**ASSESSMENT OF WILLINGNESS-TO-PAY FOR ECOSYSTEM SERVICES OF TREES BY CIVIL SERVANTS IN ABUJA MUNICIPAL AREA COUNCIL, FCT, NIGERIA**

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**16/10AS054**

**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF FOREST RESOURCES MANAGEMENT, FACULTY OF AGRICULTURE UNIVERSITY OF ILORIN, ILORIN, KWARA STATE, NIGERIA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF FORESTRY AND WILDLIFE (B. FORESTRY AND WILDLIFE)**

**August, 2023**

# DECLARATION

I hereby certify that the work I have submitted is unique to me and has not previously been partially, or fully considered for a degree or other type of recognition by any other college or organization.

............................................... ............................................. Moses Erhinyodavwe Date

# CERTIFICATION

This is to certify that the work done in this project was carried out by ERHINYODAVWE, Moses with the Matriculation number 16/10AS054 in the Department of Forest Resources Management, Faculty of Agriculture, University of Ilorin, Nigeria.

The research work has been read and approved having found it to have fulfilled the requirement for the award of Bachelor of Forestry and Wildlife (B. Forestry and Wildlife) degree in the University.

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# DEDICATION

This project is dedicated to the source of all my strength God Almighty, and to my Parents for their support and care while going through this course. It has been an experience and I also want to appreciate every one of my lecturers for their amazing support and guidance across various courses, their advice and support has kept me striving even when my strength was small.

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# ABSTRACT

Trees are very important as they provide numerous benefits to people in their environment. However, much is not known about people’s perception of and willingness-to-pay for ecosystem services provided by urban trees. This study therefore assessed the willingness-to-pay for ecosystem services by civil servants in the Abuja Municipal Area Council (AMAC), Federal Capital Territory (FCT), Abuja, Nigeria. A purposeful sampling technique was adopted for the study. The Ministry of Works and Housing, the National University Commission, the Nation Merit and Awards Commission, the Ministry of Environment, the Ministry of defense Research, and the Agricultural Research Council of Nigeria were purposefully selected for the study. The primary data for this study was gathered through the use of a questionnaire administered one-on-one and through referrals from employees of the ministries and commissions listed above. At least two to three workers were sampled in each office. A total of 90 questionnaires were administered, and 75 were recovered for analysis. Descriptive statistics were used to describe the socioeconomic characteristics of the respondents, their awareness and willingness-to-pay for ecosystem services, mechanisms for payment, and the likely barriers they face. The chi-square test of independence was also employed to determine the dependence of the WTP on the socioeconomic characteristics of the respondents. This study consists of civil servants within the age range of 20–59 years, with the majority falling within the 30–39-year bracket. The majority of the respondents were male, which was slightly higher than the females. On marital status, the majority were single, and their religion was evenly spread between Christianity and Islam, while few had other beliefs. The study also discusses the multifaceted role of trees in enhancing well-being, ecological balance, and urban design. The pivotal contributions of trees encompass air purification, stress reduction, physical activity promotion, and community cohesion. Trees also yield economic resources and address the challenges posed by urban heat. Their significance as habitats and sustenance sources for diverse wildlife is underscored. The study underscores the need for proficient urban design professionals versed in arboreal ecosystems. Survey data indicates participants' diverse familiarity levels with ecosystem concepts, with 45.3% possessing basic understanding, 52.0% demonstrating deeper comprehension, and 2.7% exhibiting advanced familiarity. Participants universally acknowledge the importance of ecosystem services such as air filtration and temperature regulation. While soil health maintenance is widely recognized, perceptions diverge on factors like wildlife habitats and recreational opportunities. Demographic factors influence awareness of ecosystem services. Willingness-to-pay for these services is generally low, attributed to perceiving trees as nature's gift. Preferred methods of support include voluntary donations, with some openness to small fees on goods and limited interest in crowdfunding. The study underscores the importance of comprehending public perceptions to shape effective strategies for ecosystem conservation and urban planning.

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# CHAPTER ONE

## 1.0 INTRODUCTION

## Background Study

Ecosystem services are essential for human well-being and economic development. These services encompass the various benefits that ecosystems provide, including provisioning services (e.g., food, water, timber), regulating services (e.g., climate regulation, water purification), cultural services (e.g., recreation, aesthetics), and supporting services (e.g., soil fertility, nutrient cycling) (Pramova *et al.*, 2012;). They are critical for maintaining ecological balance, enhancing resilience to environmental changes, and supporting the livelihoods of local communities.

In recent years, there has been a growing interest in valuing and conserving ecosystems worldwide. The recognition of the significance of ecosystem services has led to the development of various approaches to assess their economic value, such as stated preference methods (e.g., contingent valuation, choice experiments) and revealed preference methods (e.g., market-based valuation, cost-benefit analysis) (Atkinson *et al.*, 2012; Pearce and Zdemiroglu, 2002; Boyd and Banzhaf, 2007). These valuation techniques provide a framework for understanding the benefits that humans derive from ecosystems and enable policymakers to make informed decisions regarding resource allocation and conservation strategies.

However, despite the increasing recognition of the importance of ecosystem services, their sustainable management and conservation remain significant challenges. Urbanization, population growth, and unsustainable land-use practices have led to the degradation and loss of ecosystems globally, including in the Abuja Municipal Area Council (AMAC), located within the Federal Capital Territory (FCT) of Nigeria (Ujoh *et al.*, 2010; Seto *et al.*, 2012; Foley, 2005).

AMAC encompasses a diverse range of ecosystems, including forests, wetlands, grasslands, and water bodies, which provide vital services to the surrounding communities. These services include the provision of clean water, regulation of climate patterns, preservation of biodiversity, and opportunities for recreation and tourism (Theron, 2023; Costanza *et al.*, 1997; Daily *et al.*, 2009). However, the rapid expansion of urban areas, encroachment of infrastructure, and intensification of agriculture have put immense pressure on these ecosystems, leading to habitat destruction, pollution, and fragmentation (Abd-Elmabod *et al.*, 2019; Laurance *et al.*, 2012).

Given the critical role that civil servants play in the Nigerian public sector, their attitudes and behaviours toward environmental conservation are of great significance. Civil servants hold influential positions that shape policy decisions, implementation processes, and resource allocation. Their awareness, understanding, and willingness to support ecosystem conservation initiatives can significantly influence the direction and success of environmental policies and sustainable development efforts in the FCT Abuja (UNODC, 2019).

Therefore, exploring the willingness-to-pay for ecosystem services among civil servants in AMAC is crucial for effective conservation and management strategies. Assessing their perceptions, preferences, and values placed on ecosystem services can provide valuable insights into the potential for implementing market-based mechanisms or financial incentives to enhance ecosystem conservation and promote sustainable land-use practises.

By addressing the gap in knowledge regarding the willingness-to-pay for ecosystem services by civil servants in AMAC, this research aims to contribute to the broader literature on ecosystem valuation and sustainable development. The findings of this study will provide evidence-based recommendations to policymakers, land-use planners, and conservation practitioners, enabling them to make informed decisions and prioritise the preservation of ecosystem services in the face of urbanization and environmental change.

## 1.2 Statement of Problem:

The preservation and sustainable management of ecosystem services in the Abuja Municipal Area Council (AMAC), Federal Capital Territory (FCT) Abuja, Nigeria, face significant challenges due to urbanization, population growth, and unsustainable land-use practices. These factors have led to the degradation and loss of crucial ecosystems, including forests, wetlands, grasslands, and water bodies, which provide essential services such as clean water, climate regulation, biodiversity preservation, and recreational opportunities (Levin, 2013).

While the importance of ecosystem services and their conservation is widely recognized, there is a need to understand the willingness-to-pay (WTP) for these services among civil servants in AMAC. Civil servants, being influential actors in the Nigerian public sector, hold key positions that shape policy decisions, implementation processes, and resource allocation. Their awareness, attitudes, and support for ecosystem conservation initiatives can significantly influence the success of environmental policies and sustainable development efforts in the FCT Abuja.

However, there is limited empirical evidence regarding the willingness-to-pay for ecosystem services among civil servants in AMAC. Understanding the preferences, values, and factors influencing their WTP can provide valuable insights for designing effective conservation strategies and financial mechanisms (Zhang *et al.*, 2023). Furthermore, exploring their level of awareness and understanding of ecosystem services is crucial for creating targeted educational and awareness campaigns that can enhance their engagement in ecosystem conservation efforts.

Therefore, the problem addressed in this study is the lack of comprehensive knowledge about the willingness-to-pay for ecosystem services by civil servants in AMAC, FCT Abuja, Nigeria. By addressing this gap, the research aims to contribute to the understanding of civil servants' perspectives, motivations, and potential barriers regarding their willingness-to-pay for ecosystem services. Such insights will inform policymakers, land-use planners, and conservation practitioners in designing appropriate strategies and interventions to foster sustainable land-use practices and ensure the preservation of ecosystem services in the region.

## 1.2.1 Research Questions:

1. What is the level of awareness among civil servants in the Abuja Municipal Area Council (AMAC) regarding the concept of ecosystem services and their importance for human well-being and sustainable development?
2. What factors influence the willingness-to-pay (WTP) for ecosystem services among civil servants in AMAC?
3. What are the preferred mechanisms and incentives for civil servants to contribute financially toward the conservation and sustainable management of ecosystem services in AMAC?
4. How does the socio-demographic profile of civil servants (e.g., age, education, income) influence their willingness-to-pay for ecosystem services?

## 1.3 Objectives of the Study:

## 

## 1.3.1 Main Objective

The main aim of the project is to assess the willingness-to-pay for ecosystem services by civil servants in the Abuja Municipal Area Council (AMAC), Federal Capital Territory (FCT) Abuja, Nigeria.

## 1.3.2 Specific Objectives

## The specific objectives of the study are to:

1. determine the level of awareness of the concept of ecosystem services among civil servants in AMAC;
2. explore the perceptions and attitudes of civil servants in AMAC toward the conservation and sustainable management of ecosystem services;
3. identify the factors that influence the willingness-to-pay (WTP) for ecosystem services among the civil servants;
4. examine the preferred mechanisms and incentives for civil servants to contribute financially toward the conservation and sustainable management of ecosystem services in AMAC; and willingness-to-pay

## 1.4 Justification of the Study

The study on the willingness-to-pay for ecosystem services by civil servants in the Abuja Municipal Area Council (AMAC), Federal Capital Territory (FCT) Abuja, Nigeria, holds significant importance for several reasons.

Firstly, the degradation and loss of ecosystems in AMAC due to urbanization, population growth, and unsustainable land-use practices have resulted in the decline of essential ecosystem services. Understanding the willingness-to-pay for these services among civil servants is crucial for developing effective strategies to conserve and sustainably manage ecosystems. Civil servants, occupying influential positions in the Nigerian public sector, play a key role in shaping policies, resource allocation, and implementation processes. Their awareness, attitudes, and support for ecosystem conservation initiatives can significantly impact the success of environmental policies and sustainable development efforts.

Secondly, assessing the willingness-to-pay for ecosystem services among civil servants can provide insights into their preferences, values, and factors influencing their decision-making processes. This knowledge can inform the design of appropriate financial mechanisms, such as market-based instruments or incentive programs, to enhance ecosystem conservation and promote sustainable land-use practices. By understanding the motivations and barriers faced by civil servants, policymakers, land-use planners, and conservation practitioners can develop targeted interventions and policies that align with their needs and aspirations.

Thirdly, the study can contribute to the broader literature on ecosystem valuation and sustainable development. While numerous studies have explored the economic valuation of ecosystem services, there is limited empirical evidence specifically focusing on the willingness-to-pay for ecosystem services among civil servants in Abuja. By addressing this gap, the study can provide valuable insights into the perspectives and behaviours of civil servants, expanding our understanding of the factors influencing their support for ecosystem conservation initiatives.

Lastly, the findings of the study can have practical implications for decision-makers and conservation practitioners in AMAC and beyond. Evidence-based recommendations derived from the study can inform policy formulation, land-use planning, and conservation strategies. This, in turn, can guide efforts to protect and sustainably manage ecosystems, enhance ecosystem services, and contribute to the well-being and livelihoods of local communities.

# CHAPTER TWO

## 2.0 LITERATURE REVIEW

## 2.1 Introduction:

Ecosystem services, defined as the benefits that people obtain from ecosystems, have gained significant attention in environmental research and policy. Ecosystem services encompass four main categories: provisioning services, regulating services, supporting services, and cultural services (Reid,, 2005). These services play a vital role in human well-being and sustainable development. As the recognition of their value grows, the concept of payment for ecosystem services (PES) has emerged as a market-based approach to incentivize the conservation and sustainable management of ecosystems.

Earth’s ecosystems have provided humans with goods and services for millennia. Every one of us depends in one way or another on renewable natural resources to fulfil basic needs like food and water, the maintenance of healthy crops, as well as climate regulation and disease control. Nature has also provided spiritual fulfilment and aesthetic enjoyment to millions around the world (Steiner, *et al.*, 2020).

The term “ecosystem services” refers to the diverse benefits derived from the natural environment. Examples include the supply of food, water, and timber (provisioning services); the regulation of air quality, climate and flood risk (regulating services); opportunities for recreation, tourism, and education (cultural services); and essential underlying functions such as soil formation and nutrient cycling (supporting services) (Fripp, 2014). Ecosystem services make human life possible by, for example, providing nutritious food and clean water, regulating disease and climate, supporting the pollination of crops and soil formation, and providing recreational, cultural and spiritual benefits (FAO, 2022). Healthy ecosystems provide services that are the foundation for human well-being including health. Ecosystem services are the benefits people obtain from ecosystems that maintain the conditions for life on Earth (ibd-2008). Ecosystem services, outputs, conditions, or processes of natural systems that directly or indirectly benefit humans or enhance social welfare.

Types of Ecosystem Services:

Below are the different types of ecosystem services as provided in the report of Reid, (2005):

* Provisioning services refer to the tangible products obtained from ecosystems, such as food, freshwater, timber, and medicinal plants.
* Regulating services involve the regulation of environmental conditions, including climate regulation, water purification, erosion control, and natural hazard mitigation.
* Supporting services are the underlying processes that maintain the structure and function of ecosystems, such as nutrient cycling, soil formation, and primary production.
* Cultural services are non-material benefits derived from ecosystems, such as recreational opportunities, cultural heritage, and aesthetic value.

## 2.2 Payment for Ecosystem Services (PES):

Payment for ecosystem services is a market-based mechanism aimed at creating economic incentives for the conservation and sustainable use of ecosystems (Wunder, 2005). PES schemes involve compensating landowners or communities for the provision of ecosystem services (Wunder, 2005). These schemes can take various forms, such as direct payments, subsidies, or the creation of markets for ecosystem services (Wunder, 2005). PES has been implemented in various contexts globally, ranging from forest carbon offset programs to watershed protection initiatives (Pascual *et al.*, 2010).

Factors Influencing Payment for Ecosystem Services:

The success and effectiveness of PES schemes are influenced by various factors.

* Economic factors, such as the cost-effectiveness of alternative land uses and the willingness of buyers to pay for ecosystem services, play a crucial role in shaping the design and implementation of PES schemes (Engel *et al.*, 2008).
* The ecological characteristics of the ecosystem services, including their scarcity, vulnerability, and potential for substitution, also influence their value and the feasibility of PES (Farley *et al.*, 2010).
* Social factors, such as the level of awareness and acceptance of PES schemes among stakeholders, the presence of local institutions, and the involvement of local communities, can significantly impact the success of PES initiatives (Muradian *et al*., 2013).

## 2.3 Urban Forestry and the Impact of Urbanization on Forestry:

Urban forestry refers to the management, conservation, and enhancement of trees and green spaces within urban areas (McPherson *et al*., 1997). Urbanization poses significant challenges to forestry and ecosystem services. The expansion of cities often leads to deforestation, fragmentation of natural habitats, and loss of biodiversity (Seto *et al.*, 2012). These processes result in reduced provisioning services, such as the availability of timber and non-timber forest products, as well as regulating services, such as air and water quality regulation (Ziter *et al.*, 2019). Urbanization also affects the microclimate, with increased temperatures and altered precipitation patterns (Nowak *et al.*, 2018). However, urban forestry initiatives, such as tree planting and green infrastructure development, have the potential to mitigate the negative impacts of urbanization and enhance ecosystem services in urban areas (Escobedo *et al.*, 2019).

## 2.3.1 Benefits of Trees in Urban Settings

Urban forests and trees may provide environmental, social, and economic benefits. Fuelwood, fodder, lumber and poles, spices, fibres, medicines, and other non-timber forest products are among the economic or material benefits (NTFPs). These might provide for basic requirements or serve as a source of income for urban poor people or those running small businesses. On the other hand, environmental and social advantages include landscape improvement, recreation, education, and general well-being; a wildlife habitat, climate modification, control of air and noise pollution, erosion control, protection of catchment areas for urban water supplies, and the productive use or safe disposal of urban wastes (Ajewole, 2005; Carter, 1994 as cited in Ajewole, 2008). Additionally, trees can be incorporated into urban planning to do a variety of things, such as screen unfavourable vistas, create shade and shelter, define places, complement architecture, and divide conflicting land uses (Webb, 1999 as cited in Ajewole, 2008).

## 2.4 Benefits of Planting Trees

Most often we plant trees to provide shade and beautify our landscapes. These are great benefits but trees also provide other less obvious benefits.

## 2.4.1 Social Benefits

* Children have been shown to retain more of the information taught in schools if they spend some of their time outdoors in green spaces (Bowling Green, 2022).
* Trees are often planted as living memorials or reminders of loved ones or to commemorate significant events in our lives.
* Hospital patients have been shown to recover from surgery more quickly when their hospital room offered a view of trees.
* Trees make life nicer. It has been shown that spending time among trees and green spaces reduces the amount of stress that we carry around with us in our daily lives (Bowling Green, 2022).
* According to NUFU (2001) as cited in Ajewole (2008). Stress seems to be a fact, of life for those who live and work in cities. Stress increases the risk of heart disease, which is a serious threat to health and research has shown that there is significant stress relief when we have access to trees and greenery for as little as 3 min. Therefore, the stressfulness of urban living can be reduced through investment in urban forestry.
* In addition, urban forests are part of the urban fabric that connects people to nature and to

## Environmental Benefits

Trees offer many environmental benefits (Bowling Green, 2022). Trees reduce the urban heat island effect through evaporative cooling and reducing the amount of sunlight that reaches parking lots and buildings. This is especially true in areas with large impervious surfaces, such as parking lots of stores and industrial complexes.

* Trees improve our air quality by filtering harmful dust and pollutants such as ozone, carbon monoxide, and sulphur dioxide from the air we breathe.
* Trees give off oxygen that we need to breathe.
* Trees reduce the amount of storm water runoff, which reduces erosion and pollution in our waterways and may reduce the effects of flooding.
* Many species of wildlife depend on trees for habitat. Trees provide food, protection, and homes for many birds and mammals.
* Trees improve our air quality by filtering harmful dust and pollutants such as ozone, carbon monoxide, and sulphur dioxide from the air we breathe (Bowling Green, 2022).
* Urban trees/forests have a positive impact on air quality through deposition of pollutants on the vegetation canopy, sequestration of atmospheric CO2 in woody biomass and reduction of (summertime) temperatures and associated ozone formation. Links between air pollutants and both heart and lung disease are widely accepted. Asthma sufferers find that air pollution makes their symptoms worse (NUFU, 2001 as cited in Ajewole, 2008).
* Fine particles and gases such as nitrogen dioxide are significant air pollutants produced by the combustion of petrol, oil and gas. Trees act as filters and leaves have a surface area up to twelve-times greater than the ground they overshadow, helping to trap dust and carbon particles and absorb harmful gases. On sunny days, shade from urban trees/forests also helps to slow the formation of harmful ozone. Therefore, leafy town parks and tree-lined streets help to clean the air we breathe and make it healthier (Ajewole, 2008).

## 2.4.3 Economic Benefits

* Well placed trees can reduce your cooling costs in the summer by shading the south and west sides of your home. If deciduous trees are used, they will allow the sun to pass through and warm your home in the winter (Bowling Green, 2022).
* Evergreen trees on the north side of your home and shrubs around the foundation of your home can act as a windbreak to reduce the cooling effects of winter winds.
* The value of a well landscaped home with mature healthy trees can be as much as 10% higher than a similar home with no or little landscaping. (Bowling Green, 2022).

## 2.5 Valuation of Ecosystem Services:

Valuation of ecosystem services is essential for understanding their economic and social significance, as well as for decision-making and policy development. Various methods have been developed to assess the value of ecosystem services. Market-based approaches use market prices or substitute market values to estimate the economic value of ecosystem services (Freeman, 2003). Stated preference methods (SP), such as contingent valuation, elicit individuals' willingness-to-pay for specific ecosystem services through surveys (Arrow *et al.*, 1993). Revealed preference methods (RP), such as the travel cost method and hedonic pricing, infer the value of ecosystem services from observed behavior, such as travel expenses or property prices (Bockstael *et al.*, 2000). Valuation studies provide insights into the trade-offs involved in land-use decisions, guide resource allocation, and inform the design of PES schemes (Bateman *et al.*, 2015).

## 2.5.1 Types of nonmarket valuation methods

Market prices and costs can provide estimates of the increase in the value of commercial activities, such as timber extraction, fishing etc., the value of revenues from tourism activities related to visits to natural areas and the value of contracts signed by firms and governmental agencies, also known as bioprospecting contracts. However, some environmental goods and services do not affect markets and market data are not available to value them. In such cases methods have been developed to derive consumers' preferences namely: Revealed Preference and Stated Preference methods (Bockstael *et al.*, 2000).

The Stated Preference approaches include:

a) Contingent valuation (CV) CV is currently the most used technique for the valuation of environmental goods where individuals state their WTP/WTA for a good or service. One important reason for this is because only Stated Preference methods like CV can elicit the monetary valuation of the non-use values, which typically leave no 'behavioural market trace'. Furthermore, CV allows environmental changes to be valued even if they have not occurred yet (i.e., ex ante valuation) (Bockstael *et al.*, 2000)..

b) Conjoint choice or Choice experiment (CE) Conjoint choice is also commonly used Stated Preference method, and the relative merits of this against CV are, discussed much in the literature. This method elicits information on values by asking individuals to choose between alternatives; conjoint ranking, where individuals rank alternatives in order of preference and conjoint rating, which indicates their strength of preference on a cardinal scale (Abdullah, *et al.*, 2011).

The Revealed Preference methods include:

A) Hedonic pricing (HP); this estimates the economic value of an environmental commodity, say, clean air or an attractive view, by studying the relation between such attributes and house prices (Palmquist, 1991 as cited in Abdullah, *et al.*, 2011). Hedonic price estimation has been applied to elicit environmental/ecosystem values associated with recreation, landscape values and genetic and species diversity. Hedonic techniques are, employed particularly in valuing visual amenity, quality of soil assets and exposure to air pollution.

B) Travel cost method (TCM); this estimates the economic value of recreational sites by looking at the generalized travel costs of visiting these sites (Bockstael *et al.*, 1991) as cited by Abdullah, *et al.*, 2011). The valuation is then based on deriving a demand curve for the site in question, through use of various economic and statistical models. Where the individual makes a choice involving more than one site, the discrete choice models have used the random utility theory framework to value not only visits to different sites but also the attributes of sites, such as water quality (Abdullah, *et al*., 2011).

## 2.5.1.1 Contingent Valuation

Contingent Valuation is a method of estimating the value that a person places on a good. The approach asks people to report directly their willingness-to-pay (WTP) to obtain a specified good, or willingness to accept (WTA) to give up a good, rather than inferring them from observed behaviours in regular market places. Because it creates a hypothetical marketplace, in which no actual transactions are made, contingent valuation has been successfully used for commodities that are not exchanged in regular markets, or when it is difficult to observe market transactions under the desired conditions (FAO, 2000).

Although it is certainly possible to employ contingent valuation, for commodities available for sale in regular marketplaces, many applications of the method deal with public goods. Such as improvements in water or air quality, amenities such as national parks, and private non-market commodities. Such as reductions in the risk of death, days of illness avoided or days spent hunting or fishing.

Contingent valuation has proven particularly useful when implemented alone or jointly with other valuation technique for non-market goods, such as the travel cost method or hedonic approaches. It remains the only technique capable of placing a value on commodities that have a large non-use component of value, and when the environmental improvements to be valued are outside of the range of available data (FAO, 2000). Much controversy surrounds the use of CV when most of the value of the good derives from passive use, as has been typical in litigation over the damages to natural resources and amenities caused by releases of pollutants. Critics of contingent valuation allege that the quality of stated preference data is inferior to observing revealed preferences, consider contingent valuation a "deeply flawed method" for valuing non-use goods and point at the possible biases affecting contingent valuation data (FAO, 2000). Despite these criticisms, CV has formed the basis for a significant amount of policymaking in the United States. Our view of the contingent valuation studies conducted in developing countries is that most of them have been designed and implemented following rigorous standards, in the economics profession. To elaborate on this point, it appears that the majority of these studies pose willingness-to-pay questions using dichotomous choice approaches, asking the respondents whether or not they would purchase the specified commodity at the stated prices. This approach is nowadays preferred over alternative approaches, because it reduces the cognitive burden placed on the respondent, and mimics the behaviour of people in regular marketplaces. When follow-up questions were used to obtain more precise information about the respondent's WTP amount, the analysts usually took care to examine whether mean WTP would change with each new round of information as a result of strategic behaviour on the part of respondent (FAO, 2000).

Ecosystem services, payment for ecosystem services, urban forestry, and the valuation of ecosystem services are interconnected topics that have gained significant attention in environmental and sustainability research. The recognition of the importance of ecosystem services and the implementation of PES schemes has the potential to promote sustainable land management, conservation efforts, and the equitable distribution of benefits. Urban forestry plays a crucial role in enhancing ecosystem services within urban areas and mitigating the negative impacts of urbanization. Valuation studies provide insights into the economic and social importance of ecosystem services and guide decision-making processes.

# CHAPTER THREE

## 3.0 METHODOLOGY:

## 3.1 Study Area

## 3.1.1 Location:

The study was conducted in the Federal Capital Territory (FCT) Abuja which is a city that symbolizes the unity and diversity of Nigeria. Established in 1976, it serves as the administrative and political hub of the country. The FCT encompasses a rich blend of cultures, diverse ethnic groups, and a burgeoning population (Wikipedia. Abuja. (2023, September 2))

Federal Capital Territory in Abuja was created to replace Lagos as Nigeria’s capital, owing to the need for a neutral and purpose-built administrative centre. The FCT’s strategic location in the centre of the country made it an ideal choice. Construction began in the late 1970s, and in 1991, Abuja officially became the new capital, hosting the seat of government, embassies, and other significant institutions (Thomas-Emeagwali, 1989).

Abuja is a multicultural city that attracts people from all corners of Nigeria and beyond. While it primarily rests on the land of the Gwari people, its population comprises diverse ethnic groups such as the Hausa, Yoruba, Igbo, Fulani, and many others. The city’s cultural tapestry is enriched by the fusion of these traditions, creating a unique atmosphere where various languages, customs, and festivals coexist harmoniously.

The FCT boasts numerous landmarks and attractions that reflect the city’s grandeur and allure. A prominent feature is the Aso Rock, a massive granite outcrop that serves as the symbolic seat of power. The Nigerian National Mosque and the Nigerian National Christian Centre showcase the country’s religious diversity and architectural splendour. Additionally, the Millennium Park, Abuja City Gate, and Zuma Rock are iconic sites that attract tourists and residents alike (Thomas-Emeagwali, 1989)..

Abuja’s economy is vibrant and diverse, driven by both public and private sectors. The FCT serves as a major commercial hub, housing government ministries, corporate headquarters, international organizations, and diplomatic missions. The city is also renowned for its burgeoning real estate industry, with an increasing number of residential and commercial developments. The hospitality sector has witnessed tremendous growth, with luxury hotels and resorts catering to tourists and business travellers. Furthermore, Abuja’s retail and entertainment sectors are thriving, offering a wide range of shopping malls, restaurants, and recreational facilities.

The Federal Capital Territory, Abuja, represents the essence of Nigeria's unity and progress. Its rich cultural heritage, diverse population, and impressive landmarks make it a city worth exploring. From its historical significance as Nigeria’s capital to its economic prowess and cultural fusion, Abuja stands as a testament to the nation’s aspirations and achievements. As the FCT continues to evolve, it remains a beacon of development and a symbol of national pride (Obiadi *et al.*., 2018).

The FCT consist of six Area council and unlike the formation of Local Government in other states it is divided to Area councils.

1. Abuja Municipal Area Council (AMAC)
2. Bwari Area Council
3. Gwagwalada Area Council
4. Kuje Area Council
5. Kwali Area Council
6. Abaji Area Council

## 3.1.2 Climate:

The climate of the FCT ranges from the dry Season (November to March) where during this period, Abuja experiences dry and dusty conditions with low humidity. The temperatures are relatively cooler, ranging from around 20°C (68°F) to 33°C (91°F). Harmattan winds, originating from the Sahara Desert, can bring haze and reduced visibility also the Wet/Rainy Season (April to October): where in Abuja it is characterized by higher temperatures and rainfall. Showers and thunderstorms are common, with the heaviest precipitation occurring between June and September. Temperatures during this period range from around 23°C (73°F) to 32°C (90°F), and humidity levels are higher (Fanan *et al*., 2011).

Overall, Abuja experiences a relatively mild climate. Average temperatures range from around 23°C (73°F) to 32°C (90°F) throughout the year. The hottest months are usually February and March, while the coolest months are December and January, with the majority of its rainfall during the wet season (Fanan *et al.*., 2011). The annual average precipitation is around 1,200 millimetres (47 inches). Rainfall is usually heavy and sporadic, with intense downpours and thunderstorms occurring.

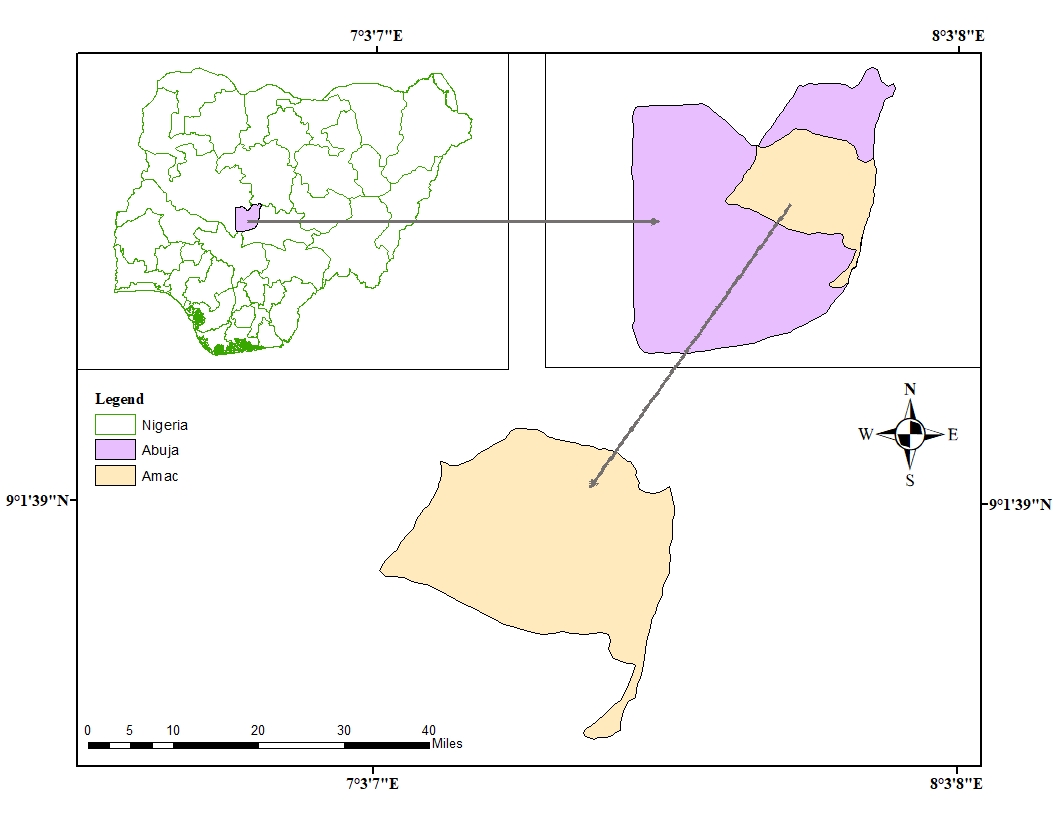


Figure 1:Map of the FCT showing the location of AMAC

## 3.2 Sampling Technique

Before the study was carried out, a survey was carried out to know which of the area councils has the most government offices and ministries, and which will correctly cover the number of civil servants in the area. Purposive sampling was used to select the ministries and offices we could cover and have access to, as some require special access. The snowball sampling technique was used in administering questionnaires to civil servants from various ministries.

Figure 1 showing the map of Nigeria, the map of the FCT and also the map of the sampled area council.



Plate 1: Front View of the Federal Ministry of Environment



Plate 2: Front View of Agricultural Council of Nigeria.

Some of the ministries in the FCT

1. Ministry of Agriculture and Rural Development
2. Ministry of Aviation
3. Ministry of Budget and National Planning
4. Ministry of Communications and Digital Economy
5. Ministry of Defence
6. Ministry of Education
7. Ministry of Environment
8. Ministry of Federal Capital Territory
9. Ministry of Finance, Budget and National Planning
10. Ministry of Foreign Affairs
11. Ministry of Health
12. Ministry of Works and Housing
13. Ministry of Humanitarian Affairs, Disaster Management, and Social Development
14. Ministry of Industry, Trade and Investment
15. Ministry of Information and Culture
16. Ministry of Interior
17. Ministry of Justice
18. Ministry of Labour and Employment
19. Ministry of Mines and Steel Development
20. Ministry of Niger Delta Affairs
21. Ministry of Petroleum Resources
22. Ministry of Police Affairs
23. Ministry of Power
24. Ministry of Science and Technology
25. Ministry of Sports and Youth Development
26. Ministry of Transportation
27. Ministry of Water Resources
28. Ministry of Women Affairs

And other commissions.



Plate 3: Office of Nigerian Research and Education Network (National University Commission).

## 3.3 Sampling Size:

The questionnaire was administered to civil servants working within the Ministries and across the various commission. Seven (7) Ministries and commissions were sampled because of the ease of access A total of Seventy-Five (75) civil servants were sampled. Ninety (90) questionnaires were administered and Seventy-Five (75) recovered. The data collected included the civil servants’ socio-economic characteristics, their perception on Ecosystem services and their willingness-to-pay. Plate 1 showing the front view of the Federal Ministry of Environment, while Plate 2 shows the front view of the Agricultural Council of Nigeria.

## 3.4 Data Collection.

Data used for the study was gathered through; the use of Questionnaire which was administered one-one across various ministries and parastatals sampled. In plate 3 we can see the office block of the Nigerian Research and Education Network (National University Commission) where the civil servants were met and administered questionnaire to. The questions were characterized by both open-ended questions and close-ended questions.

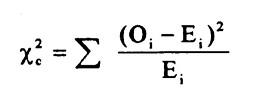
In plate 4 and 5 we can see respondents filing the questionnaire administered to them.

## 3.5 Data Analysis

The data obtained from the course of the study were analysed using IBM SPSS statistical packages for the descriptive and inferential statistics. I made use of descriptive statistical tools such as frequency and percentages, while inferential statistical tools such as chi-square test of independence.

The independent variables were years of experience, gender, age, educational qualification and income. Dependent variables general perception on ecosystem services and willing to pay for PES.

Mathematically, the chi square test of independence is expressed as:



Where:

O = observed value

E= Expected value

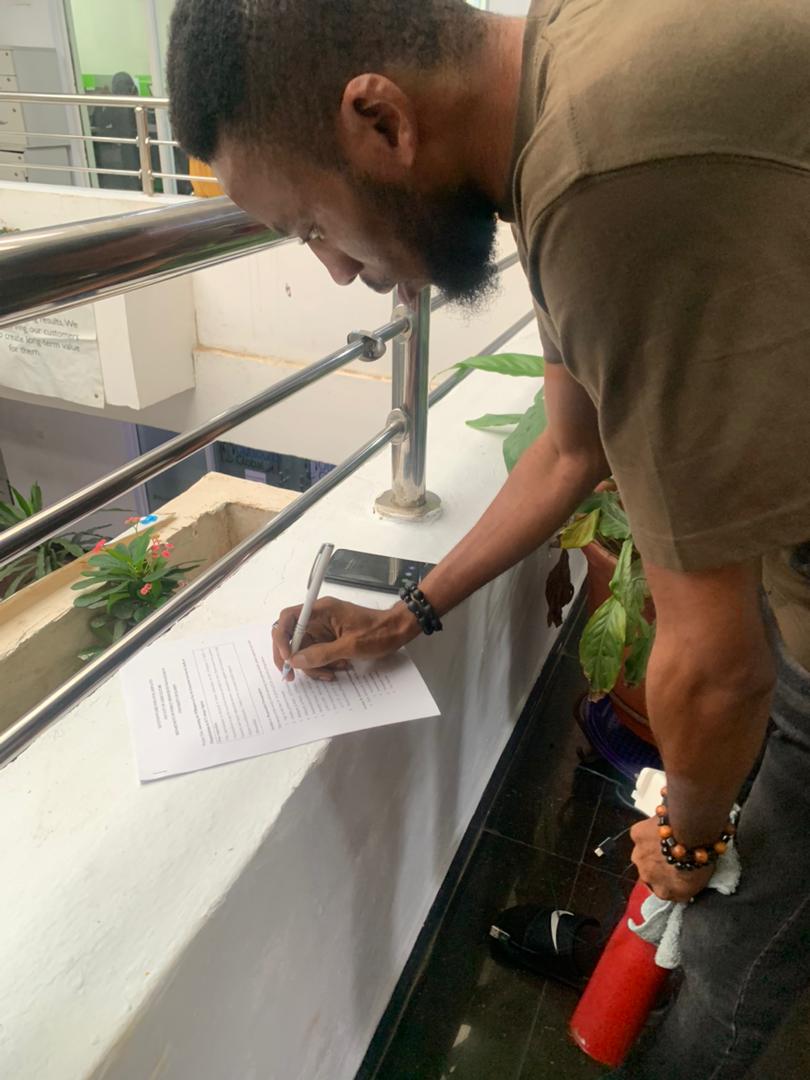


Plate 4: Respondent Filling Questionnaire

Plate 5: Respondents Filling Questionnaires during their free time.

# CHAPTER 4

## 4.0 Results

## 4.1 Distribution of Data Based on Their Demographics

Table 1 shows the demographic characteristics of 75 selected civil servants. Majority of the sampled respondents fall within the 30-39 age bracket (81.3%), followed by those aged 20-29 (6.6%), 40-49 (10.7%), and a small representation aged 50 and above (1.3%). There were more male respondent (53.3%) which is slightly higher than that of the female participants ( 46.7% ). In terms of religion, Islam and Christianity dominate, accounting for 50.7% and 41.33% of the respondents respectively, while the remaining 8.0% adhere to other beliefs. The ethnic composition primarily comprises Hausa (62.7%), Yoruba (26.7%), Igbo (6.7%), and a few from other ethnicities (4.0%).

Educational qualifications show that a significant portion of civil servants hold degrees (90.7%), followed by diploma holders (5.3%), with smaller percentages having NCE (4.0%), and none (0%) had primary/secondary education. Monthly income distribution indicates that the majority earn between #51,000 and #100,000 (66.7%), with varying income levels reported for the other categories. In terms of years of service, the majority have served for 1-5 years (70.7%), followed by 6-10 years (12.0%), and 11-15 years (17.3%). The marital status reveals that 68.0% are single, 32.0% are married, and there are no divorced respondents.

**Table 1: Distribution of civil servants’ demographic characteristics amongst the correspondents.**

|  |  |  |
| --- | --- | --- |
| Variables | Frequency | Percentage (%) |
| **Age**  Less than 20  20-29  30-39  40-49  50 and Above | 0  5  61  8  1 | 0  6.6  81.3  10.7  1.3 |
| Total | 75 | 100 |
| **Gender**  Male  Female  Total | 40  35  75 | 53.3  46.7  100 |
| **Religion**  Islam  Christianity  Others  Total | 38  31  6  75 | 50.7  41.33  8.0  100 |
| **Ethnicity**  Hausa  Yoruba  Igbo  Others  Total | 47  30  5  3  75 | 62.7  26.7  6.7  4.0  100 |
| **Educational Qualification**  Primary  Secondary  NCE  Diploma  Degree  Total | 0  0  3  4  68  100 | 0  0  4.0  5.3  90.7  100 |
| **Monthly Income**  <#50,000  #51,000 - #100,000  #101,000 - # 150,000  #151,000 - #200,000  > #200,000  Total | 0  50  15  10  0  75 | 0  66.7  20.0  13.3  0  100 |
| **Years of Service**  1-5  6-10  11-15  15-20  21-25  26-30  31-35  Total | 53  9  13  0  0  0  0  75 | 70.7  12.0  17.3  0  0  0  0  100 |
| **Marital Status**  Single  Married  Divorced  Total | 51  24  0  75 | 68.0  32.0  0  100 |

## 4.2 General Perception on Awareness and Perception of Ecosystem Services

As shown in Table 2, 45.3% agreed that they somewhat familiar with Ecosystem Services, 52.0% showing a moderately familiar, and only 2.7% indicated that they are very familiar with the topic of ecosystem services. Notably, none of the responses claimed not familiar.

The observations are noteworthy when we turn our attention to the evaluation of the Importance of Specific Ecosystem Services. Air filtration emerges as a top priority, as all participants agree it is “Very Important.” This unanimity demonstrates a shared understanding of the importance of air quality in the ecosystem. Food production follows with 85.3% recognising of its importance and 14.7% emphasising it as “Very Important.”

On Shade and shelter, 92.0% of the participants selected it as important, while 8.0% indicated that it is “Very Important.” Temperature regulation, was selected as “Very Important” by all the respondents (100%).

On Erosion Control, 86.5% agreed that it is important while 13.5% indicated and selected it as “Very Important.” 70.0% choose it as important while 30.0% viewing it as not important.

Wildlife habitat was selected by the majority of the participants (90.0%) of respondents rating it as “Not Important,” compared to 10.0% who rated it as important. On Recreational Opportunities, 25.0% selected it as important while 75.0% dismissed them as “Not Important.”

On Spiritual values, A significant percent (90.0%) rate them as “Not Important,” while 10.0% rate them as “Important.” Finally, on Soil Health Maintenance 10.0% rated I as “Very Important” and a sizable 90.0% rated it Important.

**Table 2: Distribution of Awareness and Perception of Ecosystem Services.**

|  |  |  |
| --- | --- | --- |
| Variables | Frequency | Percentage (%) |
| **How familiar are you with Ecosystem Concepts**  Not at all Familiar  Somewhat Familiar  Moderately Familiar  Very Familiar  Total | 0  34  39  2  75 | 0  45.3  52  2.7  100 |
| **Air Filtration**  Very Important  Important  Not Important  I don’t Know  Total | 75  0  0  0  75 | 100  0  0  0  100 |
| **Food Production**  Very Important  Important  Not Important  I don’t Know  Total | 11  64  0  0  75 | 15  85  0  0  100 |
| **Shade Shelter**  Very Important  Important  Not Important  I don’t Know  Total | 6  69  0  0  75 | 8.0  92.0  0  0  100 |
| **Temperature Regulation**  Very Important  Important  Not Important  I don’t Know  Total | 75  0  0  0  75 | 100  0  0  0  100 |
| **Erosion Control**  Very Important  Important  Not Important  I don’t Know  Total | 10  65  0  0  75 | 13.5  86.5  0  0  100 |
| **Disease Control**  Very Important  Important  Not Important  I don’t Know  Total | 0  53  22  0  75 | 0  70.0  30.0  0  100 |
| **Habitat for Wildlife**  Very Important  Important  Not Important  I don’t Know  Total | 0  8  67  0  75 | 0  10.0  90.0  0  100 |
| **Recreational Opportunities**  Very Important  Important  Not Important  I don’t Know  Total | 0  19  56  0  75 | 0  25.0  75.0  0  100 |
| **Spiritual Values**  Very Important  Important  Not Important  I don’t Know  Total | 0  8  67  0  75 | 0  10.0  90.0  0  100 |
| **Soil Health Maintenance**  Very Important  Important  Not Important  I don’t Know  Total | 8  67  0  0  75 | 10.0  90.0  0  0  100 |

## 4.2.1 Test for demographic characteristics and Awareness of Ecosystem Services.

From the chi-square test of independence shown in Table 3 we observed that the knowledge on concept of ecosystem services was significant with age (ꭓ2 =11.686, p= 0.009) and Income (ꭓ2 =11.601, p= 0.003) of the respondents. However, gender and education did not show any significance level on the level of knowledge of the ecosystem services.

**Table 3: Test of Independence on demographics and Awareness of Ecosystem Services.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Age | Gender | Income | Education |
| **How Familiar are you with Ecosystem Concepts.** | x  df  p | 11.686  3  0.009\* | 1.882  1  0.170 | 11.601  2  0.003\* | 2.032  2  0.362 |

## 4.3 Distribution on Willingness-to-pay for Ecosystem Services

The willingness-to-pay of the respondents was also determined. Several questions were posed to the respondents to see whether they would be willing to pay for these ecosystem/environmental services.

As showed figure 2, the respondents were questioned about whether they have ever contributed to ecosystem services in the past. When asked if they would be willing to pay for these services, 100% of them objected and indicated they had not made any payments. When they were questioned further, it was asked if they would pay for these services if they were required to do so, and the all the respondents (100%) indicated that they would.



Figure 2:Bar chart showing the Percentage response to willingness-to-pay questions by respondents.

## 4.3.1 Distribution on amount the Respondents are willing to pay

Figure 3 shown below shows that from the survey it was observed that majority of the respondents (98%) agreed to pay less than #1,000 Naira as monthly commitment to paying for Ecosystem Services, while only 2.00% agreed to pay greater than #5,000 Naira as commitment.



Figure 3: Bar Chart showing the Response to Amount respondent are willing to pay for ecosystem services.

## 4.3.2 Test for demographic characteristics and amount they are willing to pay.

In Table 4 as displayed it shows from the chi-square test of independence, none of the demographics shows significant levels to affect the amount the respondents are willing to pay for the ecosystem services. This means that the amount that the respondents are willing to pay are not dependent on any of the demographic variables.

For the willingness-to-pay the demographics does not affect the willingness-to-pay as there was a constant in the response surveyed.

**Table 4: Test of Independence of demographics and Maximum Amount they are willing to pay.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Age | Gender | Income | Education |
| **Maximum Amount willing to pay for ecosystem services.** | x  df  p | 0.233  3  0.972 | 1.158  1  0.282 | 0.507  2  0.776 | 0.104  2  0.949 |

## 4.3.3 Distribution for Reasons for Willingness-to-pay

In Table 5, 100% agreed that Tree is a free gift of nature so they do not need to pay, also 100% agreement to the question that “It’s not my responsibility to pay for services provided by trees”. While they all agreed (100%) that they indeed make use of the services, 73% agreed to the statement “I'm willing to pay, but can't afford to pay” while 27% disagreed to it. They all agreed (100%) that it is the government responsibility to budget an amount to take care of the services.

**Table 5: Distribution of Reasons for Willingness-to-pay.**

|  |  |  |
| --- | --- | --- |
| Variables | Frequency | Percentage (%) |
| **Tree is a free gift of nature so I don't need to Pay?**  Yes  No  Total | 75  0  75 | 100  0  100 |
| **It's not my responsibility to pay for services provided by trees**  Yes  No  Total | 75  0  75 | 100  0  100 |
| **I don't make use of the services**  Yes  No  Total | 0  100  75 | 0  100  100 |
| **I'm willing to pay, but can't afford to pay**  Yes  No  Total | 55  20  75 | 73.0  27.0  100 |
| **The Local Government should budget an amount for that**  Yes  No  Total | 75  0  75 | 100  0  100 |

## 4.4 Distribution on Preferred Methods on Paying to Support Ecosystem Conservatives



Figure 4: Bar Chart showing the percentage in response to the preferred mechanisms for contributing towards ecosystem services

In Figure 4, from the response majority of the respondents (100.0%) agreed to voluntarily donate for the service. 11.1% agreed to pay a small fee or tax on goods and services, none agreed to participate in crowdfunding campaigns and 22.2% choose engaging in community-based projects as one of the mechanisms they can contribute.

## 4.5 Distribution on Barriers that hinder participation in Ecosystem Conservation Initiatives.



Figure 5: Bar Chart showing the percentage in response to the barriers affecting engagement in ecosystem conservative initiatives.

The study also focused on the barriers that hinders participation in Ecosystem conservative initiatives and this is displayed in figure 5. It is observed that while a majority of them choose lack of financial resources as a reason why they won’t participate, 60% of the respondent choose that they are not aware or lack understanding of how these conservative’s work.

More than half of the respondents (53%) indicated that lack of trust in their effectiveness is one of the reasons they are not participating and also same percent of the respondents agreed that they do not have or have other commitments that do not allow them to participate in these conservative initiatives.

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# CHAPTER FIVE

## 5.0 DISCUSSION

Trees play a pivotal role in enhancing both health and social well-being by actively purifying the air, alleviating stress, promoting physical activity, and fostering community bonds. Their contribution extends to the economic realm, as they offer various resources that cater to the needs of society. In urban landscapes where rising temperatures pose challenges, trees emerge as natural temperature regulators. Furthermore, they establish essential habitats and sources of sustenance for diverse animal species. As we navigate this era shaped by human influence, the need for skilled professionals well-versed in the dynamics of urban design and arboreal ecosystems becomes increasingly evident. Effective city planning for the future hinges on a comprehensive understanding of both built structures and the pivotal role of trees. Cognizant of an abundance of empirical evidence, the compelling argument arises that investing in trees fundamentally paves the way for a better global outlook (Turner-Skoff and Cavender, 2019).

# 5.1 Distribution of Data Based on Their Demographics

The demographic characteristics of 75 selected civil servants provide interesting insights into the composition of this group.The majority of respondents fall within the 30-39 age bracket, indicating that civil servants in this sample tend to be in the prime of their working years. A smaller percentage falls into the 20-29 and 40-49 age groups, while a very small representation is aged 50 and above.Among the surveyed civil servants, there are slightly more males than females.The dominant religions among the respondents are Islam and Christianity, with a smaller percentage adhering to other belief systems.

Forethnicitymajority of thecivil servants in the sample are of Hausa ethnicity, followed by Yoruba, Igbo, and a few from other ethnic backgrounds.A significant portion of civil servants hold degrees, indicating a relatively high level of educational attainment within the group. There are also some diploma holders and a smaller percentage with NCE qualifications, while none have primary/secondary education as their highest qualification.The majority of civil servants in this sample earn between #51,000 and #100,000 per month. Other income levels are reported as well, showing some variation in the earnings of this group.Most civil servants surveyed have served for 1-5 years, indicating a relatively young workforce. There are also smaller percentages of civil servants with 6-10 years and 11-15 years of service.A significant portion of civil servants in this sample are single, while a smaller percentage are married. There are no divorced respondents among the surveyed group.

## 5.2 General Perception on Awareness and Perception of Ecosystem Services

According to the result, ecosystem services (ES) are important to people and they have positive perception of trees. (Gwedla and Shackleton, 2019). Most respondents had positive perceptions about urban trees. Most of the respondents in this study values the ecosystem services provided by trees.

Also, the study showcases the public's viewpoints concerning ecosystem concepts and their attitudes toward specific ecosystem services. The data presented in Chapter 4 sheds light on the participants' familiarity with these concepts and their assessments of the importance of various ecosystem services.

In this study, Air filtration emerges as top priority and majority of the participants of agree it is important, Shade and shelter which was also selected as important. (Lo and Jim, 2015) found that respondents in Hong Kong expressed general recognition of the main ecosystem services provided by urban trees, including providing shade and mitigating the greenhouse effect in their perceived importance of urban tree functions. Another ecosystem service said to be very important as well is air filtration.

However, in this study spiritual values, wildlife habitat, recreational opportunities were rated as least important which opposes the study by (Rozas, *et al.*, 2013) who observed that the cultural services perceived as most important for social wellbeing were cultural identity and spiritual value.

**Test for demographic characteristics and Awareness about Ecosystem Services by Trees;**

The result of the Chi-square test of independence shows that the demographic characteristics of Age, and Income has significant effect on the awareness of ecosystem services. While the awareness of the services is not dependent on Gender and Education.

## 5.3 Distribution on Willingness-to-pay for Ecosystem Services

Payments for ecosystem services (PES) initiatives are a mechanism in which individuals or communities are compensated for undertaking actions that increase the provision of ecosystem services (Ruhweza, and Masiga 2007). Although examples of PES can be traced back at least as far as the 1980s, it is still a relatively new instrument, and the experience to date in many parts of the world is not yet extensive, or based on a very long timeframe (Greiber, 2009). PES policies rely on incentives to induce behavioural change, and can thus be considered part of the broader class of incentive- or market-based mechanisms for environmental policy (Ruhweza, and Masiga 2007).

In this study, it was observed that the level of willingness was incredibly low, while there is increase and adequate awareness on the importance of ecosystem services the energy was not the same on the willingness-to-pay for these services. This goes in line with Ruhweza, and Masiga 2007 study, which revealed that, in an inventory of PES schemes2 carried out in 2005, they observed that most ecosystem providers were not aware that the services they provide have a monetary value, and the beneficiaries were not aware of the need to compensate the providers.

When asked reasons for not paying most of them pointed out that tree is a free gift of nature as such do not need to pay for the services. Some pointed that the government should handle the management of these services and they it is not their duty to pay for these services. This corroborate with (Arabomen, *et al.*, 2019), which says the key reasons provided for non-willingness to pay were: (a) It is the duty of the government (b) What is paid to the relevant authorities may be diverted for other uses.

On the amount to pay for these services many of the corresponded majority only choose to pay #1,000 naira monthly to support these services which is around 2% of the minimum salary of #50,000 naira.

**Test for demographic characteristics and willing to pay for Ecosystem Services by Trees**

The conclusions drawn from the results in Table 3 provide us a complex picture of how people feel about paying for ecosystem services provided by trees. The widespread agreement that trees are regarded as a "free gift of nature" is evidence of a shared appreciation for the intrinsic worth of natural resources. This concept of shared responsibility for environmental wellbeing is highlighted by the widespread expectation that local governments will provide funding for tree-related services. The confluence of financial constraints and desire to pay highlights the practical difficulties in reconciling environmental intentions with economic reality. Overall, the results show how ecological appreciation, social expectations, and individual financial restrictions interact to shape the complicated terrain of willingness-to-pay for essential ecosystem services.

The result of the chi-square analysis on willingness-to-pay was analysed on various fronts, I analysed based on if they were willing to pay and, on the amount, they were willing to pay. Willingness-to-pay produced a constant therefore it is not dependent on any of the demographics. Also, the amount they are willing to pay doesn’t depend on any of the demographics.

## 5.5 Distribution on Preferred Methods on Paying to Support Ecosystem Conservatives

In this study further research was done to know if the civil servants would be interested in Ecosystem Conservatives and if they are willing to support it.

The survey results show unanimous support, with majority in agreement for voluntary donations as the favoured contribution method, reflecting a strong communal commitment. Interestingly, few found a small fee on goods and services acceptable, indicating an openness to indirect financial support. Crowdfunding garnered no interest, perhaps due to uncertainty. Encouragingly, some valued community project involvement, highlighting a desire for active engagement. Respondents' financial capacities, perceived service value, and trust greatly influence their preferences. Transparency about fund usage is crucial.

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# CHAPTER SIX

## 6.0 CONCLUSION AND RECOMMENDATION

## 6.1 Conclusion

In conclusion, the study reveals a commendable level of awareness and appreciation of ecosystem services among civil servants. A substantial portion of participants acknowledge the significance of these services, reflecting a positive foundation for conservation efforts. However, according to the study there is lack of willingness-to-pay for these services. The primary reason cited for non-payment is the perception that payment is unnecessary. Some see it as a free gift of nature. Also as seen in the study civil servants are busy people which emerges as a barrier to active participation in conservation initiatives.

Furthermore, the study identifies a critical issue of low trust in initiatives that involve monetary contributions.

Finally, while civil servants demonstrate an understanding and recognition of ecosystem services, the unwillingness-to-pay and concerns about initiatives' effectiveness pose challenges for translating awareness into tangible support for conservation endeavours. Therefore, fostering trust, enhancing convenience of participation, and clarifying the value proposition of financial contributions are crucial steps towards promoting active involvement and sustainable support for ecosystem services among civil servants.

## 6.2 RECOMMENDATION

* In light of the research findings, addressing the willingness-to-pay and fostering active engagement of civil servants in conserving ecosystem services, there is need for proper orientation on the needs to conserve these services and also to pay for these services.
* To incentivize voluntary contributions, a viable approach is the establishment of regular fundraising initiatives specifically aimed at civil servants, The reason for this is because civil servants as observed in the study choose and prefer voluntary payments as a most preferred choice of paying for these services.
* Integral to the success of these fundraising endeavors is the implementation of robust documentation practices. Properly recording the allocation and utilization of funds collected during these initiatives serves a twofold purpose. Firstly, transparent documentation builds a sense of trust among civil servants, which will save the issue of trust that was a major barrier in the research. addressing a significant barrier identified in the research.

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