ASSESSMENT OF THE ECOTOURISM POTENTIALS OF OSUN OSOGBO WORLD HERITAGE SITE OSUN STATE, NIGERIA

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ABSTRACT

Uncontrolled entry into World Heritage Sites (WHS) and other tourism sites may impact negatively on vegetation and wild animal populations, thereby reducing their potential for ecotourism development. Balanced site ecology and conducive socio-economic environment are germane to sustainable ecotourism development. Needed, information on these is not well documented for Osun Osogbo WHS. Therefore, some aspects of site ecology and socio-economic variables were investigated in Osun Osogbo WHS, Nigeria.

The study was carried out using three sets of structured questionnaires, personal interview and field surveys. The sets of questionnaire were systematically administered on fifty local residents, randomly administered on 100 tourists and 60% of the WHS staff (50), respectively. Information was obtained on wildlife resources, tourism potentials, managerial challenges and administrative approaches. Within the three vegetation zones in the site: Dry High Forest (DHF), Dry Savanna Forest (DSF) and Riparian Forest (RF), samples of water were taken and nutrient agars were used to isolate their pathogens. Also, three sample plots (30mx30m) were laid in each zone for vegetation survey to determine Diameter at Breast Height (DBH), Basal Area (BA) and volume of trees. Point count and Rodger's methods were used to enumerate birds and terrestrial wildlife, respectively. Data were analysed using descriptive statistics, chi-square and ANOVA at $\alpha_{0.05}$.

Anthropogenic activities identified within the site were farming (37.3%), firewood and medicinal plants collection (20.9%), illegal grazing (17.1%), poaching (10.5%), fishing (9.2%) and crafting (5.0%). In order of importance, income (32.0%), literacy level (26.5%) and tourist's interest in culture (23.5%) were perceived to impact tourism in the WHS. The modal age group of tourists was 10-20years (40.5%). Tourist's visitation to WHS was found to be dependent on their age ($\chi^2 = 12.97$; df = 4; $\alpha_{0.01}$). Tourists population was observed to fluctuate between 38,000 in 2006 and 63,000 in 2010, while internally generated revenue recorded during these period was between ₦120, 000:00 and ₦250, 000:00. Bacteria isolated from the water included: *Escherichia coli* ($8xl0^4$cfu/mL), *Salmonella sp.* ($7.5xl0^4$ cfu/mL),

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Staphylococus sp. (5.5xl0^4 cfu/mL), *Vibro cholera* (7.5xl0^4 cfu/mL) and *Shigella sp.* (3xl0^4 cfu/mL). Absolute density of woody plants was 187 trees/ha. *Cola milleni* had the highest (18.71/ha) density on the site, while *Antiaris toxicaria, Anthodeista dyalonensis, Funtumia elastica* and *Milicia excelsa* had the least with 0.53/ha each. The BA in DHF, DSF and RF were 0.75±1.9m^2, 0.82±3.1m^2 and 0.15±0.3m^2 respectively. Tree volume in DHF (0.92±2.0) m^3, DSF (0.41±1.12) m^3 and RF (0.13±0.28) m^3 were significantly different. The DBH in DHF (22.42±21.6), DS (20.47±25.44) and RF (11.64±7.3) were also significantly different. The study area was covered by luxuriant vegetation types and was mainly inhabited by white throated monkey *(Cercopithecus erythrogaster)*. Sixteen reptiles, 13 avians and 20 other wildlife species were identified in the site with the white throated monkey *(Cercopithecus erythrogaster)* being the most sighted wild animal.

Osun Osogbo world heritage site has high potential for ecotourism development. There was evidence of inadequate management and human pressure. Habitat improvement, enhanced site protection and public awareness campaign were therefore recommended.

Keywords: Osun Osogbo tourism potential, Sacred grove, Protected area managerial challenges, World Heritage Site

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DEDICATION

This dedication goes to my late beloved mother (Sulat Hawen Wahab Mrs). May her soul rest in peace, (amen) and also my living father (Wahab Ajani Nafiu) for supportive role and guidance.

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CERTIFICATION

I certify that this work was carried out by Mr. Wahab, Munir Karounwi Adegoke under my supervision in the Department of Wildlife and Ecotourism Management Faculty of Agriculture and Forestry, University of Ibadan; Ibadan, Nigeria.

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CHAPTER ONE

INTRODUCTION

1.1 Background Information

World Heritage Sites are places of significant natural, historical and cultural values throughout the world, and the World Heritage Committee selects them for preservation. The Committee is an international organization, that is responsible for cataloging and protecting world heritage sites, and it operates under the direction of the United Nation Educational Scientific Cultural Organization (UNESCO). The World Heritage Committee attempts to promote cooperation among nations to protect the world-wide heritage site that is recognized as being of universal values, and whose conservation is of interest and a concern to humanity.

The conservation is legally binding on signatory countries that must help to identify, protect, conserve, and transmit to future generations the properties of such world heritage site. (Paul, 1972) indicated that world heritage sites include monuments, sculptures and paintings, cave-dwellings, architecturally significant buildings and places of national importance.

A Word Heritage Site could be Cultural or Natural. Cultural heritage sites include a group of separate or connected buildings, which because of their architecture, their homogeneity or their place in the landscape are of outstanding universal values based on historical, aesthetic, ethnological and anthropological points of view. A natural heritage site comprises the natural features of physical and biological formations or groups of such formations, which are of outstanding universal value from the aesthetic or scientific points of view. It is therefore an ecosystem.

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Ecosystem stands for ecological system and is essentially somewhat more of technical term for "nature" (Odum, 1963). An ecosystem is to a very considerable extent a self-regulating entity capable of achieving a degree of homeostasis or equilibrium (Kormondy, 1976). Obviously, this condition obtains when human activities and natural disasters such as volcanoes, earthquakes, and Tsunamis etc do not interfere or impact significantly on the dynamics of the ecosystem. Protected areas, particularly, world heritage sites are some of tourist attractions and subject to growing visitation.

World Heritage Sites are outstanding cultural and natural landscapes covering all kinds of ecosystems, are carefully selected through a process resulting from a 1972 multilateral agreement involving 171 countries. Maintaining such sites require adequate practices to guarantee environmentally sound management of the protected area and at the same time to ensure that local communities benefit from the parks existence.

However, it is an inevitable "destiny" the very reason why an area is chosen; for inscription of the world heritage list are also the reasons why millions of tourists flock to those sites year after year. In fact, the belief that world heritage sites belong to everyone and should be preserved for future generations is the very principle on which the world heritage convention is based. So how do we merge our convictions with our concerns over the impact of tourism on world heritage sites? The way to do this is through sustainable tourism, directing government, site managers and visitors towards sustainable tourism practices. This approach will ensure the safe keeping of our world's cultural and natural heritage site.

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In 2002, the International community virtually with its "undivided attention" focused on our cultural and natural heritage. It started with the United Nations Declaration of 2002 as the "Year for cultural Heritage". In May, 2002, of the same year, Quebec City hosted the first ever world Eco-tourism Summit, whose declaration was on the context of sustainable development of Eco-tourism for sustainable development: this was later delivered at the Johannesburg world summit. Six months later in November 2002, heritage, tourism and development were the foci of the occasion of the 30th anniversary of the World Heritage Convention. The objective is to seize this momentum by putting all the ideas, theories and plans for sustainable tourism into action. Franco, (2002) stated that "By learning to "tread lightly" on the earth, not only are we ensuring the future of World Heritage Sites but also the future of tourism. It's a win-win situation for everyone involved: the site is better protected and maintained, the tourists experience a more pleasant visit, and the local economy is boosted as a result". In many cultures of the world, sacred natural sites are important areas for environmental conservation. He further stated that Traditional respect for environment and access restrictions to sacred sites have often led to well-conserved areas with high biological diversity within otherwise degraded environments.

In the dynasty of China (26BC-220AD) there were imperial parks, such as the famous Shang-Lin Park, a fat-walled enclosure where exotic animals obtained from vassal states were kept for emperor to practices sport hunting. Epicurus (342-270BC) was credited by Pliny with the idea of creating gardens in towns, where he acquired a plot of land near the Dipylon Gate within the walls of Athens and made a garden for himself and his scholars. The Romans were not left out; they had their own pleasure parks and they developed a country home lifestyle in order

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to avoid the heat of sun (Lasdun, 1991 Corroborated by Falade, 1994). With growing interest in natural history, modern menageries, provide real, closed-up, and visual and sensual-opportunities for the world's biological richness. In Nigeria, there are at present, two recognized World Heritage sites: namely Sukur World Heritage Site in Adamawa state and Osun Osogbo (Sacred Grove) World Heritage Site in Osun state. Generally, Africans seem to have less respect for sacred sites than those in the Asians and Latin Americans. Nonetheless, parks are of recreational values to us in Africa.

Conservation of plant diversity in developing countries is of various strategies to global biodiversity conservation. The ecological environment in Nigeria is critically degraded. As evidenced by the deforestation and desert encroachment which seem to go on unabated. It is necessary and indeed imperative to take urgent step to reverse this ugly trend. This position dictated by the fact that plants are invaluable to human beings as well as other animals. Plants and animals are the integral component of the earth's biodiversity whose effective conservation will depend on the longterm understanding and participation of the local communities. This development can, and should be done without interfering with the traditional belief of such community. Liu et al, (2003) indicated that approaches to conservation of plant diversity by traditional beliefs involve the following:

1. This depending on religious belief system, establishing an association of religious plant conservation for organize local people to participate in conservation by religious activities, to document the indigenous botanical knowledge and to train local people.

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2. Training local people at different levels to improve their capacity building on conservation of plant diversity in reference of science and religion.

3. To demonstrate the conservation of plant diversity by rehabilitating the holy hill forest and plant in temple gardens.

Conservation of cultural heritage by virtue of the location, belief systems and myths of majority of people in the world over, sites of Cultural and Historical Heritage and areas of conservation of ecosystem of the ethnic groups (for short, an Ecological and Cultural Reserve) are created and therefore safeguarding the integrity of the sacred cultural heritage. In Mexico, the environmental law of the state of San Luis potosi has the uniqueness of taking account of the protection of natural sites. This can be looked into by a quotation "Sacred National sites are those which in addition to their biodiversity importance are special spaces for indigenous peoples, and where ceremonies with a divine character are performed. In these sites, reality is seen and perceived under a magic, spiritual and natural perspective, and ritual offerings and ceremonies of the very same indigenous people do take place. This is comparable to the Osun Osogbo World Heritage Site festivity. Thus, it is possible and desirable to conserve heritage site and accommodate cultural values simultaneously.

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Conservation of marine reserve in the Gulf of California, which accounts for a mere 0.008% of the world ocean, has an outstanding diversity of marine species. Thirty-four species including the sea lion (the only pinned found in the Gulf) and the sea otter (the other thirty-two species account for one third of the world's cetacean's). Conversely, in its subtropical and rich waters thrive two of the world's largest whale species, the blue whales and the fin whale. The important nesting sites for migratory and resident bird species and the grounds for sea lion colonies are typical addition in some of the Gulf Island (Acha 2003).

However, many protected areas are managed through world heritage convention for improved conservation of their natural resources. In support of this, the Tibur on Island, together with other Island in the Gulf area in the mid 1990s, fell under Federal protection as part of the Great Islands Biosphere Reserve. According to World Wide Fund for Nature, the Seri cultural and natural reserves attributes are located and map out sites of cultural significance to the Seri bottom the Island and on the mainland. Each site is positioned on a digital map and elder share the mythological stories: associated with them, this has direct impact on the management of the site's natural resources (Acha, 2003).

Conservation of landscape is embedded in the culture; the people of Dawan in west Timor protect a special landscape area for their sacred sites. They live in the Insana district of North-Central Timor (Waluyo, 2003). Their sacred sites are closely related to the presence of spring water, which is the principal reason for the conservation of these mostly forested areas (Naiola 2002, Poleng 2002). Furthermore, hunting in the sacred areas provides protein, and

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material objects for rituals and festivities. The sacred sites also provide other resources for their living needs (Naiola 2002, Waluyo 2003).

This sacred site not only maintains biological diversity and provides goods for rituals and cultural purpose but, more importantly, they produce the water necessary to maintain the livelihoods of local people. This also applies to the Osun Osogbo sacred world heritage site. Reconnaissance survey of Osun Osogbo World Heritage Site revealed that 400 different plant species grow in the area. Conversely, it is evident that sacred sites have important role to play in conserving biological diversity. Water was in short supply in Oshogbo province by then; this was the major reason why the area needs to be protected with the goddess of appeasement and provider from the gods to the benefit of worshippers and general populace that settled in the area. In addition, the local community's venerate the goddess of Osun-river, and will not allow anybody or anything to desecrate the river and its environs. Thus, they have a stake in conserving the site.

The Osun Osogbo World Heritage Site was enlisted among world-class heritage sites of cultural/natural ecosystem area frequently visited by local and foreign tourists. This enlisted international organization under United Nation Educational Scientific Commission enjoyed the counterpart funding to carry out some of its functional roles as a cultural landscape maintaining the undisturbed typical tropical rain forest vegetation. The present management of the site is directly under the supervision of Federal Ministry of Tourism, Culture and National Orientation; a parastatal in National Museum and Monuments Commission. The Site also enjoyed the supportive corroboration of the State Government and the Osogbo traditional heritage council.

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The traditional regulation and involvement of community participation contributed immensely to the sustainability of the site for ecotourism potentials which gave it a universal value at the point of view of biological and physical formations that is meant for natural or cultural landscape properties for inscription as a World Heritage Site in Nigeria in July, 2005.

Among other conservation sites and their relevance to World Heritage Site is a National Park. National parks have been aptly described as "supreme miracles of Nature" (Rhodes, 1984). The first national park in the United States of America is the yellow stone national Park which was established in 1872. It is the first National park in the World. On the other hand, the first national Park in Nigeria is Kainji Lake National Park as promulgated in Decree, now Act No. 46 of 1979.

A national park can be referred to as an area of land or sea where:

One or several ecosystems are not substantially altered by human exploitation and occupation, Floral and faunal species, geomorphologic sites and habitats are of special scientific, educational and recreational interest and value. It contains a natural landscape usually of great beauty (Nigeria National Park Service 2001).

The highest competent legal authority of the country (National or Federal Government) takes step to outlaw as soon as possible the occupation in the whole area, to enforce effectively the respect for ecological, geomorphologic, or scientific features that have led to its establishment and visitors are allowed to enter under special conditions, for inspirational, educational, cultural and recreational purposes (Nigeria National Park Service 2001).

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National parks are natural ecosystems with unique attributes, playing special roles vital to national, regional and even global well being. Apart from the provision of nature tourism or ecotourism, these Protected Areas promote ecological processes and life support systems such as protection of nutrient cycles, hydrological cycles, soil regeneration and cleansing and purifying activity. They are also pertinent in environmental protection and preservation of indigenous genetic resources, which acts as a basis of any real improvement to agricultural development. These Protected Areas also play a significant role in scientific researches in the field of spiritualism, psychology, medicine and agriculture (Nigeria National Park Service 2001).

Amubode, (1992) stated that a park is a piece of land developed for man's recreational purposes which include needs, desire, qualities, interest, power and instincts of individuals. Therefore, the objective of recreation is to bring immediate personal satisfaction of happiness and must always permit freedom of individual choice and freedom of action. However, a national park is an outdoor setting geared towards the reduction of stress from daily life engagement; though this is subject to factors like situation of things and environmental factors surrounding the needs of human being (Alarape, 1995). A zoological garden or park can be regarded as places where wild animal species, exotic or indigenous and sometimes-domesticated animals exhibited in cages or strict enclosures for peoples viewing interest. In this type of establishments, animals are given opportunity of intensive care much more than it is possible in reserves and in sanctuaries.

The zoological gardens are of two categories: Open and closed range zoological park. A sacred site is a place, which is considered holy and is partially or wholly reserved for magico-religious or ceremonial functions. As a result, compensation valuation upon compulsory

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acquisition of these places is a complex and specialized one requiring the interpretation of law and the past cultural heritage of the people concerned. Besides, sacred sites are special places where the physical world seems to meet the spiritual world. These could be the awe-inspiring natural places or sites connected to a god/goddess, a historical perspective saint or a hero, places where miracles occurred or special buildings consecrated for worship or rituals. Sacred shrines and groves are places where our ancestors lived and channels to communicate with us in various ways. (Carmichael et al, 1994)

They are inhabited by the gods or by spirits of our ancestors who animate everything found on and in the earth, which must be taken into account. The groves, shrines and squares are set apart and dedicated to the worship either of a deity, a war hero or as a burial of the nobles, with trees, rocks or water, surrounding a shrine or an altar.

They form an important component feature of the mythological landscape and cult practice of Celtic, Germanic, ancient Greek, Near Eastern, Roman and Slavic polytheism and were used in India, Japan, and West Africa. Sacred sites remain meaningful to millions today and the ancient practice of pilgrimage is as popular as ever. There is no need to be a believer to recognize that holy places, religious architecture, and sacred art are some of the beautiful and interesting sights one will encounter in one's travels. Sacred sites or sacred national sites are considered as special types of landscape areas that have been created, worshipped, and protected by local people for reason related to their cultural beliefs. The terms employed here include sacred groves, holy hills, holy forest, religious forests, fengshui lands, mystic trees, and religious sanctuaries: Sacred sites may contain sacred items or object, such as sacred trees, sculptures or images of gods, religious buildings and instruments Peng, et.al (2003).

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The formation of a sacred site involves these items closely connected with their natural surroundings and worship of these sacred items extended to the habitats that are culturally associated with them. Sacred sites are cultural landscape fragment and an ecosystem type that maintains materials and energy exchanges with the outside environment through natural ecological processes and related cultural practice.Due to interaction between natural and cultural forces, sacred sites have a profound impact on biodiversity conservation (Peng, et.al 2003).

Numerous sacred sites are obviously associated with cultural beliefs. For instance, in the Northwest Yunnan, the cultural context of most holy forests or dragon hills is primarily animist-primitive natural and spiritual worship whereas burial forest, Fengishui lands, and ancestral temples are chiefly connected with ancestor worship (Peng, et. al 2003). He further said considering their natural properties, their composition and size, the sacred sites of Northwest Yunnan could be divided into the following three types

1. Sacred forests: - Primarily comprised natural objects (plants, animals, rocks and hills etc), sacred forests usually range in size from one hundred square meters to one thousand hectares. They include sites formerly named holy hills, holy groves, dragon hills, burial forests and fengshui forests.

2. Temple sacred sites: -A combination of artificial building(s) (tower, halls, scriptures, stone inscription) and associated natural objects (gardens, ponds, and surrounding forests) in Northwest Yunnan. Larger local temple can be categorized as temple sacred sites along with the more commonly known theological temples.

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3. Sacred mountains: - These are mountains of natural-cultural complex of varying sizes, from a few kilometers to over one thousand square kilometer: Sacred Mountains often include more than one temple sacred sites or sacred forest are usually well known as belief-reposing lands, as well as for their natural scenery. Sacred mountains also called religious mountains in China, and over one third of the "famous mountains" in that country belong to this type (Sheng, 1998). The biodiversity conservation value and its importance to sacred sites are apparent in the following aspects:

These sacred sites have kept their pristine nature and natural biodiversity for hundreds of years and they are the heritage endowed for present and future generations as a legacy of the natural tradition, custom, sutras, chronicles history, culture, and science which are passed on from the ancestor, they ratify people's belief in maintaining the equilibrium between ecology and natural protection, and the sacred sites not only to benefit the ecology of a particular country but of the whole world.

Indeed, scientist and researchers have developed various hypotheses to explain the existence of customs and religious-traditions that protect nature and have great importance for biodiversity conservation in the world.Traditional societies are characterized by their close interconnection with culture and natural resources. They depend upon natural resources and biodiversity for their sustainable livelihood concerns (Ramakrishna, 1992; Ramakrishna et al, 1994, 1996). There is worldwide recognition across disciplines that regions of ecological caution exhibit a symbiotic relationship between the biophysical ecosystems and the social system;

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obviously, there is a strong cultural connection between the two. This demonstrates that culture and environments, religious belief and worshipping; are recognized and accepted in this world.

1.2. Statement of Problem

The constant intrusion and uncontrolled entry into the forest ecosystem have resulted in dwindling of the terrestrial and aquatic habitat resources. Adequate improvement of the habitat management strategies ought to be in place to safeguard the situation. The need for regular maintenance of most of our forest protected areas in the country towards sustainable tourism development form the focus of this study couple with the problem of habitat manipulation of the ecological biodiversity due to improper management of the habitat in most World Heritage Site in the country. In a case, where this developmental management are in place there are still problems of improper planning, inadequate research and inappropriate funding for continuous development of these natural/cultural features for tourism potentials.

In 1979, the forest decree no. 77 established the protection of the Osun sacred grove against activities such as illegal hunting, grazing, logging and intruding. It involved a partnership between the Federal Government and State Government. The main objective of the legislation is to guarantee the conservation of the remaining one third of the tropical forest (both tropical moist and dry) of the state. The forest reserve covers 75 ha in the core zone and 47 ha in the buffer zone (Adekunle 2012).

However, conflicts arose between the management of the protected area and the neighbouring communities because of the preservation area solely established through

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enforcement and compulsory expulsion. The social dislocation of the local communities' resident around the site has lead to their low standards of living. The ugly situation has been further compounded by the economic down-turn of the country. The resultant effects of these developments include much poorer standard of living, unemployment and engagement in criminal activities. It is no wondered therefore, that they have shown little or no interest and concern in the development and progress of the site. On the contrary, they seem to exhibit open hostility to the concept of the preservation (Personal communication).

1.3 Justification

As earlier stated, there is a dearth of study and information in respect of Osun –Osogbo world heritage site. It would seem that there is no meaningful management strategy, or even a blue print, for the effective administration of the site. This is not and cannot be, in the interest of sound management. The conflicts observed between the site management and the surrounding communities should be resolved amicably so that the latter may become actively involved in the interest of the site.

There is not enough awareness of the international values and importance of the site by the local people, nor of the benefits that may accrue to them. The main objective and thrust of this study is to focus on the fore-going challenges with a view to surmount them. However, the infrastructures are badly located in some protected ecosystem especially some of the infrastructures are constrcted right at the center areas of the forest ecosystem or in areas where certain species of wild animals concentrated in great number at the protected site, thereby

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diplacing most of these wild animal species from their niches. This in effect will have some tourism implications.

Observing the trend of tourism development in the country (protected areas), it is evidently clear that most of the revenue generated through tourism has been from one aspect of tourism ,which has to do with the international tourism part meaning that proctected forest ecosystem for ecotourism attraction rely mostly on international tourism.

Thus, neglect the domestic tourism as a source of revenue generation, a view factor critically responsible for low revenue generation, in most forest ecosystem and parks serving as tourism enclave.

The inadequate state of development in most of our forest ecosystem for tourism potentials, mostly, in their historical features also worth mentioning here as a justification for proper planning and development of tourism potentials in our protected site.

The class and high cost of accommodation facilities in most of our protected parks need to be reviewed for the attraction of tourists especially if we need to promote domestic tourism in the country since other factors are by now affecting cost of transportation to places especially the hike in price of fuel.

In terms of ecotourism potentials development, our protected areas for promotion of tourism still lack modern means of information broadcasting to the outreach of public attracting visitors to the site. In addition, it is a fact that most of the essential infrastructures required in the

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forest ecosystem are neglect due to lack of funds or finance; an aspect of improper planning and budgeting for upward development of the site.

Thus, from the aforementioned evidence, a project title of this nature in the area of ecotourism potentials need to be seen as paramount in protected area management. To be able stand the test of time and equally to meet up the present trend in conservation efforts required in our forest ecosystem able to realize a lot from the domestic and international tourism in terms of revenue generation.

There is the need to document information on the problems of wildlife conservation and management, and the effect of these problems on tourism potentials; as this will enhance the effective management practice, promotes conservation effort as well as tourism development. With the increase in human population, poverty rate and high level of illiteracy, their influence on the ecosystem need to be address to avert these problems. In addition, man has been the greatest threat to forest ecosystem in every part of the world. As an inhabitant on this earth, man has a legitimate claim to the utilization of nature and her products.

Therefore, there is need to assess the impact of human activities on the ecosystem to stop the progress of some environmental problems that may result in this present site; and future development and management strategies of the ecosystem. This work is important because much research have not been done on the infrastructures in the promotion of the ecotourism development of the site.This study assess the present status and management of the tourism features in the Osun Osogbo World Heritage site. It will also provide baseline information and

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working document for government and stakeholders that are interested in nature-cultural ecotourism development.

1.4 Scope and Limitation

This study is limited by some factors without sacrificing its quality and statistical significance:

This study was set out to provide an overview of the state of management planning, promotion and future development of eco-tourism in Osun Osogbo sacred grove (World Heritage Site) in Nigeria. The selection of the study site was based on its geographical location, ecological biodiversity and its nature-cultural potentials, which make it to be one of the two-world heritage sites in Nigeria.

Osun Osogbo sacred grove in Osun State falls within the dense tropical rain forest grassland in the South Western zone of Nigeria. Because of limited period and resources, this study cannot exhaust everything in respect of the status management and challenges in respect of the site. It should however furnish sufficient data baseline for studies and write-ups. It is therefore hoped that the study would serve as prototype for habitat management and eco-tourism in similar world heritage site.

1.5 Objectives of the study

The main objective of this study is to evaluate the ecological and socio- economic status of the World Heritage Site (Osun Sacred grove) Osun State, Nigeria; with a view to assessing its potentials for eco-tourism.

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The specific objectives include-

1. To assess the present status and management strategies of the tourism features in the site.
2. To examine the level of awareness of respondents (visitors, staff and community) in conservation programme
3. To appraise the effectiveness of the in-situ conservation of biological and cultural diversity of the site.
4. To evaluate the factors that influence stakeholders decision to involve the local communities in the management of the site.
5. To identify the constraints and challenges, which militate against the over-all management of the site

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CHAPTER TWO

LITERATURE REVIEW

2.1.0 Evaluation as a Concept

According to Cooley and Lohens (1976) evaluation was viewed as a process by which relevant data are collected and transformed into information for decision making. The authors further stated that evaluation should be seen as a process rather than a product because it transcends research and extends into decision-making.

Seepersad and Henderson (1972) stated that the following are the reasons why evaluation is necessary:

- To focus on the goals and ascertain whether the objective have been met.
- To find out if the targeted group for which the programme was designed has participated and benefited
- To decide whether the existing programme should continue.
- To redesign the programme if necessary and,
- To decide whether to do replication elsewhere.

This two authors Cooley and Lohens (1976) share the same views. Given the fore-going reasons, evaluation is not an end in itself but an input into further development and effectiveness.

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2.1.1 Concept of Habitat Management

Habitat is a place where an organism lives and carries out it biological activities. Habitat management can be broadly, defined as the management of the place where organism lives or where it can be found (Odum, 1971, Moen, 1973,). It is believe that habitat management will supply food, space and cover needed by every species. The wild animals are in need of certain resources within their habitat for their survival and efficient productivity. These require several ecologists have identified resources differently. Dasman, (1964) identified them as food, water, right soil, good topography.

Krebs, (1978) indicated that good landscape and terrain, feeding and drinking sites, food, other animal species, climatic, chemical and physical factors (such as light, soil structure and nutrients etc.) are required as ecological need of wild animals.

2.1.2 Planning Habitat Management For Eco-Tourism Development.

"To fail to plan is to plan to fail"

This maxim applies to all ventures geared towards success. Hence, the importance of early planning with the consideration of all biological, social, financial and legal aspects of a proposed program on ecosystem cannot be over-emphasized.

The management of ecological-tourism connotes a sizeable area of land in which herds of animals and cultural artifacts with their deities are managed to live in a state, which closely resembles their natural environment. The management practice consists mainly of controlling the sizes of herds (male, breeding females and their young ones) so that the vegetation is not

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subjected to overgrazing or any other form of over –utilization (Wahab, 1995). (Ayodele, 1988) corroborate this view. The management of World Heritage Site (Sacred natural site) for ecotourism development as distinguished from wildlife management is yet to take off fully in Nigeria, although it has been on in a number of South-African countries since a couple of decades ago. There is no doubt that the lots of people of such countries have been considerably bettered in terms of natural-cultural heritage availability.

Nigeria, therefore, has her experience to draw from. Indeed, the recent acceptance of tourism for sustainable development led to the legislation of UNESCO Act.91 of 1992; underscores the necessity and urgency to World Heritage Site development. The objective of this measure is not merely to compliment scarce and expensive heritage artifacts but also to provide a more economical and sustainable alternative source of revenue to the national economy (Personal communication, 2013).

2.1.3 Human Interplay On Habitat Resources Meant For Wildlife.

Much has been said about human interplay activities on wild life management and the habitat utilization in general. This has prompted the researcher to review some papers on Habitat analysis and evaluation. Trefethen (1964) indicated the importance of wildlife management and conservation. He further stated that habitat is the sum total of the environmental factors food, cover and water, that is available in a given area. He also stressed that wild animal has specific habitat requirement, and the possible distribution of its population is limited in any given area by the quality and quantity of the habitat. In view of this, a great destruction has been done to the ecosystem as results of human inter play in the established protected areas and parks and this

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development has denaturalized the habitat. The lopping of *Afzelia africana, Khaya senegalensis* and *Tamarindus indicus* by the cattle Fulani men in the Kainji Lake Natiional Park; Dagida and Kwambana Game Reserves (all three in Nigeria) which provide cover and dry season browse able materials for wildlife, is a major problem which needs an immediate check (Ayeni *et al 1982*).

Martin and Taylor (1983) reported that total protection of Sebungwe region of Zimbabwe involves the provision of buffer zones to reduce conflict between man and animal. Human activities are usually not compatible with the welfare of wildlife populations in their natural habitats.

(Lloyd, et al 1980) reported that human activities such as infrastructural development, industrial waste disposal and use of chemicals on wildlife habitat are problems.

Biswass (1985) stated that for wild animals to survive and or even for them to be rehabilitated, they should be provided with a suitable habitat of their own in which destruction of the ecosystem through mass deforestation is prevented. Caulfield (1985) indicated that the soils sedimentation in water bodies, reduces the volume of water, increases magnitude of floods, increases harsh climatic conditions and generally reduces food supply for wildlife. He further stated that end results of human – interplay on wild animal's habitat has led to the depletion of their numbers and even extinction of some endemic species.

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Dasman, (1964) indicated that habitat management for the benefit of wildlife could mean anything from complete protection of remote areas, to drastic disturbance of vegetation in various ways to create succession stages favored by certain species.

Hornaday (1973) stated that down through history each nation, race or culture has acquired certain values about wildlife: but how these values were formed and what it would take to change them are questions to be answered. Lennie (1977) reported that man's behavior toward wildlife resources is influenced by religion, culture, tradition, politics, economic and the individual's sex, age, occupation and education.

Lennie and Richard, 1977 submitted that on the political scene, that wildlife management is inextricably involved in and influenced by local, state and federal policies, therefore, conservation agencies, administrators and biologist that ignore this fact cannot make workable programs. All the fore-going destructive activities of human beings are going on in full swing at the Osun Osogbo world heritage site to the detriment of the site.

2.1.4 Participation in Protected Forest Management

Participation means opportunity given to par-take, have full access to information on policy issues and development, plans, freedom of association that permits the discussion of issues by all those interested in protected forest matters in which the views of the local forest communities are considered. Local community participation in protected area is a process and not simply the sharing of social and economic benefits (Bhatt, 1998). However, participation of local communities in protected forest management involves the empowerment of local people to

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mobilize their people to make sound decisions, manage their resources and control the activities that may affect their lives. Consequently, the local protected forest community was seen as those communities in a nation who live in and around forest rich areas, who are directly dependent on the forest resources therein and for whom the areas have a cultural or religious significance (Pretty, 1998). In conclusion, based on literature review in earlier section, it is apparent that local community participation is an effective tool in the development and management of a reserve area, to which Osun Osogbo world heritage site is no exemption.

2.2.0. Theory of Eco-Tourism

Lascurian, (1987) indicated that ecotourism, is a sub-set of tourism, deals with travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery of its wild plants and animals, as well as anything of cultural value both past and present found in these areas. He further stated that ecotourism is in ecotourism light of experimental and educational aspects of the protected natural areas. Furthermore, he reported that ecotourism is a multi-dimensional philosophical concept, which is a component of ecological development and requires planning based on strict guidelines and regulations that will enhance its sustainable operation.

Lascurian (1991) stated that ecotourism profile characteristics indicate an awareness and knowledge about the natural environment and cultural aspects, in such a way that will convert him or her into somebody keenly involved in conservation issues. He also drew attention to the main different between a mass tourist and an ecotourism over utilization and attitudes to natural resources.

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The two groups are interested in travelling to the natural areas but the mass tourist has a more passive role with nature participating in activities that do not relate to the true concern of nature or ecology such as water sports and biking; while the eco-tourism is more attracted to natural environment; and plays an active role through non-consumptive use of wildlife. The eco-tourist exhibited on natural resource activities such as botanical studies, bird sight, nature photography and observing wildlife at spot.

Figgis (1993) reported that activities carried out by eco-tourist can only occur in well-preserved or protected areas to promote conservation, but with low negative impact by visitors, and does not ignore the indigenous people inhabited in such natural settings.

(Boo, 1991) stated that eco-tourism is a nature tourism that contributes to conservation by generating funds for protected/preserved areas, creating employment opportunities for the local communities, and offering environmental conservation education and improving their living standard. He further indicated that ecotourism not only encompasses the natural and conservation components but also, the economic and educational elements.

He reiterated that eco-tourism has its benefits, and requires effective strategies such that conservation of resources could be address for sustainable management. However, eco-tourists are generally more receptive to conditions that are different from their homes from other types of tourists. The developmental benefits of ecotourism in conserved natural ecosystems and developing an ecosystem for wildlife-based industry in some cases outweigh it social and environmental cost. However, it is important to ensure that planned efforts geared towards

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development and management of the influx capacity of tourists while ensuring sustainable tourism development. In doing this the socio-cultural and economic needs of the local communities dwelling in the protected area, need to be considered.

2.2.1 Tourism and National Development

Tourism is a remarkable, economic and social phenomenon of the twentieth century and can be defined as the sum total of the phenomenon and relationship arising from the travel and stay of non –residents in so far as they do not lead to permanent residence and are not associated with any earning activity (Amubode, 1992).

2.2.2 Classification of Tourism

Tourism has been classified into 5 categories by Smith, (1977) and Ayodele *et al* (1999). These are;

1. Ethnic tourism
2. Cultural tourism
3. Historical tourism
4. Environmental tourism (Ecotourism)
5. Recreational tourism

Marguba (2001) on his own, classified tourism broadly into three, these are:

1. Cultural

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2. Religious tourism

3. Ecotourism (Ecological tourism)

In 1994, the United Nations classified three forms of tourism in its recommendations on tourism statistics as follows:

1. Domestic tourism, involving residents of a given country travelling only within the country they reside.

2. Inbound tourism, involving non residents travelling into the given country.

3. Outbound tourism involving resident travelling into another country i.e. moving out of one's country for the purpose of tourism.

2.2.3 Classification of Tourists

Lascurian (1996) classified tourists into 4 categories as follows:

i. Hard core tourists: These tourists are scientific researchers or members of tours specially designed for education.

ii. Dedicated tourists: These tourists specifically take trips for visiting protected areas, study and understand local and natural heritage of the area.

iii. Mainstream tourists: These tourists that travel to destinations primarily to take an unusual trip. For example, visit to destinations such as the Rwanda Gorilla Park, Yankari Game reserve, U.I. Zoological garden, etc.

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iv. Casual tourists: These tourists partake in nature trips accidentally as part of the general trip.

2.2.4 Potentials and Tourism Development in Nigeria

The concept of tourism development in Nigeria could be traced back to 1962 when the Nigerian Tourism Association was established. When the country was fully admitted as a member of the International Union Official Travel Organization (IUOTO) it was renamed as World Tourism Organization (WTO) in 1964. Decree 54 of 1976 established the Nigerian Tourism Board, charged with the superintendence of the Nigerian Tourism Association. Decree 81 was promulgated in 1992 for the establishment of the Nigerian Tourism Development Corporation (NTDC) as the apex agency of the Federal Government, charged with general co-ordination, marketing and promotion of tourism responsibilities in the country. The Corporation was made a federal board of parastatal under the main Ministry of Tourism and Culture that oversees its prompt operations and functions.

There are about 30,000 protected areas around the World and this fact has been noted as an achievement of the twentieth century and a great legacy for the twenty-first century. These areas covers' about 12.8 million sq.km representing almost 9.5 percent of the planets, land area and astonishingly, to some extent lager than China and India combined (WCPA, 2000). The term Protected area today encompasses more recent approach to sustainable use of reserves and wildlife areas. International union for the conservation of nature and natural resources (IUCN, 1993) defines a protected area as an area of land/sea especially dedicated to the protection of

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biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

Nigeria is well blessed with an abundance of tourist attractions, which include natural, artificial, cultural features as well as historical heritage sites. All these game reserves, national parks and world heritage sites cutting across natural ecological zones, in the country are bound to benefit significantly from these attractions with proper administration and development (Bello, 2002).

The endowment of Nigeria with material and natural resources will provide much needed revenue and foreign exchange if well- harnessed. Over dependence of successive governments on the sales of crude petroleum that sustain the nation's economy has caused the total neglect of other revenue generating sectors such as Agriculture which had contributed to the bulk of the country's main export trade in the past. (Onyeanusi and Bello, 1998).

This essential area of the economy that has suffered serious neglect by past administrations in Nigeria to date, which acclaimed the world over as one of the largest foreign exchange earners. The same tourism has sustained the economy of East African Countries like Kenya and Tanzania tremendously (Ibeun, et.al 1989).

The over- whelming number of game reserves, national parks and world heritage sites in the country are instrumental to the conservation of Biodiversity. Nigeria is bound to benefit immensely in the area of nature-cultural tourism if these potentials are fully developed. There are annually influx of tourist to conservation areas for relaxation and recreation; thus, wildlife

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industry is expanding everyday and this depends mostly on foreign and national patronage. The resultant congestion, traffic and pollution in the conservation areas are thereby increasing without adequate evaluation of their effect on the ecosystem.

Salami (1998) stated that the effect of such inflow of people and their consequent activities on the ecosystem would have an implication for tourism and very likely lead to some problems in the development of tourism in such areas. Bello, 1997 stated that there is need for constant ecological monitoring in the rolling plan of such protected areas where tourism is an annual event.

2.2.5 Tourism Potentials and Development in Osun State

In 2003, Osun state Government established Osun state tourism board whose cardinal is towards developing tourism sites within the state. The board was then under the supervision of the main Ministry of Information, Commerce and Industry but presently under the Ministry of Tourism and Culture. The Ministry is also responsible for sustainable development of tourist attractions, accommodation facilities, service delivery, transportation and other related infrastructures. The development and institutional structure necessary for the regulation of individuals and commercial concerns were put- up in the state (Personal Communication).

The ministry has put in place the following policies:

1. The policy frame work that will engage and encourage local community's participation as stake holders in the development of sustainable tourism in the state, and

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2. The policy shall be required to stabilized the system in a short term, the medium term could involve re-engineering the group providing training and capacity building while the long term will encourage more on sustainability of the accrued success achieved.

The tourism circuit is to enhance the varied tourist attraction sites that are in existence, within the state, designed to cover nomenclature of tourism attraction sites for maximum value of tourists during their visit to the state.

2.2.6 Culture and Tourism Policy in Osun State

The people of Osun state, from time immemorial has been in the forefront of promoting the rich cultural heritage of the black race. The people known as Yorubas inhabit Osun State. They constitutes about 140m people of the world's total population and are found in the South-Western states of Lagos, Ogun, Osun, Ekiti, Oyo and Ondo States. Parts of Kwara, Kogi, Delta, and Edo States also have large concentration of the Yoruba race. They are also found in diaspora and occupy Trinidad and Tobago, Cuba, Argentina, Brazil, Papua New Guinea, Haiti, South America, Barbados, Jamaica, Mexico, Puerto Rico and Uruguay in addition to West African countries like Togo, Republic of Benin, Cote d'Ivore and Ghana. More importantly, Yorubas all over the world recognize and acknowledge Ile-Ife in Osun state as their cradle and foremost repository of their custom and traditions (Adekunle, 2012).

Essentially, to further promote and publicize it's cultural and tourism potentials it has put in place a policy whose major objectives are:

i. Promotion of tourism, arts and culture,

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ii. Tour promotions meant to support and promote staging of international conferences and seminar on culture and tourism. This is to enable the international community especially lovers of cultures, arts and crafts including monuments to acquaint themselves with the rich cultural heritage of the black race in the state. The basic aims and objectives of the conferences and seminars are:

a. To draw the attention of the world to the rich cultural heritage of the Yoruba, one of the prominent nationalities in Nigeria that harbours some ancient settlements, arts and craft,

b. To draw the attention of the Yorubas in the Diasporas, and all black people in the whole world to her rich cultural heritage,

c. To attract investments into the state by show casing the state huge potentials in tourism and culture to the world,

d. To promote arts, crafts and culture of Osun state in particular and Yoruba land in general,

e. To promote research, culture and inter religious dialogue,

f. Development of Tourist attractions.

2.2.7 Tourist Attraction Sites in Osun State

There are many attraction sites in the state but prominent among them are the following:-

Olumirin water falls in Erin Ijesha,

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Osun Osogbo Sacred shrine and grove in Osogbo,

The palaces of prominent rulers such as Ooni of Ife, Owa Obokun of Ijeshaland, Orangun of Ila, Ataoja of Osogbo; and Owa Ajibogun

Oduduwa shrine and grove in Ile –Ife,

Oranmiyan staff in Ile-Ife,

Ibodi Forest Reserve in Atakumosa,

Statue of Timi of Ede at Ede,

Sussan Wedger attraction site in Osogbo,

Kirigi war site in Imesi-Ile,

Ogun shrine in Ipole-Ife,

Mysterous Tree (Igi nla) in Iwara via Iwo,

Oke-Maria spiritual site in Otanayegbaju,

Ogiyan shrine in Ejigbo,

Ayekunnugba water falls in Oke-Ila,

Atamora cave and bird watching centre in Ikire,

Cultural features such as Egungun festival in Iwo,

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Osun Osogbo festival in Osogbo,

Olojo festival in Ile-Ife,

Iwude-OgunOwa in Ijesha land,

All these add more beauty to the natural-cultural endowments of the state.

2.3.0 Sacred Groves

As defined by the Oxford Advanced Learners' Dictionary, a grove is a group of trees. Groves, especially those that are relatively natural, probably becomes sacred when they earmarked and conserved by the local communities primarily for religious or cultural reasons. Sacred groves are tracts of virgin forests with rich diversity which have been protected by the local people for centuries for their cultural and religious beliefs, and taboos that the deities reside in them and protect the villagers from different calamities (Khan *et al.*, 2003).

Usually, sacred groves are special sites or areas that have one or more attributes which distinguish them as somehow extraordinary either in a religious or spiritual sense. A sacred place often encompasses several individual sites or attractions and phenomena such as waterfalls, springs, caves, mountains, artworks, and others as its integral parts of the whole.

A river, legend or stories, histories of individuals or groups may also connect it. Although, sacred groves are declining rapidly due to modernization, urbanization, population increase, development (through science and technology) and religious beliefs, its significance in the area of bio-diversity conservation cannot be over-emphasized as they serve as community

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based monuments of rare, endangered, threatened and endemic species of fauna and flora of high medicinal value. Indeed, the sacredness, religious beliefs and taboos associated with the groves play significant role in promoting sustainable utilization and conservation of the natural resources found within the sacred areas through community participation.

A well-developed sacred grove can also serve as tourist attraction site and therefore be of immense benefit to the people through foreign exchange earnings, generation of employment, cultural exchange and social interaction between the tourists and the local people (Khan *et al.*, 2003).

To ensure adequate protection of sacred places, certain rules are often established to deter people from indiscriminate use of the places and the resources therein. Chiefly among them are restriction of access into the groves, prohibition of logging and killing of animals with the belief that the presiding deities would administer punishment and even death to those who fail to comply. Violators are made to pay several cows or goats, which will be sacrificed to appease the deity that reside in the grove (Dorm-Adzobu et al., 1991).

2.3.1 Osun Osogbo Sacred Grove

Osun Osogbo sacred grove is a dense forest site that is located in the outskirts of Osogbo, the capital city of Osun state. It is possibly one of the last remnants of primary high forest in Southern Nigeria. It is on latitude N $7.45^{0}20$' and longitude E $4.33^{0}7.992$' covering an area of about 75 hectares of land. It shares boundaries with Laro and Timehin Grammar School in the

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North, the entrance of Ladoke Akintola University of Technology in the South and runs parallel to form the Western boundary and Osun state Agricultural farm settlement in the East (Figure 1).

The grove is regard as the abode of the goddess of fertility, Osun who was one of the pantheons of Yoruba gods. Its landscape and the associated river are dotted with sanctuaries, shrines, sculptures and artworks in honour of Osun and other deities. The grove is seen and regard as a symbol of identity for the Yoruba nation and probably the last of its kind in Yoruba culture. The grove is now on the World Tourist map as the United Nations Educational Scientific and Cultural Organization (UNESCO) as a world heritage site inscribed it in 2005 in recognition of its global importance and cultural value. The justification of its inscription includes the following criteria.

Criterion 1: The development of the movement of New Sacred Artists and the absorption of Suzanne Wenger, an Austrian artist into the Yoruba community have proved to be a fertile exchange of ideals that revived the sacred Osun Grove.

Criterion 2: The Osun Sacred Grove is the largest and perhaps the only remaining example of a once widespread phenomenon that used to characterize every Yoruba settlement. It now represents Yoruba sacred groves and their reflection of Yoruba cosmology.

Criterion 3: The Osun grove is a tangible expression of Yoruba divinatory and cosmological systems. Its annual festival is a living, thriving and evolving response of Yoruba beliefs in the bond between people, their ruler and the Osun goddess.

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The grove has a mature and reasonably undisturbed forest canopy that support a rich and diverse species of flora and fauna including the endangered white throated monkey. The Osun River meanders through the whole grove with worship points situated along its length.

The broad river is overhung with the forest trees within the grove. It is believe that the earliest settlement seems to have been in the grove as it includes structures of the old two palaces and a market. However, due to population increase the community moved outside the grove to create a new town, which reflected spatially the arrangement within the grove.

2.3.2 Osun Osogbo Festival

Osun Osogbo festival comes up annually to celebrate Osun goddess, which is been acclaimed by tradition as the goddess of fertility protection and blessing. Osun is renowned for her ability to give children (through birth) to barren women and power to heal the sick and the afflicted by means of her medicinal water from the river.

The festival is a twelve days event usually held between the end of July and August. It invokes the spirits of Osogbo ancestral kings and rededicates the present of Oba to Osun as well as re-affirming and renewing the bond between deities represented in the sacred grove and the people of Osogbo. The twelfth day of the festival is led by the votary maid (Arugba) and presided by paramount ruler of the town and the priests in the midst of the whole population. The votary maid who must be a virgin from royal clans carries the calabash from the palace (Osun temple) down to the shrine located within the grove. The Osun devotees to ensure she does not stumble as she moves so that her fate and that of the community are not

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exposing to hazards guard her on every side. The celebration is noticeable with dancing, drumming and singing from different associations that presence. The festival pulls multitude of people from all walks of life both blacks and whites especially the Yoruba's both at home and in diaspora turn out impressively to grace the event.

This annual worship at the Osun Shrine near the Osun river of Osogbo has become an important tourist attraction that draw people from various parts of Nigeria and country far beyond to the annual festival in August (Wikipedia,2010).

2.4.1 Osun grove, its Conservation and Tourism

Osun Osogbo grove is today one of the UNESCO's World heritage sites and as such got registered on the world tourist map. The grove undoubtedly has great potential for both ecological and cultural tourism. The ecological aspect comprises of the flora, most of which are endemic with high medicinal value and fauna such as white throated monkey, which is an endangered species while the cultural aspect of tourism includes the annual festival and various artworks, sculptures of legends and deities, valuable antiquities, and ancient architectural designs that abound within the grove. The grove looks natural, cool and therefore ideal for sightseeing, nature walk, spiritual well-being, meditation, and recreation (Adekunle, 2012).

Sacred groves also known as sacred natural sites are part of the cultural and natural heritage of a specific group of people. At the interface of culture and nature, groves can provide important opportunities for ecotourism development assisting visitors to experience new cultures and learn

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more about nature. If practice and managed well, ecotourism linked to sacred sites can benefit the local people directly, particularly if they are seen as full partners in the development of conservation and ecotourism policies (Adekunle, 2012).

The grove must be adequately protect, conserved to optiomize its benefit of tourism to the people, and ensure sustainability. The traditional ways of conservation that were put in place to regulate utilization of the natural resources within the grove must be intensified and complemented with the modern ways of checkmating the various human activities that can undermine sustainable utilization of these natural resources. It is worth mentioning that a very large number of people from far and near assemble in Osogbo to grace a festival that can be best describe as "crowd pulling event". Therefore, the potential's are obvious and indeed the Osun Osogbo festival must be develop to international standards to realize the full ecotourism potential of this important site of attraction (Personal communication 2013).

2.4.2 Concept of Ecotourism

Ecotourism, otherwise known as ecological tourism is environmentally dependent. It is sometimes refers to as environmental or wildlife based tourism. Wildlife based tourism is a type of tourism that involves traveling to relatively undisrupted natural areas with the objective of admiring, studying and enjoying the scenery and its wild plants and animals as well as any cultural features found there (Boo, 1991). According to Lascurian (1992), ecotourism could be defined as traveling to and fro, visiting natural places that are relatively undisturbed with an express objectives of seeing, studying and admiring the features of the landscape, flora and

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fauna, as well as any cultural aspect both the present and the past, that may be found in such places.

Falade (1994) opined that ecotourism is primarily ecological and geographical in nature and includes such destinations as National Parks, game reserves, waterfalls, beautiful out crops of rock in strategic places, warm springs and zoological gardens. In addition to trying to make it small scale, wildlife based tourism must strive to minimally impact negatively on the environment because of efficient management. It helps to educate the tourist, provides funds for conservation, directly benefits the economic development and politically empowers the local communities. It also fosters mutual respect for different cultures and human rights. One of the primary objectives of conservation in our National Parks and game reserves is game viewing to highlight the biodiversity of animals and their natural habitats through ecotourism.

The threatened endangered species of fauna are preserved \and protected for this purpose. Other tourism related activities also include mountain climbing, sightseeing to appreciate the beautiful flora and landscape, sporting activities like fishing, sailing, wilderness experience and hiking. There is a growing interest in 'nature tourism', which is based on the development of natural areas and observation of nature rather than visiting cities (Lucas 1987 as cited by Ayodele 2002). Indeed visiting natural places is friendlier, livelier, healthier and devoid of pollution, hustling, and bustling of the cities. With this popularity of nature based tourism African countries like Kenya, Senegal, Morocco, Botswana and Tanzania are reaping substantially from international tourism Nigeria, now cannot continue to depend on her oil proceeds that is not enough to finance its developmental plans. She must necessarily diversify

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her economy by developing her tourism potentials and join other tourism-developed nations of the world to have her own fair share of the international tourism receipts.

2.4.3 Tourism Potentials in Nigeria

The tourism potentials in Nigeria include the following areas:- Camping and picnicking, visit to the recreation site, game viewing, sport fishing, visit amusement parks, Botanical garden, Zoological garden, Museum/zoos, National parks. Also, viewing of the architectural structure of the relics of walls and shrines in the forest/sanctuaries, visit Masquerades site, visit to the sacred water of Osun Osogbo festival and a host of others (Bello, 2012).

All the tourism potentials aforementioned are indication that Nigeria is endowed with natural resources which can attatract both local and international tourists. Through this, substancial financial resources can be generated to improve the country gross domestic product while seeking the conservation expertise for better implementation of conservation police.

2.4.4 Economic Benefit of Tourism

At the local and international level, tourism is being seen as an impetus to sustained growth and development and no longer as a generator of foreign exchange (Kareem, 2009). Tourism development is essential for the growth and development of many economies of the world especially the developing nations. This is primarily because of large proceeds realized in form of foreign exchange earnings and employment opportunities generated for the teeming population of citizens in the service industries associated with tourism. The service industries include transportation service such as airlines, cruise ships and taxicabs; hospitality services by

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hotels and resorts providing accommodation and cuisines, entertainment venues such as amusement parks and casinos, shopping malls, music venues and nightclubs. The growth of tourism has been sustained at 7-12% per year in most developing countries in the last five years (ODI, 2007).

According to WTO (2006), tourism's contribution to economic growth and development could be seen from its exports and this represent over 40% of all services exports, which puts it as the highest category of global trade. The 2005 world tourism organization's estimates puts tourism to have accounted for 3% to 10% of the GDP in the developing world. It is therefore not surprising to know that tourism has become a viable export oriented economic growth strategy for the creation of employment and reduction of abject poverty.

Tourism has become a popular global leisure activity. According to WTO (2011), there were over 940 million international tourist arrivals in 2010 with a growth of 6.6% when compared with what obtained in 2009. International tourism receipts grew to US$919 billion in 2010, corresponding to an increase in real terms of 4.7%. The huge revenue from international tourism has made available to those countries with impressive tourists arrival, the much-needed funds to tackle the incidences of budget deficit, negative balance of payment, infrastructural decay and improve their efforts on conservation of biodiversity. It can therefore state that tourism investment is an essential tool needed for development and poverty reduction. This is a challenge particularly to Nigeria that still has a lot to do in the area of tourism development for it to reap reasonably well from tourism. Tourism development is capable of reducing poverty in the land as reported by Ayodele (2002), unlike other industrial projects, which benefit the investors;

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tourism has the capacity to trickle down the benefit to a larger section of the grassroots population who can profitably share in the proceeds of this industry.

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2.4.5 Socio-Cultural Benefits of Tourism

Socio-culturally, tourism has a great influence on both the host community and their visitors. It can be a source of global amity, peace and understanding. The followings are some of the positive impacts the industry has on the social and cultural dispositions of the local people. Social contacts between tourists and the local people often result in mutual appreciation, understanding, tolerance, respect etc. Residents are educated about the outside world without leaving their home while visitors significantly learn about relatively new and distinctive culture.

Local communities benefit through contribution by tourism to the improvement of the social infrastructures like schools, libraries, health care centre's, internet cafes, etc. This enhances the social status of the people. If local cultures are the basis for attracting tourist to the region, it helps to preserve the local traditions, art works and handicrafts, which may be on their brink of extinction. A growing interest in the local culture by tourist makes the local people proud of their ways of life.

However, it must be stated that tourism and recreation should be so planned and managed that the environment qualities on which they depend are not significantly damaged so as to give room for continued wildlife tourism. (Mason, 1990) as cited by Ayodele, 2002).

2.4.6 Tourism Potentials in Osun Osogbo World Heritage Site

Tourism potentials in Osun Osogbo World heritage site include the following: - picnicking, visit to Historical site such as Ojubo religious worship centers, visit to the 1st and 2nd palaces, viewing of the architectural structure of the Old market, visit to Iyamopo Courtyard,

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Epa Bush Lakokan, Igbo-Oya, Ayedakun, Olomoyoyo, Suspended Bridge known as Gada Amititi. Also included among these potentials are the celebration of the Osun festival, game viewing of the fauna species in the heritage and appreciation of the medicinal plants in the Osun sacred grove.

All these tourism potentials mentioned above are indications that world heritage sites are well blessed with enough natural – cultural resources that attract both local and international tourists. Substantial financial resources generated used to improve the development of the existing infrastructural facilities and seeking the services of conservation experts through which conservation policies implemented (Personal communication 2013).

2.4.7 Biodiversity and Tourism Management

The recognition of diversity in the world ecotourism potential promise a bright future for any country that realizes its importance, which range from the aesthetic and cultural values to the recreational and economic contributions. This importance has not been generally appreciated in the West Africa sub-region when compared to the East Africa sub- region.

Nchor and Ibeun (1989) indicated that ecological tourism earn Botswana 32.5 million dollars in 1988 making the country tourism industries to be third largest foreign exchange earner after diamond and Beef. In Kenya, Safari center tourism is the second most important source of foreign exchange earner after coffee. One interesting fact about ecological based tourism is that it can relate to other sources towards generating revenue; with the added advantage that it

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replenishes itself if well managed. Most of the world's developed countries, which invested in tourism as far back as the early 1950's, have cause to smile today.

According to the data presented by World Tourism Organization (WTO) in the compendium of Tourism Statistics (10th edition) 1994 in Kenya, Wildlife based tourism contribute about 35-38 percent and 4.6 percent of total export and Gross National Production respectively (Ayodele and Falade 1991).

Nigeria and a few other lucky nations blessed with petroleum, which is remaining has the backbone of their economy. The worst of the oil exploitation and pollution is that it is detrimental to the animals, renders many homeless and destroys their livelihood. Hence, crude petroleum has turned to be a mixture of blessing and curse. Besides petroleum, wildlife based tourism is one sure avenue to economic development without destroying lives and beautiful landscapes. The end value of economic potentials in tourism is the amount of foreign exchange earn in countries such as Kenya, Uganda and Botswana.

Nature – Cultural sites for biodiversity protection that serve as tourism attraction are National Parks, World heritage sites, Game and Forest reserves, Sanctuaries and Strict Nature reserves. These conserved sites cut across various geological and ecological regions, thus provides tourists with diversity of attraction. Nigeria has 38 conservation areas whose selection and establishment directed toward attaining United Nations conditions for selection of conservation areas. This includes the two (2) enlisted World Heritage site for attractions. The foundation for setting aside the reserves was laid as far back as 1913 when Lord Lugard in his

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political memorandum gave the following reasons for conservation (i) Amelioration of climate (ii) Conservation of dwindling stock of wildlife both plant and animals (iii) preservation of opportunity for visual quality and aesthetics of the land and (iv) provision of opportunity for recreation (Alarape, 1995).

A great natural resource is soil. It is the combination of mineral and organic matters, arranged structurally in layers, and capable of supporting animal and plant life. These components resources are highly variable in nature. The variation involves their layering structure, colour, range of the particle sizes, nutrients, acidity, temperature, water contents, thickness, chemistry, organic contents and its associated part.

These properties differ in their parent material, climate, topography, organic content, and the amount of time it has to develop. The changes in one or more of those variables may drastically alter the soil properties, which change its nature and ability to support the particular plant species. Human activities for example trampling always exert negative effect on the soil surface. The herdsmen and their cattle also exert a major effect on the land surface.

This activities of cattle by the Fulani herdsmen lead to trampling and compaction of the soil, reduce its capacity to water retention and alter its structure, optimally causes soil erosion by wind and water. The Osun Osogbo World Heritage Site is not exempted in this ugly situation.

2.4.8 Human Impact on the World Ecosystem

The main problem associated with wildlife conservation in protected forest in the world is not animal's management but management of human pressure on the wild resources. A

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reconnaissance survey conducted in 1984 by the Indian Institute of Public Administration (IIPA) reported that majority of the country's protected Areas harbored indigenous human population and or adjacent human settlements. Indeed, many of the Protected Areas examine had the existence of right and leases for wildlife resources. A reasonable number of Protected Areas indicated encroachment and illegal occupation. Almost, 34 (14.6 numbers) percent of the 43 National parks and 17 (29.9 numbers) percent out of the 176 sanctuaries survey experience confrontation between the local people and park authorities (Kotharri et al; 1989 cited by Bello,2002)

The Fulani herdsmen are found in the protected sanctuaries or reserves in most eco-system. They are there illegally to carry out their unlawful grazing activities. This particular happening is conspicuous in highland regions that support the combine abundance of rainfall, good pasture and remain free from the treat of tsetse fly. Important examples of such regions include the Western Lake shore of Kainji Lake National Park (Doro-Malale), the Western Lake shore of Old Oyo National Park (Ibuya and Confluence in Marguba and Tede Range) and the Mambilla plateau of Gashaka-Gumti National Park (Gam-Gam Range) in which the grazing of cattle increases drastically during the rainy season. Such grazing activities were observed at the buffer zone area of the Osun Osogbo World Heritage Site (Field survey, 2011).

For effective management of the protected areas, a burning regime is always sermonized in order to prevent fire outbreak to the surrounding buffer zone in the communities. This controlled burning is termed prescribed burning regime in park management. This is in contrast with the setting of illegal fire on the ecosystem by Bororo and Fulani herdsmen who do so earlier than the

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schedule time of park management burning. This illegal burning of the conserved ecosystem by the herdsmen leads to wild fire outbreak, which devastates a large portion of the ecosystem in the months of December and January of every year primarily for grass production of their cattle depending on the geographical location. This is disastrous to the Park ecosystem, as results of wild fire outbreak, which devastates large portion of the park vegetation between February and April every year. Prescribed burning is deliberately used to clear land, to improve the quality of the soil in acidic regions by adding fresh organic matters or aid to reduce widespread fires (Wahab, et. al 2014).

The desire of human beings to live near the coast has aided degradation of aquatic life. Today, human populations occupy about two-thirds of the ocean and sea edges. Such populations have dried the wetlands and other coastal areas in order to gain land for their urban development. Most water bodies now severely polluted due to discharged of waste materials into them. This, no doubt, is a bad act for good water quality. The coastal life forms are particularly sensitive to contamination, because they have become dumpsites for pesticides, heavy metals and other pollutants, which later accumulate to high levels.

The most serious human impact that threatens aquatic life is fishing activity, as limitation to fishing activities is not known by the people, hence, over fishing has been a problem in oceans as well as in the inland waters. People have converted wetlands and swamps to farm lands, used them for mining, forestry, oil and gas extraction and highways which are leading to disappearance of aquatic environments (Bello, 2002).

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2.4.9 Natural Resources and Sustainable Development

Management of natural resources involves the preservation/conservation of renewable and non-renewable resources targeted at the prevention of pollution and environmental degradation. Natural resources found both in urban and sub-urban areas, which their management requires environmental issues, in which its sustainability extends beyond the main boundaries. Sustainable development is the management that meets the needs of the present without compromising the ability of future generation to meet its own needs (WCED, 1987). Conservation has been wrongly used as management conceived to be the non-use of resources, but need to be emphasize in two folds (1) As interaction between man and environment that would continue to produce changes, while (2) conservation disagree to resources being static. The importance of conservation value that maintain changes should not be detrimental and or such changes need not be bad; since man has acquire the knowledge and experience the power of science and technology towards combating further destruction to the environment. This is by redressing the imbalances that arises due to environmental issues. In respect to conservation, Agenda 21 and the World conservation strategy elicits the following objectives as:

- ❖ maintenance of essential processes and life-support system,
- ❖ preservation of genetic diversity,
- ❖ ensuring the sustainable use of species and ecosystems,
- ❖ provision for the recreational, aesthetic and other non-material needs of human beings,
- ❖ Participation of key stakeholders in conservation and sustainable management activities.

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Above all, much emphasis geared towards sustainability development in which conservation is the baseline. This concept of sustainable development implies balancing environmental protection with the generation to increase opportunities for employment and improved livelihood (World Bank, 1994).

2.5.0 Effect of Population on Environment

The environment is regard as the surrounding or places where organisms live. They may depend mostly on the natural resources of their environment for its sustenance in order to meet basic needs such as water, food, shelter, air, and clothing. This process of sustainable development with environment calls for environmental impact assessment on conservation of the resources by sound auditing (Bello, 2002).

Environmental problems are manifestation of disharmony between human activities and environment because when population of human was small and his technological ability was hindered his activities inflicted little damage on the environment, such damages were repaired due to regenerative power of nature. As human population increases with concentration in the urban cities, technological capacities enhance the cost of their well-being and survival.

Environmental problem of various forms with its intensities emerged to threaten the well-being of man and his natural environment, which serves as life support system. Later, it was realized by man that development could not be sustained unless the environment is well protected and managed for sustenance. However, there are ecological limits to economic growth

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for sustainable development; protection management of the environment is a major task that must be tackled by man (Bello, 2002).

2.5.1 Global Warming

There is much to discuss about global warming though it is known that the forest and oceans serve as sink for carbon dioxide. This reduces the rate of (CO_2) concentration within the atmosphere. Conversely, deforestation retards the effect of the forest as sink because scientists believe that global warming will result to major climatic changes. These changes are expected to cause thermal expansion on the oceans, melting of glacier at the Polar Regions and thus raising sea level of the ocean. The resultant effect of this global warming expected to involve changes in food chains, general disruptions to the agricultural production and flooding of the low coastal regions of the World (Bello, 2012).

The impact of climate change on the people of the World can be measured in many ways: physical damage, territorial losses, poverty indices, infrastructural damages, health indices, loss or dwindling resources, etc. Furthermore, adaptive and palliative measures can be used to ameliorate the consequences of climate change through cost driven; in which the cost impact of climate change need to be addressed customarily. (Woodwell, 1978 cited by Jibunol, 2010) stated that fluctuations in aridity are due, at least in part of development of the North Atlantic deep Water (NADW), which an important control on precipitation in North Africa which Scientists have to research more on human activities effect on global climate. To maximize the potentials of human activity on the World climate effect, there is need to investigate the cause and its courses on the earth structure. (Street, Parrot and Parrot, 1990)

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2.5.2 Infrastructural Changes

The growth in tourism establishes the need for improved infrastructure towards developing economy. Transport system require a degree of modernization: water supplies and sanitation system, access roads, airports and rail lines, telephoning system and some other public utilities services are required for extension. In economic sense, many of these services are indivisible because if the Government made the provision to tourists, they are at same time making it available to local resident. Improved roads network benefits the farmers in their areas, while airstrips constructed primarily to promote tourism may open up the economic activities of the remote regions.

The resultant effects of the monetary benefits develop from tourist spending split over to various sectors of the national economy which aacrued to the coffers of government itself. The government accrues tax excise revenue directly from tourist expenditures and indirectly from taxes of the higher incomes profits of local residents and tourism establishments. These government funds can be use to finance further infrastructural development. As part of management towards attracting tourists to the protected areas for ecotourism development, tourists are expected to view from their safari trips, all attraction sites that are of historical, cultural, and natural values in the environmentl (Sadler, et. al 1974cited by Bello, 2002).

A tourist visiting new environment expects to observe clean attractive accommodation that is safe from wild animal large or small. Good services, good foods with local dishes, and the desire for wildlife species on the menu have been voiced. The beautiful viewing from the lodge

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demanded with the ability to purchase curiosity expected in the World Heritage Sites (Bello, 2002).

2.5.3 World Heritage Site/National Parks

Reception to the World heritage site/National parks must be warmly efficient. Maps and Handbills must either be available at the point of entry or in terms of inform source-out promo to the Sites before the visitation (Personal communication, 2011).

Natural and cultural heritage (tangible and intangible features), artistic features, sculptures and wild animals must be naturally seen with other notable species of interest, especially big games such as lion, elephant and antelopes are essential for satisfaction of the curious feelings of the protected site and photographic images of the heritage features of attraction is made by the tourist (Personal communication, 2011).

Good road maintenance for tourist comfort during viewing of the features and other attractions in form of transport should be ascertained, to provide easy photographic images of the wildlife species at the site. Other forms of transport system need to be effective and maintained for better efficiency while in operation (Personal communication, 2013).

Tourists are always inquisitive to observe good examples of the local culture with their demand because of various requirements of specialist, a tourist may be keen in bird watching, artistic sculptures, relics of ancestral features, and more importantly interested in viewing the fauna species and many places of scientific/ historical values.

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Tourist's arrivals in National Parks are under the aids of tour operators with efficient reception expectation, safe movement and minimum restriction for their client within the area controlling of the National Parks (Wheater, 1974).

2.5.4 Features of Attraction for Tourist in World Heritage Site

It is deem necessary to delve into the historical /cultural background of such sites. The attraction sites are special areas of interest, which connotes the heritage importance of a sacred or holy place within the sphere of its scientific and cultural values. However, the ingredients from each country determined its own blend for its own purpose. In principle, tourists are in Africa to view the scenario of the wilderness, photograph certain species of wild animals during safari in national parks, interested in excavation of old pot shells, viewing and photographing the nature-cultural features in the World heritage sites.

The tourists are interested in observing local people, in what kind of houses do they live in, how they dress to their market, how they mingle with each other on the streets of their villages or cities. They prefer purchasing souvenirs made with local materials especially handcrafts items such as sculptures that symbolize the role models of the Africa statue of a sacred sites or artifacts. These, mass-produced souvenirs flooded the market not only in Africa but also in various shops of Edinburgh in few years ago (Riney, 1974 cited by Bello, 2002).

In addition, tourists are to view some major features of geographical values such as plateaus, the Nile river, mountains, and falls. Each of these major features attracts tourists from all over the World (Riney, 1974).

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2.5.5 Historical/Cultural Features

It is worth mentioning that man-made relics are an important stimulus to tourist travel; so it is in North Africa before mass movement begins. The chief attractive power sites of historical values are the Mediterranean coast and the Nile valley, while Coptic inheritance of Ethiopia and Zimbabwe are sites of recent synthetic structures (e.g Aswan, Kariba, Niger and Volta dams). These are future appealing areas representing where fishing and water sports are possible. The various landscapes in these countries make them to be an attraction site for tourist. Hundred miles of tropical beaches of white sands in lagoon and the palm-fringed Atlantic Oceans un-interrupted by vast river deltas were attractions features (Coppock and Mcmaster, 1974).

The rain forest with varied foliage in the south, the rising hills and Savanna vegetation in the central zone, the rolling plains and Sahara desert in the North extend into the republic of Zimbabwe and constitute the smooth changing series of the landscapes.

The pictorial record of hamlets and villages depicts a typical settlement pattern with unique architectural design; and their decoration changes from one region to the other. The Benue-Niger River with many tributaries and falls give rapid attraction to visitors with the panoramas of a great scenic beauty, with the higher dam in Kainji and its artificial lake Kainji gave its valuable tourism potential (Bello, 2002).

The arts and culture of artisans in most African countries have developed to refined forms of self-expressions. Their products depict the diversity of the countries ethic and religious ways

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of life. Nigeria is endowed with varied tourism attraction assets distributed within the six geo-political zones; with enough large market potentials that cater for both domestic and international tourism that sustaining the country's tourism development.

The available number of tourists visiting the country and the facilities made for tourism interplay were constraints to tourism development outfit, such constraints include inadequate hotel and hospitalities capacities, time-consuming immigration procedures, high transport fares and airfares all these limit the tourism development and need to be resolved to make it thrive adequately in our nation. Tourism developments in Nigeria need to concentrate in few places, which can as well developed into holiday resorts (Bello, 2002).

2.5.6 Existing Wildlife Regulation in Nigeria

Establishment of national conservation body was in place with regulation policies. This regulates all the necessary procedures towards conservation of natural resources.

Apprehension of the value of wildlife resources in the country does not bind on amalgamated National law on wildlife conservation. Protection of wildlife species were governs by then with three game laws, in which its modifications lead to the creation of states in 1967 and 1976. Although, each modified existing law establish the unified National Wildlife Conservation regulation that has its territorial coverage within the country as thus: (Handbook for park and game guards, 1989).

The enactment of 1916 "game law" was utilized in the Eastern states comprises of Anambra, Imo, Cross Rivers, and River states. That of 1963 law was made for use by the

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Northern States, which now comprises the Bauchi, Benue, Borno, Gongola, Kaduna, Kwara, Niger, Plateau and Sokoto and others.

The enactment of 1982 law made for used by the Western states comprising Edo, Delta, Lagos, Ogun, Ondo, Oyo, Osun and Ekiti. These Acts when compared with the existing regulations in some Eastern and Southern countries (like Kenya, Tanzania, Botswana and South Africa) of Africa, which are found at the fore-front of wildlife conservation management considered it inadequate for conservation requirements since those laws were too feeble for apprehension and punishment of the intruders.

Enactment of Act No. 46 in 1979, establishing the first National Park; Kainji Lake National Park for its existence and day-to-day running administration of the park composed of eighteen sections grouped into three parts: Park and its Management Board, Offences and penalties and Miscellaneous and supplementary for schedules. The management purpose is for the conservation of the animals, plants and other historical/cultural elements of the National Park (Conservator of Park, 2012).

Enactment of Act No. 11 in 1985 was towards preservation and conservation of endangered species (control of international Trade and Traffic). The decree stipulated that as from April 20, 1985, the hunting, capture of or trade in the animal species specified in its schedule 1, and this have been absolutely prohibited. Some of the prohibited animal species in schedule 1 are Otter shrew, Giant pangolin, Tree pangolin, all Columbus monkeys, all mongooses, Gorilla, African palm squirrel, Porcupine, Lion, Leopard, Cheetah, Civet Cat and Wild dog.

Enactment of Act No. 36 in 1991 made for the establishment of six National Parks within the country, with adequate provision for effective protection, management cum administration of the parks. In this new regulation, the abolishment and dissolution of the old Board of

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administrative management in Kainji Lake National Park stated in Decree No. 46 of 1979 was included.

The Decree No.36 of 1991 empowered the six newly established parks and made provision for a National management board with the appointment of an Executive Conservator-General for all the parks; and Conservator of Park in each Parks with their Chairmen of boards. Acts No.77 of 1977 established the Osun Osogbo sacred grove on which this study focuses. The enactment of Act No. 77 of 2005 made for the establishment of National Museum and Monuments including the Osun Osogbo World heritage Site (Curator, 2013).

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CHAPTER THREE

METHODOLOGY

3.1 STUDY AREA

The dense forest of Osun Sacred Grove, (now World Heritage Site) is on the outskirts of Osogbo city. Some of the last remnants of primary high forest in southern Nigeria are the abode of Osun, the goddess of fertility, or the waters of life, one of the pantheons of Yoruba gods. Although the forest meanderers of the river Osun set within the forest sanctuary are shrines, sculptures and art works erected in honors of Osun and other Yoruba deities. Suzanne Wenger and the fellow New Sacred Art artists created many in the past forty years. The new work has revitalized the grove, which now seen as a symbol of identity for all Yoruba people.

This study area in terms of the categories of cultural property set out in Article 1 of the 1972 World Heritage Convention, it is a site while in terms of the operational guidelines for the implementation of the World Heritage Convention, in paragraph 39; could also be a cultural landscape (ICOMOS, 2005).

The study was conducted in Osun Osogbo Sacred Grove named World Heritage Site in state of Osun Osogbo, south Western Nigeria. State of Osun was formed from the then Oyo State on the 27th August, 1991 (Fig. 1 & 2). The State is composed of 30 Local Government Areas and one Area council in Ife. The predominant occupation is farming with a population over 2 million people.

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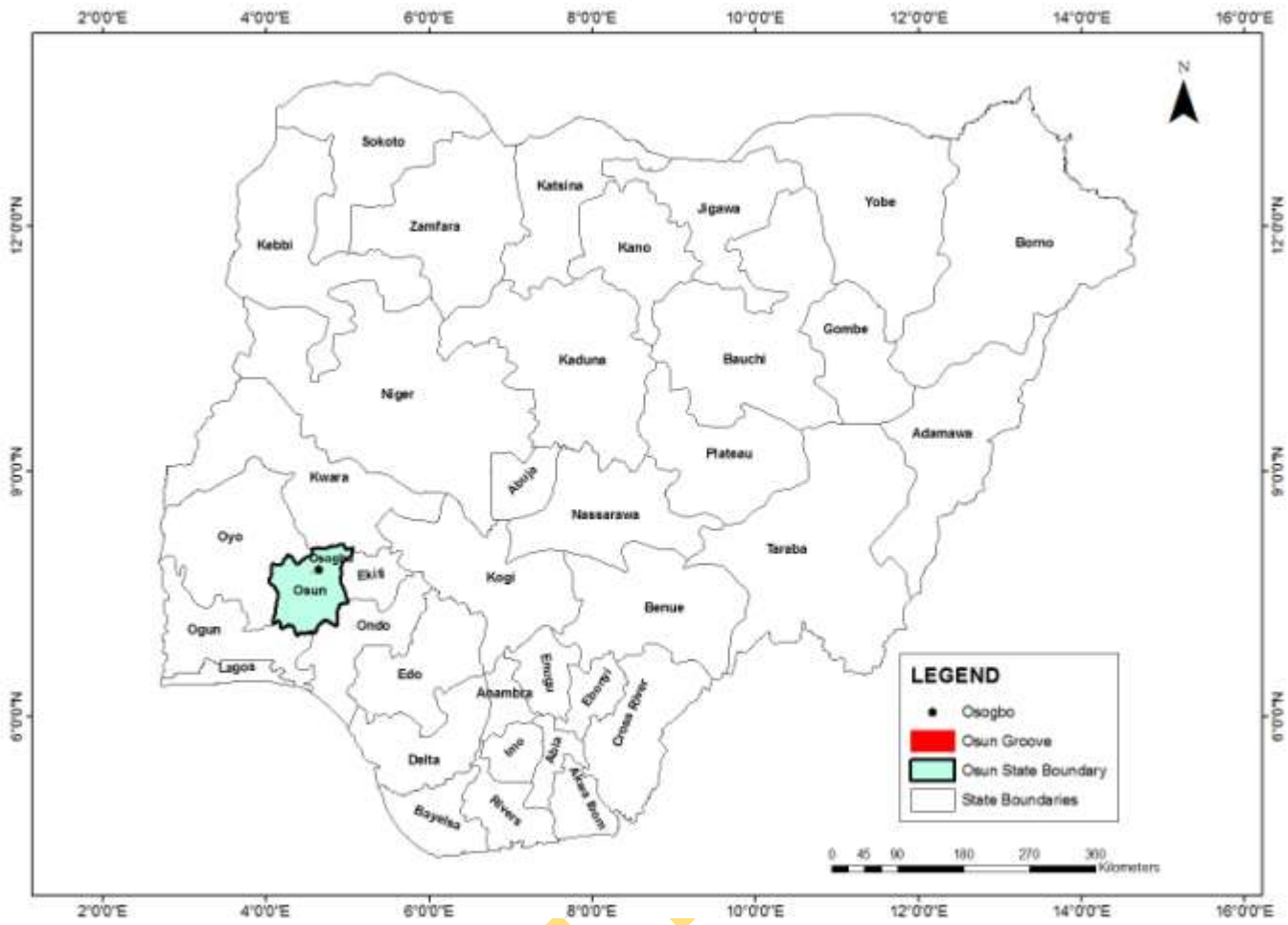

Figure 1: Map of Nigeria showing the study state.

Source: field survey

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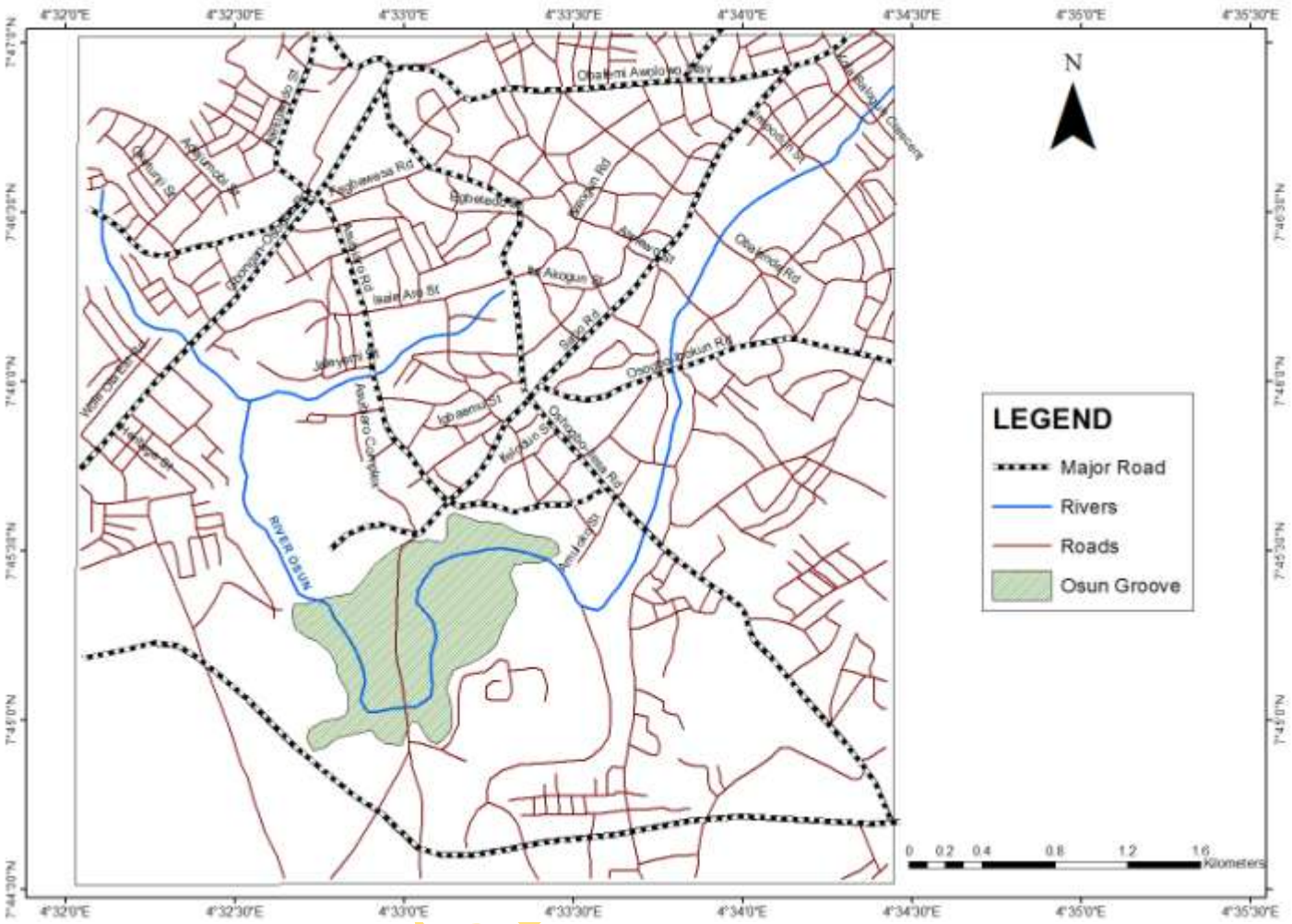

Figure 2: Map of Osun State showing the study city

Source: field survey

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The indigenes are primarily Yoruba with well-defined tradition. The Yoruba incontest strongly believe in the existence of Almighty God and do worship him through several intermediaries called deities such as "Egungun", "Ela" "Esu", "Ile-di" "Sango", "Ogun", "Sanponna". These are presented in Plate 1 to 9. These are places of worship (shrines) located in the forests or in towns/cities. Where such shrines found in the cities, it is forbidden areas for non-admitance assess to enter such place except in the open annual pilgrimage festival period.

At time, these places are permanently out – of - bounds for a particular sex. For instance, the female are not allowed to enter the shrine or witness the worship of "Oro". These taboos restrict the activities permissible in these forests (usually called sacred groves now referred to as WHS) and thus promote site and biodiversity conservation of the place (Adebisi, 1999).

This Osun Osogbo World Heritage Site is located approximately between latitudes $N7^0$. 45020^1 and longitude $E4^0$ 3307.992^1 in the southwestern corner of Nigeria. It is restricted to southern part of Osogbo and covers an area of 1.22 sq. km (75 hectares at the core zone surrounded by 47 hectares of buffer zone).

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Plate 1: The Main gate shows Images of Osun goddess, Timehin the discoverer of the settlement and others inside OOWHS.

Source: Field Survey (2012)

Plate 2: Sculptural symbolic act of Osun Osogbo goddess welcoming people to the Ojubo inside OOWHS

Source: Field Survey (2011)

Plate 3: Images of Sango and Oya inside the OOWHS

Source: Field Survey (2011)

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Plate 4: Esu Shrine shows sculpture of Esu Laalu (god of vengeance) located in the OOWHS

Source: Field Survey (2011)

Plate 5: Sculpture of Iya Mapo located inside the OOWHS

Source: Field Survey (2011)

Plate 6: Sculpture of Adunni Olorisa (Susanne Wenger) and her Member

Source: Field 2011

Plate 7: Ela shrine: Sculpture of Ela regarded as the intermediary between God and man inside OOWHS

Source: Field Survey (2011)

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Plate 8: Worship assemblage for the Ogbonis' fraternity inside OOWHS

Source: Field Survey (2011)

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Plate 9: Sanponna Shrine (gods of smallpox and chicken pox) inside OOWHS

Source: Field Survey (2011)

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It is a large area of undisturbed primary tropical dense rainforest ecosystem in the north central and southern part and mangrove in east (Omotoso, 2004). Osogbo is situated on the margin of the southern forest of Nigeria on a raised parcel of land of about 350 meters above sea level.

The OOWHS was established during the second settlement of Osogbo in Ohuntoto forest (Igbo Ohuntoto) with many historical back- grounds (plate 10). Decree 77 of 1979 culturally and legally protects this sacred grove. The site is an important ecological gene pool containing one of the oldest relatively undisturbed primary areas of rainforest in Africa. Consequently, the OOWHS forest vegetation is approaching the climatic climax witnessing influx of fauna especially the primate groups (Adebisi, 1999).

The vegetation is said to have evolved over 30 million years. Because of its critical (precarious) conservation status, it has been renamed as one of the United Nation Educational Scientific Cultural Organization World heritage sites of exceptionally rich floral and faunal life-forms in the world. The river drains the Osun basin in the north-south direction and passes out through the grove in the southeastern area. The underlining rock of the riverbed is of Precambrian formation. They are uncovered in some parts of the grove during the dry season when the river cuts into pools/lakes within the banks.

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Plate 10: The market scene (Oja Ontoto) inside the OOWHS.

Source: Field Survey (2011)

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The soils are of depositional nature towards the riverbanks and at the lower slopes. Occasionally, the soils formed at the summit of the hill could be seen (especially on Adunni Hill). The two main seasons (dry and rainy) generally observed within Osun state is typically experience within the grove. Harmattan effect is usually mild in the grove. The rainy season is between March and October with a double peak recorded in May/June and October/November. The mean annual rainfall is above 1000mm with relatively high humidity (greater than 60% during the day and not less than 70% at night), usually associated with high temperature between the ranges 22^{o}-35^{oc}. The microclimate within the grove is more humid than it is in a greater part of southern Nigeria (Adebisi, 1999).

3.2 Historical Background

The people of Osogbo originally settled in the Ipole forest in a particular site found by the Owa Ode. Due to population increase during the reign of Owa Larooye, severe water shortage was experience. As a result, a powerful hunter and friend of the reigning king advised the people to migrate to the Ohuntoto forest where he had sighted a big river during his hunting expedition. Consequently, King Owa Larooye and his people migrated from Ipole forest to the forest zone area of Ohuntoto forest where they had an adequate supply of water (Adebisi, 1999).

The people of Osogbo subsequently migrated to the present site of Osogbo city after loss of lives and properties was experience due to flood disaster. This new site is about two

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kilometers away from the river Osun flood plain, which continuously serves the purpose of regular steady water source to the inhabitants of Osogbo (Adebisi, 1999).

Osun, a princess of Elekole of Ikole –Ekiti was one of the wives of Sango, the Alaafin of Oyo. She moved to Osogbo due to a dispute between her and Oba (her rival wife) because of her barrenness. She eventually married to an Osogbo indigene and later became pregnant after repeatedly drinking the water exuded from the body of Iko-Osun, a spiritual fish that lived in the Osun River. Later she became a worshipper of the Osun River and sanctified after her death (Adebisi, 1999). This is sighted on the Iron Gate entrance to the Grove Plate 1.

3.3.1 Reconnaissance Survey

This was carried out for a period of two months to identify the major habitat conditions and areas of research interests at the site. It involved going round and visiting the divisions of the World Heritage Site. All the communities were also visited.

3.3.2 Secondary Data

Scheduled interview were conducted among the World Heritage site (Grove) professional staff, especially those in research, conservation, education and protection units, to gather information on their personal experience in the grove, management problems and possible steps being taken by the grove curator to resolve the administrative challenges being encountered.

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The data used for this study were gathered from primary and secondary sources. The primary data were received from the structured interviews and questionnaires appendix administered to the protection and conservation staff, curators, site managers, conservation and research officers, subject matter officers including the policy makers, other related concerned people as well as communities dwelling along the conservation areas. This is similar to the approach adopted by Inah and Onadeko (1997).

Information sought and received includes evaluation of the wildlife resources and tourism potentials of the forest protected site as well as the management problems and challenges, coupled with the administrative approaches taken in resolving them.

The data were analyzed using percentage and statistical analysis of variance (ANOVA). The procedures for data collection were as follows:

a. Structured questionnaires were designed to collect information on the physical features, both tangible and intangible, historical/cultural sites, archaeological sites, visitor facilities and number of tourists who visit the Grove.
b. Personal interviews were conducted at selected areas of the forest-protected site to acquire data on the utilization of the resources in and around the buffer zone of the grove.
c. Field trips was conducted in and around the Forest protected Grove to evaluate the status of some of the features. Photographs of the facilities and features were taken for assessment.

3.4.1 Determination of Soil fertility and Nutrient status

Transects were taken at 10m apart within each vegetation zone. Soil samples were taken at 0.15cm and 15-30cm depths respectively in triplicate and composited. Samples were then taken from the composite samples for laboratory analysis. Soil analysis was carried out according to

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the methods used in the Laboratory Manual for agronomic studies in soil, plant and microbiology (Agboola, 1986) and Manual series No. 7Automated and semi-automated methods for soil and plant analysis prepared by International Institute of Tropical Agriculture (IITA, 1981).

3.4.1.1 Determination of Total Nitrogen (Kjeldahl Method)

a. Ten grams of air –dry soil was weighed accurately on a filter paper (in duplicate)

b. The sample screwed up in the filter paper and placed in a dry 500ml Kjeldahl flask

c. The catalyst mixture provided in tablet form (this contains selenium, copper, Tetra oxo sulphate (VI) acid and sodium sulphate) were added.

d. .Thirty ml of technical grade concentration of Tetra-oxo-sulphate (VI) acid was added and the contents in the Kjeldahl flask were mixed by means of a swirling motion.

e. This was heated on a heater in the fume cupboard, rotating the flask at intervals, until the digest got clearer (light green or grey). Countinued heating was for one hour at this stage.

f. This was allowed to cool by adding approximately 100 ml of tap water and shaken.

It was transfer to a clean flask. The sandy residue was washed repeatedly with approximately 50ml aliquots until 250ml of solution was obtained. The flask was stopped to prevent ammonia fumes or extraneous matter entering the flask.

g. Fifty ml of 4% boric acid solution was placed in a 500ml conical flask on which 150ml level has been marked with a grease pencil.

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h. Three drops of mixed indicator (methyl red plus methylene blue) were added to the boric acid.

i. The receiving flask placed in a way that the tip of the condenser tube is below the surface of the boric acid.

j. small piece of litmus paper was added to the flask containing the diluted digest. Then, addition of 125ml approximately 45% sodium hydroxide was added by pouring it carefully down the side of the flask so that the alkali formed a layer below the acid.

k. The flask was attached mixed with the condenser and contents by means of a circular swirling motion. The litmus paper should now indicate that the solution is alkaline.

L. This was distilled until about 150ml of liquid was present in the receiving flask. The distillation was watch carefully. The flame was adjusted so that sucking back or excessive frothing is prevented.

M. Titration was done with standard hydrochloric acid (approximately 0.05N). The end-point was a grey-blue colour, intermediate between the purple (acid) and green colour (alkaline).

Calculations:

1. Nitrogen (N) in the sample = ml. HCl. Used (i.e. titration value minus blank value) X normality of HCl.

2. Convert to a percentage basis by multiplying the factor 0.14 (for a 10g sample).

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3.4.1.2 Determination of Phosphorus

a. In a standard sample of Phosphorus stock solution – Dissolve 0.2194gm of dry KH_2PO_4 in distilled water in 500ml standard volumetric flask and made up to mark. The solution contains 100ppm of phosphorus.

b. In a reagent bottle A: 12gm of ammonium sulphate was dissolved in 250mlof distilled water H_2O. In 100ml of distilled H_2O, 0.2908gm of autonomy potassium nitrate was also dissolved. The two dissolved reagents were added to 1000ml of 5N H_2SO_4. (148ml conc. H_2SO_4 to1litre) and mixed thoroughly, made up to 2,000mls and stored in Pyrex glass bottle in a dark and cool compartment.

c. In reagent bottle B: 1.05mg of ascorbic acid was dissolved in 200ml of reagent A and mixed . This reagent should be prepared as required, as it does not keep more than 24 hours.

Preparation of standard curve for Phosphorus determination:

Standard solution containing 0, 0.2, 0.6, 1.0, 1.6, and 2.0 (mg/litre) were prepared.

A standard curve was obtained from the prepared solution by:

Placing 5ml of standard (including the blank) in labeled test –tubes, 3ml of distilled water solution was added after which addition of 2ml reagents B was mixed properly and noted for the concentration of Phosphorus in those diluted standards (0, 0.1, 0.3, 0.5, 0.8 and 1.0mg/l)

Measuring of the absorbance (optical density) after 10minutes at 882mm,

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Plotting graph of absorbance against concentration.

Experimental Procedure

a. Extraction:

1. Six grams of air –dry soil was weighed and placed in a conical flask,

2. added with thirty ml of extracting solution and shook for one minute (i.e. 1m NH_4Cl as extraction,

3. after which filtered immediately through a Whatman No. 42 filter paper.

a. **Estimation of Inorganic Phosphorus in extract**

An aliquot of extract was placed in a labeled test tube. The molybdenum blue colour was developed following the procedure outlined for the standards. The size of the aliquot was chosen by trial and error so that the reading on the reading absorption meter falls within the range on the standard curve.

a. While using the standard curve previously prepared, the concentration of phosphorus in the coloured solution was read off,

b. by using the appropriate dilution factor, the content of phosphorus (mg/kg) in the air-dry soil which has been removed by each extract ant was calculated.

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3.4.1.3 Determination of Soil organic matterWalkley-Black wet oxidation method.

Apparatus:

1. Burettes of 50ml.

2. Erlenmeyer flask

3. Pipette of 10ml capacity

4. Automatic pipette.

b. Reagents:

1. Potassium dichromate ($K_2Cr_2O_2$) 1N: 49.04mg of $K_2Cr_2O_7$ was dissolved in distilled water and diluted in one liter.

2. Concentration of Tetra oxo sulphate (V1) acid (H_2SO_4).

3. Indicator 0- Phenanthroline –ferrous complex 0.025m (ferroin). When the ferrous indicator is not available it can be prepared accordingly: 14.85gof 0.phenanthroline monohydrate and 6.95g of $FeSO_4$. $7H_2O$ were dissolved in water and diluted to one litre.

4. Ferrous solution (0.5N): 196.1g of ferrous ammonium sulphate $Fe(NH_2 (SO_4)_3.6H_2O$ was dissolved in 500ml of water containing 20ml of concentration Tetra oxo-sulphate (vi) acid and diluted to 1 liter.

5. Organic matter standard:

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6. 81g of dextrose was dissolved in water and diluted to 1 litre of 5ml; Aliquot of this stock solution is equal to 0.5%organic matter if 1.25g of soil is used.

Procedure

1. (a) about 25g of soil was ground to pass through a 60-mesh sieve,

(b) 0.5g samples of air dried soil was weighed out in duplicate and transferred to 500ml Erlenmeyer flask;

2. added by means of a pipette up to 10ml of $K_2Cr_2O_7$ and swirled to mix,

3. about 20ml of conc.H_2SO_4 (using a graduated cylinder), and swirled gently for minutes,

4. after which was allowed to stand for 20-30 minutes,

5. the suspension was diluted with about 200ml of distilled water,

6. ten ml of 85% H_3PO_4, about 0.2g of NaF (use measuring spoon) and added with 3to 4 drops of phenanthroline indicator,

7. the excess Cr_2O_7 was back titrated with 0.25M ferrous solution to wine- red end point,

8. a reagent blank (same procedure except that no soil was run into it).

Calculations

a. ML of Ferrous solution used to titrate sample =

b. Concentration of Ferrous solution =

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c. ML of Ferrous solution used to titrate blank =

d. Milliequivalents of readily oxidazable, OX per gram of soil

$$\frac{\text{ml. } FeSO_4 \text{ .in. blank} - \text{mL.} FeSO_4 \text{.in Sample} * \text{conc. } H_2SO_4}{\text{wt. of Soil used}}$$

= meg 0x/g.

e. Percentage carbon: This value is obtained by assuming that the milliequivalent of organic matter oxidized is equivalent to oxidation of 77% of organic carbon from a valency of zero to +4.

%C = meq. 0X/g x 12/400; 1/0.77 x 100

= meq 0X/g x 0390.

Where 12/400 is the millequivalent weight of carbon, 1/0.77 is the factor for converting the carbon actually oxidized to total carbon; and 100 is the factor to change from decimal fraction to percentages.

f. Percent of organic Matter: (% 0.M). This value is obtained by assuming that the carbon percentage is correct and that the organic matter contains 58% carbon.

% 0.M = C x1/0.58 = % C x1.72……. (iii)

Where 1/058 is a factor converting carbon to organic matter.

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3.4.1.4 Determination of Soil pH

a. Apparatus:

1. Glass electrode pH meter
2. Mechanical stirrer 1550ppm
3. 10 ml soil scoop and leveling rod.
4. Set of standard extraction cups
5. A 10ml dispenser.

b. Reagents:

1. Distilled water
2. Calcium chloride solution (1M. $Cacl_2$)

147.02g Calcium chloride dehydrate $CaCl_2$ $2H_2O_)$ was dissolved in distilled water and diluted in 1 litre.

3. Potassium chloride solution (1N KCL)

74.55g potassium chloride (KCl) dissolved in distilled water and diluted to 1 litre.

Procedure

1. Using the standard scoop (10ml), one level of the scoop was transferred into the extraction cups.

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2. 10ml distilled water was dispensed

3. Allowed it to stand for 15 minutes

4. Strired for 5 minutes

5. Stand for 10minutes

6. The pH value was read on the pH meter. Standardized with buffer solution of pH 4.0 and 7.0.

3.4.1.5 Determination of exchangeable K with flame Photometer

Apparatus

a. Flame photometer

b. Mechanical stirrer – 1550rpm

c. Set of extraction cups

d. Dispenser 30ml

e. Filter paper No. 540 (9 cm)

f. Top loading, weighing balance

b. Reagents

1. Ammonium Acetate solution (1N NH_4OAc pH_7 .O)

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2. About 10litres of distilled or deionised water was added to an 18-litre polyethylene bottle carefully and 1044ml of glacial acetic acid was added and stirred well.

3. Then 1260ml conc. NH_4 OH (sp. Gravity 0.90) carefully added in small amounts at a time while stirring. This made up to 17-litre mark and cooled. The pH was adjusted to 7.0 using either acetic acid when the pH is higher than 7.0 or NH_4 OH if the pH is lower than 7.0. The volume was later check and adjusted to 18litre.

STANDARD

1. To clean 1000ml volumetric flask 300ml distilled water was added.
2. Under a fume hood 58ml of glacial acetic was carefully added and stirred.
3. 70ml of NH_4OH – was carefully added.
4. The pH was checked and adjusted to 7.0
5. 100ml of K was added to the solution.
6. Reference solution 1000ppm.was made up to 1litre. One litre of ml of this solution contains 100mgof K.

Working Standard

By using volumetric pipettes, transfer the stock standard to a clean 250ml volumetric flask and made up to volume using 1NNH4OAc and mixed.

Procedure

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1. 5.0 of soil was weighed and transferred to an extraction cup.

2. 30ml of 1NNH_4OAc was added by using a laboratory dispenser.

3. Add the stirred solution for 15minutes on a mechanically (1550rpm)

4. The soil suspension stood for 15 minutes and the filtered by using a Whatman No. 540.

5. Each sample was diluted 25 times with 1N NH_4OAc as diluent, using a laboratory dilator.

6. The flame photometer was used to read K.

3.4.2 Identification of Flora and Fauna Resources Composition and Vegetation Potential Utilization

Quadrat method (Obot, 1986) was used. Quadrats of 30m x 30m were established at 30m apart along fixed transects of 100m apart within each vegetation zone. Seventeen quadrats were laid in each of the three vegetation zones. Hundred percent enumerations were carried out in each of the quadrats. All plants within the quadrats were identifying at species level. Girth sizes of the woody plants were measure at breast height with a tape rule and grouped into class sizes. The utilization levels of the browse species was also documented through the assistance of an experienced field staff using consumption rate. Hutchinseen and Dalziel (1952) follow authorities of plant scientific name. The girth size distributions were illustrated with a bar chart.

3.4.3 Assessment of fauna resources

Ground survey method through direct observations (Rodgers, 1975) was used. The Site was divided into blocks according to the vegetation zones. Movable transects (i.e. changeable

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transect) were made at 100m apart within the blocks. Records of wildlife species sighted with binocular were made on data forms in the hours of 0.6:30 – 10:30 and 16:30 – 18:30 along the laid transects. Animal censuses were carried out monthly during the dry season and wet season in the two section of the Site.

Formular/model of animal population estimation recommended by (Agbelusi, 1995) was used as follows:-

$$NH = \frac{n\,k + (1-)\,(nK - nk - 1)}{\alpha}$$

Where, NH = Estimated population`

n k = highest value in observation

nk -1 = next to highest value

α = confidence interval

α = 0.05 (meaning 95%)

$$\text{Population density} = NH = \frac{NH}{A}$$

A = area in Km^2

Factors affecting the movements and distribution of wild animals in the park are also listed.

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3.5 Occurrence of Bacteria Organism

3.5.1 Determination of microbial load in water samples

Each water sample was serially diluted to obtain dilutions of up to 10 – fold while 1ml of dilutions 10^{--2}, 10^{-4}, and 10^{-5} were pipette into sterile Petri dishes and molten nutrient agar was added. It was swirled to allow for even distribution and incubated at 37^{o}C for 24 hours.

3.5.2 Isolation and Enumeration of organisms

Each water sample was serially diluted in sterile peptone water to obtain dilutions of 10^{-1}, 10^{-2}, 10^{-3}, and 10^{-4} respectively. Aliquots of 0.1ml of the 10^{-2} dilution was septically inoculated onto the solidified agar media using a spread plate method. MacConkey agar plates were incubated at 37^{o}C and 44.5^{o}C for 48hours for isolation of coliforms and feacal coliforms respectively. The presumptive feacal coliform colonies were sub-cultured on Eosine methylene blue agar to differentiate between *Escherichia coli* and *Klebsiella spp.*

Organism isolation and enumeration of *Staphylococcus species*, *Salmonella species*, *Shigella species* and *Vibrio species* were carried out using Mannitol salt agar, Salmonella-Shigella agar and Thiosulphate citrate bile salt-sucrose agar plates which were inoculated and incubated at 37^{o}c for 48hours respectively.

3.5.3 Biochemical characterization of isolates

The gram-positive organisms were differentiated based on their reactions toward catalase and coagulase test respectively. Coagulase test demonstrated the ability of certain species of bacteria to produce coagulase enzyme. Motility, oxidase and citrate test were carried

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out to differentiate the gram-negative rods. Sugar fermentation ability of the bacterial isolates was determined by using the following sugars; glucose, sucrose, lactose, galactose and maltose.

Frequency distributions were used to compare girth size classes' distribution in the major trees sampled in the grove, height –diameter relation of trees in World Heritage Site. Bar chats were used to compare Ecotourism activities and impacts of human activities. Pie chart was used to compare the state of origin distribution on the respondents. Student's t- Test ANOVA, logistic regression, measure of central tendency were also used for data analysis on soil samples.

3.6 List of faunal species at the World Heritage Site

a. The World heritage site is blessed with series of natural resources both faunal and floral.

Faunal Species:

Common Name	**Scientific Name**
African civet	*Viverra civetta*
African manatee	*Trichechus senegalensis*
Giant Gambian rat	*Cricetomys gambianus*
African Tortoise (spurred)	*Geochelone sulcata*
Bush buck	*Tragelaphus scriptus*
Bush pig	*Phacochorus ethiopiticus*

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Brush-tailed Porcupine	*Hystricidae sp*
Nile monitors Lizard	*Varanidae sp*
Maxwell's duiker	*Cephalophus sp*
Red-flanked duiker	*Cephalaphus spp*
Musk Shrew	*Crucidura sp*
Rock python	*Python sebae*
Royal python	*Python regius*
Red river hog	*Potamochoerus porcus*
Cane Rat	*Thryonomys swinderianus*
Mona Monkey	*Cercopithecus erythrogaster*

3.7 List of floral species at the World Heritage Site

Dry High Forest Flora species:

Burkia Africana

Afzelia africana

Diospyros meispelisformis

Acacia complex

Riparian forest

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Danniellia oliveri

Antcaris africana

Grass species

Andropogon sp

Brachiaria sp

Shrubs species

Chloris sp

3.8 List of Historical /Cultural Features at the World Heritage Site

a. Archeological, Historical/Cultural sites

Main Gate inscription

Ojubo Osun shrine

Sango and Oya shrine

Esu shrine

Ela shrine

Ogun Shrine

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Sanpona Shrine

Ile Aye dakun Shrine

Ile –di (2nd Palace)

b. Recreational Sites and Sight attraction features for tourism outfits

Oja Ontoto

Entrance of Iyamopo Courtyard

Entrance of Second Palace

Suspended Bridge (Gada Amititi)

Artistic Transformation of Accord exhibit during Assemblage of lodge

Sculptural significance blessing of Osun Osogbo

c. Artistic work

The Votary Maid (Arugba) with the ritual calabash and other devotees.

The entrance for Votary maid Arugba to the shrine

Physical presence of tourists during annual pilgrimage

Dry high forest support to arboreal animal

Wonderful beauty of nature on Mona monkey.

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1st Palace

3.8.1 List of other facilities available at the World Heritage Site

d. Infrastructural facilities

Construction and maintenance of roads

Construction and provision of walk ways

e. Protection and safety Facilities

Security guards personnel were attached to the sacred grove to protect the heritage site, also education unit provide tour guides to the tourists/visitors of the grove.

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CHAPTER FOUR

4.0 RESULTS AND DISCUSION

4.1 Results

Two hundred questionnaires were administered to respondents in and around the World Heritage Site (Osun Osogbo Sacred Grove) while only a hundred and fifty-eight (158) were retrieved. Thus, the percentage of the respondents' distributed to the questionnaire is 79%.

4.1.1 Demographical Information about respondents

4.1.2 Age distribution of respondents

The percentage distribution of occurrence age brackets of respondents shows that majority of the respondents fell within the age groups 10-20 (40.50 %) and 21-30 (24.05 %) years. Few numbers of respondents (6.96%) fell within the age group 51-60 years. Chi square analysis ($P < 0.05$) shows a significant association between age groups of respondents and visitation to the site. Thus, age groups have significant effect on tourist's visitation (Table 1).

4.1.3 Distribution of respondents

The observation shows that the percentage distribution of the male respondents that made visitation to Osun Osogbo World Heritage Site is more than that of the female. However, the effect of gender on visitation to the site had no significant different (Table 2).

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4.1.4 Educational level of respondents

The various educational levels of the respondents in percentages distribution was observed during the study. Investigation reveals that the tertiary education recorded the highest percentages of (58.8 %), while the least percentage of (6.4 %) attended primary school. The result shows that the educational level of tourists had a significant association on their site visitation (Table 3) (at p = 0.05).

Table 1: The Frequency distribution of respondents' age groups

Age Groups	Frequency	Percentage
10-20	64	40.50
21-30	38	24.05
31-40	25	15.82
41-50	20	12.65
51-60	11	6.96

Source: Field Survey (2011)

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Table 2: The effect of gender on visitation to the sacred grove.

S/N	SEX	FREQUENCY	PERCENTAGE
1	Male	83	52.5
2	Female	75	47.5
	Total	158	100

Source: Field Survey (2011)

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Table 3: The Frequency Distribution of Respondents' Educational Level.

S/N	EDUCATIONAL LEVEL	FREQUENCY	PERCENTAGE
1	Tertiary	91	57.59
2	Secondary	55	34.81
3	Primary	12	7.59
	Total	158	99.99

Source: Field Survey (2011)

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4.1.5 Occupational level of respondents

The percentage distribution of respondents (visitors, inhabitants and staff) occupation status in Osun Osogbo world heritage site shows that the highest percentages (39.87%) are unemployed, while the least percentages (5.69%) are teachers. The result analysis of the data indicates that there is a significant association between tourist's occupations to the site visitation (Table 4).

4.1.6 Marital status of respondents

Frequency distribution of respondents according to marital status in the site was presented in Table 5. More than half of the respondents (54.43%) were singles while the least percentage was divorcees (2.53). However, there is a significant effect of tourist's marital status to site visitation.

4.2 The respondents nativities and visitation to the site

The frequency distribution of respondents' nativities and visitation to the World Heritage Site was observed during the study. The result shows that the higher percentage of respondents (50.63 %) recorded to Non-natives while (49.37%) were natives. The non- natives were more curious to know the tourism potentials of the site than the native people were. Out of the natives (78) 60.25% engage in visitation while 80% of non-natives engage in visitation. Overall, one hundred and three respondents out of one hundred and fifty eight who responded to the questionnaire engage in visitation of the site (65.18%) while fifty-five numbers of

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respondent's did not engage in site visitation (34.81%) There is no significant relationship between the respondent's nativity in relation to their visitation to site (P >0.05) (Tables 6 and 7)

Table 4: Occupational Distribution of Respondents.

S/N	Types of Occupation	Frequency	Percentage
1	Civil Servant	54	34.17
2	Herbalist	11	6.96
3	Business	21	13.29
4	Teaching	9	5.69
5	Unemployed	63	39.87
	Total	158	100

Source: Field Survey (2011)

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Table 5: Frequency distribution of respondent's according to marital status around the WHS

S/N	MARITAL STATUS	FREQUENCY	PERCENTAGE
1	Single	86	54.43
2	Married	68	43.03
3	Divorced	4	2.53
	Total	158	100

Source: Field Survey (2011)

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Table 6: The Frequency Distribution of Respondents' Nativities

S/N	NATIVITY	FREQUENCY	PERCENTAGE
1	Native	78	49.37
2	Non-native	80	50.63
	Total	158	100

Source: Field Survey (2011)

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Table7: Visitation to Osun Osogbo World Heritage Site in relation to nativity of respondents.

Visitation	Native	Non-native	Total
Those that engage in visitation	47	56	103
Those that do not engage in visitation	31	24	55
	78	80	158

Source: Field Survey (2011)

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4.3: The Awareness of respondents visitation about the site

The level of public awareness on the significance of the World Heritage Site was considered during the study. The significance awareness of respondents in relation to their visitation was observed. This frequency distribution on level of public awareness reveals that 139, 87.97% of the respondents' aware of the significance of the site as a World Heritage Site while 19, or 12.03% did not (Table 8). In addition, 73 or 87.95% of the male respondents engaged in visitation and have higher percentage awareness/visitation of the site while 12.05% was the least percentage of the male respondents that did not (Table 9). From the chi-square analysis awareness had a significant effect to the site visitation (at $P < 0.05$).

By using the Chi-Square test analysis it is evident therefore that there is a strong significantly different between the respondents' visitation in relation to the awareness of the site.

This shows that awareness contributed to respondents' visitation to the site. The result reveals that respondents' awareness to the site has much percentage than those that did not aware of the site; this might be lack of interest, ignorance or no time. Observation reveals that large numbers of male respondent's (52.52%) are more aware of the World heritage site than the female (47.48%).

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Table 8: Level of Public Awareness about the significance of the Site

S/N	Awareness	Frequency	Percentage
1	Aware of the significance	139	87.97
2	Not- aware of the significance	19	12.03
	Total	158	100

Source: Field Survey (2011)

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4.4: Visitation of respondents to the site

The percentage distribution frequency of respondents' to the site shows that large number of them (87.97%) do engaged in visiting the site as relate to their awareness while (12.3%) did not (Table 9)

The highest turnout of visitors to the site during the study recorded in the year 2006 was due to curiosity of the people visiting the site because of the enlistment of the site to world heritage site. In doing this, the visitation to the site outside pilgrimage and during pilgrimage was analyzed. As a result of curiosity of knowing the site, large number of people visited the grove during and outside the festival from different parts of the country as shown in the pie-chart below

The grove recorded the highest number of tourists in the year 2005, followed by visitation made in 2006 and 2004 respectively while the moderate value was in year 2008-2010 and the least visitation occurred in the year 2007. The annual pilgrimage of Osun festival 2011 shows the physical observation of the local and foreign visitors as plates 11a and 11b respectively.

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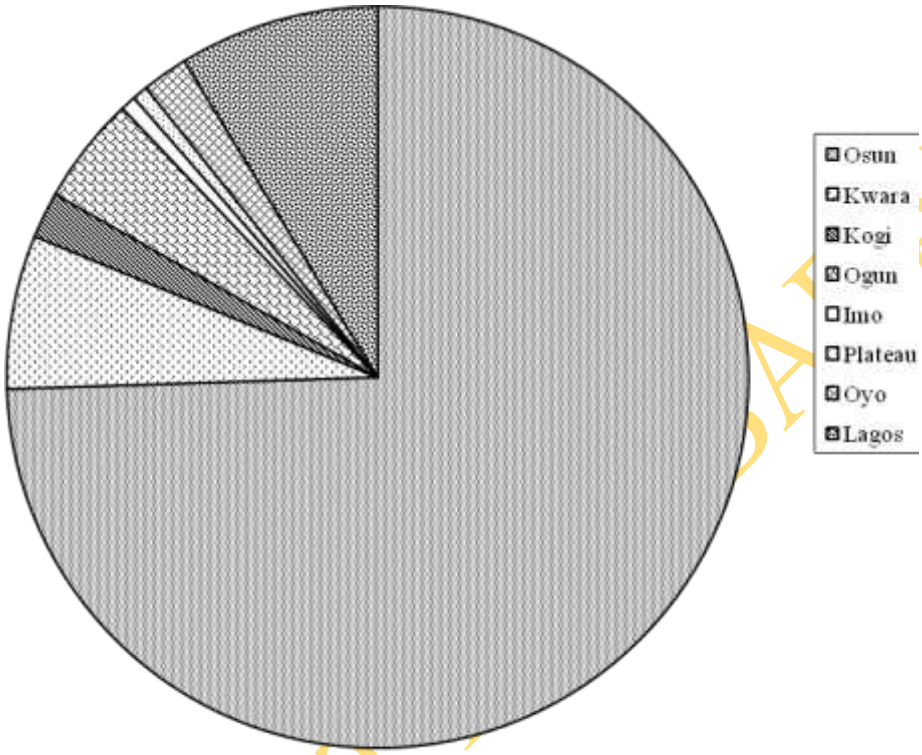

Fig. 3 Pie chart showing the frequency of respondents state of origin.

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Table 9: Visitation of the World Heritage Site in Relation of Respondents' Awareness.

Visitation/Awareness	Male	Female	Total
Aware/Engagein visitation	73 (87.95)	66	139 (87.97)
NotAware/Donot engage in visitation.	10 (12.05%)	9 (12%)	19 (12.3%)
Total	83 (52.53%)	75 (47.46)	158 (100)

Source: Field Survey (2011)

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Plate 11a: Presence of foreign tourists at the OOWHS during the annual pilgrimage festival Osun-2011.

Source: Field Survey (2011)

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Plate 11b: Pavilion used to accommodate the visitors inside the OOWHS during the annual pilgrimage Osun 2011

Source: Field Survey (2011)

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4.5: Annual arrest of intruders to the site

The site is located in the core of Osogbo city**.**

The site has been facing various categories of challenges with human conflicts within the support zone communities around the site. Illegal fishing activities in the sacred river water accounts for the highest arrest in number of arrest made in 2011, followed by illegal felling of trees in 2003 and the least number of arrests was in 2007. The penalties attached to each activity of the culprits at the site in the field record (Table 10). The various activities such as illegal grazing and illegal felling of trees have drastic effect on the biodiversity of the site. These were also observed and recorded during the study (plates 12 and 13) respectively.

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Table 10: Annual number of Arrest and penalty in WHS (2001-2011)

S/N	Years	Number of Arrest	Nature of offence	Penalties
1	2001	Nil		
2	2002	Nil		
3	2003	6	Felling of trees	Two were remanded for 3 months, 4 were cautioned
4	2004	2	Felling of Bamboo	Cautioned
5	2005	4	Fishing	Cautioned
6	2006	8	Fishing	Cautioned
7	2007	1	Felling of trees	Jailed for one month
8	2008	4	Felling of Bamboo	Cautioned
9	2009	2	Farming and bush burning	Cautioned
10	2010	2	Felling of Bamboo	Cautioned
11	2011	9	Fishing	Cautioned

Source: Field Office (2011).

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Plate 12: Herds of illegal grazing cattle activity after drinking from the main river at the buffer area of the OOWHS.

Source: Field Survey (2011)

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Plate 13: Timber log felled down by the illegal fellers at the buffer zone of OOWHS

Source: Field Survey (2011)

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4.6 Causes of Wildlife Ecotourism illegal activity around the OOWHS

The frequency distribution of the causes of illegal activities around the buffer zone of the site records the highest percentage of 32.0% due to income levels of the respondents while the least percentage of 19.0% attached to increase number of tourists flow to the site during and after annual festival (Table 11).

4.7: Management strategies adopted to reduce negative human activities within the site

The frequency distribution adopted by themanagement towards reducing negative impact of human activities in the site was observed (Table 12). The efforts geared towards protecting the biodiversity of the natural/cultural environment. This is largely a local community participation method in support of conservation management of the site. The management activities towards the sustenance of the OOWHS also show on the renovation of the artistic sculptures of fence wall (Plate14). Also, as part of management strategies towards enhancement of tourism potentials of the site newly constructed walk ways and maintenance of the main roads was rehabilitated by the State Government to promote tourism output of the Osun Osogbo WHS to ease tourist movement during the annual festive period as shown in plates 15 and 16 respectively.

4.8: Respondents perception on the tourism potentials of the site

The frequency distribution on the perception of the tourism potential due to respondents grading at the site was identify (Table 13). Appreciable potential level recorded the highest percentage (30.37%), followed by manageable potential level of 23.41%; while the moderate

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potential level of 17.72% was in poor state and not – appreciable potential level was the least percentage of 9.49%. The fair apprehension and perceptions attached to the tourism potentials of the site was observe with the high turnout of tourists during the annual pilgrimage festival in plate 11a to 11b above. Other tourism potentials that attracted the visitors attention to the site are presented in plates 17-27 below. As part of respondence perception towards tourism potentials management of the site it was revealed that the site was adequately managed by some respondents as shown in fig 4. It was also revealed that certain management effort should be put in place towards better management of the site, this was revealed in figure 5.

Table 11: Causes of Wildlife EcotourismIllegal Activities around the OOWHS

S/N	Variable	Frequency (%)
1	Income level	32.00
2	Literacy level	26.50
3	Interest in culture	23.50
4	Increase tourist's flow	18.00

Source: Field Survey (2011)

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Table 12: Management Strategies Adopted to Reduce Negative Impact of Human Activities

S/N	Variable	Percentage
1	Job Creation	20
2	Involvement in management decision	10
3	Effective Patrol	20
4	Conservation Education	50

Source: Field Survey (2011)

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Table 13: Respondents' grading of the Tourism Potentials of the Site.

S/N	Potentials Levels	Frequency	Percentage
1	Appreciable	48	30.38
2	Not-Appreciable	15	9.49
3	Manageable	37	23.42
4	Poor	28	17.72
5		30	18.99
	Not at all		
	Total	158	100

Source: Field Survey (2011)

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Plate 14: Part of artistic work renovation as part of management activity.

Source: Field Survey (2011)

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Plate 15: Main Road to the OOWHS

Source: Field Survey 2012

Plate 16: The Newly Constructed Walk Way inside OOWHS.

Source: Field Survey (2012)

Plate 17: The resting place of Suzan Wenger in Ayedakun Shrine inside OOWHS

Source: Field Survey (2011)

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Plate 18: Lakokan site of the great hunter Timehin at the first sight of water in OOWHS

Source: Field Survey (2011)

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Plate 19a: The Sculpture of the First Palace of the Ancient town Osogbo located inside the grove.

Source: Field Survey (2012)

Plate 19b: A person entering into the First palace for divine consultation from the devotees inside the OOWHS

Source: Field Survey (2012)

Plate 20: Entrance of Iyamopo Courtyard within the Heritage site.

Source: Field Survey (2011)

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Pate 21: The entrance of the second palace inside the OOWHS

Source: Field Survey (2011)

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Plate 22a: Suspended Bridge inside the grove

Source: Field Survey (2011)

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Plate22b: The picnick site of tourists on the suspended bridge during the annual pilgrimage festival Osun 2011

Source: Field Survey (2011)

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Plate 23: The artistic transformation of accord exhibit while in assembly during fraternities worship inside WHS.

Source: Field Survey (2011)

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Plate 24: Sculptural significance of Osun Osogbo goddess as the provider of children (usually called Osun Olomoyoyo) located inside the OOWHS

Source: Field survey 2012

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Plate 25: Votary Maid (Arugba) with the ritual calabash and other devotees.

Source: Field Survey, 2012

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Plate 26: The Entrance of Votary (Arugba) to the shrine

Source: Field Survey (2011)

Plate 27: Natural activity of Mona Monkey

Source: Field Survey (2011)

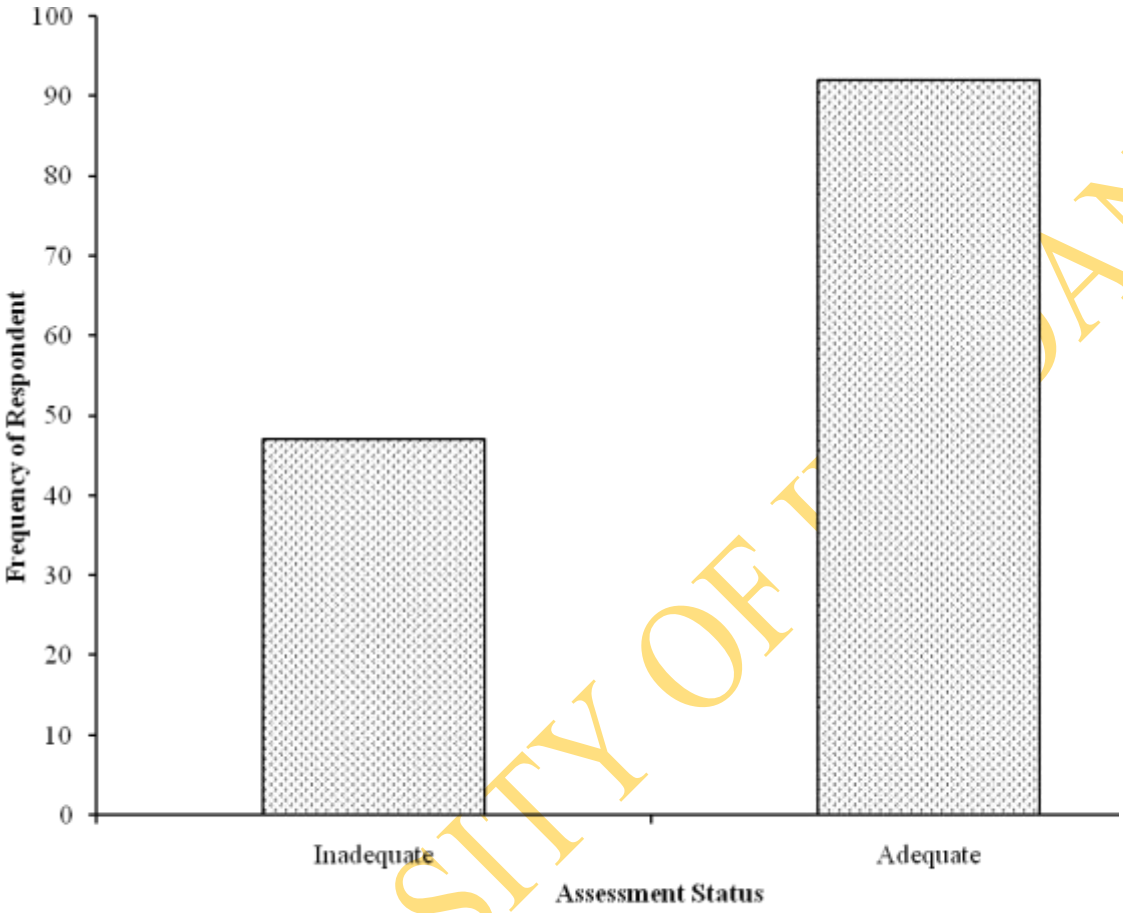

Fig 4 Frequency distribution of respondents' assessment of management of World Heritage Site.

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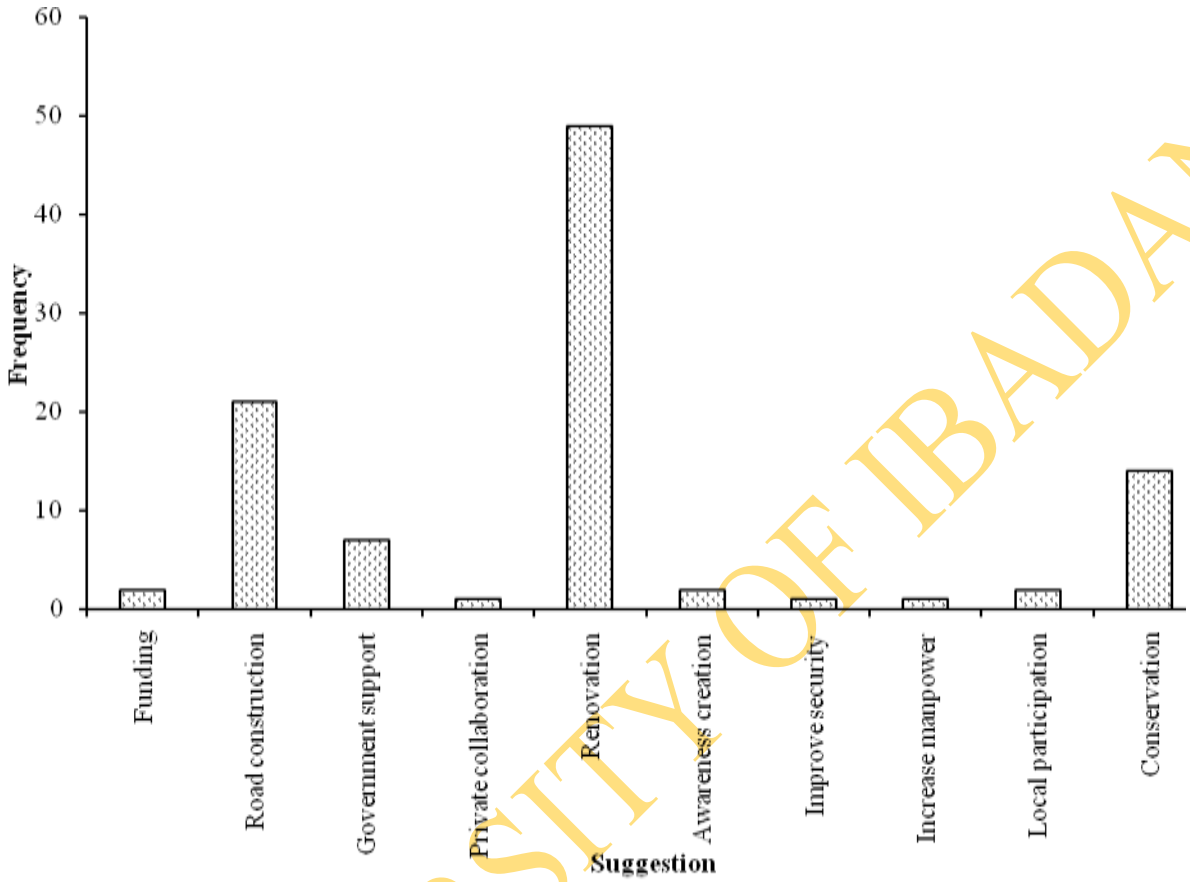

Fig 5 Frequency distribution of respondents' suggestions on how to manage the World Heritage Site better

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4.9 Human activities around buffer zone of the site

The frequency distribution of human activity around the buffer zone of the protected area was observed during the study (Table 14). Farming recorded the highest percentage of (37.34%) amongst the human activities taking place in the buffer zone, followed by collection of firewood/medicinal plants. The least percentage record was in crafting (6.32%). In addition, the resultant effects of human activities around the buffer zone of the protected area are in plate 12 and 13 above.

Table 14: Human activity around the buffer zone of OOWHS

S/N	ACTIVITY	PERCENTAGE
1	Farming	37.3
2	Firewood and Medical plant collection	20.9
3	Illegal grazing	17.1
4	Poaching	10.5
5	Fishing	9.2
6	Crafting	5.0

Source: Field Survey (2011)

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4.10: Regression analysis of willingness in management

Ho: Awareness influence the respondents' willingness in joining the management of the site while Hi: does not. The logistic regression analysis shows statistically that there is an increase of 1.953 in awareness of people in the area holding other variables constant; in respect of the response variable on willingness in joining the management. Therefore, with the obtained P value of 0.008. It is observed that the test is significantly different. In relation to the study, it is evidence to say that awareness of the Osun Osogbo World Heritage Site by the people has brought willingness intention towards joining in the management of the site (Table 15).

4.11: Regresssion analysis on nativity and awareness of respondents

Table 16 accounts for the influence of the captions on the willingness in joining the management of the Osun OsogboWorld heritage Site. As presented, the hypothesis that Ho = Nativity +Awareness +Observe leisure influence willingness towards joining the management of the site. The alternative hypothesis Hi = does not. The null hypothesis shows that awareness influence the willingness in joining the management of the site Ho = awareness influence it; the alternative Hi = does not. The p-level value determines the significance of the test**.**

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Table 15: Logistic regression of Willingness in joining the management of the OOWHS

WTJ MGT	= -2.015+1.953	AWA/WHS
Odss Ratio		7.05
P-Level	0.008	0.013

Source: Field Survey (2011)

Table 16: Logistic regression on Nativity, Awareness, and Observe leisure

WTJ/MGT =	-2.12+	0.259NAT+	1.831AWA/WHS+	0.142OBS/LSR
P- level	0.008	0.466	0.021	0.717
Odds Ratio		1.30	6.24	1.152

Source: Field Survey (2011)

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4. 12: Vegetation Survey

The study reveals that three distinct vegetation types were discernable in the site. These are the riparian forest, the dry high forest, and the derived savanna. The riparian forests are along the course of the river with variable widths and the most common species of the riparian forest at the site are *Antaris africana; Burkia africana; Pavetta corymbosa; Voacanga africantum; Lonchocarpus sericeus and Drypetes chevalieri*. The dry high forest constituted the largest portions of the floral species types in the site and the most common species contains *Brachystergia ericoma; Bryscocarpus coccineus; Blighia sapida; Celtis zenkeri; Canthium hispidum; Cola millenii and Spondia mombin.* Typical floral species of the derived savanna in the site are *Andropogun tectorum, Acacia ataxacantha, Baambusa vulgaris, Imperata cylindricum and Tamarindus indica.*

The frequency distributions of the girth sizes of the trees species shown are plotted on graphs (fig. xvi, xvii and xviii). Girth class 0.00-50.00 found to be the most frequent followed closely by the girth class 50.00-100.00; and the moderate girth class observed was among 100.00-150.00. The absolute densities of woody plants were found to be 187 trees per hectare. The relative densities of the 35 tree species were recorded (Table 17). The highest value of 18.71/ha was recorded for *Cola millenii* as its relative density among all the tree species during the survey. In addition, the forest vegetation types within the OOWHS observed during the survey shows the appreciable arboreal activitity of the Mona monkey (*Cercopithecus mona*). Tall grown forest vegetation supported living biomass that utilized the arboreal ecosystem of dry high forest area as reflects in plate 28.

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Table 17: Relative densities of floral species sampled

S/N	Species	Frequency	Relative density(No/ha)
1	*Celtic mildberia*	9	4.81
2	*Dalium guinensis*	15	8.02
3	*Celtic pentadra*	5	2.67
4	*Anthocleista dyalonensis*	1	0.53
5	*Milicia excelsia*	1	0.53
6	*Lecanoiodiscus cupanoides*	9	4.81
7	*Funtumia elastica*	19	10.16
8	*Antiaris africana*	1	0.53
9	*Cola milleni*	35	18.71
10	*Ritchiea capparoides*	10	5.34
11	*Rothmannia hispida*	6	3.21
12	*Eliastic nilentic*	1	0.53
13	*Baphia nitida*	12	6.41
14	*Deihbolla pinnata*	2	1.06
15	*Hollerhana floribunda*	2	1.06
16	*Triplocylon sclerocylon*	3	1.60
17	*Celtic zenkeria*	13	6.95
18	*Brachyestigia eurycoma*	5	2.67
19	*Subscopoides spp*	1	0.53
20	*Bosqua angolensis*	3	1.60
21	*Antiaris tosigania*	1	2.67
22	*Blighia sapida*	5	0.53
23	*Olais subscopoides*	2	1.06
24	*Entandrophragma utile*	1	0.53
25	*Thonigia sangunia*	1	0.53
26	*Terminalia spp*	1	0.53
27	*Albezia ferruginiea*	6	3.20
28	*Pentaclethra macrophillla*	1	0.53
29	*Lecaniodiscus cupanoides*	1	0.53
30	*Spondia monbin*	2	1.06
31	*Elias guinensis*	2	1.06
32	*Gmelinia arborea*	7	3.74
33	*Newbouldia laevis*	1	0.53
34	*Ficus capensis*	2	1.06
35	*Milestia thonigia*	1	0.53

Source: Field Survey (2011)

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Table 18: Vegetation Sample of Osun Osogbo World Heritage Site.

Serial Number	Vegetation Type	Dominant Woody Species	Dominant Grass Species
1	Riparian Forest	*Danniellia oliveri, Gardenia spp,*	*Hyperrheinia spp*
		Psychatia latistipula	*Andropogon spp*
		Pavetta corymbosa	*Hyperrhenia smithiaa*
		Voacanga africanum	
		Antaris Africana	
		Lonchocarpus sericeus	
		Drypetes chevalieri	
		Afzelia Africana	
		Entandrophragma cylindricum	
		E. angolensis	
2	Dry High Forest	*Brachystergia ericoma*	
		Bryscocarpus coccineus	
		Blighia sapida	
		Spondia mombin	
		Celtic zenkeri	
		Millicia excels	
		Brachystergia nigerica	
		Cola millenii	*Brachiaria spp*
		Terminalia ivorensis	*Hyperrheinia*
		Albizia ferruginea	
3	Derived Savannah Forest	*Andropogun tectorum*	
		Acacia ataxacantha	
		Bambusa vulgaris	
		Imperata cylindricum	*Andropogon spp*
		Tamarindus indica	
		Elaeis guinensis	*Chloris spp*
		Holarrhena floribunda	
4	Diospyros mespliformis	*Dyospyros mespliformis*	*Oplismenus hirtellus*
		Polysphaenia orbuscula	

Source : Field Survey 2010

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Plate 28: Arboreal display of the Mona Monkey species.

Source: Field Survey (2011)

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4.13: Faunal

All the animals' species shown in (Table 19) were those sighted during the frequent trip to the site including those sighted by the site workers. The most frequent and abundant animal species sighted at will on free range are the white throated monkeys. The wonderful natural beauties of this species within the Site promote the tourism development of the place for both local and foreign visitors' that patronized the OOWHS. Table 20 to 23 shows that those animals are still in existence within the OOWHS as evidenced during the study. The wonderful beauty of nature on Mona monkey (*Cercopithecus mona*) is enough for the ecotourism outfit of the Site (Plate 29).

Table 19 Checklist of Faunal species sighted in the course of the study

S/N	Common Names	Scientific Names
1	Bat	*Chiroptera megacheroptera*
2	Bush pig	*Potamchoerus porcus*
3	Royal Antelope	*Neotragus pygmaerus*
4	Royal python	*Python regius*
5	African Manatee	*Trichechus senegalensis*
6	Grass cutter	*Thryonomys swinderianus*
7	African Tortoise (spurred)	*Geochelone sulcata*
8	African giant rat	*Crcetomys sp.*
9	Mona monkey	*Cercopithecus sp.*
10	Hyrax	*Provavia capensis*
11	Maxwell's Duiker	*Cephalophus sp.*
12	Patas Monkey	*Erythrocebus patats*
13	Nile Crocodile	*Crocodilus niloticus*
14	Oribe	*Ourebia ourebi*
15	Porcupine	*Hystrcidae sp*
16	African Civet	*Viverra civetta*
17	Nile Monitor Lizard	*Varanidae sp*
18	Snail	*Archachatina marginata*
19	Musk Shrew	*Crocidura sp*
20	Red flanked duicker	*Cephalophus rutilatus*
21	Brush-tailed porcupine	*Atherus africanus*
22	White throated monkey	*Cercopithecus erythrogaster*

Source: Field Survey (2010)

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Table 20: Checklist of Wildlife Species (Mammals) in Osun Osogbo World Heritage Site

Serial Number	Common Name	Zoological names and Authors
1.	African Civet	*Viverra civetta* {Schreber 1778)
2	African giant rat	*Cricetomys gambianus* (Waterhouse 1810)
3	African Manatee	*Thryonomys swinderianus*
4	African Tortoise	*Geochelone sulcata*
5	Bush buck	*Tragelaphus scriptus* (Pallas 1766)
6	Bush pig	*Potamchoerus porcus*
7	Brush-tailed porcupine	*Atherus africanus* (Gray 1842)
8	Grasscutter	*Thryonomys swinderianus*
9	Tree Hyrax	*Dendrohyrax dorsalis* (Fraser 1854)
10	Maxwell's duiker	*Cephalophus sp*
11	Musk Shrew	*Crocidura occidentalis* nigeriae (Dollman 1915)
12	Mona Monkey	*Cercopithecus mona* (Screber 1775)
13	Oribi	*Ourebia ourebi*
14	Porcupine	*Hystrcidae sp*
15	Patas Monkey	*Erythrocebus patas*
16	Red Flanked duiker	*Cephalophus rufilatus (Gray 1846)*
17	White Throated monkey	*Cercopithecus erythrogaster (Gray 1866)*
18.	Pale- bellied pangolin	*Manis tricuspis* (Linnaeus 1766)
19.	Oil Palm Squirrel	*Protoxerus strangeri* (Waterhouse 1842)
20.	Nile Rat	*Avicanthes niloticus* (Dasmarest 1822)

Source: Field Survey (2010)

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Table 21: Checklist of Reptiles in Osun Osogbo World Heritage Site

Serial Number	Order	Zoological Name	Common Name	Author
1	CHELONIA	*Pelusios niger*	West African Black Forest Turtle	(Dumeril&Bibron, 1835)
		Kinixys erosa	Serrate Hinge-back tortoise	(Scweiggeer, 1812)
		Pelomedusa subrufa	West African River Turtle	(Schweiggeer, 1812)
		Pelomedusa subrufa	Black Terrapin	
2	CROCODILIA	*Crocodylus niloticus*	Nile Crocodile	(Laurenti, 1766)
3	SQUAMATA(Squria or Lacertilia)	*Vavanus niloticus*	Nile Monitor Lizard	(Linnaeus, 1766)
		Agama agama	Rainbow Lizard	(Linnaeus, 1766)
		Cameleo senegalensis	Senegal cameleon	
		Hemidactylus brooki angulatus	Common House Gecko	(Hallowell, 1852)
		Hemidactylus fasciatus	Banded Gecko	(Gray, 1842)
		Hemidactylus richardsoni	Richard's Gecko	(Gray, 1845)
	OPHIDIA OR SERPENTES			
		Python sebae	Africa Rock Python	(Gmelin, 1788)
		Python regius	Royal Python	(Shaw, 1802)
		Naja melanoleuca	Spitting Black Cobra	(Reinhardt, 1843)
		Bitis gabonica	Garbon Viper	Dumeril&Bibron, 1854
		Dendroaspis viridis	Green tree Mamba	(Hallowell,1844)

Source: Field Survey (2012)

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Table 22: Checklist of some avian species in the Osun Osogbo World Heritage Site

Serial Number	ORDER	ZOOLOGICAL NAME OF REPRESENTATIVE	COMMON NAME
	NON-PASSERINES		
	ACCIPITRIDAE	*Milvus migrans*	Fish eagle
		Buteo anguralis	Red-necked buzzard
		Trigonoceps occipitalis	White-headed Vulture
	PHASIANIDAE	*Numida meleagris*	Guinea fowl
		Francolinus alboquolaris	White–throated Francolin
	PICIDAE	*Dendopicos obsoletus*	Brown-backed woodpecker
		Euplectes orix	Red Bishop
	MUSAPHAGIDAE	*Crinifer piscator*	Grey plantain-eater
		Albissynia roller	
	PASSERINES		
	PYCNONOTIDAE	*Chlorichia flavicollis*	Yellow-throated leaf love
	Turnicidae	*Turnix sylvatica*	Button quail

Source: Field Survey (2012)

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Table 23: Checklist of Fish Species Observed in Osun Osogbo Sacred River

Serial Number	Family	Species	Season
1	CLARIIDAE(Mud)	*Clarias lazera*	Dry/Wet
		Heterobranchus bidorsalis	Wet
	CICHLIDAE (Cichlids)	*Hemichromis fasciatus*	Dry/Wet
		Oreochromis niloticus	Dry/Wet
		Pelmatochromis kingslayae	Wet
		Tilapia mariae	Wet
		Tilapia melanopleura	Wet
		Tilapia zilli	Dry/Wet
	CYPRINDAE (Minnows)	*Barbus ablabes*	Dry
		Barbus callipterus	Dry
		Barbus lepidus	Dry
		Barbus nigeriensis	Dry
		Barbus occidentalis	Dry
	HEPSETIDAE (Africa river Pike)	*Hepsetus odoe*	Wet
	MOCHILIDAE (Upside down Catfish)	*Synodontis batensoda*	Wet
		Synodontis filamentisus	Wet
		Synodontis clarias	Wet
	MORMYRIDAE (Trunck fishes)	*Marcusenius senegalensis*	Dry/Wet
		Mormyrus rume	Wet
	OPHIOCEPHALIDAE (Snake Heads)	*Chana obscura*	Dry/Wet
	SCHILBEDAE (African Glass Fish)	*Schilbe mystus*	Wet

Source: Field survey 2010

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Plate 29: The wonderful beauty of Nature on Mona Monkey

Source: Field Survey (2011)

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4.14: Soil chemical nutrients capacities

The soil pH ranges between 4.2 and 7.2 with a mean pH of 5.7. The organic content of the soil sample on different levels had a range of 14.70 and 32.85 with a mean average of 22.09g/kg. The nitrate of the soil in the different topographical levels ranges from 0.89 and 1.34 with a mean average value of 1.09. The available phosphorus content in the soil at different topographical levels ranges from 11.58 to 29.19 with a mean value of 17.76 ppm. The values obtained from the exchangeable cathions (H+) shown in the Table below. The soil potassium contents at different topographical levels ranges from 0.11 to 0.67 with a mean value 0.34(mol/kg). The sodium content of the soil at the various levels of topography ranges from 1.81and 2.23 with a mean value of 1.92 (g/kg).

The total amounts of calcium concentrations found in the soil samples obtained at different topographical levels, ranges from 0.10 to 23.88 with a mean value of 9.35(mol/kg) and the amount of magnesium contents available at different topographical levels ranges from 1.19 and 3.42 with a mean value of 2.14(mol/kg). The test was used to determine the effect of the topographical levels on the nutrients capacity of the soil from the statistical analysis, it was observed that topography has no significant effect on the soil nutrient capacity at (P= 0.05). However, there is no doubt that the protection measure taken by the management of the site has greatly conserved the natural/cultural biodiversity potentials of the sacred site for better eco-tourism development. The soil analysis of the Osun Osogbo WHS was observed (Table 24).

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Table 24: Fertility/Nutrient Status and pH of Soil at the World Heritage Site

S/N	Vegetation type	Depth (cm)	pH	P mg/kg	O.C g/kg	N g /kg	K mol/kg
1	Dry Forest	0-15	4.5	12.18	14.70	0.89	0.19
2	Savanna Forest	0-15	4.2	11.58	15.12	0.93	0.11
3	Derived Savanna Forest	0-15	6.6	22.87	36.00	1.34	1.38
4	Riparian Forest	0-15	6.9	12.98	32.85	1.21	1.36
5	Diospyros Mespliformis Forest	0-15	7.2	29.19	26.46	1.06	0.67

Source: Field Survey (2010)

4.15: Water Survey

The Bacteriological examination survey of the sacred river water was carried out in ten different scarifications points to determine the epidemiological prevalence of the pathogenic organisms associated with water borne diseases in the study area. A total of forty samples were collected for laboratory analysis. The prevalence of the bacteria during the dry and wet seasons examined and the percentage of the isolated pathogenic organism was determined. The analysis of water observed was shown in Tables 25 to 35 simultaneously.

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Table 25: Prevalence of Bacteria during the Dry Season

Sample site	Average pH	Coliform count ($x10^4$ cfu)	Vibro count ($x10^4$ cfu)	Total bacteria count($x10^4$cfu)
Ojubo	8.50	02	16	50
Suspended Bridge	6.0	02	15	53
Ibusan	7.12	04	09	15
Olomo Wewe	7.90	02	18	50
Lakokan	7.60	04	Ng	15
Alakisa	8.00	01	30	30
Oju-Iwe	8.62	02	19	70
Osogbo	7.20	02	10	50
Ajigun	6.75	10	02	35
Elegbaa	6.80	10	04	40

Source: Field Sample (2011)

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Table 26: Prevalence of Bacteria during the Rainy Season.

Sample Site	Average pH	Coliform count ($x10^4$cfu)	Vibro Count ($x10^4$cfu)	Total bacteria count ($x10^4$cfu)
Ojubo	6.21	04	10	32
Suspended Bridge	8.20	NG	08	25
Ibusan	7.82	02	04	15
Olomo Wewe	8.50	01	12	25
Lakokan	6.70	02	NG	15
Alakisa	8.20	04	04	10
Oju-Iwe	9.00	NG	07	30
Osogbo	7.20	NG	05	40
Ajigun	8.00	05	NG	23
Elegbaa	7.20	15	NG	20

Source: Field Sample (2011)

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Table 27: Chemical analysis of water in the dry and rainy seasons.

Sample Site	pH		Total Hardness		Chloride ion		Total dissolved Solids		Total alkalinity	
	A	B	A	B	A	B	A	B	A	B
Ojubo	8.5	6.21	220	220	8.00	7.00	.0044	.0077	40	40
Suspended Bridge	6.0	8.20	140	200	8.20	7.00	.0016	.0087	40	40
Ibusan	7.12	7.82	420	220	7.00	8.00	.0087	.0088	40	30
Olomo-Wewe	7.90	8.50	280	200	5.50	6.00	.0070	.0082	66	40
Lakokan	7.60	6.70	260	240	7.00	7.20	.0035	.0046	40	50
Alakisa	8.00	8.20	140	140	5.00	5.00	.0145	.0067	40	40
Oju-Iwe	8.62	9.00	200	140	4.00	5.20	.0144	.0200	50	50
Osogbo	7.20	7.20	240	200	5.00	6.20	.124	.0144	40	60
Ajigun	6.75	8.00	240	240	4.50	4.40	.1816	.2000	40	70
Elegbaa	6.80	7.20	260	200	4.50	6.20	.0126	.0200	40	40

Source: Field Survey (2011)

A = Dry Season

B = rainy Season.

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Table 28: Morphology and biochemical characteristics of Isolates.

Morphology	V.P	Grams reaction	Iodole test	LAC	GLU	MAN	SUC	CAT	COA	CIT	M.R	ISOLATE
Organism are pinkish, flat ,round and dry	A	A	+	_	_	A	-	+	+	-	A	Eschericial coli
Organisms are raised mucoid, colourless, circular with smooth edge	-	A	-	+	+	+	A	-	+	+	-	Staphylococcus
Colourless Colony with dark spot raised, mucoid circular	+	+	+	A	-	-	+	-	+	-	-	Salmonelia sp
Colourless colony raised, mucoid and circular	-	-	-	A	+	+	A	+	-	-	+	Shigella sp
Large, smooth, elevated and yellowish colonies circular rand dry	-	-	-	A	A	-	-	-	+	-	+	Vibro cholera

Source: Field Survey (2011)
KEY: A = Acid no gas; + = positive; - = Negative

LAC: Lactose; GLU: Glucose

MAN: Mannitol

SUC: Sucrose

CAT: Catalase

COA: Coagulase

CIT: Citrate

M-R: Methyl Red

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Table 29: Prevalence of Microorganisms Isolated in the WHS.

Organism	No of Isolates ($x10^4$cfu)		Prevalence (%)	
	A	B	A	B
E. coli	12	6	30	21.42
Salmonella sp.	8	5	20	17.85
Vibrio cholera	10	5	25	17.85
Shigella sp.	4	2	10	7.14
Staphylococcus sp.	6	5	15	17.85
Total	40	23	100	100

Source: Field Survey (2011)

A = Dry season

B = Rainy season

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Table 30: Some physical properties of Osun Osogbo Sacred Water Samples within the Site during sampling study.

	Ojubo Osun		Ibusan Osun		Suspended Bridge	
Physical parameter	Dry	Wet	Dry	Wet	Dry	Wet
Ambient Air Temperature (^{0}C)	35.5	30	34	30	34.5	30.5
Water Temperature (^{0}C)*	27	25.5	27.5	25	26.5	25
Water Colour	Light Brown	Yellowish Brown	Yellowish Brown	Dark Brown	Light Brown	Yellowish Brown
Water Depth (m)	1	4.5	2.5	5.1	2.3	4
Conductivity (mol/cm)*	112	158	114.5	164	120	165
Suspended solids (mg/l)*	89	140	92	145	95	133.5
Dissolved Solid (mg/l)*	49	60	60	62	54	65
Total Solid (mg/l)*	138	200	152	207	149	198.5

Source: Field Survey (2011)

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Table 31: Some Chemical analysis of water Samples collected from the portion of Osun Osogbo Sacred River during the Sampling study.

	Ojubo Osun		Ibusan Osun		Suspended Bridge		Lakokan Osun	
Chemical Parameters*	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
P^H	7.8	6.75	7.65	6.45	7.85	6.55	7.6	6.78
Alkalinity (mg/l)	53	34	54	31	57	30.1	53	33.2
Acidity (mg/l)	1.7	2.3	1.5	2	1	2.2	1.2	3.1
Organic matter (mg/l)	1.22	2.19	1.46	2.69	1.73	1.46	1.22	2.92
Dissolved Oxygen (mg/l)	5.8	5.4	5.8	6.3	5.8	6.2	6.6	6
Biochemical Oxygen Demand (mg/l)	1	2	1	2.2	0.6	1.8	1.4	1.8

Source: Field Survey (2011)

*Mean for surface and bottom samples.

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Table 32: Concentration (mg/l) of some ionic components assayed in the Osun Osogbo Sacred River during the Sampling.

	Ojubo Osun		Osun Ibusan		Suspended Bridge		Osun Lakokan	
Ionic Composition* (mg/l)	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
CATIONS	35.5	30	34	30	34.5	30.5	35.5	30.5
Sodium	5.3	8.8	3.65	5.65	4.4	6.85	3.42	34.33
Potassium	3.35	4.5	1.8	3	2	4.14	1.5	4.11
Calcium	1.59	1.48	1.26	1.47	1.45	1.76	1.59	1.82
Magnesium	7.39	8,18	6.41	8.1	6.72	9.32	6.05	3.33
ANIONS						132.5	97	152.5
Carbonate	31.8	45	32.4	41.05	32.4	42.5	31.8	47.1
Bicarbonate	64.65	51.2	64.6	56.1	69.5	49.35	64.6	53.4
Nitrate	0.3	0.39	0.21	0.8	0.11	0.98	0.31	0.89
Phosphate	2	4.1	1.5	3.9	1.3	4.8	1.7	4
Chloride	1.6	3	2.5	1.9	2.5	2.7	2.5	2.88

Source: Field Survey (2011)

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Table 33: NAFDAC packaged of water microbiological examination.

S/N	PARAMETER/UNIT	STANDARD
1	Aerobic Mesophilic Cont cfu/ml	100
2	Aerobic Mesophilic Count/ml	1 max
3	Total Coliform MPN/100ml	Nil
4	E. Coli, MPN/100ml	Nil
5	Pseudomonas/ml	Nil

Source: NAFDAC (2006)

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Table 34: Recommended Water Quality Standard for Fish Production

Parameter	Recommended Level	Sources
P^H	6.5-8.5, 6.5 -9.0	Pescod, 1977; Boyd, 1981, Ayodele and Ajani,1999; Olukunle, 2000;
Dissolved Oxygen	>2mg/l, >5mg/l	Pescod, 1977; Boyd, 1981; Ayodele and Ajani, 1999
Turbidity	30 -60 cm	Ayodele and Ajani, 2000
Temperature	21^0 c -32^0 c, 25^0c - 30^0c	Ayodele and Ajani, 1999; Olukunle, 2000
Co_2	<12mg/l, 5 -10mg/l	Pescod, 1977; Boyd, 1981
NH_3	0.6 -2mg/l, <1mg/l	Boyd, 1981; Pescod, 1977
Nitrate	0.01 -0.04	Pescod, 1977; Ajani, 2000
Dissolved Solids	< 1000mg/l	Pescod, 1977
Nitrite	< 0.05	Boyd, 1981

Source: NAFDAC (2006)

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Table 35: NAFDAC packaged of water quality standard physiochemical examination.

Serial number	Parameter/Unit	WHO Standard
1	Colour Hazen Units	15
2	P^{H} 20^{c}	7.0 – 8.5
3	Conductivity	-
4	Turbidity, NTU	5
5	Total Solids, mg/l	500
6	Total Suspended Solids, mg/l	-
7	Total Dissolved Solids, mg/l	500
8	Total Hardness, mg/l	100
9	Sulphate, mg/l	200
10	Total Alkalinity, mg/l	100
11	Chloride, mg/l	200
12	Residual Chlorine	0.3
13	Nitrate, mg/l	50
14	Nitrite, mg/l	3
15	Phosphate, mg/l	-
16	Calcium, mg/l	75
17	Magnesium, mg/l	30
18	Iron, mg/l	0.3
19	Lead, mg/l	0.01
20	Manganese, mg/l	0.5
21	Copper, mg/l	2.0

Source: NAFDAC (2006)

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4.16: The effect of age group, distribution of respondents profession, and marital status

As presented in table respondents were under the age group 10 to 20 years of age, 38 were between 21 and 30 years of age, 20 were in the age group of 31 to 40 years old, 15 were in 41 and 50 years while the remaining 6 respondents were under the age group 51 and 60 years old. Out of the 53 respondents in the age bracket of 10-20 years, 54.71% engaged in visitation to the World Heritage Site while 45.29% did not. Within the age bracket of 21-40 years, 65.51% engaged in World Heritage Site visitation while the remaining 44.49% did not. For the age bracket between 41 to 60 years, 95.23% engaged in WHS visitation while 4.77% did not. Overall 55.06% or 87 respondents engaged in World Heritage Site visitation while the remaining 49.04% or 43 respondents did not take part in site visitation.

The highest number of those that engaged in Site visitation fall within the age bracket of 10 to 20 years followed by age group 21 to 30, 31-40 and 41-50 years of age respectively. The reasons for the respondents not engaged in Site visitation were not given. As shown in table 2, 52.5% of the male respondents engaged in visitation to the Site while the remaining 47.5% did not engage in Site visitation. Out of the 83 respondents who were male 53 or 63.85% engaged in visitation to the Site while 30 or 46.15% did not. The chi-square analysis of the data in the table indicates that gender has no significant effect on World Heritage Site visitation ($p < 0.05$).

When the rate of visitation to the site was assessed during the study it was indicated that 104 or 65.82% out of the 158 respondents engaged in site visitation while 54 or 34.18% of them did not at all. This can be observed in fig 6 to 8 respectively.

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As shown the highest number of respondents 59 or 64.83% out of the 91 attained tertiary education level engaged in visitation to the Site, followed by 34 or 61.81% of the 55 respondents who received secondary educational level while lowest 12 or 2.02% were exposed to primary level of education

In the outline of the above 39.87% or 63 who were unemployed have the highest percentage distribution of respondents to the site while least percentage distribution of respondents are teachers. Out of the 54 or 34.17% of the respondents who were civil servants 37 of them took part in visitation to the WHS while the rest did not. It was observed that 13.29% or 16 of the business-men engaged in visitation; while others did not. On visitation to the Site, a moderate percentage of 6.96% was recorded in respect of the herbalists as shown in table while the least percent of 5.69% of respondents accounts for the teaching profession.

The statistical test of the data using Chi-square procedure indicated that profession has no significant different on visitation to the World heritage site at $P > 0.05$. It was revealed that 54.43% of the single respondents had the highest percentage value, followed by the married with 43.03% and the least 2.53% was recorded for the divorced. The statistical test of the data using Chi-square analysis procedure indicated that willingness to visitation to the World heritage site has no significant effect on the marital status (at $P > 0.05$).

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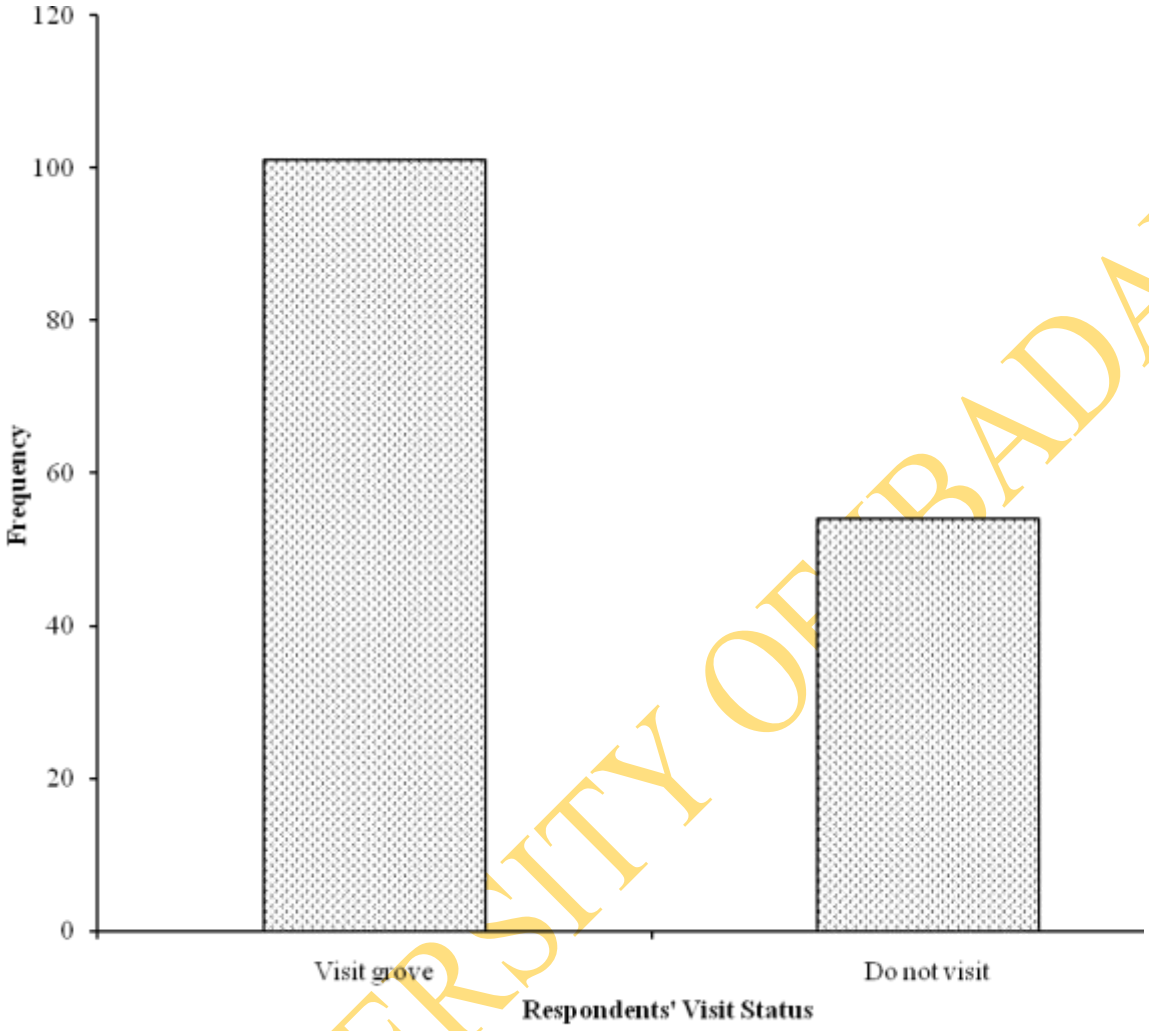

Fig 6 Frequency distribution of respondents visit World Heritage Site and otherwise

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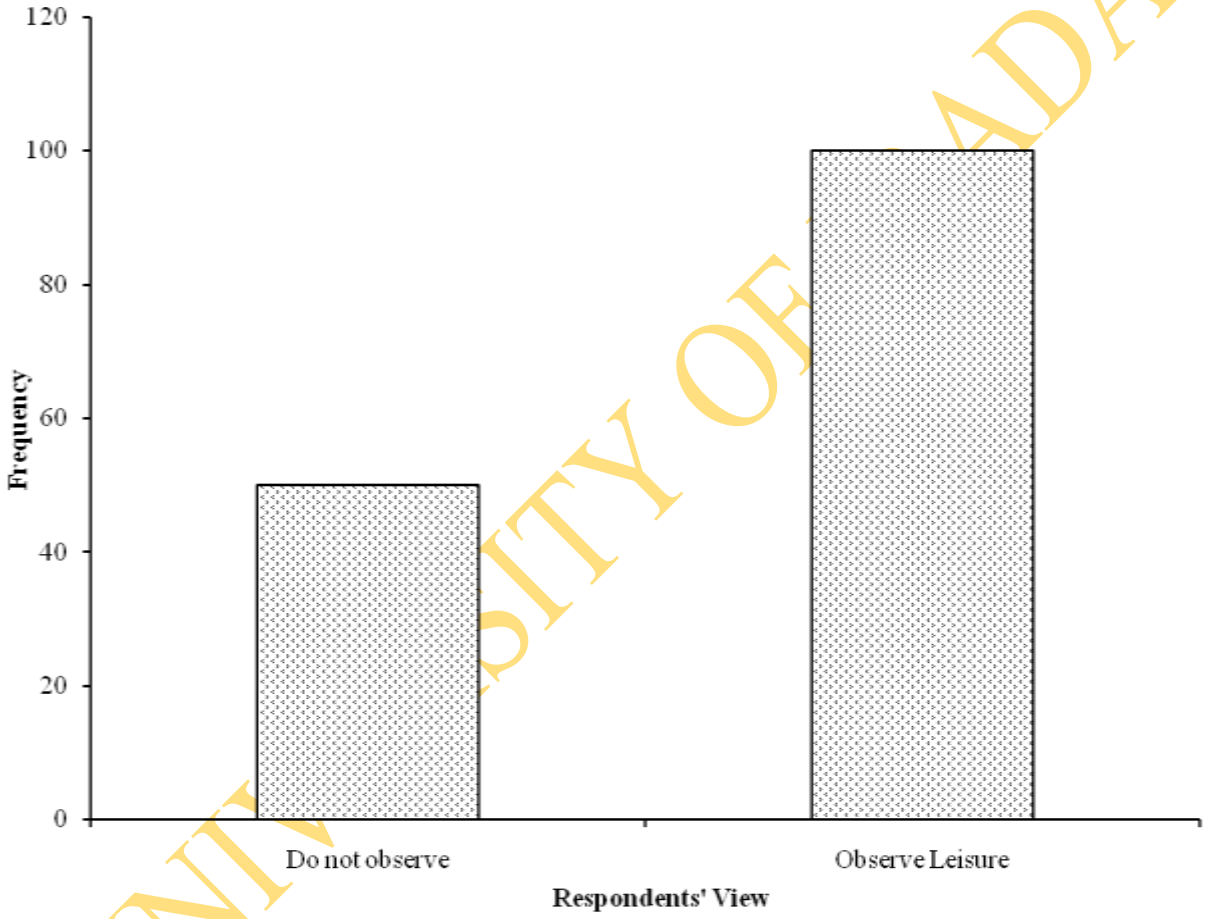

Fig 7 : Frequency distribution of respondents' view as to whether they observe leisure or not

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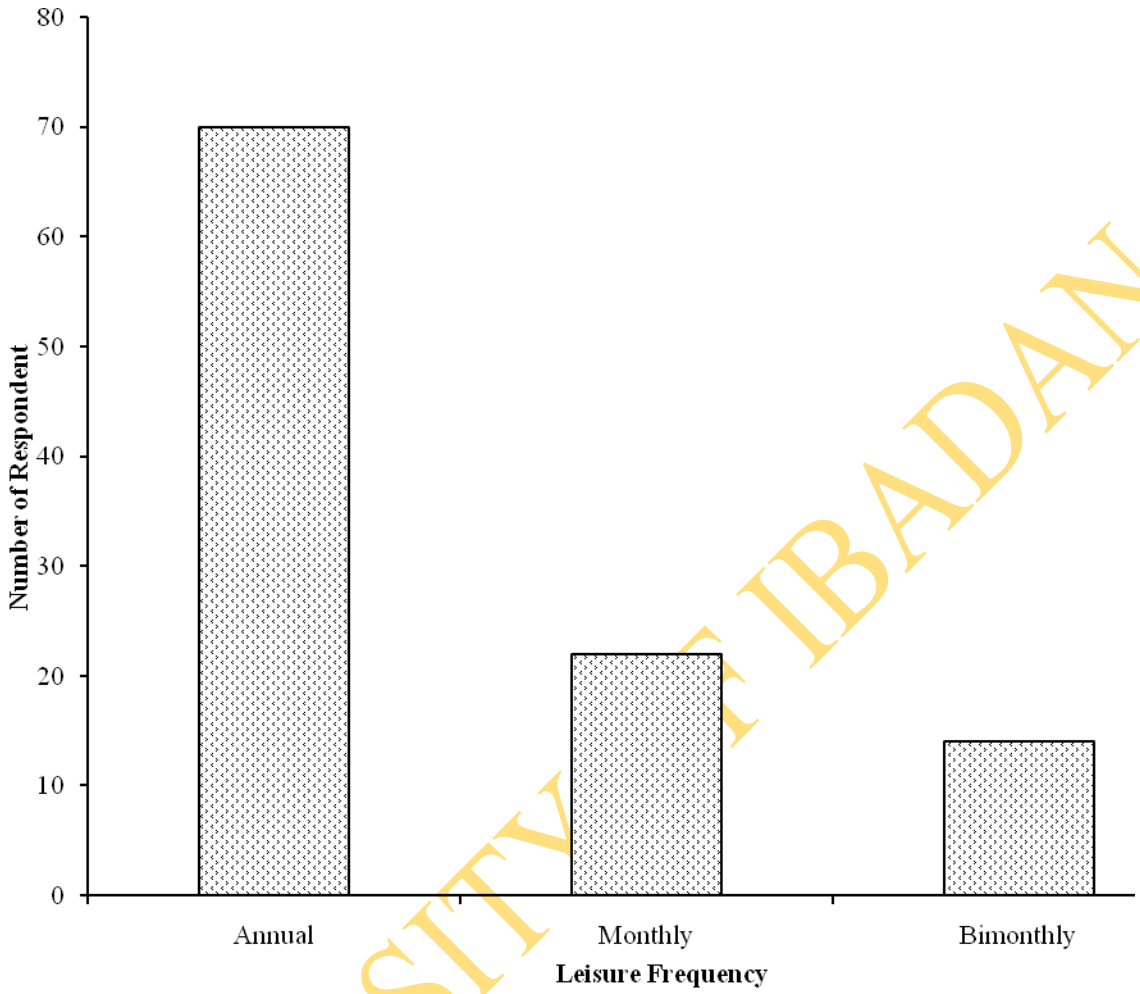

Fig 8 : Distribution of frequency of leisure of respondents in World Heritage Site

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4.17: Awareness of the existence of World Heritage Site

The effect of respondents' nativities was observed during the survey. It was indicated in the above that non native respondents had the highest percentage of 50.63%. 70% or 56 out of the number 80 were shown to have engaged in visitation of the World Heritage Site while 30% did not. Overall, it was shown that 103 or 65.18% of the respondents were those that engaged in visitation to the Site while 55 or 34.81% of the respondents did not. The statistical test of data in table using Chi-square analysis procedure indicated that respondents' nativities have no significant effect on visitation of the World Heritage Site (at $P > 0.05$).

The level of public awareness about the significance of the Site was observed during the study. This shows that the respondents are significantly aware of the existence of the WHS. 139 of the respondents or 87.97% were duly aware of the Site significance while the least percentage of 12.02% respondents accounts for un- awareness of the Site.

As presented out of the 83 male respondents 73 or 87.95% of them aware of and engaged in visitation to the Site while 10 or 12.04% of the respondents were neither aware of nor engaged in visitation to the Site. Overall, 139 or 87.97% of the respondents were well aware and engaged in visitation while 19 or 12.02% were not aware nor engaged in visitation to the Site. The highest percentage of awareness/visitation to the WHS was observed in male respondents while the least percentage of unawareness and therefore no visitation to the Site reflect in female respondents. The chi-square analysis revealed that awareness was significantly different to the site visitation of Osun Osogbo World Heritage Site as shown during the study. This is shown in

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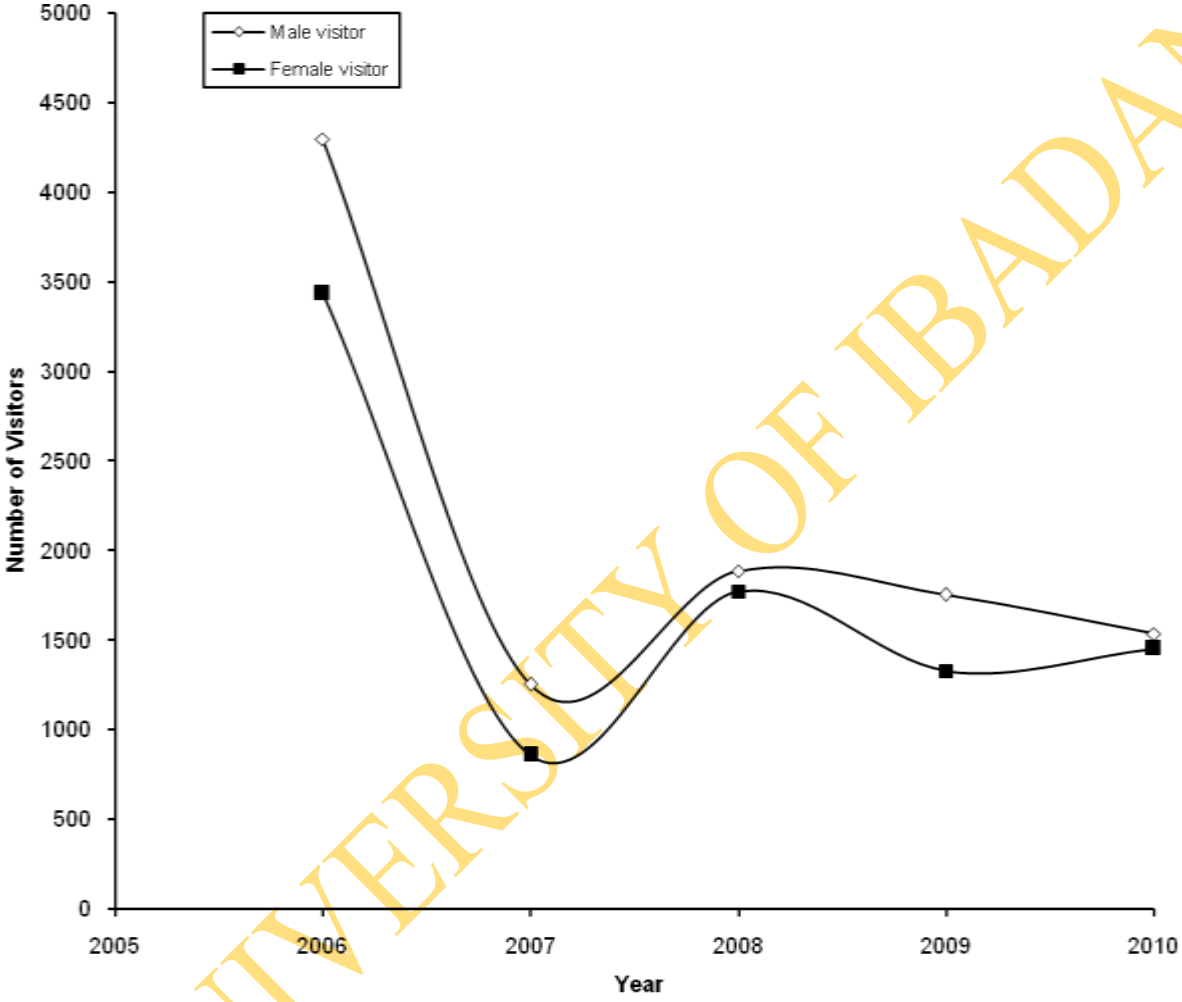

Fig 9 : **Number of male and female visitors to the grove between 2006 and 2010**

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4.18: Visitation of respondents

The ecotourism potentials' of the Osun Osogbo World heritage Site was observed during the study. This was investigated to determine the turnout of visitors that patronized the site during the annual pilgrimage and outside/after the yearly event of pilgrimage.

The total number of tourists that visited the Osun Osogbo World heritage site during the survey was recorded. The number of visitors in year 2000 (4,488) increased gradually until it came to a peak (8,150) in 2005 the year of enlistment. There after the number began to fall from 7,735 in year 2006 to 3,356 in year 2010. This shows the actual trends of tourists visitation to the grove outside of annual pilgrimage period

Also, the total number of tourists that visited the Osun Osogbo WHS during annual pilgrimage was recorded in the course of study. The number of visitors who visited the grove during annual pilgrimage increased progressively since the year of enlistment of the Grove to World Heritage Site from 42, 500 to maxima level of 63, 500 in the year 2010; having a moderate fall in the year 2007 and 2008. Though, the turnout was a bit fair of right from the year 2000 but very impressive immediately after the enlistment.

The tourist visitation during annual pilgrimage period was observed during the study, it was revealed that the highest number of tourists had been on positive progressive line since the year of enlistment of the site. The ecotourism potentials' relating to the revenue generated between the period of study revealed positive significance difference within the year investigated in the course of study as evidence in fig 10 to 12 below.

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The arrests of offences and penalties attached to the offences committed within the Site were review during the survey. As indicated the highest number of offences (9) recorded in the Osun Osogbo World heritage Site is illegal fishing. The illegal fishermen and bamboo fellers were cautioned and discharged while the illegal tree felling offenders were convicted.

The percentage estimation of management strategies adopted to reduce negative human activities around the buffer zone of the Site was observed during the survey. It was observed that 50% conservation education to the Osun osogbo World heritage Site has the highest value, followed by the 20% of effective patrol of the total landmass of the site and 20% for job creation for the local communities surrounding the Site found to be moderate while the least percentage 10% was recorded for the involvement of the local communities stakeholders in management decision taken.

The result shows that the frequency distribution of activities of the respondents around the site boundary. The most frequent activities along the boundary area of the Osun osogbo World heritage site is farming (37.34%); followed by the collection of fire wood and medicinal plants 20.88%; followed by the 17.08% on grazing; 9.49% was recorded for hunting within the site while the least percentage 6.32% was on fishing activity. The statistical test of data using Chi-Square procedure indicated that there is no significant different on the activities of the people around the World Heritage Site (at $P > 0.05$).

The respondents' perception of the tourism potentials of the Osun Osogbo World Heritage Site was studied. It was observed in table 15, that 30.38% are in appreciable potential levels and

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have of the highest grading, followed by the 23.42% in the manageable potential level as moderate grading and (l9.49%) of no- appreciable level of tourism potential was recorded as the least grading. It was observed that some respondents (18.98%) did not grade the tourism potential levels of the Site at all, while 17.72% of respondents ranked the potential levels of the Site as poor.

The logistic regression model of respondents' visitation to the OOWHS was indicated based on willingness to join in the management of the Site. It was found that there was a strong significantly different of respondents willingness to join hands with the management at $p = 0.008$ as shown in table 16. (P-level value determine the significant of hypothesis (at $p < 0.05$))

The influence of logistic regression procedure on variables such as nativity, awareness and observed leisure period towards willingness in joining the management of the Site was found to be significant on awareness variable at $p < 0.05$. P=0.021 alone; this shows that the test is significantly positive on the willingness of the respondents in join the management. Considering the influence of nativity, awareness and observing leisure period on the willingness to join in the management of the World Heritage Site, it was observed from the logistic regression that nativity has nothing to do with willingness in joining the Site management (at $p > 0.05$ P – level equal .466 greater than $P > 0.05$). Also observed from the model table is that awareness has a greater influence than nativity and observed leisure variables on the willingness towards joining the management of the Site as evidence from the p-level value of .021(at $p < 0.05$) while observation on the effect of leisure period is another variable on the willingness towards the management of the Site as evidence by the P – level value of .021.

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The significant effect of leisure period is another variable considered in the logistic model shows at $p > 0.05$. This evidence revealed that the value has nothing to do with the willingness towards joining the management of the Site. With a P –level value of 0.717, it is glaring that the variable has nothing to do with the willingness to join in management of the Site by the respondents.

The result reveals the relative density of the floral species sampled within the Grove during the study. It was recorded that *Cola milleni* has the highest number of frequency and relative density, followed by the *Funtumia elastic, Dalium guinensis, Celtic zenkeri, Baphia nitida, Ritchia capparoides and Lecanoidiscus cupanoides* all found within the moderate dominant levels while least found species are *Antaris africana, Anthocleista dyalonensis Eliastic nilentic and milicia excelsia.* It is evidence that *Cola millen*i stands out as the main dominant floral species sampled during the study.

In the course of the study, the vegetation of the floral species was sampled and it was observed that the floral species are many apart from those in the sample plots. This floral species are found mostly in the dry high forest, savanna forest and riparian forest vegetation types of the Site as shown. Also, the faunal species of the Site was observed during the survey. It was observed that some notable animal species are still in existence within the Site. The soil nutrients analysis of the Site was carried out during the survey. It was recorded that the soil nutrients are

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acidic. The test of effect of the topographical levels on the soil nutrients capacity revealed no significant different as observed (at $P > 0.05$).

The bacteria examination of the sacred river water survey of the Site was observed in the course of study. This was carried out to determine the prevalence of the pathogenic organisms associated with water borne diseases in the study area. It was observed that the sacred river water contains some microorganisms' bacteria when subjected to laboratory isolation test. Observation shows that the prevalence of *Escherichia coli (21.42%), Salmonella (17.85%), Vibrio cholera (17.85%), Shigella (7.14%)* and *Staphylococcus (17.85%)* species are in association with the river water. Despite this, the communities still make use of the river water for their sacrifices because of mystic believe attached to the Osun Osogbo river goddess as evidence. The survey analysis of the sacred river water carried out shows that the river water contaminated with pathogenic microorganisms of different forms and strongly not recommended for drinking and any other forms of utilization.

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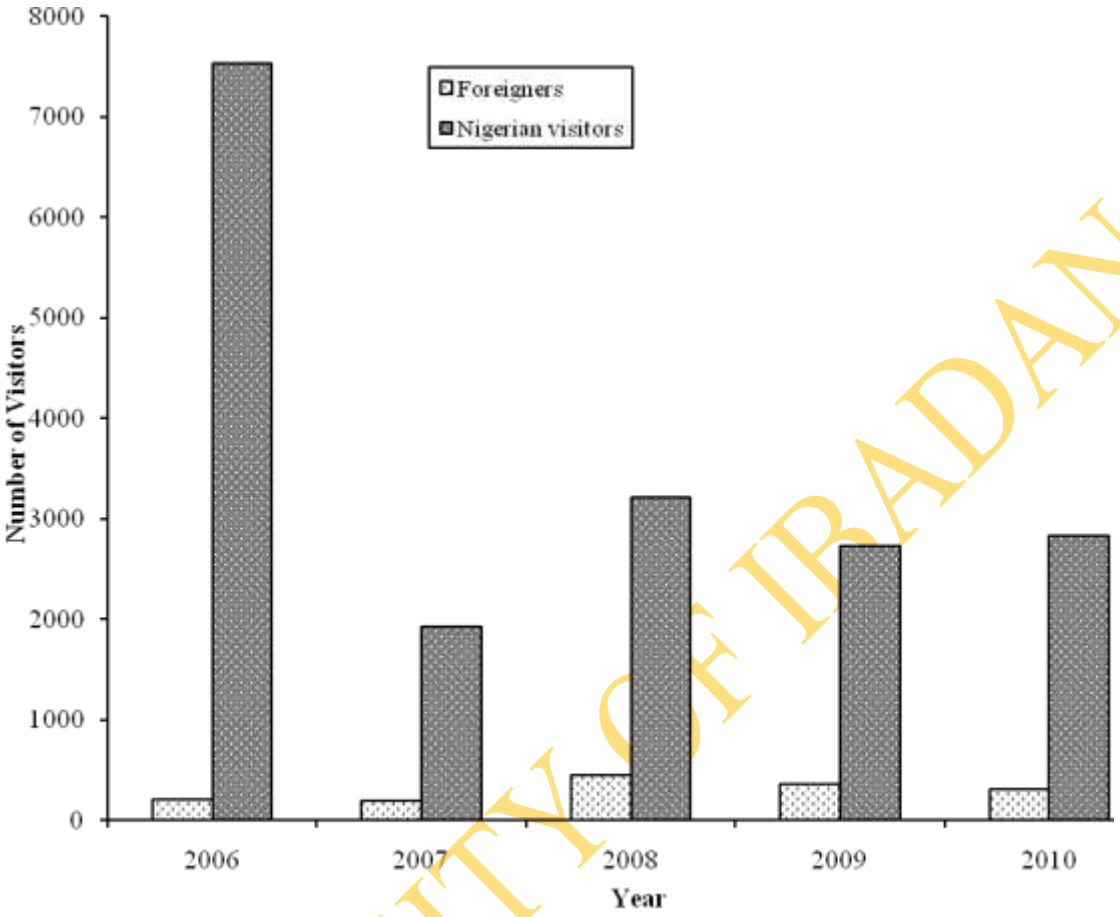

Fig 10 : Number of foreigners versus nigerian visitors to the sacred grove between 2006 and 2010

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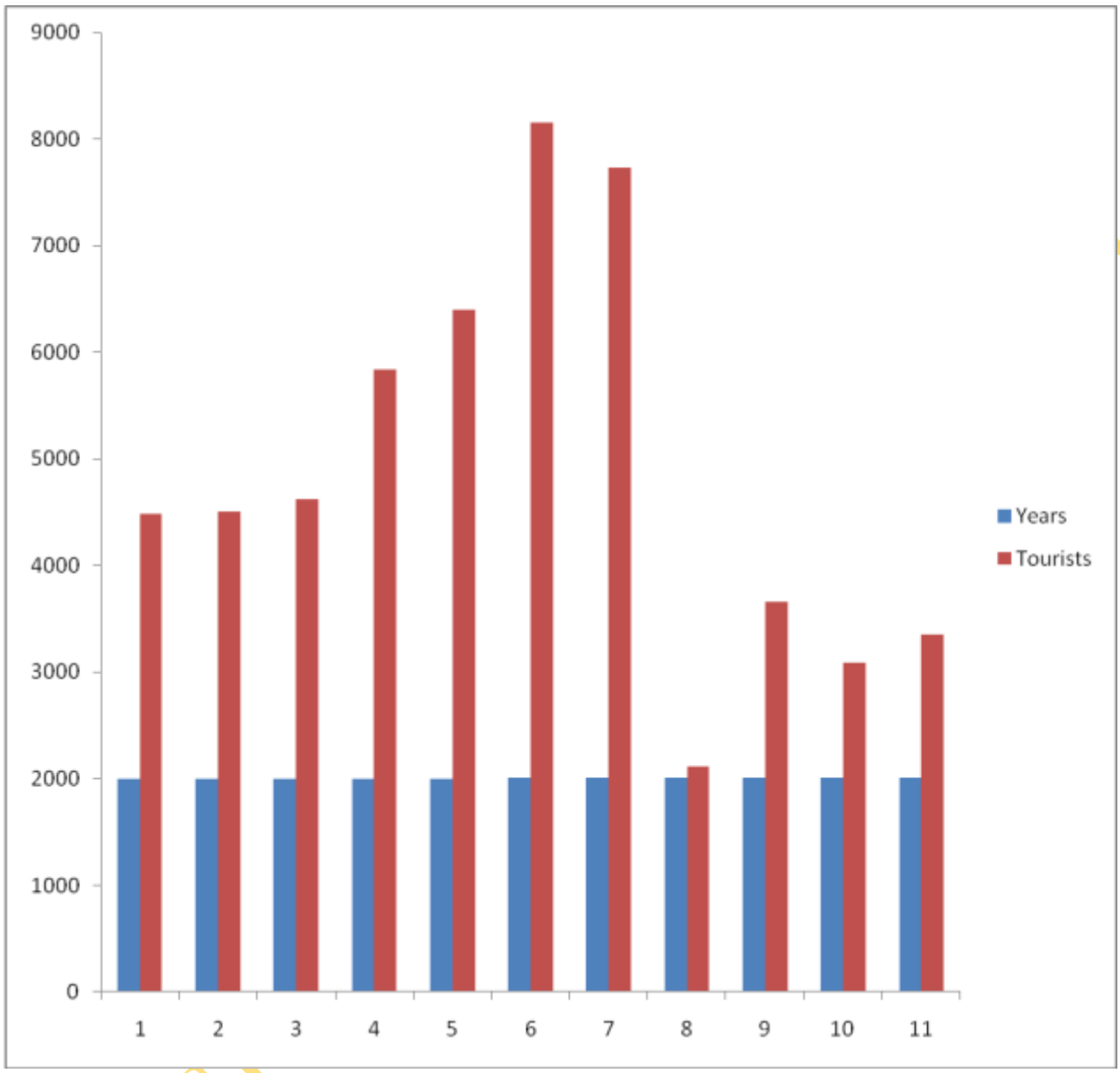

Fig.11: Tourist Visitation to Osun Osogbo World Heritage Site outside annual pilgrimage (2000-2010).

Source: Field survey 2011

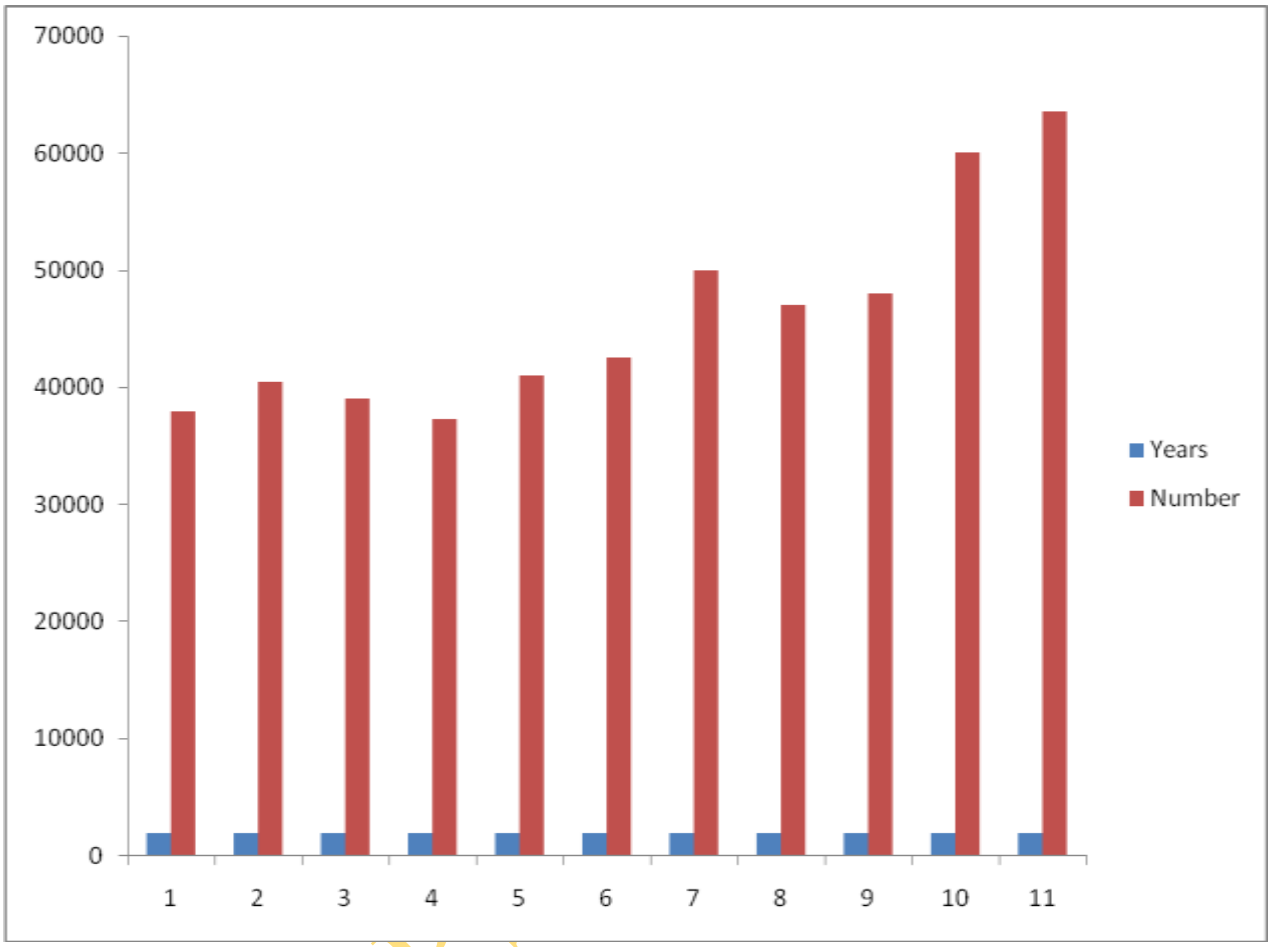

Fig.12: The rate of tourists visitation to Osun Osogbo World Heritage Site during the annual pilgrimage (2000-2010).

Source: Field survey 2011

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4.19: Statistical analysis

Analysis of variance (ANOVA) was used to test whether there is significant different in mean of the respondents visitation status to the site. It was discovered that a reasonable number (107) of respondents made visit to the grove while those that do not made visit to the grove were in average number (51). It was observed that there is a significant different in the number of tourists visitation status between those that visit and those that do not $P < 0.05$.

The respondents views as regards observing leisure or do not was undertaken during the study. It was discovered that the number of respondents that do observe leiture is significantly higher than those that do not $P < 0.05$. The percentage number of respondents observing their leisure time shows a higher significant different on annual period compare to those of monthly and bimonthly Visitors. On the average the general overview of the graph revealed highest number of visitors to the grove in 2006 but it was significantly reduce in 2007. The reasons may not be far from the facts that the government of that time paid little attension to the activities of the site and much concern were not obtained from the local tourists.

However, in 2008 there was reasonable growth in the number of tourists (both male and female) that visited the site during the period, the reason may not be far from the fact that there was better organization, attention and developmental oriented activities at the site. Since, 2008 till 2010 there have been almost a stable number of visitors to the site. Hence, a significant different in male visitors compare to the female $P < 0.05$.

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Analysis of variance was used to test whether there is significant different in mean between the local and foreign tourists to the sacred grove in the year 2006 and 2010. It was discovered that there is a significant different in number of tourists between the years $P < 0.05$. The significant different was reasonably observed in year 2006. However, an observable growth in the number of tourists patronage both foreign (800) and local (3500) was significantly noticed. The reason may not be far from the fact that of promotion of culture and tourism industry in the state.

The test of mean of the significant different on the respondents assessment of the management status of the grove shows that adequate management assessment status had a reasonable significant different compare to those rated it to be inadequate $P< 0.05$.

Analysis of variance used to test the mean differences on possible suggestions on how better the site can be managed was revealed. It was discovered that there is a significant different on general renovation of the attraction features of the site towards enhancing tourism potentials. However, respondents views on road construction and conservation education were also auggested to be of significant effect on tourism management of the site for better improvement $P < 0.05$.

The test of mean of significant different in the number of visitors to the site between the year 2000 -2010 was revealed. It was discovered that there is a significant different in the turnout of visitors to the site between year 2002 -2007 the reason may not be far from the fact that much

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attention and publicity was to the site because of it enlistment as a world class heritage site at those period. The significant different shows a polygonal distribution curve $P < 0.05$.

Observation on the tourist's visitation to the site during the annual pilgrimage festival and outside it was study. The statistical analysis on the test of mean on the tourists visitation to the site outside annual pilgrimage festival shows a normal distribution curve. Hence, the significant different was observed to be positive $P < 0.05$. In addition, the distribution level of significant on the rate of tourist's visitation during the annual pilgrimage festival (2000 -2010) shows a positive distribution of ogive curve. This shows that there is a significant different.

Statistical analysis observed on the internally generated revenue from the foreign tourists to the site within the year 2006 -2011 shows a significant different $P < 0.05$. The test of mean of significance revealed a normal distribution curve a evident of positive appearance of the tourists to the site. However, a reasonable increase in revenue generated in the year 2008 as compare to others duely represented in the graph.In addition, the test of means of significa nce on the internally generated revenue from Nigerian tourists between the year 2006 -2011was revealed. It was discovered that there is a significant different on the generated revenue under the year of review. This can be seen with the Ogive curve distribution pattern of statistical analysis $P < 0.05$.

The test of means of significance on the yearly revenue generated from both Nigerian based and foreign based tourists was statistical revealed. It was discovered that there is a high significant dfferent on the revenue generated yearly from the foreign based tourists compared to the Nigerian based tourists. The reason may not be far from the fact that Nigerian was not much

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incusitive on patronage of nature – cultural tourism site as compared to the foreigners. The distribution curve shows a normal test of significance effects on the revenue generated yearly from the tourists.

4.20: Vegetation and Soil Survey

The results analysis of this research has shown that there are substantial opportunities of natural value in the protection and development of the site (Osun-Osogbo Sacred Grove) for the purpose for which it was established. The Analysis of Variance on the vegetation survey to the site reflected a positive effect on the basal area and volumes of the tree samplings during the study. This is shown in figures 13 to 15 below.

The vegetation covers in the grove which could be described as high density of tropical rain forest not only provide a cool, quiet and calm environment for the visitors but also performs the vital role of water shed, gene pool, and stream system preservation. The absolute density of the woody flora species was found to be 488 trees/ha. Out of the 35 floral species encountered during the sampling procedure test, *Cola milleni* was observed to be of highest density ratio 18.71/ha.

The result of the soil chemical nutrients analysis indicated that the soil of the grove is generally acidic containing low nutrient reserves 4.2-6.9. This agrees perfectly with Ogunkunle (1995) who declared that Nigerian soils are principally dominated by low acidity of clay soils because of other limitation included such as acidity and aluminum toxicity, low nutrient reserves, nutrient imbalances and multiple nutrient deficiencies (see appendix). The statistical analysis of

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the result obtained in the chemical nutrients of soil samples indicated that topography has no significant effect on soil nutrient capacity. The farming communities around the site are of the view that the serene tropical luxuriant rain forest should give way to agricultural cultivation and practices. They also think that the trees should be exploited for commercial purposes. This is evident in the illegal felling of commercial trees, illegal grazing and farming. If these illegal activities are allowed to continue, the result would impact negatively on the ecosystem. Consequently, there may be no alternative to jettisoning the area as a protected reserve.

Analysis of Variance for Vegetation Survey

Variable	Degree of freedom df	MS	F	P-value
Diameter at Breast Height (DBH)				
Ecological Zones	2	2585.28	6.2479	0.0022
Error	262	413.79		
Basal Area (BA)				
Ecological Zones	2	9.7821	2.2283	0.1097
Error	262	4.3900		

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Sample Volume (SV)				
Ecological Zones	2	13.2066	5.450884	0.0048
Error	262	2.422836		

Analysis of variance (ANOVA) was used to compare the mean of the ecological zones sample in Osun Osogbo World Heritage Site.

The results indicated significance difference at $P < 0.05$ in (DBH) and (SV) while significant different at $P > 0.05$was recorded in (BA)

Summary

Effect	Mean values of variables		
	DBH (cm)	BA (m^2)	SV(m^3)
Ecological Zones			
Dry High Forest	22.42 a		0.92 a
Derived Savannah Forest	20.47 a		0.41 b

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Riparian Forest	4.64 b	0.13 b

Source: Field Survey (2011)

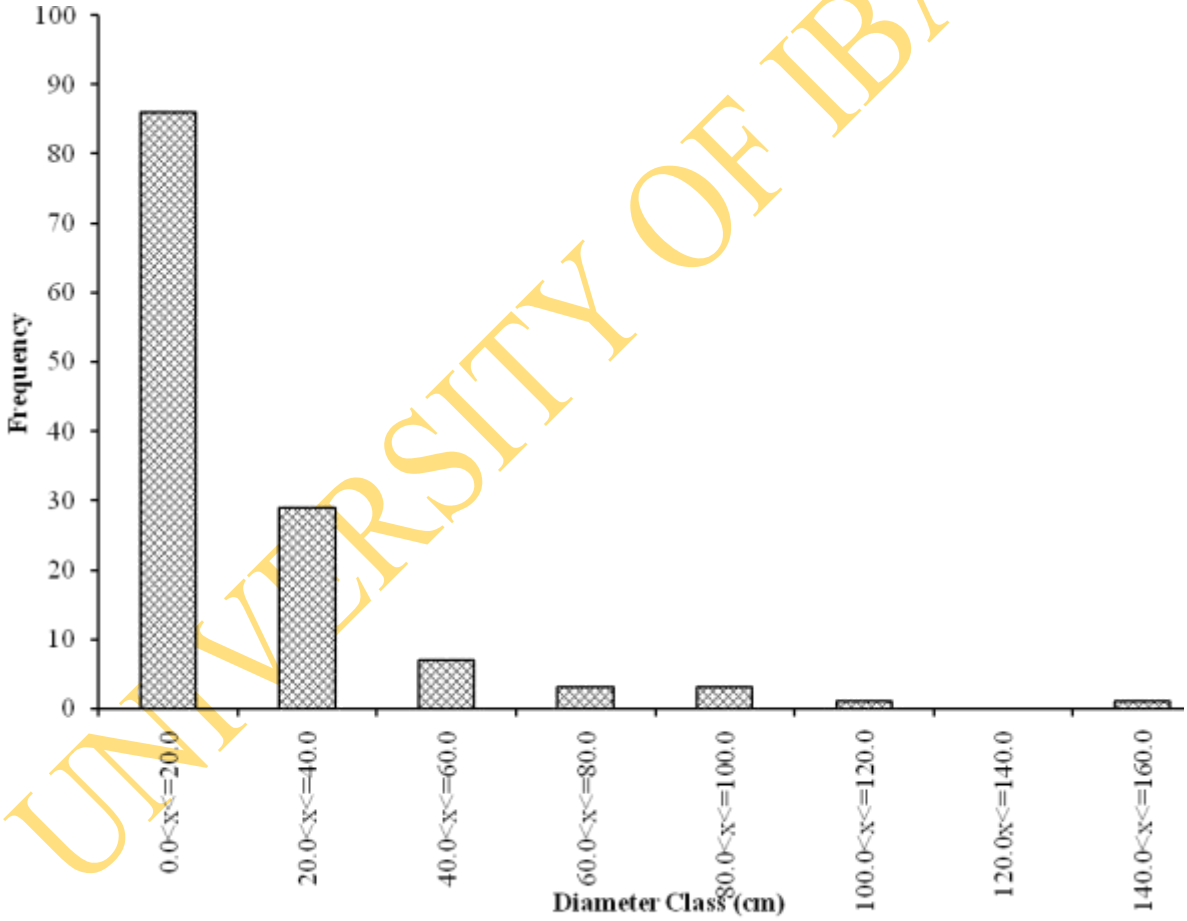

Fig 13 : Frequency distribution of diameter of trees in the dry high forest zone of the study area.

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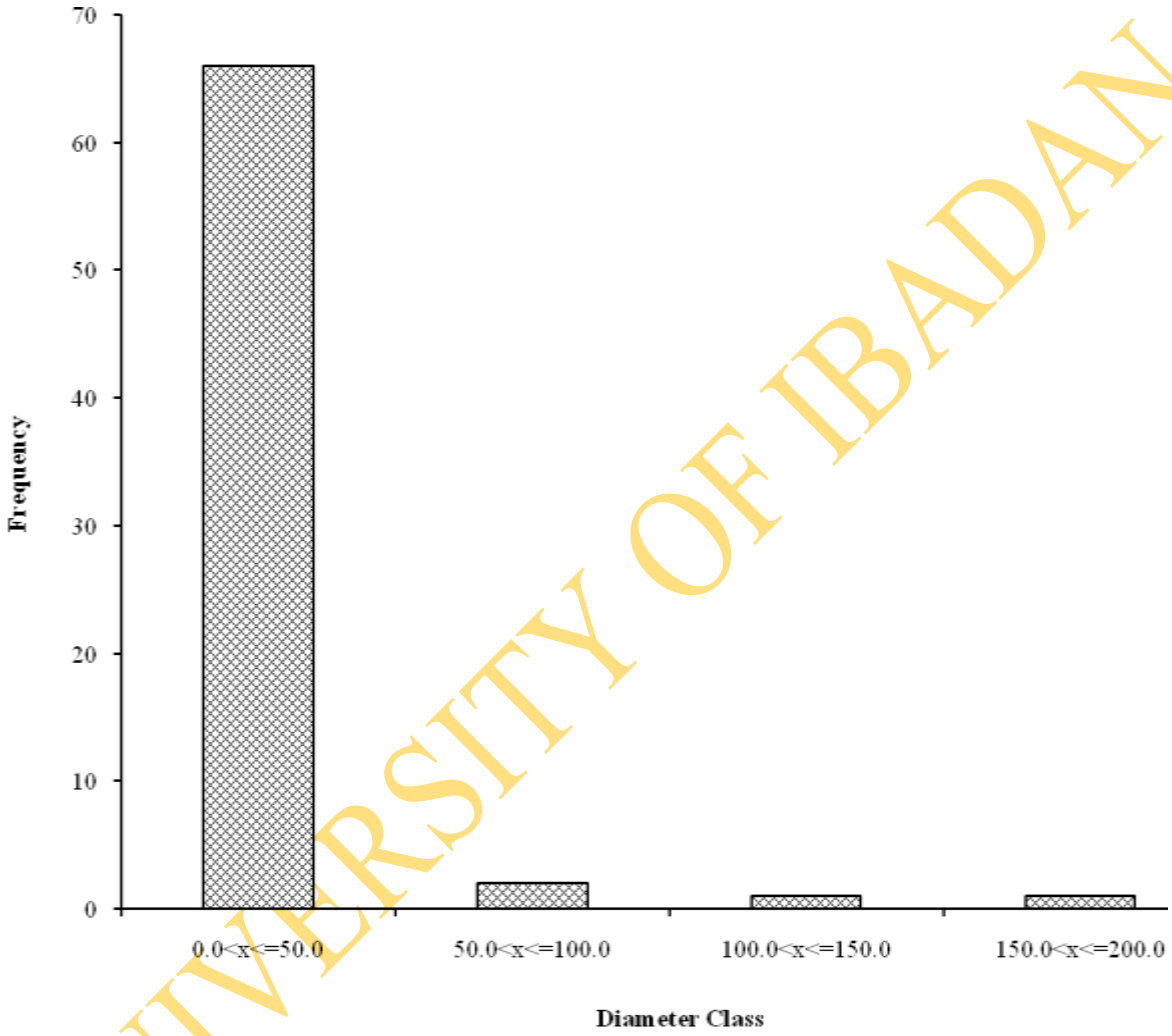

Fig 14 : Frequency distribution of diameter of trees in the derived savannah zone of the study area

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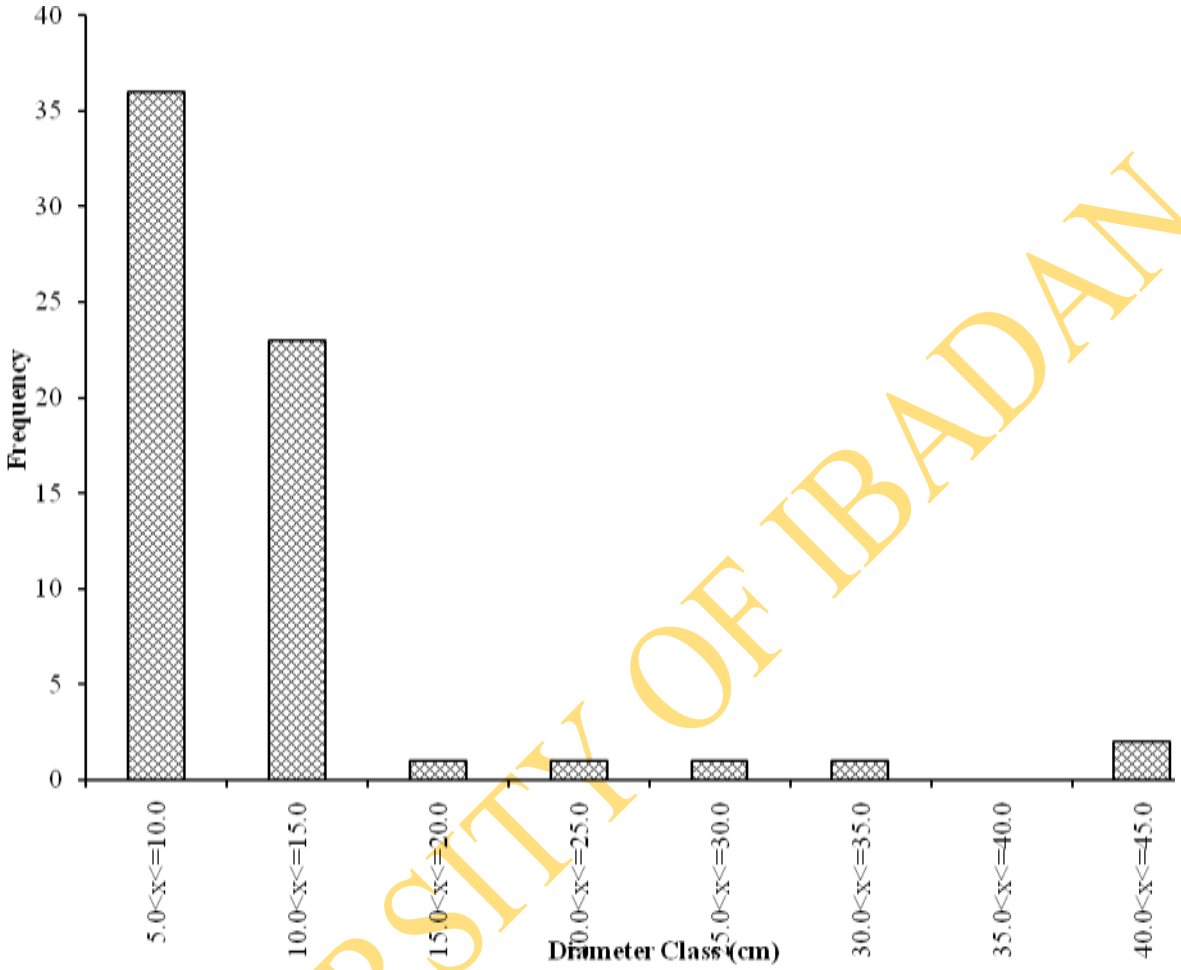

Fig 15 : Frequency distribution of diameter of trees in the riparian frorest zone of the study area

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4.21: Reasons for visitation

In the course of this study, it was observed that the majority of those that engaged in World Heritage Site visitation were in the age bracket of 10-20, 21-30 and 31-40 years. This is the period when human beings are active and vigorous and able to move about to pursue their endeavours. Hence, it was observed that age group has a significant effect on the site visitation (at $P < 0.05$). The effect of marital status on World Heritage Site visitation was also noted and the statistical analysis result reveals that marital status has no significant effect on visitation to site ($P > 0.05$).

The study revealed that gender has no significant effect on visitation to the OOWHS (at $P > 0.05$) and it was also observed that profession has no significant different on visitation either (at $P > 0.05$). The results indicated that the highest percentage of those who engaged in OOWHS visitation were civil servants, business men and teachers. However, it must be pointed out that the types of profession of people are a determinant factor of their level of income. In spite of the fact that civil servants are generally noted to be financially strict in spending they still engaged in WHS visitation. This may be due to the availability of time to them during the major public holidays and annual leave periods that permit leisure and relaxation. The high number of students visiting the WHS can be related to their curiosity which is an index of youthful exuberance. The nativities of respondents were reviewed during the study and it was revealed by the Chi-Square test that nativity has no significant effect, although the number non-natives was higher than that of natives (at $P > 0.05$).When the educational background of respondents was classified in the study; it was statistically observed that there is no significant effect of it on

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visitation to the OOWHS (at P > 0.05). The highest number of tourists was found to be recorded in 2005 after the site had been enlisted among the WHS; the enlistment gave more attraction and recognition to the site.

The awareness and significance of the existence of the World Heritage Site was noted during the study and it was revealed by the Chi-Square test that awareness of the OOWHS visitation by the respondents shows a significant different (at P < 0.05). The study revealed the offences committed by the culprits intruding to the sacred grove (OOWHS); it was observed that the highest number of arrest was made against illegal fishing and illegal felling recorded in 2006. It is also interesting to note that reasonable size of respondents wish to see the World Heritage Site in a good tidy environment such that Nigerians and foreigners could be more attracted to visitation and recreation of the tangible features within the site. Through this substantial revenue could be accrue to the site.

The majority of the respondents are curiously interested in seeing the Osun Osogbo goddess. It is also expected that wild animals such as bush buck, duikers and other big games of different families/species are among the expected desirables features to be sighted during recreation period, though, this hope was no doubt in vain since the monkey species (white throated) increased public stay and enjoyed their viewing at the site.

The most popular features mentioned by the respondents are Ojubo, which was highest in frequency followed by the availability of recreational facilities. Apart from these, other features

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that attracted the respondents (plate 3 to 13) while at the site is the suspended bridge that hangs on the river course and allow easy navigation to the other side of the site during viewing.

A sizeable number of respondents visit the site to carry out their desired goals at some other days apart from the festive period; set aside certain amount of money and /or time for recreation, The study also indicated that majority of the respondents were for research and education, and also recreating themselves once a while. It is worth mentioning that the proximity of the site to reputable hotels which Nigerians and foreigners patronize is a factor that encourages visitors to the site.

4.22: Other observable features

The above reasons and features attract visitors to the site, there are a few features appaulling to visitors. These include the untidiness and irritating oduor resulting from the pile-up of waste materials at the Sites this dump site could be seen by the left side close to the fence wall of the petroleum station while entering the grove (plate 30). These nefarious activities are due to high level of illiteracy of the respondents along the boundary couples with the poverty rate of the intruders utilizing the site. Also, is the illegal habitation of the sacred grove by some group of hoodlum that resides within the grove and smoke India hemp (Cannabis sativa) and use other forms of hard drugs. These miscreant are dangerous and a nuisance to visitors.

It is obvious at this juncture that it is desirable and beneficial to improve the habitat of the Site as a natural/cultural based tourism centre. Also, its existence must be viable economically. Since, the public finance is being expended in the management of the site. From the information

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obtained from the Curator of the Site it was revealed that the main source of income for the WHS is by the sale of tickets. Despite the degraded nature of the place it still records about 345visitors monthly on the average. The conservative income is from three hundred and forty five (345) visitors per month at the rate of fifty naira (₦50) per ticket is ten thousand three hundred and fifty naira monthly (₦10,350:00). This boils down to one hundred and twenty four thousand two hundred naira (₦124,200:00 per annum) only. It is believed that if the Site is well managed one could imagine the amount of revenue it could be realize through the sale of tickets, souvenirs and tiding up of the craft shop and relaxation places. This would substantially increase the revenue base. Major challenges to the site management are erosion of the water courses, illegal bush burning, and illegal hunting, dumping of refuse, illegal grazing, illegal fishing, land encroachment and finance. Finance is the overriding limitation in the management of the OOWHS. All these could be reduce with the advent of good management and adequate financial support for ecotourism development activities on the Site as shown in fig 16 to 18 below.

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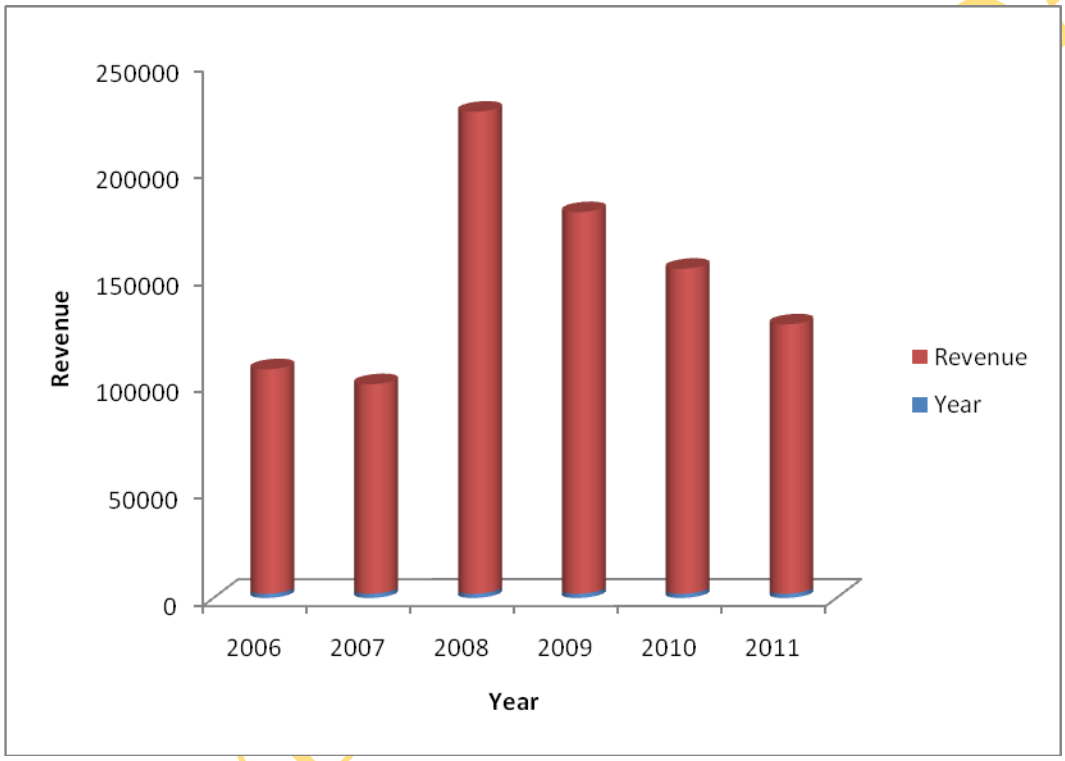

Fig. 16: Internally generated revenue from the Foreigners in WHS 2006-2011

Source: Field Survey 2011

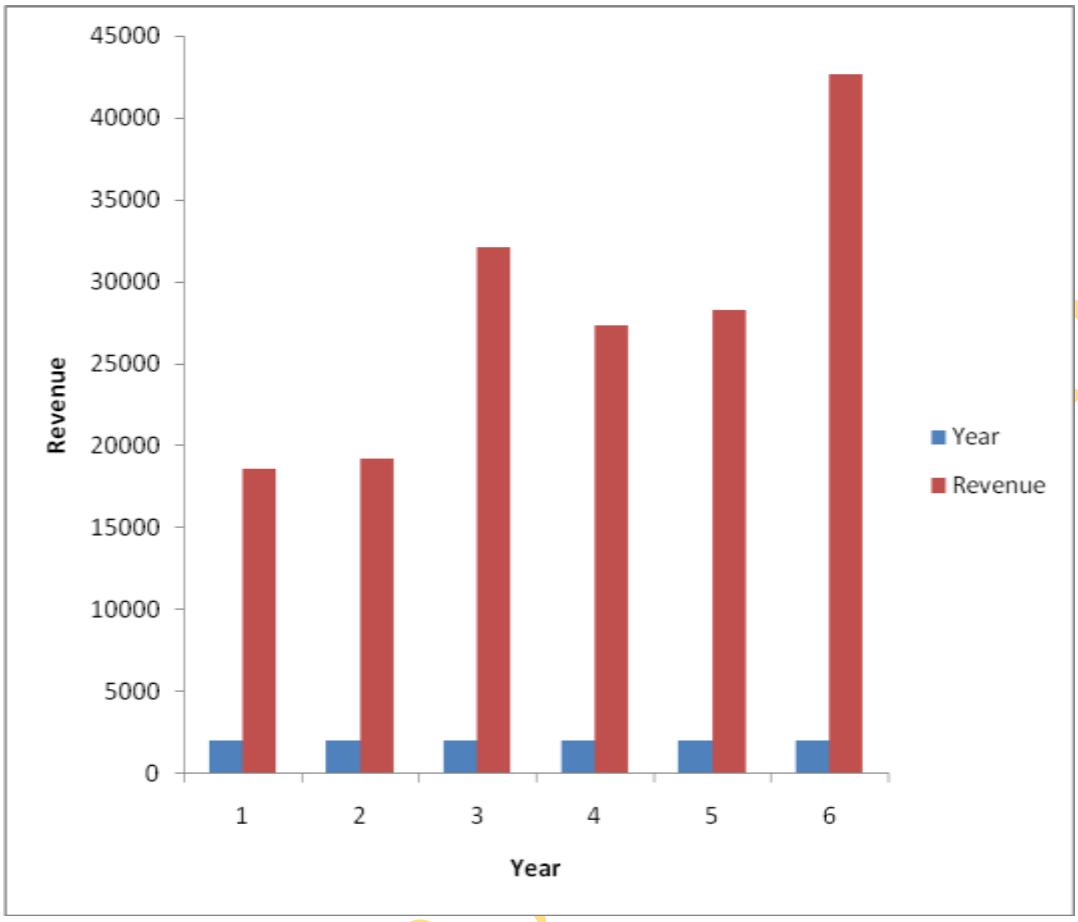

Fig.17: Internally generated revenue from Nigerians in WHS 2006-2011

Source: Field Survey 2011

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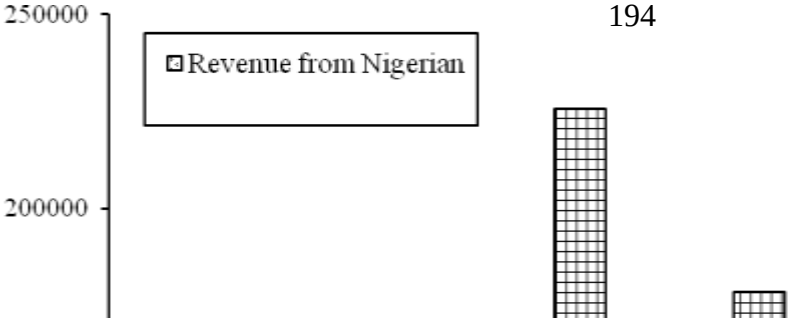

Fig 18

Source: Field Survey 2011

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Plate 30: Dump site along the main road intosite

Source: Field Survey (2010)

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4.23: Observation on water quality

The prevalence of bacteria during the dry season is evidents. The result shows that the total bacterial counts exceeded the maximum permissible level of the World Health Organization standard for drinking water. The same result was obtained during the rainy season. However, the total bacterial count for the rainy season is lower than that of the dry season because of the dilution of the water by the incoming floodwater flowing into the river. It also shows that the contamination is not due to the incoming floodwater but the dirty surrounding and people using the river around the grove.

The presence of coliform organisms namely *Vibrio cholerae, Escherichia coli, Salmonella* and *Shigella* testifies to the fact that people defecate into the river and this can lead to outbreak of diseases as a result of people drinking the contaminated water or using it for bathing (sacrifices). The result of the physio-chemical analysis showed that the pH at all points of sampling point's falls within the range of WHO standard for drinking water except Oju iwe, which has a pH of 8.62 during the dry season and 9.00 during the rainy season. The values of the total alkalinity fall within permissible limit while the total hardness did not meet the desirable limit of Nigerian standard for drinking water quality.

The high prevalence of *Escherichia coli* during the rainy and dry season suggests faecal contamination of the river water. This situation is worsened by other isolates like *Salmonella, Shigella* and *Vibrio cholerae*. All the organisms are present in the water and are dangerous to human health because they are causative agents of diseases such as Cholera, dysentery and typhoid fever. It is worth mentioning that the proximity of the WHS to Yetty Hotel and others

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within the city of Osogbo which ire being patronized by the wealthy local individuals and foreigners is instrumental in the interest of visitors to the site. This mean that prompt attention need to be given to some notable attractive features within the site as a right step towards managing the place for enhanced eco- tourism development .

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CHAPTER FIVE

5.0: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1: CONCLUSION

This study has revealed the relevance of renovation through habitat manipulation management of the Osun Osogbo World Heritage Site to eco-tourism development in Osogbo city.

The grandfather clock of history on the OOWHS never halts. The inconsiderate decision at present may lead to an abundant harvest of regret tomorrow. The non-conservation of the World Heritage Site would lead to lot of environmental disaster to the buffer zone population in particular and the inhabitants of Osogbo in general. .

The study shows that the OOWHS soil is generally acidic with low nutrients reserves. The research also reveals that age has significant effect on respondents' visitation to the World Heritage Site. It was observed that both young and old take part in World heritage Site visitation, although the highest incidence of visitation occurs amongst the age bracket 10-40 years.

Gender has been depicted to have no significant effect on visitation to WHS. It was revealed that both sexes take part in WHS visitation but males tends to have engaged more in visitation than the females. Education has no significant effect on the respondents' visitation to the site. The categories of respondents' educational levels revealed that people of tertiary education visited the site mostly followed by those with secondary education.

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This study reveals that profession has significant effect on respondents' visitation to the WHS. The civil servants and students are more interested in visitation than any other categories of workers and others sampled.

Awareness shows to have a strong significant effect on the visitation and willingness to join or assist in the management of the site. This makes it evident that people are quite aware of the significance of the existence of the world heritage site, and a reasonable large number of the respondents prefer to visit the place during festive period and outside the period to any other natural/cultural based tourism centres.

It was establish that a considerable number of the respondents seek for renovation of the heritage site and construction of more road networks within to affect easy viewing of its resources and features. If this is done, there is no doubt that the site would record a greater number of visitors monthly and annually. Conversely, the majority of respondents go for research and education, recreational outing occasionally.

The World Heritage Site if properly supplied with all necessary input and outputs such as prompt funding, infrastructural development and adequate publicity would go a long way to become a magnet of attraction not only to the public who aspire to see natural beauty of nature/cultural heritage features of the nation.

The outline histogram revealed a product of statistical analysis of the respondents visitation to the sacred grove (WHS) that large number of people made their visit. This shows that there is significance value attached to the site because the frequency values of those that made visit is more than those that did not. In addition, the view of the respondents observation

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on leisure period was statistical calculated by the histogram representation which revealed that the frequency values of people that observed leisure is more than those that did not. The histogram representation of peoples periodic observation of leisure to the site was conducted during the study; it was revealed that large number of people observed their leisure period annually, followed by monthly observation and bimonthly respectively.

Also, during the study the frequency distribution of respondents' sexes that made visit to the World heritage Site was recorded; it was revealed that the number of male that visited the site is more than that of the female between the year 2006 and 2010. The perception of visitors' types that made visit to the World Heritage Site was assessed during the study. It was revealed that the number of local visitors is higher than the foreigners.This establishes that a large number of visitors made their visit to the site in the year 2006, followed by 2008, and 2010. Consequently, one may infer that people's inquisitiveness towards W H S increases as the site was enlisted by the UNESCO and also attracted foreigners to increase in number in their visits in the year 2008.

The management status of the World Heritage Site was observed during the study. The histogram representation shows that the management administration of the site was fair enough, as they discharged their administrative responsibility effectively. The visitors at the Site corroborate this view.

Based on observation during the study, the histogram representation shows the respondents visiting there advanced various suggestions towards better ways of managing the site. Such suggestions include the renovation of the sacred heritage features, followed by road

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construction network to ease traffic congestion during visitation to the site, as well as conservation management of the existing wild animals and plants within the site for effective protection. Substantial government funding support strongly suggested as an imperative for managing the site towards its proper eco-touristic functions.

The economic viability of the floral species present in the OOWHS was assessed during the study; this was observed through the girth sizes of the species in classes with their frequency distribution. The frequency distribution of tree species of girth classes between 0.0000- 50.0000 and 50.0000-100.0000 (cm) have the highest frequency of 170 and above respectively. This shows that the floral species are merchantable for economic forest sustainability

As presented in the scattered graph, the height in meter length of the flora species observed during the study was calculated by its diameter relationship within the site. It was revealed that tree species of 100 Diameter at breast Height (DBH cm) has the highest height 80 cm. This shows that the site is well endowed with valuable economic tree species and how best its volume can support the economic viability of the floral species serve as good attraction site better eco-touristy functions.

The annual visitors' data in each year within 2000-2011 were collected during the study. It emerged that the highest number of visitors were observed within the years 2004-2006. This shows the level of curiosity of respondents towards World Heritage Site establishment in the country.

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The Pie-Chart shows the frequency of visitors' state of origin, from the chart it is revealed that Osun state, followed by Oyo and Lagos, has the highest percentage distribution and the least was observed in Imo, Kogi and Plateau states. This shows that public awareness of the site is very pronounced between south western states and some parts of North Central region of the country.

5.2: RECOMMENDATIONS

Based on the data available in the course of this study and the analysis of same, coupled with the suggestions by the Site staff and the public at large, it becomes necessary to offer tangible and useful recommendations to all stake-holders in respect of the Osun Osogbo Sacred Grove, a World Heritage Site. In the light of this, the following recommendations, which are intensive and extensive, but are by no means exhaustive, are made towards a satisfying standard of developmental management:

Without adequate funding, there cannot be any meaningful development of any system. The ecosystem of study (WHS) is no exemption to this fact. One can say without any iota of doubt that the Site is by far from being adequately funded. It is therefore strongly recommended that this situation be addressed in terms of generous and adequate funding by all concerned. The Federal Government must as a matter of urgency accord the Site a high priority.

A good focus on the landscape management goals should be a watchword to the Site managers to reduce human activities on the Site. Such illegal activities include grazing,

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collection of medicinal plants felling of trees, farming and poaching. Objectionable indicators of degradation as these arise on the Site should be urgently addressed so that the factors of enlistment of the Site will not be negated. Otherwise, the Site makes risk being un-enlisted. The World Heritage Committee should monitor closely the activities and performance of the Site management and make necessary inputs as the need arises. There should be regular exchange of ideas among the managers of all the WHS. This practice will serve as an influence and of immense help to decision-makers. A safety and protection management unit should be established as part of administrative arms of management towards better protection of the total landscape of the sacred Site. This suggestion deserves an expeditious consideration and action.

It is important that additional hands (professionals) be employed for efficient performance of management activities. The present staff strength of (82) workers is not adequate considering the landscape area of the Site. One of such experts to be employed should be a seasoned wildlife biologist or archeologist who must be experienced in museum management and extension education. Similarly, the less than twenty (20) protection staff (security) at the Site is not enough for effective protection of the total Site landscape; since. Indeed their strength does not conform to the International Union for Conservation of Nature (IUCN, 1990) regulation of five square kilometer manning by one protection man in a protected area.

Patrol activities within the site should be encouraged (during the day and night) and made much more intensive to reduce, if not stop, illegal human activities for adequate effectiveness of the regulations and acts. The patrol staff should be trained and fully equipped with modern

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weapons. The movement of vehicles along the entrance of the grove should be controlled in order to give animals the right of way in the protected biodiversity of the ecosystem.

A standby vehicle should be attached to the Site to convey tourists to the Osun spiritual shrine (Ojubo) right from the entrance gate during the annual pilgrimage. This measure will serve dual purpose of reducing overcrowding as well as increase the revenue generation capacity of the Site during the festival.

Relaxation facilities/structures must be renovated and maintained adequately for effective use. One of such facilities is a reference library should be attached to the museum office, and equipped with journals and magazines related to natural/cultural landscapes, natural resources conservation and WHS in general.

In addition, there is an urgent need for a standard craft shop at the Site for the sale of lots of traditional/cultural souvenirs of the Osun heritage. Another infrastructural requirement is the establishment of a museum of natural history in the WHS featuring interesting exhibits, depicting tangible features and animals found at the Site and within the state.

In addition, there is the need for the establishment of a decent snacks shop towards the entrance gate of the grove and if possible, a decent restaurant should be provided at a vantage point. These will facilitate visitors urge to recreate in a cozy environment. Making provision for playing indoor games such as draughts, snookers and table tennis must be done at the Site for tourists. A smooth road network that will expose some attractive features should be constructed for effective management, enhance viewing by Site tourists. This will facilitate visitors' utility

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and keen interest; the main road that passes through the Site witnesses heavy traffic flow. This situation should be checked to reduce the number of vehicles, as it is not supported in IUCN (1990) standard for protected area.

Training programmes should be established to educate tourists and serve the vital role of laying codes of conduct for them. This will inform and educate the tourists about the benefits, merits and values of their tours both before and after their arrival at the Site. Initiate stakeholders' dialogue on community involvement in tourism development;

Promote consultation processes in tourism planning, involving local communities; lunch educational and awareness programme on tourism for local communities and promote history and museum;

Promote the respect for indigenous peoples' and local communities' self- determination autonomy and socio- cultural integrity;

The management should make efforts to empower Luke-worm groups (Women in particular) to become involved in tourism planning and management; also pertinent to examine the relationship between the Site, buffer zone, surrounding area and destination towards effective management including the control of immediate happenings outside the Site.

Allowing stakeholders involvement in Site governance and management for substantial improvement and meaningful interpretation of traditional norms and regulations should be bind on the WHS. The Curator or Museum Manager to foster mutual understanding of issues and show how to work together to achieve a range of sustainable benefits for tourism, communities,

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the environment and heritage in general should uphold these factors. The entrance gate ticket fee to the grove need to be reviewed upwards to increase the income generation that will be ploughed back for the ecological betterment of the Site.

The floral species identified in the grove should be tagged for the educational purpose it will serve visitors at the Site; the labeling of the floral species should be encouraged to promote the ecotourism potential of the site.

Adequate riparian buffer strip vegetation should be maintained along the stream in the grove to protect the watercourse from erosion, and provide an enabling habitat for birdlife. Additionally, appropriate shrubs should be planted on stream banks for soil stabilization.

The check dams should be constructed at water inlets to reduce the run-off (erosion) impact within the site.

Bureaucratic bottle-neck should be curtailed in discharging the serious operations at the site so as to reduce undue delays in matters that affect the day- to- day running of the Site.

Under certain circumstances, the Osun state Government should be encourage to assist the Site management financially and/or otherwise. One such area readily comes to mind is the promotion of website of the Site in collaboration with Nigerian Tourism Development Corporation for wide publicity and marketability of the Site;

If necessary, the Federal government may re-imburse the state government in respect of such or any other form of assistance.

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Appendices

Appendix1: Effect of Gender on Visitation to the World Heritage Site.

Variables	Male	Female	Totals
	53 (63.85%)	51 (68%)	104 (65.82)
Engaged in visitation to the World Heritage Site			
Notengagedin visitation to the WHS	30 (46.15%)	24 (32%)	54 (34.18)
Totals	83 (52.5%)	75 (47.5%)	158

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Appendix 2: Awareness/Visitation of the Respondents to the Site.

Visitation/Awareness	Male	Female	Total
Aware/Engaged in visitation	73 (87.95%)	66 (88%)	139 (87.97%)
Not Aware/Do not engage in visitation	10 (12.04%)	9 (12%)	19 (12.02%)
Total	83 (52.53%)	75 (47.46%)	158 (100)

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Appendix 3: Fauna Species found within Osun Osogbo Grove

Ref. No.	English Name	Scientific Name	IUCN Ranking
PRIMATA			
1.	Lesser busy baby	*Galago demidovii*	
2.	Bossman's potto	*Ceropithecus potto*	
3	Mona Monkey	*Cercopithecus mona*	
4.	Putty nose monkey	*Cercopithecus nictitans*	Vulnerable
5.	White-throated monkey	*Ceropithecus erythrogaster*	Endangered
6.	Red-capped mangabey	*Cercocebus torquatus*	Vulnerable
7.	Patas monkey	*Erythrocebus patas screbus*	Vulnerable
INSECTIVORE			
8.	Dusky Musk Shrew	*Crocidura occidentalis nigeriae*	
9.	Mann's Musk Shrew	*Crocidura manni*	
10.	Straw-coloured Fruit bat	*Epidolon helvume*	

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11.	Gambian Fruit bat	*Epomorphorus Gambiwans*	Unknown
12.	Hammer-headed bat	*Hypsignathus monstrous*	
13.	Dwarf Epaulet bat	*Micropteropus pusillus*	Unknown
14.	Epaulet bat	*Epomops Franqueti*	
15.	Pygmy Fruit bat	*Epomops Franqueti*	Unknown

PHOLIDOTA

16.	Pale-bellied pangolin	*Manis tricuspis*	Rare
17.	Long-tailed pangolin	*Manis-longicaudata*	Rare

RODENTIA

18.	Redless Stripped squirrel	*Funisciurus anerythrus*
19.	Forcados Stripped Squirrel	*Funisciurus raptorum*
20.	Gambian Sun Squirrel	*Helioscuirus Gambians*
21.	Red-legged Sun Squirrel	*Heliosciurus rufobranchium*
22.	Red-legged Ground Squirrel	*Euxerus erythropus*
23.	Oil Palm Squirrel	*Protoxerus Strangeri*

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24.	Beecroft's Flying Squirrel	*Anomalurus beecrofti*	
25.	Nile Rat	*Avicanthes niloticus*	
26.	Rusty-bellied Rat	*Lophuromys sikapusi*	
27.	Temmick's Mouse	*Mus musculoides*	Unknown
28.	Peter's Mouse	*Mus setulosus*	Unknown
29.	Pygym mouse	*Mus minutoides*	Unknown
30.	Brush tailed Porcupine	*Atherurus africanus*	
31.	Cane Rat or grass cutting	*Thryonomys Swinderianus*	
32.	Giant Gambian Rat	*Cricetomiys gambianus*	
33.	Emin's Gaint Rat	*Cricetomiys emini*	

CARNIVORE

34.	Civet Cat	*Vivera civetta*	
35.	Genet Cat	*Genetta maculate*	

HYRACOIDEA

36.	Tree Hyrax	*Dendrohyrax dorsalis*	Vulnerable

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ARTIODACTYLA

37.	Red river-hog	*Potamochoerus porcus*	
38.	Sitatunga	*Tragelaphus s*pekei	Vulnerable
39.	Bushbuck	*Tragelaphus scriptus*	
40.	Maxwell's Duiker	*Cephalophus maxwelli*	
41.	Red-flanked Duiker	*Cephalophus rufilatus*	
42.	Yellow-backed Duiker	*Cephaliphus sylvicultor*	

SALIENTA ANURA

43.	African Clawed Toad	*Xenopus laevis*	
44.	Common African Toad	*Bufo regularis*	
45.	Forest Frog	*Phrynobatrachus calcaratus*	
46.	Forest Frog	*Dicroglossus occipitalis*	
47.	African tree frog	*Afrixalus dorsalis*	
48.	African tree frog	*Hyperrolius sylvaticus*	
49.	African tree frog	*Opisthosthylax immaculatusp*	

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50. African tree frog *Kassima senegalensis*

LACERTILA

51 Rainbow Lizard *Agama agama*

52. Nile monitor lizard *varanus niloticus* vulnerable

53. Senegal cameleon cam*eleo senegalensis*

54. Five-lined skink *mabuya quinquetaeniata sharica*

55. Orange-flanked skink *mabuya perroteti*

56. White-lipped skink *mabuya maculibaris*

57. Fat-tailes savanna skink *mochlus sundavalis*

58. Common House Gecko *Hemidactylus brooki angulatus*

59. Banded Gecko *Hemidactylus fasciatus*

60. Richard's *Hemidactylus richardsoni*

OPHIDIAN

61. African Rock Python *Python sebae* Vulnerble

62. Royal Python *Python regius* Vulnerable

63. Gwrbon Viper *Bitis gabonica*

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64. Green tree Manba Dendroaspis viridis

65. Spiting Black Cobra *Naja melanolleuca*

CHELONIA

66. West African Black Forest Turtle *Pelusios niger*

67. West African turtle *Pelomedusa Subrufa*

68. Serrate Hingeback tortoise *Kinxys erosa*

CROCODILE

69. Nile Crocodile *Crocodilus niloticus*

NON-PASSENRINES FALCONIFORMES

70. Eritran shikra *Acciipiter badius*

71. Sparrow hawk *Accipiter* melanoleucus

72. African white backed vulture *Psendogypus africanus*

73. Common vulture *Necrosyres monachus*

74. Black kite Milvus nigrans

75. Abyssinian-lanner *Falco biamicus*

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PODICIPEDIFORMES

76.	Little African grebe	*Podiceps biamicus*

GALLIFORMES

77.	Double-spurred francolin	Francolinus bilcacaratus
78.	Lathan's francolin	Francolinus lathani

COLUMBIFORMES

79.	Red-eyed dove	*Streptopelia semitorquata*
80.	Tambourine dove	*Turtur tympanistria*
81.	Red-bellied wood-dove	Turtur afer
82.	Green fruit pigeon	Treron australis

CUCULIFORMES

83.	Didric cuckoo	*Chrysococcyn caprius*
84.	Emerald cuckoo	*Chrynsococcyn cupreus*
85.	Black cucckoo	*Cuculus clamosus*

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86. Violet plantain eater *Musophaga violacea*

87. Grey plantain-eater *Crinifer piscator*

88. Green-crested touraco *Touraco persa*

CORACIIFORMES

89. Malachite kingfisher *Alcedo cristata*

90. Senegal kingfisher *Halcyon*

91. Pigmy kingfisher *Cexy picta*

92. Blue-throated *Eurystomus gularis*

PICIFORMES

93. West African baret *Lybius vieilloti*

94. Naked-faced barbet *Gynnobucco calvus*

95. Lennon tinker bird *Pogoniulus bilineatus*

96. Yellow-bellied barbet *Trachyphonus purpuratus*

97. Buff-spotted woodpecker *Campethera nivosa*

98. Grey woodpecker *Mesoposxos goertae*

99. Pied crow *Corvus albus*

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100. Common garden bulbul *Pycnonotics barbartus*

101. Slender-billied bulbul *Andropaduus*

102. Garden warbler *Sylvia borin*

SALINTA ANURA

103. African clawed toad *Xenopus laevis*

104. Common African toad *Bufo regularis*

105. Forest frog *Phrynobatrachus calcaratus*

106. Forest frog *Dicroglossus occipootalis*

107. African tree frog *Afrixalus dorsalis*

108. African tree frog *Hyperroliius sylvaticus*

109. African tree frog *Oposthothylax immaculantus*

110. African tree frog *Kassima senegalensis*

APPENDIX 4: Flora Species of Osun Osogbo Grove

SPECIES #	SCIENTIFIC NAME	FAMILY	TYPE
1	*Abuliton muritiana*	Malvaceae	Herb
2	*Arbus precatorius*	Papilionoideae	Climber

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3	*Acaci ataxacantha*	Minosoideae	Climber
4	*Acanthus montanus*	Acanthaceae	Shrub
5	*Acacia pennata*	Mimosoidiee	Shrub
6	*Adenia lobata*	Passiflorceae	Climber
7	*Acasia sp*	Mimosoideae	Tree
8	*Adansonia digitata*	Bomvasoideae	Tree
9	*Agerantum conzsoldes*	Composite	Herb
10	*Alchorna cordifolia*	Euphorbiaceae	Shrub
11	*Archornea laxiflora*	Euphorbiaceae	Shrub
12	*Aelaea obligua*	Connaraceae	Herb
13	*Adhortia sp*	Acanthaceae	Shrub
14	*Albizia adianthifolia*	Mimosoideae	Tree
15	*Albizia ferrugine*	Mimosoideae	Tree
16	*Aframamum meleguata*	Zingiberaceae	Herb
17	*Albizia gumifera*	Mimosoideae	Tree
18	*Albizia sp*	Mimosoideae	Tree

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19	*Albizia zygia*	Mimosoideae	Tree
20	*Andropogon gayanus*	Poaceae	Grass
21	*Amphimas pterocarpoides*	Papilionoideae	Tree
22	*Annanas comosus*	Bromeliaceae	Herb
23	*Andropogum tectorum*	Poaceae	Grass
24	*Anchomanes difformis*	Araceae	Herb
25	*Afzelia africana*	Caesalpiniodes	Tree
26	*Ananas sativa*	Bromeliaceae	Herb
27	*Aneilema beninense*	Commelinaceae	Herb
28	*Annona seneglensis*	Annonaceae	Tree
29	*Antiaris tozicaria*	Moraceae	Tree
30	*Amorphophallus dracontiodes*	Araceae	Herb
31	*Asphilia latifolia*	Astericaceae	Herb
32	*Aphanostitis manii*	Apocynaceae	Herb
33	*Asphilia africana*	Astericaceae	Herb
34	*Alstonia boonei*	Apocynaeae	Tree

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35	*Alstonia congensis*	Apocynaeae	Tree
36	*Asystasia gangetica*	Acantaceae	Herb
37	*Anthonotha macrophylla*	Caesalpinioideae	Tree
38	*Alternathera sessillis*	Amaranthaceae	Herb
39	*Alternathera sessillis*	Amaranthaceae	Herb
40	*Axonopus compressus*	Poaceae	Grass
41	*Azadiracta indica*	Meliaceae	Tree
42	*Baissea axillaries*	Apocynaceae	Herb
43	*Baissea subsessiilis*	Apocynaceae	C/Herb
44	*Baissea grassilis*	Apocynaceae	Herb
45	*Bambusa vulgaris*	Poaceae	Tree
46	*Allophyllus africanus*	Sapiindaceae	Tree
47	*Brachairia deflexa*	Poaceae	Herb
48	*Brachairia repens*	Poaceae	Herb
49	*Bridelia micrantha*	Euphorbiaceae	Tree
50	*Bridelia ferrugenea*	Euphorbianceae	Tree

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51	*Blighia sapida*	Sapindaceae	Tree
52	*Blighia unijugatac*	Sapindaceae	Tree
53	*Bombax buonopozense*	Bombacaeceae	Tree
54	*Burmannia hirtelus*	Burmannaceae	Grass
55	*Boreria veticulala*	Rubiaceae	Herb
56	*Baphia nitida*	Papilionoideae	Tree
57	*Trilepisium madagascariense*	Moraceae	Tree
58	*Brachystegia eurycoma*	Casealpiniodeae	Tree
59	*Boringa sp*	Boraginaceae	Tree
60	brysocarpus occineus	Cornaraceae	Tree
61	Albizia lebbeck	mosoideae	Tree
62	*Cactus feruginea*	Cornaraceae	Tree
63	*Albizia coriaria*	Mimisoideae	Tree
64	*Canthium hispidum*	Rubiaceae	Tree
65	*Canthium horizontale*	Rubiaceae	Tree
66	*Canthium mannii*	Rubiaceae	C1/ shrub

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67	*Canthium subcordata*	Rubiaceae	C1/ shrub
68	*Canarium schweinfurthii*	Burseraceae	Tree
69	*Cassis suberiana*	Caesal piniodeae	Herb
70	*Canthium* sp	Rubiaceae	Tree
71	*Canthium subcordatum*	Rubiaceae	Tree
72	*Canthium vulgare*	Rubiaceae	Tree
73	*Ceiba pentandra*	Bombacaeceae	Tree
74	*Coccinia bateri*	Cucurbitacea	Climber
75	Colocasia esculentum	Areaceae	Herb
76	*Africa papaya*	Caricéceaea	Tree
77	*Anthoclesia vogelli*	Longanaceaeae	Shrub
78	*Colocasia sp* (xcanthosoma)	Araceae	Herb
79	*Cochlospermum tinctorium*	Conchlospermacea	Shrub
80	*Clerodendron capitatum*	Verbanaceae	Shrub
81	*Anthocleista djalonensis*	longanaceae	Tree
82	*Clreodendron formicarum*	Verbenaceae	C/Shrub

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83	*Baphia pubescens*	papilionoideae	Tree
84	*Celitis intgrifolia*	Ulmaceaea	Tree
85	*Celtis brownie*	Ulmaceaae	Tree
86	*Celtis milabraedii*	Ulmaceaae	Tree
87	*Celtis zenkeri*	Ulmaceaea	Tree
88	*Chasmanthera dependence*	Menispermaceac	Climber
89	*Chromolaena odorata*	Compositea	Shurb
90	*Cissampelos mucronata*	Rubiaceae	Climber
91	*Chassalia holly*	Rubiaceae	Tree
92	*Corynanthe pachyceras*	Sapotaceae	Tree
93	Climbers	Climbers	Tree
94	Cleistopholis patens	Annonacea	Climber
95	Cleistophlis patens	Annonaceae	Tree
96	*Crotolaria retusa*	Papilionoideae	Tree
97	*Commelina diffusa*	Commelinaceae	Tree
98	*Commelina hirsute*	Commelinaceae	Herb

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99	*Commelina nutrition*	Commelinacae	Herb
100	*Combretum racehorse*	Commelinaceae	Shrub
101	*Combretum smesthmannii*	Commelinaceae	Tree
102	*Commelina* sp.	Commelianceae	Herb
103.	*Cynometra vogelii*	Caesalphinioideae	Tree
104.	*Cynastrum cordifolia*	Tecophilaeacea	Herb
105.	*Cynometra megalophylla*	Ceasalpinioideae	Climber
106.	*Cynometra pachycers*	Rubianaceae	Tree
107.	*Cola accuminata*	Sterculiacea	Tree
108.	*Cola gigantean*	Sterculiacea	Tree
109	*Cola hispidia*	Sterculiacea	Tree
110.	*Cola millenii*	Sterculiacea	Tree
111	*Cola nitida*	Sterculiacea	Tree
112.	*Cola sp*	Sterculiacea	Tree
113.	*Capsicum annum*	Solanaceae	Shrub
114.	*Capsicum frustescens*	Solanaceae	Shrub

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115.	*Carpolia lutea*	Polygalaceae	Shrub
116.	*Carpologonium mucunoides*	Papolionoideae	Climber
117	*Cordia millenii*	Borginaceae	Tree
118.	*Cordia tissenrantii*	Boraginacea	Shrub
119.	*Cissus adenopoda*	Vitaceae	Climber
120.	*Cissus barbeyana*	Vitaceae	Climber
121.	*Cussonia barteri*	Araliaceae	Tree
122.	*Cissus debilis*	Vitaceae	Climber
123.	*Cissus minosoides*	Caeesalpinioideae	Tree
124.	*Cassia occientalis*	Ceasalpinioideae	Tree
125.	*Cissus sp.*	Vitaceae	Tree
126.	*Costus afer*	Costaceae	Herb
127.	*Cissus polyanthia*	Ampelidaceae	Herb
128.	*Costus dubius*	Costaceae	Herb
129.	*Centrosema pubesens*	Papilioniodeae	Creeper
130.	*Cuberia acuitifolia*	Rubiaceae	Herb

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131.	C*ulcasia nitiaa*	Araceae	Climber
132.	*Daniellia ogea*	Ceasalpinioideae	Tree
133.	Culcasia saxatilis	Araceae	Climber
134.	*Culcasia scandens*	Araceae	Climber
135.	*Cuveria truncate*	Rubiaceae	Tree
136.	*Cyathula achyranthiodes*	Amaranthaceae	Herb
137.	*Cyanotis lanata*	Commelnaceae	Herb
138.	*Cyanastruc cordifolia*	Thymelliaceae	Herb
139.	*Cythula prostrate*	Amaranthaceae	Herb
140.	*Cyathula sp*	Amaranthaceae	Herb
141.	*Cyperus umbelatus*	Cyperaceae	H/Sedges
142.	*Desmodium veluntinum*	Papilionoideae	Herb
143.	*Deinbolla pinnata*	Sapindaceae	Tree
144.	*Discoglypremna calnuera*	Euphorbiaccae	Tree
145.	*Diospyros iturensis*	Ebenaceae	Tree
146.	*Diospyros mombutensis*	Ebenaceae	Tree

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147.	*Diospyros alboflavescens*	Ebenaceae	Tree
148.	*Diospyro dendo*	Ebenaceae	Tree
149.	*Diospyros barteri*	Ebenaceae	Tree
150.	*Discoreopphyllum cumminsu*	Menispermaceae	Climber
151.	*Dioclea reflexa*	Papilionoideae	Climber
152.	*Diospyros sp.*	Ebenaceae	Tree
153.	Diospyros piscatorial	Ebenaceae	Tree
154.	*Dialim guineense*	Caaesalpinioideae	Tree
155.	*Dichapetalum barteri*	Dichapetalaceae	Herb
156.	D*ichaptalum madagascariense*	Dichapetalaceae	Shrub
157.	*Digitaria debilis*	Poaceae	Strangle
158.	*Digitaria exilis*	Poaceae	Strangle
159.	*Drypetes gilgiana*	Poaceae	Shrub
160.	*Drypetes aframensis*	Euphorbiaceae	Tree
161.	*Drypetes gossweileri*	Euphorbiaceae	Tree
162.	*Drypetes chevalieri*	Euphorbiaceae	Tree

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163.	*Drypetes molyduana*	Euphorbiaceae	Tree
164.	*Drypetes welwitschii*	Euphorbiaceae	Tree
165.	*Discorea alata*	Dioscoreaceae	Climber
166.	Disthemonanthus benthamianu	Ceasalpiniodeae	Tree
167.	*Dissomeria crenta*	Samydaceae	Tree
168.	*Discoreadumentorum*	Dioscoreaceae	Climber
169.	*Discorea sanense*	Dioscoreaceae	Climber
170.	Discorea rotundifolia	Melastomaceae	Herb
171.	*Discorea sanense*	Dioscoreaceae	Climber
172.	*Desplatsia subericarpa*	Tiliaceae	Shrub
173.	*Dracaena arborea*	Liliaceae	Tree
174.	*Dracaena barteri*	Agavaceaea	Tree
175.	*Dracaena bicolor*	Liliaceae	Shrub
176.	Dracaena mannii	Liliaceae	Tree
177.	Dracaenapetetroti	Agavaceaea	Tree
178.	*Dracaena sp.*	Agavaceaea	Tree

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179.	*Dracaena* sucolusa	Liliaceae	Shrub
180.	Entandrophragma cylindericum	Meliaceae	Tree
181.	*Eclipta prostrate*	Asteraceae	Herb
182.	*Elaeis guinensis*	Arecaceae	Palm
183.	*Entandrophargma angolense*	Meliaceae	Tree
184.	*Entandrophargma candolii*	Meliaceae	Tree
185.	Entandrophargma utile	Meliaceae	Tree
186.	*Euriosema pulcherrima*	Papilionoideae	Shrub
187.	*Euphorbia heterophylla*	Euphorbiaceae	Herb
188.	Euphorbia hirta	Euphorbiaceae	Herb
189.	Euphorbia poisonii	Euphorbiaceae	Herb
190.	Euphorbia sp.	Euphorbiaceae	Herb
191.	Zanthoxyllum xanthoxyloides	Rutaceaea	Tree
192.	*Ferns*	Ferns	Fern
193.	*Ficus capensis*	Moraceae	Tree
194.	*Ficus elatricoides*	Moraceae	Tree

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195.	*Ficus exasperate*	Moraceae	Tree
196.	*Fibristylis ferugineai*	Poaceae	Grass
197.	*Ficus mucoso*	Moraceae	Tree
198.	*Ficus thonningii*	Moraceae	Tree
199.	*Funtumia Africana*	Apocynaceae	Tree
200.	*Funtumia elastic*	Apocynaceae	Tree
201.	*Garcinia kola*	Guttiferae	Tree
202.	*Garcinia mannii*	Guttiferae	Tree
203.	*Geopila obvallata*	Rubiaceae	Herb
204.	*Geopila repens*	Rubiaceae	Herb
205.	*Glyphaea brevis*	Tuliaceae	Tree
206.	*Glircidia sepium*	Papilionoideae	Shrub
207.	*Gloriosa superb*	Liliaceae	Climber
208.	*Gmelina arborea*	Verbanaceae	Tree
209.	*Gnestis ferruginea*	Connaracear	Tree
210.	*Gongromema latifolio*	Asclepiadaceae	Climber
211.	*Grewia carpinifolia*	Tiliaceae	Tree

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212.	Grewia *coriacea*	Tiliaceae	Tree
213.	*Guarea cedrata*	Meliaceae	Tree
214.	*Guarea cedrata*	Meliaceae	Tree
215.	*Cynastrum cordifolium*	Tecophilaeeae	Herb
216.	*Homalium grandis*	Ulmaceae	Tree
217.	*Hippocratea pallens*	Celastraceae	C/Shrub
218.	*Hedranthera barteri*	Apocynaceae	Tree
219.	*Hilleria latifolia*	Phytollacaceae	Herb
220.	*Homallium floribunda*	Apocynaceae	Tree

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P.M.B.9442

Questionnaire for assessing the status of ecological Tourism Potentials development in Osun Osogbo World Heritage Site.

Section A (To be fill by the respondents)

Name ……

Surname Other Name

Age distribution: i 10-20, ii 20-30, iii 30-40, iv 50 and above

Educational Level: i primary, ii secondary iii tertiary

Occupation……

Marital Status: i. Single ii. Married

Establishment/Ministry……..

a. Where do you spend your holidays/leaves…… Yes or No
b. Did you observe your leisure period……Yes or No
c. How often did you visit the Sacred Grove :(i) monthly (ii) bimonthly (iii) Aunty time..
d. How do you know the existence of the site (Sacred grove) i. Internet ii Radio iii others
e. Have you visit the site during or outside the festival period Yes or No
f. What were your interest attraction features that made you visit the site……
g. What interest you most in the site…….
h. Is there any cultural or natural features that interest your visit to the site i. Wildlife/Game, ii. Archeological/ Historical features iii. Recreation
i. Is there any satisfaction in the attraction features viewing during your visit Yes or No
j. Do you have any comments on the services/facilities……..
k. What is your general view about the management of the site……..

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Section B **(To be filled by staff of the site)**

Name……

Surname Other Name

Official Status…… ……

Name of your establishment……..

a. **How many sections do you have in your establishment……**
b. **Is your site provided with chalets? Yes or No**
c. **Did you have tracks or nature trail in your site? Yes or No**
d. **How many patrol men do you have as security guards to the site? .....**
e. **Are there adequate protection measures to life of visitors that come to the site? Yes or No**
f. **What is the management strategy towards reduction human activities to the site i. Adequate ii. Inadequate**
g. **What are the management adoption strategies in reducing the negative impact of visitors to the site? ……..**
h. **What are the major management challenges to the site development? …….**
i. **Please list out some of the attraction features of the site**

i.
ii.
iii.

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iv.
v.
vi.
vii.
viii.
ix.
x.

j. Please fill the column below for the number of visitors that come your establishment annually and their Nationality with the total income generated.

Year	Foreigners	Nigeria	Total	Income generated
2001				
2002				
2003				
2004				
2005				
2006				
2007				
2008				
2009				
2010				
2011				
2012				

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ABBREVATIONS

W H S	**World Heritage Site**
OOWHS	**Osun Osogbo World Heritage Site**

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