SOCIO-ECONOMIC ASSESSMENT OF ECOSYSTEM SERVICES OF AN URBAN PARK IN UNIVERSITY OF BENIN, BENIN CITY.

BY

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AGR2004405

DEPARTMENT OF FOREST RESOURCES AND WILDLIFE MANAGEMENT

FACULTY OF AGRICULTURE

UNIVERSITY OF BENIN

BENIN CITY

NOVEMBER, 2025.

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A PROJECT REPORT SUBMITTED TO THE DEPARTMENT OF FOREST RESOURCES AND WILDLIFE MANAGEMENT, FACULTY OF AGRICULTURE, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF AGRICULTURE DEGREE B.AGRIC. (FOREST RESOURCES AND WILDLIFE MANAGEMENT)

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CERTIFICATION

This is to verify that this project work was carried out by Osasu OMOROGIEVA of the Department of Forest Resources and Wildlife Management, Faculty of Agriculture, University of Benin, Benin City.

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08/12/25	
Date	Date

DEDICATION

To the Lord God Almighty, whose mercies are new every morning and whose love is everlasting, I dedicate this work. It is by His grace, love, and mercy that I have come this far, not by my strength.

With a deep sense of gratitude, I also dedicate this work to my loving parents, Mr and Mrs. Omorogieva Obazee. I appreciate their unwavering support throughout my years of study.

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ABSTRACT

Urban parks form an integral part of urban forest ecosystems, providing a wide range of ecological, socio-economic, and cultural benefits essential for human well-being and sustainable urban development. This study assesses the socio-economic value and public awareness of ecosystem services provided by trees within the Faculty of Social Science Park at the University of Benin, Benin City, Nigeria. A structured questionnaire was administered to 95 respondents selected through proportional sampling based on visitor frequency. Data collected were analysed using descriptive statistics and the Relative Importance Index (RII).

Findings showed that respondents demonstrated a high ability to identify key ecosystem services such as shade provision, aesthetic enhancement, air purification, recreational support, medicinal resources, and habitat provision. Cultural benefits such as recreation, landscape beauty, and stress reduction recorded the highest RII values, with beautification (RII = 0.808) and shade provision (RII = 0.80) ranked most important. Awareness of ecosystem services was also high, especially for provisioning services such as medicine (RII = 0.85) and timber (RII = 0.84). Despite this, willingness to pay (WTP) for park conservation was low, with 80% unwilling to contribute financially. Economic constraints accounted for over half (53.9%) of the reasons for refusal, highlighting the influence of income on environmental support behaviour.

The study concludes the need for stronger environmental education, improved park infrastructure, and the integration of green-space management into university planning. This study recommends enhanced awareness, and policy backing of urban forest ecosystem services, in order to promote its long-term conservation and optimize the park's role in supporting environmental quality, cultural values, and campus well-being.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of Study

Urbanization has led to significant transformations in land use, often at the expense of natural landscapes and green spaces. Within this changing urban environment, urban parks have emerged as critical components of urban ecosystems, commonly categorized as a distinct type of urban forest due to their multifunctional ecological and social roles (Konijnendijk *et al*., 2018). Urban forests, broadly defined, include all publicly and privately owned trees, woodlands, and green spaces within urban areas, and parks stand out for their intentional design to combine ecological functions with recreational and cultural benefits (Roy *et al*., 2012).

Urban parks, often considered a vital form of urban forest, are multifunctional green spaces that deliver a wide range of ecosystem services critical to the well-being of urban populations. As cities expand and landscapes become increasingly dominated by built environments, the importance of urban parks as natural infrastructure has grown significantly. These spaces provide not only ecological benefits such as carbon sequestration, air purification, stormwater management, and microclimate regulation, but also socioeconomic advantages including recreational opportunities, enhancement of property values, promotion of mental and physical health, and strengthening of social cohesion (Bolund & Hunhammar, 1999; Kabisch *et al*., 2017; FAO, 2020).

A park in urban society is a publicly accessible, deliberately designed and managed green space within a city or town, aimed at supporting recreation, ecological functions, cultural expression, and the overall enhancement of residents' physique and psychology (Kabisch *et al*., 2024). They

provide the population with places to exercise, socialise and experience nature, which has been shown to reduce stress and support mental health (Twohig-Bennett & Jones, 2018).

The Millennium Ecosystem (MA) Assessment (Assessment, 2005) described an ecosystem as "a dynamic complex of plant, animal and micro-organism communities and the non-living environment interacting as a functional unit". The benefits that people derive from their ecosystems are collectively referred to as *ecosystem services* (Assessment, 2005; DEFRA, 2007; Graves et al., 2009). The importance of the ecosystem services (ES) concept is in how it shows the diversity of flows of benefits from the natural environment and as well provides a means for valuation and recognition of both "value in use and non-use" (Graves et al., 2009). Since the Millennium Ecosystem Assessment (MA) framework highlighted the critical dependency of humankind on the environment, and the degradation that puts that dependency at risk, the ecosystem services concept has been used as a means of identifying, categorizing, and valuing the benefits that ecosystems provide, and the concept is now firmly established as an analytical tool in policy agenda (Gómez-Baggethun *et al*., 2010; Fisher *et al*., 2009).

Human societies derived many essential provisioning services from natural ecosystems, including food, firewood, game animals, fodder, timber and medicinal products. These services represent important and familiar part of the economy. They also perform fundamental life support services without which human civilization would cease to thrive. These include the purification of air and water detoxification and decomposition of wastes, regulation of climate, production and maintenance of biodiversity, from which key ingredients of our agricultural, pharmaceutical industrial enterprises are derived. This array of services is generated by a complex interplay of natural cycles powered by solar energy and operating across a wide range of space and time (Daily, 1997). However, despite the immense importance of the forest,

agencies and organizations have reported great loses of the ecosystem due to unfavourable forestry practices all over the world (FAO, 1997). The loss of diversity may not only lead to a loss of commercial opportunity but may also compromise ecosystem functions (Louren *et al*., 2000, Coleman and Hendrex, 2000). The report of the Nigerian biodiversity strategy and action plan (NBSAP, 2002); stated that the recognition of the value of forest resources particularly its non-timber values could lead to their increased use as a tool in social and economic development as well as to the development of more complete understanding of the Nigerian environment.

Ecosystem services are very important to the wellbeing and survival of people. Society depends on the continuous provision of ecosystem services for wellbeing and especially in poor countries where ecosystem services are fundamental in many people's livelihoods. These services according to the MA (Assessment, 2005), include:

i. Provisioning services such as food, fresh water, wood, fuel and fiber;
ii. Regulating services that affect climate, flood, disease, and water purification;
iii. Cultural services that provide recreational, educational, aesthetic, and spiritual benefits; and
iv. Supporting services such as soil formation, photosynthesis (primary production) and nutrient cycling.

The recognition and valuation for each of the above ecosystem services vary greatly depending on whether the impact is direct or indirect. Those services that have a direct impact on livelihoods (such as food, fiber, fuel wood, some cultural services and recreation) are more easily recognized and valued. Other services provided by the ecosystem (such as regulation of the climate, the purification of air and water, flood prevention, soil formation and nutrient cycling) are less recognized and valued, and therefore take the form of "nonmarket, public goods whose

values are difficult to directly ascertain" (DEFRA, 2007; Graves *et al*., 2009) and this also provides the reason why they are frequently omitted within decision-making and policy appraisals (Isoun, 2006; DEFRA, 2007; Graves *et al*., 2009).

1.2 Statement of Problem

Urban parks, often regarded as a type of urban forest, provide multiple ecosystem services, such as air purification, carbon sequestration, temperature regulation, biodiversity support, and socio-cultural benefits that are essential for urban well-being (Kabisch *et al.,* 2015; Roy *et al.,* 2012). However, in many cities, including those in developing countries, the socioeconomic value of these services is rarely quantified or integrated into urban planning and policy frameworks. As a result, urban parks are frequently undervalued, poorly maintained, or threatened by urban expansion and competing land uses (Haase *et al.,* 2014).

The concept of ecosystem services (ES) provides a theoretical framework of the policy perspective and emphasises the need to communicate, assess and quantify the value of ecosystems (Gómez-Baggethun and Barton 2013). Along with ecological and economic values, sociocultural values have been emphasised in determining the value of goods and services that ecosystems provide to the well-being of society (e.g. de Groot *et al.* 2002).

In many urban areas, decision-makers and planners tend to undervalue or overlook the tangible and intangible benefits provided by urban parks because these services are not adequately quantified or translated into economic terms (Jim & Shan, 2013). This leads to underinvestment in park maintenance and protection, as the contribution of urban parks to urban residents' livelihoods, social cohesion, and health is often perceived as secondary to build infrastructure development (McConnachie & Shackleton, 2010).

The challenge is further compounded by increasing urban population density, which intensifies competition for land, and by climate change impacts, which stress both the ecological integrity and service capacity of urban parks (Elmqvist *et al.,* 2015). Without comprehensive socioeconomic assessments, cities risk undervaluing urban parks, thereby accelerating their degradation or conversion to non-green uses. Furthermore, rapid urbanization has resulted in a significant decline in urban green space per capita, exacerbating social inequalities in access to these ecosystem services (Kabisch & Haase, 2014). This makes it increasingly important to assess not only the ecological functions of urban parks but also their socioeconomic contributions, which can inform policies aimed at equitable urban planning and sustainable development (Gómez-Baggethun & Barton, 2013).

As the university continues to experience rapid physical development and urbanization, understanding the ecological and socio-economic functions of existing trees is critical for promoting sustainable environmental management and campus planning. Also, Capturing ecosystem services and their value for society is expected to support decision-making.

1.3 Objective of Study

The main objective is to socio-economically assess ecosystem services provided by tree in the Faculty of Social Science Park in the University of Benin. The specific objectives are to;

i. identify the ecosystem services provided by trees in the park.
ii. examine the socio-economic and cultural values of the trees to the visitor in the park.
iii. evaluate the level of awareness and perception about the ecosystem services provided by trees in the study area.

1.4 Justification of Study

Trees within urban and institutional environments such as universities offer critical ecosystem services that enhance environmental quality, human health, and sustainability. The University of Benin (UNIBEN), as a growing academic institution, is experiencing rapid infrastructural development, often at the expense of green spaces. Yet, trees on campus play essential roles in microclimate regulation, carbon sequestration, biodiversity conservation, and the well-being of students and staff. Moreover, university campuses are microcosms of urban landscapes and often set the standard for environmental stewardship. This study will therefore support UNIBEN's role in advancing sustainability by generating baseline data on its tree-based ecosystem services.

However, these values are rarely documented or integrated into campus management decisions. A formal assessment will help university administrators recognize and integrate these services into campus planning and policy.

The findings of this research will raise awareness among students and staff about the importance of trees and promote a conservation culture. With growing interest in climate and environmental action among youth, institutions of higher learning have a responsibility to model sustainable behaviour and environmental accountability.

1.5 Scope

This research will specifically focus on the Faculty of Social Science Park, University of Benin, located at Ovia North East Local Government area of Edo State, Nigeria, as the study area. The research aims to the ecosystem services provided by trees in the park. The scope also includes an evaluation of socio-economic and cultural benefits to the university community, the perception and level of awareness of students and staff towards the importance and conservation of trees.

However, this study excludes trees outside the Faculty of Social Science Park and non-tree vegetation such as grasses and shrubs.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Urban Forest

Urban forests are a distinct component of the urban landscape fundamental to the composition of urban green areas and they are ecosystems characterized by the presence of trees and other vegetation in association with human developments (Nowak *et al*, 2001), They include ornamental, street and parkland trees, protected forests and green areas found in cities (Kuchelmeister, 2000). They are also major constituent of growth in the quality of life of the population, especially in large urban centres and also in towns (Rodrigues; Copatti, 2009). As documented by McPherson *et al*., (1999) urban trees influence global climate change through direct removal of greenhouse gases from the atmosphere. They also help in amelioration of urban climate and mitigation of air pollution (Nowak, 2000). As documented by Singh (2002), trees, serve the functions of carbon sequestration, watershed protection, providing shades and homes to many life forms and above all, acting as purifier to the ecosystem. Avenue trees found within University campuses in various cities are part of the urban forests and they play immense beneficial role in making the University environment conducive for impacting knowledge. Trees are purposely left or planted in academic areas for many reasons one of it been the environmental services it performs (Egunjobi, 1989; Babalola, 2010; Gutscher and Bauer, 2011). Urban trees are strategic components of the green substructure envisioned to make our growing cities more ecological in this period of climate change (Erker and Townsend, 2019).

2.2 Parks and Garden

Urban parks and gardens serve as crucial elements of green infrastructure that deliver a broad array of ecosystem services (Kabisch *et al*., 2015). In African cities, including Nigeria, these

green spaces not only provide recreation and aesthetic value but also preserve cultural heritage, facilitate social cohesion, and support mental well-being (Jim & Chen, 2017; Adegun, 2017). Traditionally, parks and gardens have been defined by their landscape and aesthetic appeal. However, recent scholarship views them through the lens of ecosystem services functions and benefits provided by natural systems to human society (TEEB, 2010). Parks and gardens are framed as multifunctional socio-ecological systems delivering a variety of ecosystem services critical to urban sustainability and human well-being (Jim & Chen, 2020; Kabisch *et al*., 2015).

A park is typically defined as an intentionally managed public or semi-public space that conserves natural elements and biodiversity, while also providing provisioning, supporting, cultural and regulating services such as recreation, urban cooling, and stormwater mitigation (FAO, 2025; Chiesura, 2004). For example, Murtala Muhammed Park in Lagos and Millennium Park in Abuja have been documented to reduce urban heat island effects, improve air quality, and provide space for cultural events (Iwuagwu *et al*., 2020).

Trees are important to humankind not only economically, environmentally, and industrially but also spiritually, historically, and aesthetically for they sustain human life through direct and indirect gain by providing a wide range of products for survival and prosperity (Asif *et al*., 2007). There are several uses of trees to man in Africa, people traditionally planted trees around their houses for fruits, nuts, leaves, fuel wood, folder, building materials, windbreaks among others (Fuwape and Onyekwelu 2011). It was common to plant trees in village square to provide shade during meetings, ceremonies, education, recreation, worship and so on. The immense biodiversity generates a variety of natural resources which help to sustain the livelihood of the local communities (Agbelade, 2013).

Indigenous tree species such as *Parkia biglobosa, Vitellaria paradoxa*, and *Afzelia africana* have been shown to play key roles in supporting rural livelihoods through the provision of food, medicine, and income, while also maintaining ecological stability (Arowosoge & Popoola, 2021). In urban areas, trees mitigate air pollution, reduce surface temperatures, and enhance aesthetic and recreational values, contributing significantly to public health and urban resilience (Ogunjobi *et al*., 2021).

2.3 Benefit of Parks and Garden

Parks and gardens deliver diverse ecosystem services, broadly grouped as (Konijnendijk, C. C., Annerstedt, M., Nielsen, A. B., & Maruthaveeran, S. 2013):

I. **Regulating services:** Parks and gardens moderate local microclimates by providing shade, reducing surface and air temperatures, and mitigating the urban heat island effect Bowler, (D. E., Buyung-Ali, L., Knight, T. M., & Pullin, A. S. 2010), reducing flood risk, and improving air quality (Demuzere *et al*., 2014). In Lagos, green spaces reduce surface temperatures by up to 2–3°C (Iwuagwu et al., 2020).

II. **Provisioning services**: Provisioning services are one of the major categories of ecosystem services described by the Millennium Ecosystem Assessment (2005). They refer to the direct products that people obtain from ecosystems, including food, water, timber, fuel, and medicinal resources. In the case of parks and gardens, provisioning services highlight the tangible goods these green spaces supply to society. It aids in supplying medicinal herbs, traditional vegetables, and ornamental plants (Taylor & Lovell, 2014). In Nigerian community gardens, women often cultivate indigenous crops used in cultural cuisine (Oladele & Adewumi, 2021).

III. **Supporting services:** Supporting services are the fundamental ecological functions that underpin all other ecosystem services (provisioning, regulating, and cultural). According to the Millennium Ecosystem Assessment (2005), they include processes like nutrient cycling, soil formation, primary production, and habitat provision. In parks and gardens, supporting services are crucial because they sustain biodiversity and maintain the natural systems that make other benefits possible. It serves as habitat for pollinators, soil stabilization, and nutrient cycling (Tzoulas *et al*., 2007).

IV. **Cultural services:** Cultural services are the non-material benefits people obtain from ecosystems. According to the Millennium Ecosystem Assessment (2005), they include recreation, aesthetic enjoyment, spiritual fulfilment, cognitive development, and cultural identity. In parks and gardens, cultural services are especially important because they directly connect people with nature and improve quality of life in urban settings. This include: recreation, spiritual enrichment, cultural ceremonies, education, and sense of identity (Daniel *et al*., 2012).

2.3.1 Environmental Benefits of Parks and Garden

2.3.1.1 Mitigating the Urban Heat Island (UHI) Effect

Urban canopy cover helps lower city temperatures by providing shade and promoting evapotranspiration, thereby mitigating the urban heat island (UHI) effect (Oke, 1982; Akbari *et al.,* 2001). Trees reduce heat absorption by pavements, roads, and buildings, lowering surface and air temperatures. Studies have shown that urban tree cover can reduce summer temperatures by up to 4°C (7°F) in some regions (Gao *et al.,* 2020).

2.3.1.2 Improving Air Quality

Trees improve air quality by filtering airborne pollutants, including particulate matter (PM), nitrogen oxides (NO_x), sulphur dioxide (SO_2), and carbon monoxide (CO) (Nowak & Dwyer, 2007). Research indicates that urban trees remove thousands of metric tons of air pollution annually, leading to reduced respiratory illnesses in city populations (McPherson et al., 2011).

2.3.1.3 Carbon Sequestration and Climate Change Mitigation

Urban forests play a key role in carbon sequestration, absorbing atmospheric carbon dioxide (CO_2) and storing it as biomass (Orobator & Adahwara, 2022). This helps offset greenhouse gas emissions and mitigates climate change. A study by Pregitzer et al. (2019) highlights that well-managed urban forests can significantly contribute to carbon storage, improving urban sustainability.

2.3.1.4 Stormwater Management and Flood Prevention

Tree canopy intercepts rainfall, reducing stormwater runoff and flooding (Xiao & McPherson, 2002). By absorbing and slowing rainwater, trees decrease the burden on stormwater drainage systems, prevent soil erosion, and improve water quality (Chiesura, 2004).

2.3.1.5 Enhancing Biodiversity and Wildlife Habitat

Urban canopy cover supports biodiversity by providing habitats for birds, insects, and small mammals (Beninde et al., 2015). A study by Sandström et al. (2006) found that cities with higher canopy cover have greater ecological diversity, helping sustain urban wildlife.

2.3.2 Social Benefits

2.3.2.1 Enhancing Public Health and Well-being

Exposure to urban green spaces has been linked to reduced stress, improved mental health, and lower rates of cardiovascular diseases (Ulrich, 1984; Mitchell & Popham, 2008). Tree-lined streets and parks encourage outdoor activities, promoting physical fitness and well-being (Jamean & Abas, 2023).

2.3.2.2 Noise Pollution Reduction

Urban canopy cover acts as a natural sound barrier, absorbing and deflecting urban noise from traffic, industries, and crowded areas (Hunter & Luck, 2015). This leads to quieter and more peaceful urban environments, reducing noise-related stress among city residents.

2.3.2.3Crime Reduction and Community Safety

Research suggests that increased canopy cover is associated with lower crime rates. A study by Kuo & Sullivan (2001) found that neighbourhoods with well-maintained green spaces experienced lower levels of vandalism, theft, and violent crimes, as trees enhance natural surveillance and encourage community interaction.

2.3.2.4 Increased Recreational and Aesthetic Value

Urban forests enhance the aesthetic appeal of cities, making them more attractive and liveable (Chiesura, 2004). Green spaces provide opportunities for recreation, tourism, and social gatherings, contributing to higher life satisfaction among residents (Sandström et al., 2006).

2.3.3 Economic Benefits

2.3.3.1 Energy Conservation and Cost Reduction

Trees provide shade to buildings and streets, reducing cooling costs in summer by up to 25% and cutting heating costs in winter by blocking wind (Akbari *et al*., 2001; McPherson *et al*., 2011). This leads to lower electricity bills for households and businesses.

2.3.3.2 Increase in Property Values

Real estate values increase significantly in areas with high tree cover. Studies have shown that properties near tree-lined streets and parks can be valued 7-15% higher than those without greenery (Tyrväinen & Miettinen, 2000).

2.3.3.3 Boosting Local Economies and Job Creation

Urban canopy management creates jobs in tree planting, landscaping, maintenance, and environmental conservation (Beninde et al., 2015). Additionally, green tourism in well-forested urban areas attracts visitors, boosting local businesses and economic growth (Gill et al., 2007).

2.4 Social, Economic and Cultural Benefits of trees to University Community

Trees are essential components of university landscapes, offering a range of benefits that extends beyond aesthetic appeal. They contribute to environmental sustainability, improve campus microclimates, foster social interaction, and support cultural identity (Akintoye *et al*., 2021). In academic settings, understanding the socioeconomic and cultural values of trees is crucial for integrating green infrastructure into institutional planning and policy (Jim & Chen, 2009).

2.4.1. Social Benefits:

Trees play a significant role in enhancing the social well-being of university communities. Green spaces with trees improve students' mental health, reduce stress, and provide recreational spaces for relaxation and social interaction (Ulrich *et al*., 1991; Wolf, 2018). Shade trees around lecture halls, libraries, and walkways create comfortable environments that encourage outdoor learning, group discussions, and informal networking among students and staff. Furthermore, trees promote inclusivity by providing safe and accessible areas for gatherings, sports, and leisure activities (Chiesura, 2004). By fostering a sense of belonging and social cohesion, trees contribute to stronger community bonds within the university setting.

2.4.2. Economic Benefits:

Economically, trees contribute to significant cost savings and value creation for universities. Strategically planted trees reduce energy costs by providing natural cooling during hot seasons and windbreaks during colder months, thus lowering dependence on artificial heating and cooling systems (Akbari, Pomerantz & Taha, 2001). They also enhance the aesthetic and property value of campus facilities, making the institution more attractive to prospective students, staff, and donors (McPherson *et al*., 2005). Additionally, tree-based landscapes reduce maintenance costs of stormwater infrastructure by intercepting rainfall and mitigating flooding risks (Nowak & Dwyer, 2007). In some cases, universities can generate revenue or research funding through carbon credit projects, sustainable landscaping programs, or tree-based enterprises.

2.4.3 Cultural Benefits:

Trees also hold strong cultural and symbolic significance in university communities. Many campuses preserve heritage trees as living monuments that reflect institutional history and identity (Jim, 2004). They are often integrated into cultural ceremonies, graduation photo traditions, and serve as symbolic landmarks for orientation and memory (Konijnendijk *et al*., 2006). Furthermore, trees embody cultural values of environmental stewardship and sustainability, teaching students about ecological responsibility and the interconnectedness of society and nature (Clark *et al*., 1997). In African university contexts, trees such as iroko (Milicia excelsa) or baobab (Adansonia digitata) may carry traditional meanings, representing wisdom, knowledge, and community gathering, aligning naturally with the mission of higher education.

Examining these values provides a framework for sustainable campus management, enhances student well-being, and reinforces the cultural heritage embedded in green spaces. They can broadly be grouped into:

1. **Cultural Value Objectives:** Cultural values relate to the symbolic, educational, and heritage significance of trees within the university community.
    - 1.1. **Preserving Historical and Heritage Trees:** Many universities have heritage trees that carry symbolic importance, linked to institutional history, traditions, or notable events (Jim, 2004). An objective of cultural valuation is to document and protect these trees as part of campus heritage conservation.
    - 1.2. **Promoting Social Cohesion and Community Identity:** Trees and green spaces serve as gathering points, promoting social interaction among students, faculty, and visitors (Chiesura, 2004). The objective is to evaluate how tree-rich environments influence campus culture, encourage community building, and foster inclusivity.

1.3. **Promoting Social Cohesion and Community Identity:** Trees and green spaces serve as gathering points, promoting social interaction among students, faculty, and visitors (Chiesura, 2004). The objective is to evaluate how tree-rich environments influence campus culture, encourage community building, and foster inclusivity.

2. **Policy and Planning Objectives:** From an institutional perspective, examining the socioeconomic and cultural values of trees aims to:

   2.1. Develop green infrastructure policies that prioritize ecological and social benefits.

   2.2. Guide campus master planning to integrate tree planting with educational facilities and pedestrian networks.

   2.3. Foster stakeholder engagement, involving students, staff, and alumni in tree management and conservation programs (Beatley, 2016).

2.5 Awareness and Perception about the Ecosystem

Awareness refers to the extent to which individuals recognize the existence and functions of ecosystem services. Studies indicate that most urban residents are generally aware of the aesthetic and recreational values of trees, but less informed about their regulating and supporting functions such as carbon sequestration, stormwater regulation, and habitat provision (Jim & Chen, 2006). In university settings, students may recognize the shade and relaxation benefits of trees but may undervalue their contribution to air quality, climate regulation, and biodiversity conservation (Kabisch & Haase, 2014). Perception reflects how individuals interpret and prioritize the importance of these services. Perceptions are influenced by socio-economic factors, cultural background, education level, and frequency of park use. For example, park visitors may strongly perceive trees as essential for relaxation, recreation, and social interactions, while policymakers may emphasize their role in climate resilience and ecosystem stability (Shackleton

et al., 2017). In many developing countries, economic pressures often shape perceptions, with communities valuing provisioning services (such as fruits and fuelwood) more than intangible cultural or regulating services.

2.6 Challenges of Parks and Gardens in Urban Areas

Urban parks and gardens play a vital role in enhancing environmental quality, promoting public health, and supporting social well-being. However, the rapid pace of urbanization, inadequate funding, poor management, and competing land uses pose significant challenges to the sustainability and effectiveness of these green spaces (Jim, 2013). Understanding these challenges is essential for developing strategies that ensure parks and gardens continue to deliver their ecosystem and social services effectively.

2.6.1. Land Use Pressure and Urbanization

One of the most pressing challenges facing parks and gardens in urban areas is land scarcity caused by rapid urbanization. As cities expand, open green spaces are often converted into residential, commercial, or industrial developments (Kabisch *et al.,* 2016). Urban planners frequently prioritize economic development over environmental preservation, leading to the encroachment and fragmentation of existing parks. This issue is particularly severe in developing countries, where weak land-use planning and enforcement mechanisms exacerbate the loss of green spaces (Mensah, 2014).

2.6.2. Inadequate Funding and Maintenance

The lack of financial resources for maintenance and management significantly undermines the sustainability of urban parks and gardens. Many municipal governments allocate insufficient budgets for landscaping, waste management, security, and infrastructure repair (Byrne & Wolch,

2009). Consequently, parks often become neglected, poorly maintained, and unsafe for users. The absence of public-private partnerships and limited community engagement further worsen the problem, as maintenance burdens fall solely on underfunded local authorities (Jim & Chen, 2006).

2.6.3. Poor Design and Infrastructure

In many cities, parks and gardens suffer from poor design, inadequate facilities, and limited accessibility. Some are designed without consideration for inclusivity, excluding persons with disabilities, children, and the elderly (Nesbitt *et al.,* 2019). Lack of pathways, rest areas, lighting, and signage reduces usability and visitor satisfaction. Moreover, improper planning can result in parks that fail to integrate ecological functions such as stormwater regulation, biodiversity support, and temperature moderation (Kabisch *et al.,* 2017).

2.6.4. Environmental Pollution and Degradation

Urban parks are increasingly affected by pollution from surrounding industrial and vehicular activities. Air and noise pollution, as well as littering and waste dumping within park boundaries, degrade the quality and aesthetic appeal of these green spaces (Nowak *et al.,* 2014). Soil contamination and invasive species also threaten biodiversity within urban gardens. Without proper waste management systems, many parks become dumping grounds rather than safe recreational environments.

2.6.5. Security and Vandalism Issues

Security concerns are another major challenge. Poorly maintained and poorly lit parks often become hotspots for antisocial behaviour, vandalism, and crime (Madureira *et al.,* 2018). This discourages visitors, especially women and families, from using these spaces. A lack of policing

and community oversight can lead to the deterioration of park facilities and a general decline in public trust in urban green spaces.

2.6.6. Inequitable Access and Social Exclusion

Not all urban residents enjoy equal access to parks and gardens. Low-income neighborhoods are often underserved with fewer or poorly maintained green spaces compared to wealthier areas (Wolch *et al.,* 2014). This environmental injustice leads to disparities in health benefits, recreation opportunities, and social cohesion. Moreover, privatization and commercialization of public parks sometimes restrict entry through fees, limiting accessibility for marginalized groups (Anguelovski, 2016).

2.6.7. Climate Change Impacts

Climate change poses emerging challenges to the sustainability of urban parks and gardens. Extreme weather events such as heatwaves, droughts, and flooding damage park vegetation and infrastructure (Gill *et al*., 2007). Changes in rainfall patterns affect plant growth and increase maintenance costs. Additionally, cities in tropical regions face higher pest infestations and disease outbreaks that threaten plant diversity (Jim, 2013).

2.6.8. Lack of Public Awareness and Participation

Public apathy and limited community participation in the management of parks and gardens also hinder sustainability. When citizens are unaware of the ecological and health benefits of green spaces, they are less likely to advocate for their protection or volunteer in their upkeep (Chiesura, 2004). Effective park management requires public engagement, environmental education, and partnerships between governments, NGOs, and local communities.

CHAPTER THREE

3.0 MATERIALS AND METHODS

3.1 Study Area

The research was conducted in the Faculty of Social Science Park, University of Benin, Edo State, Nigeria. The university lies between longitudes 6°24'12"N and 6°24'17"N, and latitudes 5°37'16"E and 5°37'23"E (Ilaide and Opeyemi, 2023), the park lies in longitude 6°23’49’’N and 6°23’51’’N and latitude 5°37’20’’E and 5°37’23’’E. The University of Benin is located in the rain forest zone of southern Nigeria. The study area typically experience a tropical climate, with two main season- a wet season and a dry season. The first season lasts from March to November, while the latter lasts from November to February. The mean annual rainfall ranges from 1500mm to 2000mm and the mean relative humidity is about 75% at noon and about 95% at 6am while the minimum and maximum temperatures are between 27°C and 32°C respectively (UNIBEN master plan, 1993). The altitude is 74.5m above sea level, and the northern part of the campus is drained by the Ikpoba River (UNIBEN master plan, 1993). According to Ogwu *et al*. (2016), its elevation is around 1800 feet in the north and 500 feet in the south. Its red soil has a small amount of clay and is mostly loamy in some places. It has vegetation similar to that of rainforests. The land is a fantastic spot for both native and exotic species to flourish and establish robust vegetation because of the large trees and rich soil. Due to significant anthropogenic alteration over a long period of time, the ancient forest had been replaced by a mosaic or secondary forest (Dania-Ogbe *et al*., 1992).

3.2 Sample Size and Sampling Technique

A reconnaissance survey was carried out on the park to estimate the number of people present and the result showed that about 50 to 100 people visit the park with peak amount over the weekends (Fridays and Saturdays) with over 200. The average number of person present in the park over a period of a week was taken to be 125 persons Using 76% sampling intensity, 95 persons would be selected.

Proportional sampling would be applied to determine the amount of visitor to be sampled in the park per day. Proportional sampling allocation: Expressed as;

$$nh = \frac{Nh}{N} \text{ x } \frac{n}{1}$$

Where: nh is sample size for, Nh is the population size of stratum h, N is the total population size (615), and n is the overall sample size (95).

Table 3.1: Park daily visitor

Days	**Number of visitor**	**Number of Sampling visitors**
Monday	58	9
Tuesday	64	10
Wednesday	65	10
Thursday	52	8
Friday	136	21
Saturday	240	37
Total	**615**	**95**

Source: Field Survey, 2025

3.3 Data Collection

The study used both primary and secondary data to fulfil its research goals. A closed-ended questionnaire was used to collect primary data. The questionnaire is divided into five sections:

1. Section A: Demographic information
2. Section B: Identification of the ecosystem services
3. Section C: Awareness and knowledge about ecosystem services
4. Section D: Use and activities in the park and garden

5. Section E: Socio-cultural values and benefits

6. Section F: suggestion and improvements

The questions were be a combination of closed-ended and Likert-scale items to capture both categorical and ordinal data.

The questionnaire would include both closed and open-ended questions, allowing for quantitative and qualitative responses. Secondary data would be collected through, published books, journal papers, and reports on campus. This would offer supplemental information for the primary data.

3.4 Data Analysis

Data collected from the field would be coded, entered, and analysed using descriptive and inferential statistical technique. Descriptive statistics such as frequencies, percentages, means, and standard deviation will be used to summarize summarized in tables and charts for clarity and inferential statistics with the use of analysis of variance to compare responses of students from the respondents.

3.4.1 Relative Importance Index

Relative Importance Index is a measure of the level of significant to rank factors based on importance or impact (Holt, G.D. 2014)

$$\text{RII}=\frac{\sum W}{AN}$$

Where RII = Relative Importance Index

$\sum$W = weight of score awarded for a variable by respondent from 1-5

A = Highest integer on the response scale

N = Total number of respondents

Plate 1a: lnterview with repondents in the Park

Plate 2: lnterview with repondents in the park

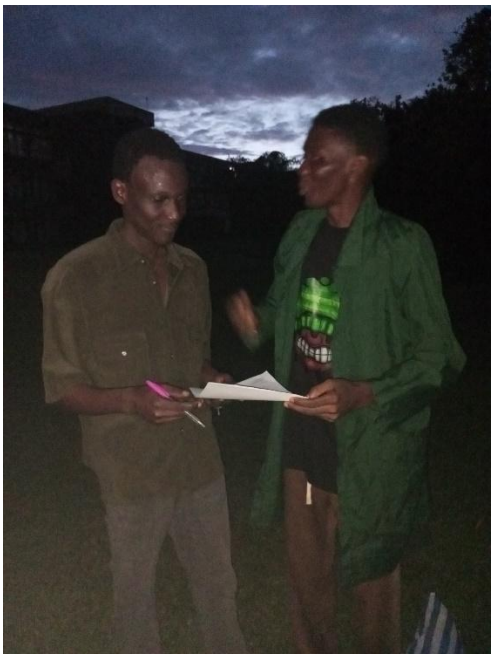

Plate 3: Imterview with respondent in the park

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Demographic Characteristics of Respondents

The age of the respondents ranged from 17 and 40 years with a mean age of 23 years. There was a higher proportion of Male to Female with a mean of 1.49. The education level of respondents was mostly tertiary (3.02). The respondents were mostly students with a mean of 1.57, and they were mostly single with a mean of 1.05. These respondents were dominated by Christians (1.14) who were Ibo by tribe with a mean of 2.31 (Table 4.1)

Table 4.1 Demographic variable of Respondents at Faculty of Social Sciences Park and Garden

Variable	Mean	Min.	Max.	Std. Dev.
Gender[1]	1.49	1.00	2.00	0.50
Age (years)	22.62	17.00	40.00	3.11
Education level[2]	3.02	1.00	3.00	0.14
Occupation[3]	1.57	1.00	3.00	0.88
Marital status[4]	1.05	1.00	2.00	0.22
Monthly Income (₦'000)	47.93	10.00	30.00	51.14
Tribe [5]	2.31	1.00	5.00	1.14
Religion[6]	1.14	1.00	2.00	0.35
How long have You resided in this Environment	2.81	1.00	6.00	1.27

[1]Male =1, Female = 2, [2]Primary = 1, Secondary = 2, Tertiary = 3, No Formal Education = 4, [4] Student =1, Employed = 2, Self Employed = 3, [4]Single = 1, Married = 2, Separate = 3, Divorced = 4, Widow/widower = 5, [5]Bini =1, Ibo = 2, Yourba = 3, Hausa = 4, Other = 5, [6]Christians = 1, Muslim = 2, Traditional worship = 3, Others = 4

4.1.2 Identification of Ecosystem services

The respondent showed a high level of identification of the ecosystem services provided by the park (Figure 4.1). The least identified of the ecosystem services provided was Timber and Fibre with 98% identification while the other recorded a 100% identification.

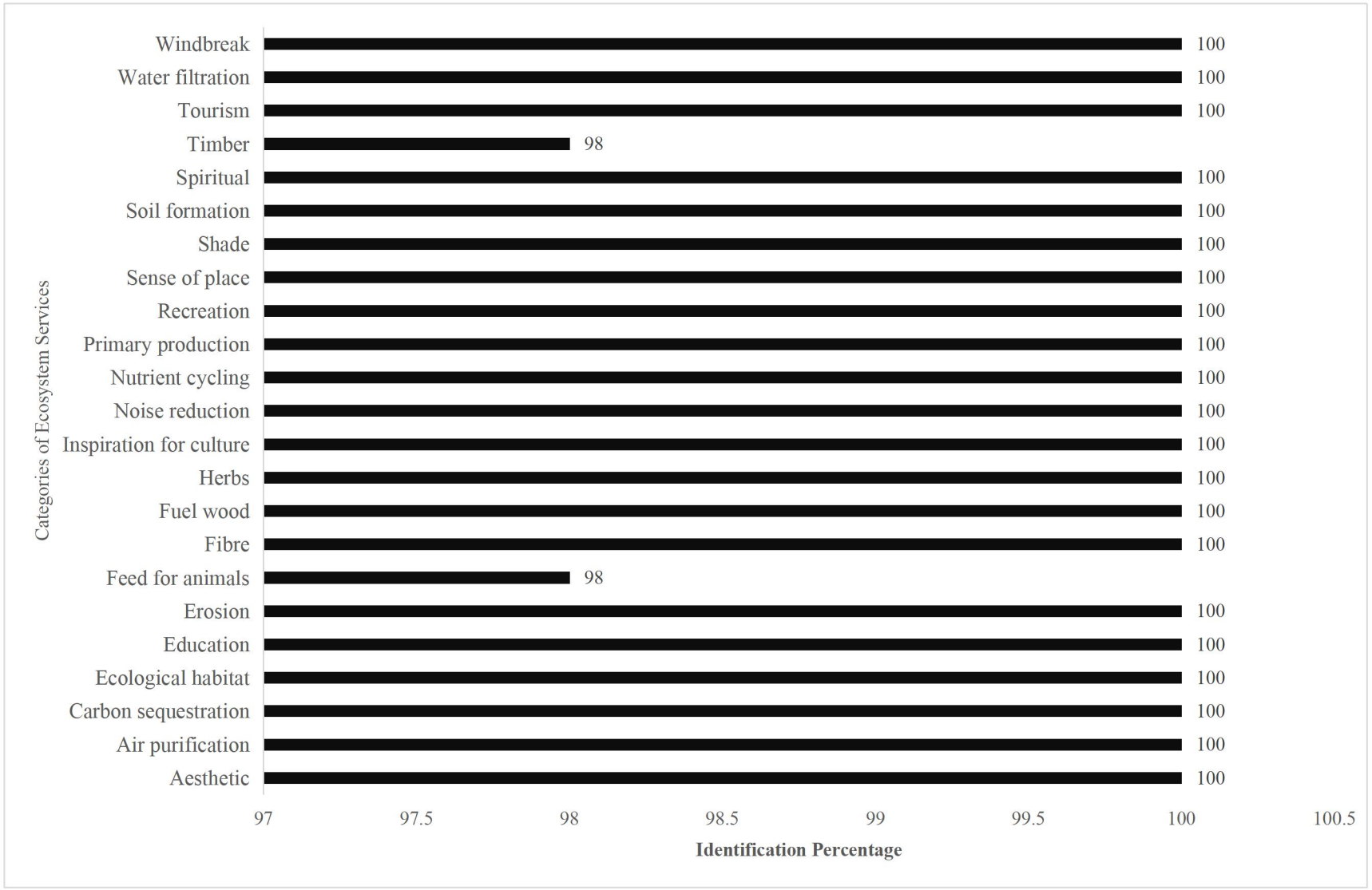

Figure 4.1: Percentage Identification of Ecosystem services

4.1.3 Perceived Importance of Ecosystem Services

Results in Table 4.2 shows that much importance was placed on economic benefits of ecosystem services with a mean RII of 0.66 than its socio-cultural benefits which had a mean RII of 0.65 at the park and garden. The highest Relative Importance Index (RII) recorded was the park serving to beautify the area with RII of 0.808, followed by provision of shade with RII of 0.80. The least RII was the park serving as ritual site with RII of 0.46, followed by provision of timber with RII of 0.49

Table 4.2 Perceived level of Importance of Ecosystem services of Urban Forest

Perceived Benefits	Don't know	Strongly disagree	Disagree	Agree	Strongly agree	Mean	Std. Dev.	RII	Mean RII
Socio-cultural benefits									
Is a place to meet that promote social interaction among people	1.00	8.00	22.00	37.00	27.00	3.85	0.97	0.77	
Improves a person's mood and reduces stress	2.00	2.00	27.00	29.00	33.00	3.96	0.97	0.79	
Improves the beauty of the area	2.00	5.00	11.00	46.00	31.00	4.04	0.92	0.81	
Provision of shade	5.00	3.00	11.00	43.00	33.00	4.01	1.04	0.80	
Provides a place of worship	5.00	3.00	22.00	37.00	28.00	3.84	1.06	0.77	
A place to seek supernatural help	6.00	15.00	16.00	38.00	20.00	3.54	1.17	0.71	
Provide recreational space	7.00	2.00	10.00	48.00	28.00	3.93	1.07	0.79	
Provides food	5.00	6.00	12.00	45.00	27.00	3.87	1.06	0.77	
Provides fuel wood	7.00	9.00	16.00	33.00	30.00	3.74	1.21	0.75	
A place for crowning community leaders	26.00	14.00	14.00	25.00	16.00	2.91	1.48	0.58	
Provides timber	25.00	35.00	13.00	11.00	11.00	3.55	1.31	0.49	
Serves as ritual site	47.00	10.00	13.00	13.00	12.00	2.29	1.50	0.46	
Reduces crime due to improve mental health	15.00	26.00	15.00	17.00	22.00	2.95	1.42	0.59	
Improves physical health	16.00	18.00	27.00	18.00	16.00	3.38	1.11	0.63	
									0.65
Economic benefits									
Reduce electricity bill	12.00	18.00	27.00	23.00	15.00	3.12	1.25	0.62	
Add value to property	20.00	12.00	26.00	22.00	15.00	3.00	1.36	0.60	
Saves money from food	11.00	8.00	27.00	35.00	14.00	3.35	1.18	0.67	

Provides job	10.00	5.00	24.00	40.00	16.00	3.49	1.16	0.70	
Sources of raw material for charcoal production	3.00	4.00	26.00	47.00	15.00	3.71	0.90	0.74	
A cheap and easy means of producing organic fertilizers	3.00	4.00	38.00	37.00	13.00	3.56	0.896	0.71	
Sources of raw material for furniture production	7.00	2.00	22.00	42.00	22.00	3.74	1.074	0.58	
									0.66

NOTE: RII- Relative level of Importance

4.1.4 Perceived level of Awareness and Perception of Ecosystem services provided by the tree in the study area

Table 4.3 shows that respondents were mostly knowledgeable about provisioning ecosystem services category with an RII of 0.81, followed by support services (0.79), regulation services (0.78) and cultural services (0.77). Respondents were primarily aware that trees in the study area provide medicine (0.85) which is a provisioning ecosystem services which had the highest Relative Importance Index (RII) among other ecosystem services assessed. This was followed by provision of timber with RII of 0.84. The least RII was the park serving as aesthetic with RII of 0.64 and this belong to the cultural ecosystem services category.

Table 4.3: Perceived Level of Awareness on Ecosystem services

Perceived Benefits	Not Imp.	Maybe Impt	Imp.	Very Impt	Extremely Impt	Mean	Std. dev.	RII	Mean RII
Provisioning services									
Food	2.00	1.00	6.00	56.00	30.00	4.17	0.77	0.83	
Fresh Water	8.00		29.00	39.00	19.00	3.64	1.07	0.73	
Fibre	5.00	3.00	5.00	62.00	20.00	3.94	0.93	0.79	
Timber	2.00	4.00	3.00	50.00	36.00	4.20	0.86	0.84	
Medicine	1.00	2.00	2.00	55.00	35.00	4.27	0.71	0.85	
Fuel wood	2.00	2.00	4.00	59.00	29.00	4.18	0.74	0.83	
Feed for animals	6.00	1.00	6.00	61.00	21.00	3.95	0.95	0.79	
Raw materials	5.00	3.00	2.00	53.00	21.00	4.07	0.98	0.80	
									0.81
Regulation services									
Local climate regulation	6.00	3.00	7.00	44.00	35.00	4.04	1.07	0.81	
Air quality improvement	4.00	3.00	6.00	50.00	32.00	4.08	0.95	0.82	
Carbon storage	6.00	2.00	11.00	41.00	35.00	4.02	1.07	0.80	
Noise reduction	7.00	3.00	20.00	42.00	23.00	3.75	1.09	0.75	
Prevention of disease	10.00	3.00	19.00	44.00	19.00	3.62	1.16	0.72	
Wastewater treatment	12.00	2.00	20.00	44.00	17.00	3.55	1.19	0.71	
Erosion prevention	4.00	4.00	7.00	57.00	21.00	3.89	0.96	0.77	
Windbreak	6.00	1.00	7.00	55.00	26.00	3.99	0.98	0.80	
Maintenance of soil fertility	5.00	1.00	7.00	60.00	22.00	3.98	0.91	0.80	
									0.78
Cultural services									
Aesthetic	4.00	9.00	47.00	34.00	1.00	4.71	5.17	0.64	
Education	4.00	1.00	10.00	46.00	34.00	4.11	0.94	0.82	
Recreation	7.00	3.00	5.00	53.00	27.00	3.95	1.07	0.80	

Worship	8.00	8.00	9.00	46.00	24.00	3.74	1.18	0.75	
Inspiration for culture	5.00	3.00	7.00	58.00	22.00	3.94	0.95	0.79	
Tourisms	8.00	4.00	5.00	44.00	34.00	3.97	1.16	0.79	
Sense of place	7.00	5.00	6.00	56.00	21.00	3.83	1.07	0.77	
									0.77
Support services									
Pollination	5.00	1.00	12.00	53.00	24.00	3.95	0.95	0.79	
Habitat for plant and animal	3.00	1.00	5.00	54.00	32.00	4.17	0.83	0.83	
Maintenance of genetic diversity	6.00	4.00	6.00	58.00	21.00	3.88	1.01	0.78	
Soil formation	6.00	5.00	11.00	49.00	24.00	3.84	1.07	0.77	
Nutrient cycling	4.00	5.00	8.00	54.00	24.00	3.94	0.97	0.79	
									0.79

NOTE: RII- Relative level of Importance

4.1.5 Willingness to pay for park maintenance and tree conservation

The results in Figure 4.2 show that 80% of the respondents were not willing to pay for the park maintenance and tree conservation, while 20% were willing to pay.

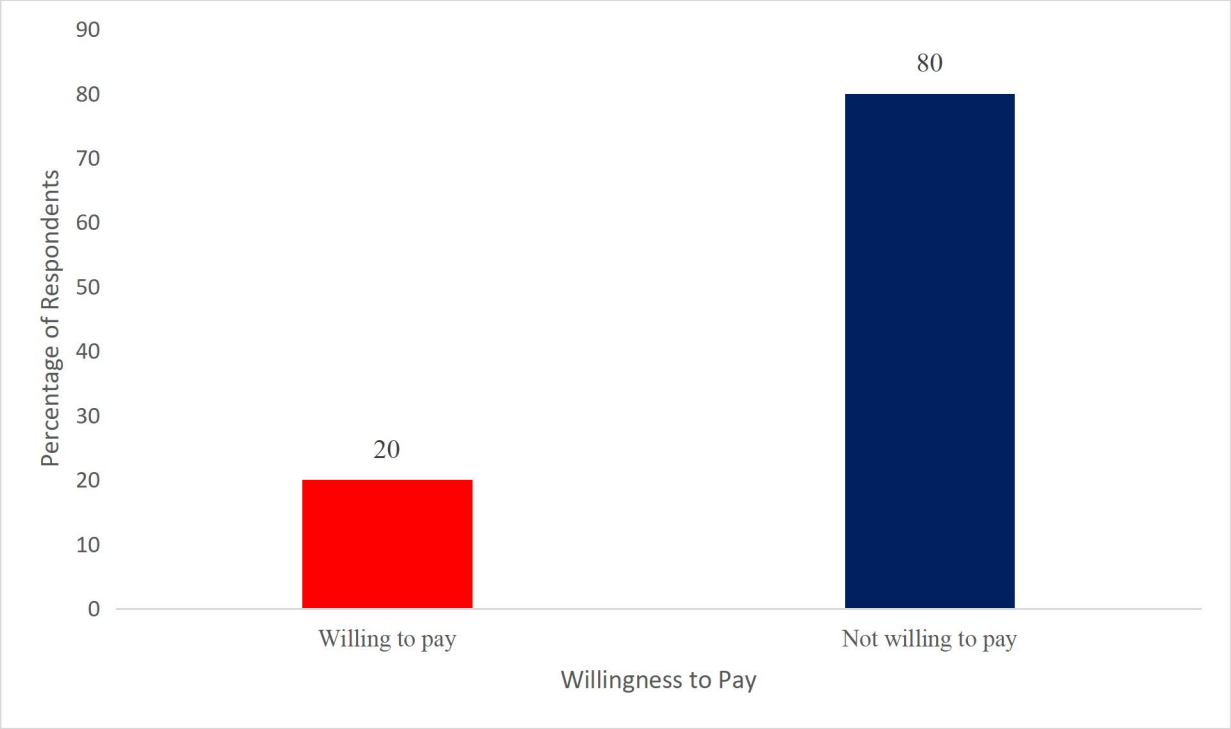

Figure 4.2: Willingness to pay

4.1.6 Factors affecting Willingness to pay

The results shows 53.9% of the respondents' reason for the refusal to pay for the park maintenance and tree conservation was budget/economic reason, while 17.1 % gave the reason of difficulty to answer, 13.1% saw the park being a free gift of nature, 7.6% did not trust in government, 6.6% believe their payment of tax should cover for this, and 1.3% were of the view that the park maintenance and management were solely government responsibility (Figure 4.3).

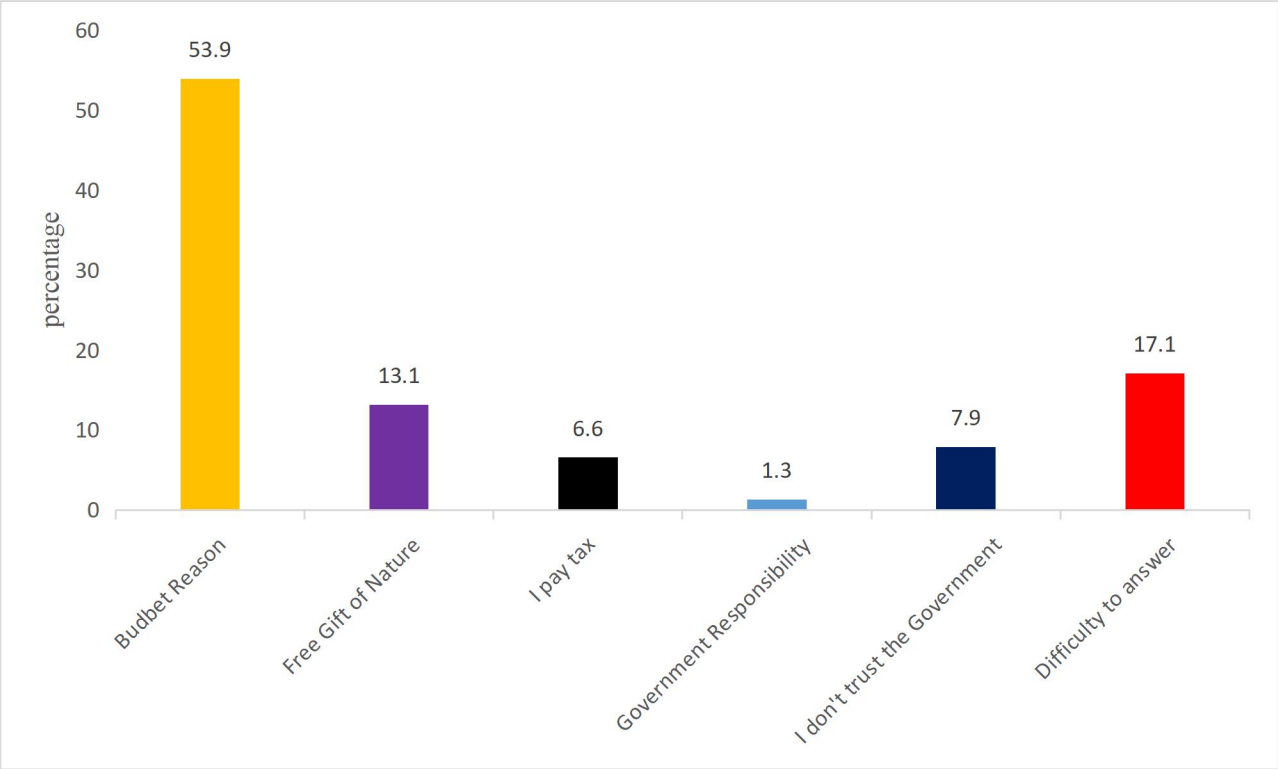

Figure 4.3: Factors Affecting Willingness to Pay

4.2 Discussion

Respondents at Faculty of Social Science Park and Garden comprised of more male visitors than female visitors with an average age of 23 years. Their level of education were mainly at the tertiary level. Most of them were employed and not yet married. Their average monthly income was ₦47,930. Most of them were Ibo by tribe and a majority of the respondents were Christians. Their average time spent around the school environment was 3 years.

The Faculty of Social Science Park and Garden provides a diverse range and category of ecosystem services and benefits for visitor of the park and the University in general. The ecosystem services provided were food, medicine/ herbs, shade, fibre, aesthetic, relaxation space,

education and research, ecological Habitat, soil formation. Also, some of the benefits provided by this urban forest include provision of timber, improves the beauty of the area, provision of shade, reduce temperature, purify air, provide homes for plants and animals, add values to property, provide food, provide fuel wood. However, respondents valued the economic benefits provided by the urban forests than the socio-cultural benefits. Moreover, respondents were mostly aware of the provisioning category of ecosystem services in the study area among the other categories considered. This agrees with Whittington (2002), who found that individual with limited financial resources tends to prioritize food, shelter and medicine over environmental and recreational consideration. Besides, provisioning services are directly involved in community well-being. This result corroborates those of Zhang (2016), Gouwakinnou (2019); Ahononga(2020); and Nyangoko (2021)and suggests that tangible services directly affect the community, unlike indirect services (Ouko, 2018). On the other hand, the local perception of regulating and supporting services was low compared to provisioning services. And supporting services are the main basis for the production of provisioning services (Ahononga 2020).

Most respondents were not willing to pay for the establishment, maintenance and management of the urban forest. This agrees with the study done by Arabomen (2019), who reported low willingness to pay for tree conservation in Benin City and found that willingness to pay strongly correlated with income and awareness.

Moreover, majority of the respondents were not willing to pay due to economic/budget related reasons. This agrees with the study done by Baugartner (2012), who showed how income distribution (not only mean income) affects willingness to pay and the shape of demand for ecosystem services. This agrees with the study done by Arabomen (2019), who reported low

willingness to pay for tree conservation in Benin City directly linked to house hold income; finds economic constraints limit cash willingness to pay despite non-monetary appreciation.

CHAPTER 5

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

The study concludes that urban parks serve as vital ecological infrastructure, providing tangible and intangible benefits that enhance the quality of life of residents and users. At the University of Benin, the Faculty of social science Park performs essential functions—ranging from air purification, microclimate regulation, and carbon sequestration to recreation, cultural identity, and social interaction. Although with high level of awareness, the low willingness to contribute financially by the public affect the preservation but reflects strong public appreciation and environmental consciousness among users. The significant difference between students and non-students suggests that life experience and professional engagement influence environmental valuation. Hence, continuous sensitization and environmental education are essential to bridge this perception gap.

Ultimately, this research demonstrates that maintaining and enhancing urban green spaces like the Faculty of Social Science Park is not only an ecological necessity but also a socio-economic investment that supports sustainable urban development.

5.2 Recommendations

5.2.1 Awareness and Community Involvement

1. **Environmental Education Programs:** The University should introduce awareness campaigns, seminars, and educational courses to promote understanding of ecosystem services, particularly among students who demonstrated relatively lower appreciation.

2. **Community Engagement:** Engage students, residents, and staff in participatory conservation programs—tree planting, park clean-up drives, and eco-fairs—to enhance stewardship and sense of ownership.

3. **Cultural Integration:** Utilize the park for cultural and artistic events that highlight environmental values, linking nature appreciation to local traditions and creativity.

5.2.2 Research and Monitoring

1. **Continuous Data Collection:** Regular socio-economic and ecological surveys should be conducted to monitor changes in public perception and environmental conditions over time.

2. **Long-Term Ecological Assessment:** Future research should focus on quantifying the biophysical benefits of the park—such as carbon storage, air quality improvement, and biodiversity indicators.

3. **Comparative Studies**: Further studies comparing multiple urban parks across Nigeria would provide broader insights into how demographic and cultural factors influence the valuation of ecosystem services.

5.3 Contribution to Knowledge

This study contributes to the growing body of knowledge on urban ecosystem services in Africa by:

1. Providing empirical evidence on socio-economic valuation of ecosystem services within an academic setting.

2. Offering a replicable methodological framework for similar studies across Nigerian urban centres.

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Questionnaire

Dear Sir/Madam,

I am a student of University of Benin, Benin City carrying out a research on the benefits of ecosystem services provided by urban trees. The purpose of this survey is to collect data on the perceived importance of ecosystem services provided by this Nature Park and garden to the community.

The data collected will be used for academic purposes and the duration of interview will be about ten (10) minutes. Would you like to participate? If yes, please kindly answer the following questions. Your response will be treated with utmost confidentiality.

SECTION A: Demographic Information

1. Location: ……..
2. Gender: a) Male ☐ b) Female ☐
3. Age: ……
4. Education: a) Primary ☐ b) Secondary ☐ c) Tertiary ☐ d) No formal ☐ education
5. Occupation: a) Student ☐ b) Employed ☐ c) Self Employed ☐ d) Unemployed ☐ e) Pensioner
6. Marital status: a) Single ☐ b) Married ☐ c) Separated ☐ d) Divorced e) Widow/widower ☐
7. Monthly income …….
8. Tribe: a) Bini ☐ b) Ibo ☐ c) Yourba ☐ d) Hausa ☐ e) Other Please specify…….
9. Religion: a) Christian ☐ b) Muslim ☐ c) Traditional Worshipper ☐ d)Others ☐ Please specify……
10. How long have you resided in this environment? ……

SECTION B: Identify the Ecosystem Services Provided by Urban Forests in the Study Area

11. What ecosystem services do you know that trees in this park and garden provide and how important

are they to you?

Categories of ecosystem Services	**Not Important 1**	**Maybe important 2**	**Important 3**	**Very important 4**	**Extremely important 5**
Provision services					
Food (fruits, vegetables)					
Feed for animals					
Timber					
Fuel wood					
Herbs/medicine					
Fibre					
Regulation services					
Shade/local climate regulation					
Windbreak					
Air purification					
Water filtration/purification					
Noise reduction					
Carbon sequestration					
Erosion/flood control					
Cultural services					
Aesthetic/beautification					
Recreation/relaxation					
Spiritual					
Tourism					
Sense of place					
Inspiration for culture, art & Design					
Education/research					

Support services					
Ecological habitat for rearing Animals					
Soil formation					
Nutrient cycling					
Primary production					

If any other benefits, please specify and states it level of importance ……

……

….

SECTION C: Assess the Socio-economic Benefits and Contributions of Urban Forests to Sustainable

Livelihoods and Environmental Stability in the Study Area

9. Do you visit this park? a) Yes ☐ b) No ☐

10. If yes, how often do you visit?

a) Always ☐ b) Sometimes ☐ c) Rarely ☐

11. What benefits do you get from visiting this nature park and garden and how important are these benefit

to you?

Benefits	**Not Important 1**	**Maybe important 2**	**Important 3**	**Very important 4**	**Extremely important 5**
Socio-cultural Benefits					
Is a place to meet that promotes social interactions among people					
Improves a person's mood and reduces stress					
Improves the beauty of the area					

Provision of shade					
Provide a place of worship/cultural Festivity					
A place to seek supernatural help/intervention					
Provide recreational space					
Provides food					
Provides fuel wood					
A place for crowning community chiefs and leaders					
Provides timber					
Serves as ritual site					
Reduces crime due to improve mental health					
Improves physical health					
Economic Benefits					
Reduce electricity bills from fan, air condition etc. due microclimate Regulation					
Add value to property, thus increasing their prices					
Saves money from food/vegetables and fuel wood it provide					
Provide job for those who grow and maintain the trees					
Source of raw materials for charcoal production					
A cheap and easy means of producing organic fertilizers					
Source of raw materials for furniture production					

Environmental/Ecological Benefits					
Reduce temperature					
Purify air					
Reduce noise pollution					
Provide home for plants and animals					
Provide oxygen					
Sequester/absorbs carbon dioxide					
Reduce storm water runoff/flooding					
Prevent soil erosion					
Improves soil quality					
Purify water					
Serves as windbreak					
Mitigation of climate change					

If any other benefits, please specify and states it level of importance ……

……

…..

- Before answering the question below, consider that there is no right or wrong answer and that you will not be the only one paying for the establishment and maintenance of trees/development of this park. Please also consider your income and what effect your willingness-to-pay amount will have on your budget.

  If the University decided to set up a board to plant more trees, maintain and protect this park and garden and needs the monthly financial contribution of individuals in this environment for the sustenance of the project.

12. How much will you be willing to pay for the establishment, maintenance and conservation of trees in

this nature park? a) …….

b) No payment

13. If the no payment option is ticked, then what could be the reason for your refusal to pay?

a) Budget-related/economic reasons

b) Payment should not be made for trees and its services because it is a gift of nature

c) The tax I pay to government should take care of this

d) It is solely government responsibility

e) I don't trust the government

f) It is difficult to give an answer to the question asked

g) Other reasons, please specify ……

SECTION D: Evaluate the Level of Awareness and Perception about the Ecosystem Services Provided by the Urban Trees in the Study Area.

14. Do you know that the presence of trees/forests in our environment provide the following ecosystem services?

Ecosystem Services	**Don't know 1**	**Strongly Disagree 2**	**Disagree 3**	**Agree 4**	**Strongly Agree 5**
Provisioning Services					
Food					
Fresh water					
Fibre					
Timber					
Medicine/herbs					
Fuel wood					
Feed for animals					

Raw materials					
Regulation Services					
Local climate regulation (reduce temperature)					
Air quality improvement					
Carbon storage/sequestration					
Noise reduction					
Prevention of disease					
Wastewater treatment					
Erosion and flood prevention					
Windbreak					
Maintenance of soil fertility					
Cultural Services					
Aesthetic/beautification					
Education/research					
Recreation, mental and physical health					
Spiritual/worship					
Inspiration for culture, art and design					
Tourism					
Sense of place					
Support Services					
Pollination					
Habitat for plant and animal					
Maintenance/conservation of genetic diversity					
Soil formation					
Nutrient cycling					

15. What brings you to this park?

a) Walking, jogging and running ☐ b) Picnicking ☐ c) Relaxation ☐ d) Social ☐ gathering

e) Education/research ☐ f) Others ☐ please, specify ……..

SECTION F: Suggestions and Improvement

16. What improvements would you like to see in terms of infrastructure? a) Seating ☐ b) Pathways ☐ c) Better lighting ☐ If other, Please specify……

17. Which areas need the most improvement? a) cleanliness ☐ b) Safety ☐ c) Educational signage ☐ d) Recreational Facilities ☐ If other, Please specify ……

18. Are there specific plants, trees, or landscaping styles you would like introduced? …… ……

19. Do you have suggestions for community involvement? ....