UNIVERSITI PUTRA MALAYSIA

ECONOMIC VALUATION OF WILDLIFE-BASED ECOTOURISM RESOURCES IN YANKARI GAME RESERVE, BAUCHI STATE NIGERIA

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By

ABDULLAHI ADAMU

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia in Fulfilment of the Requirements for the Degree of Master of Science

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DEDICATION

This thesis is dedicated to my mother Hajia Hafsat Binti Abdullah

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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Chairman: **Associate Professor Mohd Rusli Bin Yacob, PhD**

Faculty: **Environmental Studies**

Natural resources in general and biodiversity in particular provide numerous functions that includes; hydrological such as the hydrological cycle and soil formation, ecological, including; nitrogen fixation and carbon sequestration, social, and economic such as the ecotourism opportunity, research and education benefits to the society. However, the absence of market for these resources negatively affects the way and manner by which they are being treated by the society which subsequently reduced the numerous benefits that are derived from them. The economic valuation of these non-marketed goods helps to find and attach price or economic values to them. Therefore, as these environmental resources are usually not traded in the market, the non-market valuation techniques are applied to estimate their economic value common among them is the Contingent Valuation Method (CVM) which have been widely used to measure the economic value of natural resources. The main purpose of this study is to estimate the use and non-use values of wildlife-based ecotourism resources in Yankari game reserve using environmental economic tools. The study employed the Dichotomous choice Contingent Valuation Method (DC-CVM) on 335 on-site local visitors to estimate the use value of the ecotourism resources in Yankari and 237 local residents from the adjacent communities to the reserve to investigate the non-use value. Logit regression model was used in estimating the use and non-use values of the resources. The result revealed that gender, age, education level, gross monthly income, bids amount and visit frequency were significant determinants of the willingness to pay by the Visitors for an increase in the entrance fee into the game reserve. On the other hand the respondents' age, gross monthly income, bid amount and attitudes towards the environment resources were important determinants of willingness to pay by the non-users to pay a donation for conservation of resources in Yankari. The result also showed that the visitors are willing to pay ₦ 508 (US$ 3.4) for conservation as against the

current entrance fee of ₦ 300 (US$ 1.8) and the use value of the reserve was estimated to be ₦ 960,468.5 (US$ 6002.93) based on average annual visitors to the reserve. The non-users mean willingness to pay was calculated at ₦ 594 (US$ 3.71) and the non-use value was also estimated at ₦ 32,500,116 (US$ 203,125.73). Therefore, the total benefit of conservation of the reserve is approximately ₦ 33,460, 584.5 million (US $ 209,128.65). Results of this study would help to assist policy makers and the management of the reserve especially in terms of revenue generation. This information can be used to estimate the benefits for further investment in the reserve, to value the game reserve according to demand if there are budget deficit, and in particular to invest for biodiversity conservation.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Sarjana Sains

PENILAIAN EKONOMI SUMBER EKO-PELANCONGAM BERASASKAN HIDUPAN LIAR DI RIZAB HIDUPAN LIAR DI YANKARI, BAUCHI NIGERIA

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Sumber asli secara umum dan biodiversiti terutamanya menyediakan pebagai fungsi yang merangkumi; hidrologi seperti kitaran hidrologi dan pembentukan tanah, ekologi, termasuk; pengikatan nitrogen dan penyerapan karbon, sosial, dan ekonomi seperti peluang eko-pelancongam, manfaat penyelidikan dan pendidikan kepada masyarakat. Walau bagaimanapun, ketiadaan pasaran untuk sumber-sumber ini secara negatif memberi kesan kepada cara dan gaya mereka diperlakukan oleh masyarakat yang seterusnya mengurangkan pelbagai faedah yang diperolehi daripada mereka. Penilaian ekonomi terhadap barang tidak dipasarkan membantu untuk mencari dan lampirkan harga atau nilai-nilai ekonomi kepada mereka. Oleh itu, memandangkan sumber-sumber alam sekitar ini biasanya tidak diniagakan dalam pasaran, teknik penilaian bukan pasaran digunakan untuk menganggarkan nilai ekonomi mereka. Lazim diantaranya adalah Kaedah Penilaian Kontinjen (CVM) yang telah digunakan secara meluas untuk mengukur nilai ekonomi sumber semula jadi. Tujuan utama kajian ini adalah untuk menentukan nilai penggunaan dan bukan penggunaan sumber ekoturism berasaskan hidupan liar di rizab mergastua Yankari menggunakan alat ekonomi alam sekitar. Kajian ini menggunakan pilihan dikotomi Kaedah Penilaian Kontinjen (DC-CVM) pada 335 pelawat tempatan di lokasi untuk menganggar nilai penggunaan sumber eko-pelancongam di Yankari dan 237 penduduk tempatan daripada masyarakat bersebelahan dengan rizab untuk menyiasat nilai bukan penggunaan. Model regresi logit telah digunakan dalam menganggar nilai penggunaan dan bukan penggunaan sumber. Keputusan mendedahkan bahawa jantina, umur, tahap pendidikan, pendapatan kasar bulanan, jumlah bidaan dan kekerapan lawatan adalah penentu signifikan terhadap kesanggupan untuk membayar oleh pengguna (Pelawat) untuk peningkatan dalam bayaran masuk ke dalam rizab mergastua. Sebaliknya umur responden, pendapatan kasar bulanan, jumlah bidaan dan sikap terhadap sumber alam sekitar

adalah penentu penting dalam kesanggupan untuk membayar oleh bukan pengguna untuk membayar derma untuk pemuliharaan sumber di Yankari. Hasil kajian juga menunjukkan bahawa pelawat sanggup membayar ₦ 508 (US$ 3.4) untuk pemuliharaan berbanding bayaran masuk semasa ₦ 300 (US$ 1.8) dan nilai penggunaan rizab dianggarkan sebanyak ₦ 960,468.5 (US$ 6002.93) berdasarkan purata pengunjung tahunan untuk rizab. Purata kesediaan untuk membayar bagi bukan pengguna telah dikira ₦ 594 (US$ 3.71) dan nilai bukan penggunaan juga dianggarkan ₦ 32,500,116 (US$ 203,125.73). Oleh itu, jumlah manfaat pemuliharaan rizab adalah lebih kurang ₦ 33,460, 584.5 juta (US$ 209,128.65). Hasil kajian ini akan membantu untuk menolong pembuat dasar dan pengurusan rizab terutamanya dari segi penjanaan pendapatan. Maklumat ini boleh digunakan untuk menganggar manfaat untuk pelaburan selanjutnya di rizab, untuk menilai rizab mergastua berdasarkan dengan permintaan jika terdapat defisit peruntukan, dan khususnya untuk melabur untuk pemuliharaan biodiversiti.

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the Degree of Master of Sciences .

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LIST OF ABBREVIATIONS

CBD	Convention on biological diversity
CS	Consumer Surplus
CM	Choice Modeling
CVM	Contingent Valuation Method
HP	Hedonic pricing
HPP	Hedonic property pricing
PA's	Protected areas
SBDC	Single Bounded Dichotomous Choice Formats
TCM	Travel Cost Method
TEV	Total Economic Value
WTA	Willing-To-Accept
WTP	Willingness to Pay
YGR	Yankari game reserve

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The rapidly growing 'ecological footprint' of modern society has led to habitat destruction and fragmentation, species extinction and the general loss of biodiversity (Suckall, Fraser, Cooper, & Quinn, 2009). On a global scale for example, the rate at which biodiversity is being lost is many times higher than the natural extinction (Cardinale et al., 2012; Meduna, Ogunjinmi, & Onadeko, 2009). The continuous destruction of the natural environment by human activities, especially in the recent time, has necessitated the establishment of protected areas worldwide towards the end of the 19th century (Arabatzis & Grigoroudis, 2010).

The protected areas (PAs) establishment is believed to be an effective measure towards ensuring protection of the ecological environment and biodiversity (Wang & Jia, 2012). These areas are generally created with the primary aim of biodiversity conservation, the protection of the ecosystems, and the maintenance of ecological processes. They proved to have contributed significantly in the maintenance of the productive capacity of the related ecosystems, the preservation of genetic materials and biodiversity, the protection of man-made and cultural elements and also rural development as a whole (Colchester, 2004).

Protected areas also helped in maintaining 'ecosystem services' like carbon sequestration, flood protection and recreational opportunity (Arabatzis & Grigoroudis, 2010). Many of these protected areas are expected to contribute immensely to poverty reduction and sustainable development (Rogerson, 2006). Hence biodiversity is termed the wealth of life which is found on the earth's plants, animals, microorganisms in their millions, and the complex system they formed (Meduna, Ogunjinmi & Onadeco, 2009).

However, many protected areas around the world are financially not self-sufficient. As a result, significant numbers of them were either not able to meet their conservation objectives or developmental goals (Robyn & Eagles, 2007). Africa for instance, is a home to many of the world's rich biodiversity areas, but most of the countries in Africa find it difficult to protect their biodiversity because of continuous land use pressure and inadequate conservation funds as protected area management is mostly dependent on public funding (Togridou, Hovardas & Pantis, 2006).

There is an indications that continuous funding for environmental conservation by the central governments in many African countries may likely be reduced in the future (Togridou et al., 2006; White & Lovett, 1999) as many areas are

experiencing a decrease in public funds or limited funds for the maintenance and management of these natural environments (Reynisdottir, Song & Agrusa, 2008).

This lack of funding could be attributed to the failure of governments in many countries to recognize both the market and non-market values of the protected areas. These include income from tourism as well as non-monetary services that can contribute to the improvement in quality of life. As governments do not recover these benefits, they are rarely inspired to allocate funds that are adequate for proper management of the areas (Baral, Stern & Bhattarai, 2008). This ugly trend have rendered the financial self sufficiency of these ecologically-rich protected areas very critical for their survival (Togridou et al., 2006), and most of the biodiversity in these protected areas will only survive if humans choose to protect it and are willing to allocate funds for its conservation (Lindemann-Matthies, Junge, & Matthies, 2010; Stokes, 2006).

Recently, discussions within the conservation field focused mainly on the enhancement of the financial sustainability of protected areas. The financial sustainability as defined by (Emerton, Bishop, & Thomas, 2006, p.15) is the ability to secure long-term stable and sufficient financial resources, also to allocate them in a well-timed manner and in an appropriate form, so as to cover the full costs of protected area management and to ensure that they are effectively and efficiently managed in line with conservation and other developmental objectives.

However, securing of funds for the protection and enhancement of these natural environments have always been a source of concern for sustainable management of the protected areas especially where nature-based tourism is a key product (Reynisdottir et al., 2008). From environmental point of view, funding for biodiversity conservation is believed to be one of the important benefits derived from ecotourism. Ecotourism therefore is believed to be a major way of ensuring the self-financing of the protected areas (Togridou et al., 2006; McNeely, 1994).

The recreational service offered by the protected areas in the form of ecotourism is one of the important components that have contributed to the sustainable growth and development of these areas. Currently, there is increase in people's demand to spend their precious time for leisure, not just in recreational centres, but rather in ecologically-rich protected areas (Arabatzis & Grigoroudis, 2010). For instance, most visitors to Africa were mainly interested in ecotourism, which helped in developing and sustaining the economy of many countries like Kenya and Tanzania (Eugene, et al., 2009).

Some analysts believed that in Nigeria, ecotourism is a segment of the economy with higher potentials to contribute significantly not only to the country's foreign exchange earnings, but also in reducing the sources concentration of the foreign exchange (Bankole, 2002). However, despite the fact that ecotourism is believed to be the segment with the potentials to contribute higher to the revenue

generation in Nigeria, it is perhaps the segment of the economy with the lowest consideration for investment (Eugene, et al., 2009).

An economically viable entrance fees to the protected areas can make them financially self-sufficient, by sending a good message about the value of land devoted to conservation. Higher entrance fees for foreign visitors for instance can help to boost revenue generation substantially there by making ecotourism the best land use option (Coria & Calfucura, 2012).

A biodiversity-rich area with appealing landscape and charismatic fauna resources may charge higher entrance fee, implying a suitable instrument for funding conservation of rich ecosystems (Stronza & Gordillo, 2008). The charismatic wildlife species of interest to most visitors of a protected area are usually the rare and endangered species, therefore, they might be willing to pay higher amounts for conservation projects (Lindsey, et al., 2007). Even in some areas where such endangered fauna species were not common, some unique species can help to raise awareness about the need for biodiversity conservation (Coria & Calfucura, 2012). Thus, determining visitor's willingness to pay for biodiversity conservation would help in formulating policies that will improve the recreational benefits of the game reserve, minimise visitors' congestion and improvement in biodiversity conservation.

1.2 Statements of Problem

In Nigeria today, ecotourism is not a new phenomenon. The country is ranked among the richest in terms of biodiversity in Africa, mainly due to its unique array of rich ecosystems and vast natural resources. This includes a diversity of flora and fauna resources of more than 4,600 plant species and 1,340 species of animal that includes 274 mammals and 860 birds (Meduna et al., 2009).These ecological resources attracted many local and international tourists to various destinations across the country, including Yankari game reserve.

But with the influx of tourists to many protected areas in Nigeria, wildlife based-tourism contribute only 1.1% to export and 0.2% to Gross National Products to the country as compared to Kenya with a 35.8% contribution to total export and 4.6% to Gross National Product according to the World Tourism Organization (Meduna et al., 2009). This less contribution from the wildlife based tourism can be attributed to the government's inability to recognise both the market benefits associated with the protected areas such as the income from tourism, as well as the non-market benefits that can be derived from conservation of these areas. Hence, government were rarely inspired to allocate more funds for management of these areas (Baral et al., 2008).

The failure of government to recognize the economic value of protected areas means that ecotourism resources and conservation-related activities would continue to be unjustifiably discriminated in the allocation of public funds against

other sectors, since they are considered less valuable or profitable. As cited by Reynisdottir et al., (2008) the most commonly used indicator for determining the economic value of a protected area is the WTP for that particular place, yet no study was conducted in Yankari game reserve that employed WTP for entrance fee determination.

This is however attributed to the fact that in many African countries, setting up of entrance fees into protected areas is mostly not based on a thorough knowledge and understanding of the characteristics of demand and supply of the goods and services in the ecotourism market. The lack of knowledge therefore makes it difficult to predict the environmental and economic benefits of the changes in the entrance fee structure and also the estimation of the exact revenue lost that may occur due to some pricing policies.

The way in which entrance fees into most of the wildlife-based ecotourism areas in Nigeria are set underestimate the value of wildlife, because they mostly fail to capture the real visitor's willingness to pay or maximise income for the protected areas. Also studies have found that the entrance fee into many of the African wildlife-based ecotourism sites is not set by the market condition and is usually too small to reveal the real economic value placed on the protected areas by the visitors. This low entry fee cannot justify conservation of biodiversity or carrying out a policy of cost recovery (Mmopelwa, Kgathi, & Molefhe, 2007), thereby creating an inefficiency in the market.

Moreover, the actual values of Nigeria's protected areas is not known, thus the society also undervalues their importance due to the absence of real market. For instance in Yankari game reserve, no valuation study was ever conducted to estimate the economic value the natural resources. This is particularly worrisome considering the influx of visitors to the game reserve and the possibility of market failure for ecotourism if the tourism demand is price elastic.

The undervaluation of the protected areas as a result of inappropriate setting of entrance fee or failure to establish the entrance fee entirely has resulted in the underestimation of real economic benefits associated with protected areas establishment, this therefore hamper the development of appropriate conservation policies, planning and prudent management of natural resources, thus resulting in failure to achieve the conservation objective of the protected areas.

Furthermore, since the prime objective of any protected area is the conservation of its resources, lack of adequate fund for various conservation projects and programs is an indication of a serious threat confronting many wildlife-based tourism sites in Nigeria. As their survival and sustainability depends on conservation effort, the objective of their establishment cannot be accomplished unless alternative ways of generating more fund are devised which can be channelled into various conservation projects that can guarantee the sustainability of the various resources in the destinations. Thus, setting of entrance fee or its increase through economic analysis of visitors' willingness to pay represents the

most appropriate and available market mechanism for financing as well as generating revenue for protected areas.

This study therefore, estimate the optimum amount that could be levy as entrance fee based on the result of CVM study which will assist in capturing the real amount that visitors are willing to pay as entrance fee as well as the amount that non-users are willing to donate for conservation in Yankari. This may also help to guide the management of the reserves, policy makers and micro-economic planners to understand the real economic values of the game reserve.

1.3 Objectives of the Study

The general objective of this research is to estimate the use and non-use value of wildlife-based ecotourism resources in Yankari Game Reserve, Bauchi State Nigeria.

Specific objectives:

1. To determine the respondents' attitudes towards the ecotourism resources in Yankari.
2. To determine visitors' perception and their level of satisfaction with the ecotourism resources in Yankari Game Reserve.
3. To estimate the visitors' and non-users' willingness to pay for conservation in Yankari Game Reserve.

1.4 Significance of the Study

The traditional economic theories and approaches that consider only the extractive component (Use value) of the resources and the economic benefits from ecotourism, does not only underestimate the value of protected areas but also had negative environmental and policy implications for protected area management. The key objective of protected area establishment is not just for ecotourism, but rather the preservation of wildlife species and natural ecosystems that will ensure a continuous flow of goods and services (largely non-marketable) which would provide a greater social, economic and environmental benefits.

This study would help policy makers and the management of Yankari Game Reserve to take into account not only the benefits but also the associated costs of the environmental resources when making decision. Ecotourism nowadays is considered an important source of income to many countries. As cited by Meduna, et al., (2009), ecotourism contributed about 35.8 % to Kenyan total export and 4.6% to its Gross National Product. This indicates that protected areas now goes beyond their direct benefit of keeping the well-being of biodiversity and environment but also is becoming a major source of national GDP. This study

tries to come up with policy suggestion that will make the game reserve a major source of income to the nation and avenue for employment of labour.

For ecotourism to be an effective instrument that would mobilize financial resources for protected area management, a more innovative methods are required that will enable the protected area managers to capture the real benefit of ecotourism for re-investment in conservation programs. As analysis of ecotourism provides the opportunity to apply economic concepts and theories using both the conventional and alternative methods, the application of CVM in this study make it a useful tool for estimating the appropriate entrance fee and for testing the robustness of economic concepts and methods in understanding the revenue leakages and the consumer surplus for proper management and developing policies for the game reserve.

Therefore, charging entrance fee into a wildlife-based ecotourism destination is an important tool for sourcing additional fund which could be channelled for conservation expenditures that will ensure sustainability of the resources. This is particularly important as economists suggested that huge benefits of tourism are currently not captured, and this can only be realized by applying a more efficient pricing policy for the protected area management and it can subsequently balance the trade off as a result of improper pricing policy. This research help to identify an economically viable as well as socially acceptable entrance fee that will justify the economic value placed on these resources.

It is well known fact that natural resources have many benefits to humans comprising both the use and non-use value. There have been many studies conducted in various countries to evaluate consumers' willingness to pay for the use value of natural resources in recreational sites and some studies focused on the non-use value. Therefore this study estimates both the use and the non-use value of ecotourism resources together in Yankari game reserve, it also examined the public attitude towards ecotourism resources in the protected area, it determined the visitors' level of satisfaction with the ecotourism resources in the reserve and help in creating public awareness about their intrinsic contribution environmentally, socially and economically for biodiversity conservation.

Finally, as many protected areas around the world are financed by government with few of them that are self-financed from the entrance fee collected from visitors, it is revealed that most of the protected areas around the world are under-funded. Therefore, this study apart from finding the optimum amount as entrance fee for Yankari game reserve, it would find other ways of raising funds through donation from the public (non-users) due to the intrinsic value the society placed on natural resources that could be channelled for wildlife preservation in particular and biodiversity conservation in general.

1.5 Organization of the Thesis

This thesis is organized into chapters as follows; Chapter one provides the general background of the study, the problem statement, the study objective and the significance of the study. Chapter two provides a review of relevant literatures and some empirical studies related to the research. The chapter three discusses the background of the study area, the sampling design and sampling procedure, method of data collection and data analysis. In chapter four, results of the findings were presented and discussed while the chapter five provides a general conclusion, recommendations and policy implication of the research outcome.

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LIST OF PUBLICATIONS

1. Factors Determining Visitors' Willingness to Pay for Conservation in Yankari Game Reserve, Bauchi Nigeria. **Accepted** by the International Journal of Economic and Management (IJEM)
2. Local People's Attitudes and Willingness-To-Pay for Conservation: A Case of Yankari Game Reserve Bauchi, Nigeria. **Submitted** to Journal of Sustainable Development
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