. 2024).

2.1 Economic contributions of forest resources to livelihoods

Forests contribute significantly to the livelihoods of millions of people around the world, particularly in rural areas. These contributions come from both direct and indirect uses of forest resources. Direct uses include timber harvesting, NTFP collection, and wildlife trade. Indirectly, forests support industries, tourism, agroforestry, and other rural enterprises (Banda et al., 2021). For many rural communities, forest-based activities provide essential income; with non-timber products often being the most accessible resource for poorer populations (Bennett et al., 2020). Forests play an important role in

poverty alleviation. In areas where formal employment opportunities are limited, forests serve as a safety net, helping communities maintain food security and generating supplementary income (Davis et al., 2021). The economic potential of forests is also evident in the growing market for forest-based Eco-tourism, which is becoming an increasingly important source of revenue for developing regions (Zhou and Yu, 2020).

3. Methodology

3.1. Study area

Idi-shin is a region in the Southwest of Nigeria. Idi-shin is located at latitude 7°40'87'N and longitude 3°8'56' E, at an altitude of 336 m and with a precipitation regime ranging from 1,300mm to 1,500mm. The average temperature is about 37.2° and the average range is about 75 to 100% (McPherson, 2006).

3.2. Sampling procedure

Idi-shin was specifically selected for this study. For the essence of projection, a document showing the population of the area for 1991 was obtained from the National Population Commission (NPC) of Oyo State and from this document, a projection of the population of the area in 2025 was calculated using the formula:

$$Pn = Poert \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where: Pn = Final population, Po = Initial population, e = exponential. r = growth rate (3.2%), t = time internal (x – 1991) years, t = 34 years

Thus, the total population for 2025 was 5,673 people. In addition, a sampling intensity of 2.5% as adopted by Diaw *et al* (2002), was used to select respondents for this study. This indicated that when the population is less than 500, a sampling intensity of 10% is adopted; for a population greater than 500 but less than 1000, a sampling intensity of 5% was adopted while a sampling intensity of 2.5% was used for population greater than 1000. From the above, a total of 142 respondents were randomly selected for this study.

3.3. Method of data collection

Primary and secondary data were used for this study. Primary data were collected using a structured questionnaire while the secondary data were obtained from the N.P.C. registration document. The questionnaire was designed to obtain information on the level of residents' awareness of urban tree planting, the participation of residents in the planting of urban tree species, the common types of tree species used and the socio-economic benefits of urban tree planting to residents of Idi-shin.

3.4. Data analysis

Data was analysed using descriptive statistics and the logistic regression analysis. The logistic regression is expressed below;

$$\log\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 + \beta_2 + \beta_3 + \beta_4 + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where: P is the probability that a respondent gets socio-economic benefits from Urban tree planting, β_0 is the intercept; β_1, β_2, β_3, β_4 are the coefficients corresponding to the predictor variables. The

coefficients were estimated using the maximum likelihood estimation method. The model assesses the log-odds of assessing the socio-economic benefits of urban tree planting as a function of the predictors (Independent variables). The exponential of each coefficient (Exp. (B)) represents the odds-ratio, which indicates the change in odds of adoption for a one-unit increase in the predictor, holding other variables constant.

4. Results

4.1. Demographic information of respondents in the study area

The result in Table 1 shows the demographic information of the respondents in the study area. The age distribution revealed that the majority (37.3%) of the respondents were between 31-50 years old, while the lowest percentage (5.6%) of the respondents were 65 years and above. This clearly shows that the youth prefer to reside in the urban areas than the elderly, who in most cases would prefer to live in the rural areas (home roots) (Olawuyi, 2019).

Table 1. Demographic characteristics of respondent

Demographic characteristics	Frequency	Percentage
Age		
10- 20	20	14.1
21-30	40	28.2
31-50	53	37.3
51-65	21	14.8
65 and above	08	5.6
Total	142	100
Gender		
Male	60	42.3
Female	82	57.7
Total	142	100
Marital status		
Single	42	29.6
Married	77	54.2
Widowed	15	10.6
Divorced	8	5.6
Total	142	100
Educational status		
No formal education	8	5.6
Primary	15	10.6
Secondary	35	24.6
Tertiary	61	43.0
Others	2	16.2
Total	142	100
Occupation		
Civil servant	60	42.3
Artisan	49	34.5
Farmers	11	7.7
Others	22	15.5
Total	142	100

Source: Field survey (2025)

This can also be attributed to the fact that the urban areas are better equipped with infrastructure that contributes to a good standard of living. The result of gender shows that 57.7% of the respondents were female while 42.3% of the respondents were male. This may be because men are always busy looking for other ways to support their families and are not always at home while the women (even if they work) are mainly housewives and as such they carry out most of the planting activities in the residence where they reside (Faleyimu, 2013). The results also show that 54.2% of the respondents were married while the less (5.6%) were divorced. This is an indication that most of the plantations in the region were established by the married for one purpose or the other in their residence. It was also observed that 43.0% of the respondents had a higher education while 5.6% of the respondents had no formal education. This also clearly shows that most of respondents living in the study area were educated. In addition, the study also shows that 42.3% of the respondents were civil servants while 7.7% of the respondents were farmers. This implies that most of the respondents took up white collar jobs and other businesses to support themselves and therefore may pay less attention to the planting of trees (Aluko, *et al.,* 2020)

4.2. Level of awareness of residents on urban tree planting in the study area

The result in Table 2 shows the level of awareness of respondents to tree planting.

Table 2. The level of awareness of residents on urban tree planting in the study area

Level of awareness	Frequency	Percentage
Do you have idea on tree planting		
Yes	90	63.5
No	52	36.6
Total	**142**	**100**
If yes, how did you get this information?		
Mass media	25	16.9
Forest extension	15	10.6
Internet	38	26.8
Discussion	26	18.3
Television	18	12.7
Chat	20	14.1
Total	**142**	**100**
How often do you get the information?		
Frequently	70	49.3
Occasionally	72	50.7
Total	**142**	**100**
Yes	95	66.9
No	47	33.1
Total	**142**	**100**
Is tree planting necessary in your environment?		
Yes	102	71.8
No	40	28.2
Total	142	100
Do you have interest in tree planting?		
Yes	110	77.5

No	32	22.5
Total	**142**	**100**
What is the purpose of planting trees?		
Beautification	30	21.1
Provision of shade	36	25.4
Acts as windbreakers	14	9.9
For recreational purpose	6	4.2
For food/ fruits	46	32.4
Others	10	7.0
Total	**142**	**100**
What are the reasons for not planting trees?		
Lack of space	37	26.1
Time consuming	14	9.9
Lack of fund	12	8.5
Trees are difficult to plant	30	21.1
No technical know how	24	16.9
Long maturity of trees	20	14.1
Others	5	3.5
Total	**142**	**100**

Source: Field survey 2025

It was found that 63.4% of the respondents had information about tree planting, while 36.6% of the respondents had no information about tree planting. This implies that most of the respondents in the study area have access to tree planting information in one way or another. The Table also shows that 26.8% of the respondents got the information from the internet; this was followed by respondents (18.3%) who received information from discussions with friends, relatives etc. while a few (10.6%) of the respondents received the information through the forest extension. The strong response recorded on the internet may be since the internet has become the most common way of obtaining information in recent times. However, 50.7% of the respondents receive this information from time to time. This result clearly shows that information on tree planting is not always available on regular basis compared to some other programmes. This, therefore, does not encourage respondents to plant trees Potapov *et al.*, 2017). More so, 66.9% of the respondents said that tree planting is important while 71.8% of the respondents stated that tree planting is necessary in the study area. Regarding the purpose of planting trees, 32.4% of the respondents said that the trees were planted to provide fruits which were later sold to generate income. This was followed by respondents who planted trees for the purpose of providing shade (25.4%), while some respondents (7.0%) planted trees for other purposes.

This implies that many respondents planted trees to produce fruits that are consumed or sold to meet their daily needs and to provide shade in hot weather. This confirms the results of Maller *et al.*, (2008), that many people planted trees because it serves as wind break and for shades. Moreover, regarding the respondents' interest in tree planting, the result shows that 77.5% of the respondents are interested in tree planting while 22.5% of the respondents are not interested in tree planting in the study area.

Thus, the reasons for the lack of interest in planting trees in the study area were the lack of space (26.1%), difficulty in planting trees (21.4%), no technical know-how (21.4%) etc.

This supports the results of Ananyewa and Emmanuel (2023) who stated that due to some risks associated with presence of trees in the urban area, residents could develop a negative attitude towards planting trees in their environments.

4.3. Common tree species planted in the study area

The result in Table 3 shows the common trees species identified in the study area. *Mangifera indica* (mango) was the most common tree species in the homes of most respondents. This may be because the mango tree is one of the most common fruit trees known to many people in this area and this might be related to the fact that it provides fruits, shade, serves medicinal purposes and the respondents also generate income through their sales (El-Rahman, *et al.,* 2019). Therefore, this supports the result of Vincent (2013) that trees planted in the environment can be a source of livelihood for the people who care for them. Other tree species identified in the area include: *Gliricidia sepium, Anacardium occidentale, Morinda lucida, Tectona grandis, Gmelina arborea, Nauclea diderrichii, Delonix regia* etc. These trees serve different purposes; such as for shade, windbreaks, medicinal purposes, income generation, timber production, beautification etc. (McPherson *et al*., 2002).

Table 3. Common tree species identified in the study area

S/N	Scientific names of species identified	Common names	Local name (Yoruba)	Number of occurrence	General uses
1	*Morinda lucida*	Morinda	Oruwo	9	Medicinal purposes
2	*Peltophorum Pterocarpum*	Copper pond	Igi copper	1	Medicinal purposes, Shade
3	*Mangifera indica*	Mango	Mangoro	27	Fruit, medicinal, shade,Income
4	*Gliricidia sepium*	Gliricidia	Agunmaniye	25	Income, medicinal, fruit
5	*Tectona grandis*	Teak	Teak	8	Shade, pole, income
6	*Gmelina arborea*	Bench wood	Gmelina	9	Shade, windbreak
7	*Anogeissus leiocarpa*	Africa birch	Africa birch	7	Shade, wind break
8	*Anacardium occidentale*	Cashew	Cashew	13	Fruits, shade, medicinal Purpose
9	*Shorea roxburghii*	White meranti	Shorea	4	Fruit production, income, Shade
10	*Eucalyptus torelliana*	Cadaga tree	Cadaga	2	Timber production, shade, income
11	*Casuarina equisetifolia*	Christmas tree	Ahoyaya /Igi Irin	4	Ornamental plant, Income
12	*Terminalia catappa*	Almond tree	Igi fruit	10	Relaxation, wind break
13	*Cedrella odorata*	Spanish cedar	Kado	7	Beautification
14	*Hildegardia barteri*	Mast	Okurugbedu	3	Erosion control
15	*Terminalia ivorensis*	Terminalia	Black afara	2	Shade, income
16	*Zanha golungensis*	Muchenya (shona)	Igi-idan	6	Recreation, windbreak
17	*Polyalthia longifolia*	Masquerade tree	Asoko	15	Beautification, income
18	*Theobroma cacao*	Cocoa	Koko	2	Medicinal use

S/N	Scientific names of species identified	Common names	Local name (Yoruba)	Number of occurrence	General uses
19	*Cordia allitoctora*	Salm wood	Ecuador Laurel	2	Shade, relaxation
20	*Elaeis guineensis*	Palm tree	Igi ope	7	Beautification, income
21	*Khaya senegalensis*	Africa mahogany	Djalla	3	Income, shade
22	*Citrus paradise*	Grape	Grape	10	Fruit, medicinal
23	*Xylia xylocarpa*	Iron wood	Igi irin	3	Shade, timber production
24	*Triplochiton scleroxylon*	Obeche	Arere	5	Shade, income
25	*Cola nitida*	Kolanut	Obi	2	Income, medicinal value
26	*Delonix regia*	Flame of the Forest	Panseke	4	Beautification, shade
27	*Moringa oleifera*	Drum stick	Moringa	9	Medicinal purposes
28	*Holarrhena floribunda*	False rubber tree	Igi rubber	2	Shade, medicinal
29	*Nauclea diderrichii*	African peach	Opepe	5	Shade, income
30	*Cassia fistula*	Golden shower tree	Amaltas	3	Shade, income, medicinal purposes

Source: Field survey (2025)

4.4. Socio- Economic Benefits of urban tree planting to residence of Idi-shin

To further investigate the Socio- Economic Benefits of trees to residents of Idi-shin area, a binary logistic regression analysis was conducted. The dependent variable was Socio- Economic Benefits of trees to residents of Idi-shin area (Yes/No), while the independent variables include: Erosion Prevention (EP), Beautification of the Environment (BE), Income (I), Provision of Shade (PS), Purification of the Atmosphere (PA), Herbal Medicinal Value (HMV), and Protection of the Environment (PE).

Provision of Shade (PS) was the most significant Socio- Economic benefit of urban tree planting in the study area with odds-ratio of 22.14. This was followed by Erosion Prevention (EP), Purification of the Atmosphere (PA), Protection of the Environment (PE), Herbal Medicinal Value (HMV) and Beautification of the Environment (BE) with odd-ratios of 11.02, 7.17, 3.28, 2.36 and 2.20 respectively (Table 4). This implies that the higher the odds- ratio, the more likely the socio-economic benefits of urban tree planting to the residents of Idi-shin area (Deeks, 1996)

Table 4. Logistic binary nature for the socio-economic benefit of urban tree planting to residents of Idi-shin area

Independent variables	Co-efficient	Odds- ratio
Erosion Prevention	0.04	11.02*
Beautification of the environment	-1.16	2.20*
Income	-1.69	0.18
Provision of Shade	0.76	22.14*
Purification of the Atmosphere	-1.75	7.17*
Herbal Medicinal Value	0.23	2.36*
Protection of the Environment	1.16	3.28*

Dependent Variable: socio-economic benefit of Urban Tree Planting (SEBUTP) (Yes = 1, No = 0)

Source: Field survey (2025)

5. Conclusions

Planting of trees in the urban areas plays a vital role in making the environment conducive for better living as it provide numerous environmental, economic and social benefits. Therefore, efforts should be made to create more awareness on tree planting in the urban areas. Activities such as World Environment Day and other Campaigns programmes on the awareness of tree planting should be given serious priority to enlighten the residents on the need to imbibe the habit of tree planting in the study area. Likewise Research Institute and other related field should make it a point of duty that residents around the environment are enlightened on tree species and their importance to ensure protection, conservation and sustainability of these species.

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References

Adams, J. (2020). Community Forestry Enterprises and Sustainability in Developing Countries. *Journal of Sustainable Forestry,* 8(4), 567-590.

Alonzo, M., Baker, M. E., Gao, Y. and Shandas, V. (2021). Spatial configuration and time of day impact the magnitude of urban tree canopy cooling. *Environmental Research Letters*. 16(8):084028. https://doi.org/10.1088/1748-9326/ac12f2

Aluko, O.J., A.A. Adejumo and A.O. Bobadoye, (2020). Adaptive strategies to deforestation among Non-timber forest products (NTFPS) collectors across gender line in Oluwa Forest Reserve area of Ondo State, Nigeria. *Agro-Science,* 19 (2): 48-52

Ananyeva, O and Emmanuel, R. (2023). Street trees and urban heat island in Glasgow: Mitigation through the 'Avenues Programme.' *Urban Forestry and Urban Greening.* 86:128041. https://doi.org/10.1016/j.ufug.2023.128041

Banda, S. S., Zhou, L., and Li, S. (2021). Forest-based livelihoods and sustainability: Economic impacts in rural areas. *Forest Policy and Economics*, 128, 102465.

Bennett, J., Jones, K., and Zhang, X. (2020). Ecotourism and forest resource management: A case study of community-based tourism in Southeast Asia. *Journal of Sustainable Tourism*, 28(6), 881-899.

Davis, A., Thompson, M., and Brown, G. (2021). Equity and social justice in forest resource utilization: Challenges and solutions. *Environmental Management*, 58(3), 403-417.

Deeks, J. 1996. Swots corner: What is an odd ratio? *Bandolier,* 3 (3), issues 25, 6-7

Diaw, K. Blay, D. and Adu-Anning, C.2002. Socio- economic survey of forest fringe communities: Krokosua Hulls Forest Reserve. A report submitted to the Forestry Commission of Ghana. Pp 32 - 35.

El-Rahman, A., Bakry, M., and El-Zoghby, I. (2019). Flowering, Yield and Fruit Quality of Balady Mango Seedling trees as influenced by *Parlatoria oleae (*Colvee) Infestation Rate. *International Journal of Horticulture, Agriculture and Food Science*, *3*(2), 102-111. doi: 10.22161/ijhaf.3.2.9

FAO. (2021). Sustainable Forest Management and its Role in Achieving the SDGs. FAO Publications, *Rome*. 9(5), 129-139

Faleyimu, O.I., B.O. Agbeja and O. Akinyemi, (2013). State of forest regeneration in Southwest Nigeria. *Afr. J. Agric. Res*., 8: 3381-3383.

Green, D. (2021). Policy Gaps in Forest Conservation: Addressing Governance and Institutional Challenges. *Journal of Forest Policy and Economics,* 5(2), 112-130.

Hastre, C. and Baker, C. (2006). Natural rubber: History and development in the natural industry. TT 443: 24

Hebert R, Hill O, Kett H, Levin P, Murphy-Williams M, Wyse L. (2024). Street trees provide an opportunity to mitigate urban heat and reduce risk of high heat exposure. *Scientific Reports*. 14(1):3266. https://doi.org/10.1038/s41598-024-51921-y

Locke DH, Baker M, Alonzo M, Yang Y, Ziter CD, Murphy- Dunning C, O'Neil-Dunne JPM. (2024). Variation the in relationship between urban tree canopy and air temperature reduction under a range of daily weather conditions. *Heliyon*. 10(3):e25041. https://doi.org/10.1016/j.heliyon.2024.e25041

Maller, S. K., McDow, W. and Halpin, P. (2008). Shades of green; measuring the value of urban forests. *J. Exp. Bull.* 25: 563-579.

McPherson, E. G. (2006). Benefit and cost of tree planting and care in Chicago. NT: 24-49.

McPherson, E. G., Simpson, J. R. and Scott I. C. (2002). Analysing microclimate and air quality benefits with parking lot shades ordinances. Welter and Leben 4:98.

Olawuyi, E.B., (2019). Illegal activities in Ago-Owu Forest Reserve in Osun Sate and its implication on sustainable forest management. *J. Res. For. Wildl. Environ*. 11: 296-305.

Potapov, P., M.C. Hansen, L. Laestadius, S. Turubanova and A. Yaroshenko *et al.,* (2017). The last frontiers of wilderness: Tracking loss of intact forest landscapes from 2000 to 2013. *Sci. Adv*., Vol. 3. 10.1126/sciadv.1600821.

Smith, M. (2020). Non-Timber Forest Products and their Role in Local Economies. *Forest Economics and Management Review,* 9(1), 98-115.

United Nations. (2019). World urbanization prospects: The 2018 revision. New York (NY, USA): United Nations, Department of Economic and Social Affairs. ST/ESA/SER.A/420. 103 p. https://population.un.org/wup/assets/WUP2018-Report.pdf

Vincent, O. (2013). Improving water use efficiency of crop varieties in the North China plain: Review and analysis. *Journal of integrated agriculture*. NLC: 1-12-35.

Wong N.H., Tan C.L., Kolokotsa D.D., Takebayashi H. (2021). Greenery as a mitigation and adaptation strategy to urban heat. *Nature Reviews Earth & Environment*. 2(3):166-181. https://doi.org/10.1038/s43017-020-00129-5

Zhou, W., and Yu, Y. (2020). Forests, biodiversity, and ecosystem services: A critical link to human well-being. *Global Environmental Change*, 64, 102135