



UNIVERSITI PUTRA MALAYSIA

***ECONOMIC ANALYSIS OF RESOURCE CONSERVATION AND
HOUSEHOLD PREFERENCES ATTRIBUTES IN HADEJIA-NGURU
WETLANDS, NIGERIA***

ABDULLAHI ADAMU

FPAS 2018 8



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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 Doctor of Philosophy**

December 2017

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DEDICATION

This thesis is dedicated to my mother Hajiya Hafsat Binti Abdullah



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

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ABDULLAHI ADAMU

December 2017

Chairman : Associate Professor Mohd Rusli Bin Yacob, PhD
Faculty : Environmental Studies

Natural flood plain wetlands are among the most biologically productive and diverse ecosystems on earth. However, in spite of their importance in sustaining human welfare, they are the most threatened of all ecosystems. The objective of this study is to evaluate the economic benefit associated with resource conservation in Hadejia-Nguru wetland so as to provide policy-makers with much needed information on the economic value of the benefits generated by the sustainable management of the wetland. This study employed the most widely used non-market valuation techniques in measuring the economic value of natural resources. A face-to-face interview using a structured questionnaire of a dichotomous choice contingent valuation, choice experiment was employed to 393 households in communities residing within the wetlands (user category) and 405 households in upstream communities outside the wetland (Non-user category).

Binary Logistic regression was employed in estimating the CVM model while Conditional logit model, random parameter logit model, and latent class model were employed for the choice experiment analysis in order to estimate attributes values and heterogeneity in the households' preferences. Results from the choice experiment for the user category shows the preference of the wetlands' attribute, with 'improvement in productivity of the wetland as the most preferred attribute. From the non-user category, 'tourism and recreation' was the most preferred attribute. The result from the CVM model revealed that gender, age, education level, gross monthly income, bids amount, membership of environmental organisation, pro-environmental attitude and knowledge of the importance of the wetland were significant determinants of the willingness to pay conservation tax by the users for the sustenance of the wetland. On the other side, the significant determinants of

willingness to pay donation by the non-users includes; gender, respondents' age, gross monthly income, bid amount, household size, governmental trust, and pro-environmental attitude. The result also revealed that the users were willing to pay ₦ 2,324.08 \approx \$ 7.62 per household for conservation of the wetland, while the non-users mean WTP amount was ₦ 2290.31 (US\$ 7.50). Based on the CVM result, the total use benefit of conservation of the wetland was approximately ₦ 1,162,040,000 (US \$ 3,809,967.21), while the total non-use benefit was estimated at ₦ 29,366,540,335.11 (US \$ 96,283,738.80). Therefore, the total benefit of conservation of the wetland was approximately ₦ 30,528,580,335.11 (US \$ 100,093,706.02). The study outcome would inform policy makers on the economic value of the wetland and to better their understanding on the consequences of present policies concerning wetland management. The study therefore recommended that the conservation of the wetlands should be considered as an integral system that would create institutional mechanisms, which will ensure the incorporation of local communities in decision-making and management of the wetland. This strategy would help in minimizing trade-offs and would promote synergies for sustainable wetland management.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

ANALISIS EKONOMI DARIPADA PEMULIHARAAN SUMBER DAN CIRI-CIRI KAWASAN TANAH LEMBAB HAWA HADEJIA-NGURU, NIGERIA YANG MENJADI PILIHAN UTAMA PENDUDUK

Oleh

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Tanah lembab yang menjadi tadahan banjir semulajadi adalah kaya dengan ciri –ciri biologi serta ekosistem di bumi. Walau bagaimanapun, selain kepentingannya dalam mengekalkan kebijakan manusia, kawasan tersebut juga merupakan kawasan yang paling terancam daripada ekosistem yang lain. Objektif kajian ini adalah untuk menilai manfaat ekonomi yang dikaitkan dengan pemuliharaan sumber di tanah lembab Hadejia-Nguru untuk menyediakan maklumat yang sangat diperlukan oleh penggubal dasar mengenai nilai manfaat ekonomi yang terhasil daripada pengurusan tanah lembab yang mampan. Kajian ini menggunakan teknik penilaian bukan pasaran yang paling banyak digunakan dalam mengukur nilai ekonomi sumber asli. Temu bual secara bersemuka telah dijalankan menggunakan soal selidik berstruktur iaitu melibatkan penilaian kontinjen pilihan dikotomous, eksperimen pilihan digunakan untuk 393 isi rumah dalam komuniti yang tinggal di kawasan tanah lembab (kategori pengguna) dan 405 isi rumah di komuniti yang terletak di luar kawasan tanah lembab (kategori bukan pengguna). Regresi logistik binari digunakan dalam menganggarkan model CVM sementara model logit bersyarat, model logit parameter rawak, dan model laten kelas digunakan untuk analisis percubaan pilihan untuk menganggarkan nilai ciri dan kelainan dalam keutamaan isi rumah. Keputusan dari percubaan pilihan bagi kategori pengguna menunjukkan keutamaan pada ciri tanah lembab, dengan peningkatan produktiviti tanah lembab sebagai ciri yang paling utama. Dari kategori bukan pengguna, 'pelancongan dan rekreasi' adalah ciri yang paling utama. Hasil daripada model CVM mendedahkan bahawa jantina, umur, tahap pendidikan, pendapatan kasar bulanan, jumlah bida, keanggotaan organisasi alam sekitar, sikap pro-alam sekitar dan pengetahuan mengenai kepentingan tanah lembab adalah penunjuk yang penting dari segi kesediaan untuk membayar cukai pemuliharaan oleh pengguna bagi memulihkan tanah lembab. Di sisi lain, penunjuk penting dari segi kesediaan membayar derma

oleh bukan pengguna termasuk; jantina, umur responden, pendapatan kasar bulanan, jumlah bida, saiz isi rumah, amanah kerajaan, dan sikap pro-alam sekitar. Hasilnya juga mendedahkan bahawa pengguna sanggup membayar $\text{RM } 2,324.08 \approx \$ 7.62$ bagi setiap isi rumah untuk pemuliharaan tanah lembap, manakala bagi bukan pengguna pula jumlah purata nilai WTP adalah $\text{RM } 2290.31$ (US \$ 7.50). Berdasarkan hasil CVM, manfaat penggunaan melalui pemuliharaan tanah lembap adalah lebih kurang $\text{RM } 1,162,040,000$ (US \$ 3,809,967.21), sementara manfaat yang tidak digunakan sepenuhnya dianggarkan sebanyak $\text{RM } 29,366,540,335.11$ (US \$ 96,283,738.80). Oleh itu, jumlah manfaat melalui pemuliharaan tanah lembap adalah kira-kira $\text{RM } 30,528,580,335.11$ (AS \$ 100,093,706.02). Hasil kajian ini akan memaklumkan kepada para pembuat dasar tentang nilai ekonomi tanah lembap dan untuk memberi pemahaman tentang akibat dari dasar-dasar sedia ada mengenai pengurusan tanah lembap. Kajian ini mencadangkan agar pemuliharaan tanah lembap harus dipertimbangkan sebagai sistem integral yang akan mewujudkan mekanisme berinstitusi, yang akan memastikan penyertaan rakyat tempatan dalam membuat keputusan dan pengurusan terhadap tanah lembap. Strategi ini akan membantu dalam meminimumkan perdagangan dan akan menggalakkan bidang pengurusan tanah lembap yang mampan.

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I certify that a Thesis Examination Committee has met on 6 December 2017 to conduct the final examination of Abdullahi Adamu on his thesis entitled "Economic Analysis of Resource Conservation and Household Preferences Attributes in Hadejia-Nguru Wetlands, Nigeria" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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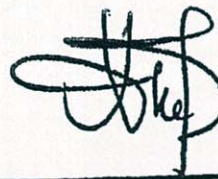
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LIST OF ABBREVIATIONS

CBA	Cost Benefit Analysis
CBD	Convention on biological diversity
CS	Compensating Surplus
CM	Choice Modeling
CLM	Conditional Logit Model
CVM	Contingent Valuation Method
DB	Double Bounded
DC	Dichotomous Choice
IIA	Independent Irrelevant Alternative
IID	Independently and Identically Distributed
HP	Hedonic pricing
HNW	Hadejia-Nguru Wetlands
LCM	Latent Class Model
SBDC	Single Bounded Dichotomous Choice Formats
TCM	Travel Cost Method
TEV	Total Economic Value
WTA	Willing-To-Accept
WTP	Willingness to Pay

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Globally, there is a continuous increase in economic, social, and environmental distress as a result of over exploitation of natural resources that causes environmental degradation, with human race paying high cost. The rate at which the destruction of the earth vital resources such as the wetlands is continuing, especially in developing countries is very alarming, and is believed to be one of the major causes of increase in poverty, food security and accessibility of portable drinking water. The human activities continue to exploit the planet of its vital biodiversity resources that its endowed with in which at the long run, the impact manifested from local actions, to regional problem and latter to global issue (Lambert, 2003).

In the 60s, wetlands were perhaps one of the most neglected and misunderstood ecosystems, as they are boundary ecosystem found between water body and land (Williams, 1991). However, at present, it has been acknowledged that wetlands are among the most productive ecosystems on the planet that provides human with consumable goods and services through the functions they performed for improved safety, health and welfare (Thompson & Hollis, 1995).

Nowadays, there is increase in awareness, and growth in understanding of the benefits associated with wetlands, not just because of enhancement in scientific investigations about the functions of the wetlands and its attributes, but also by a paradigm shift in people's perception by viewing wetlands as a valued environment. In addition, with increase in economic pressure, the importance of wetlands as a valued resources base is becoming known, as evidence continue to emerge on their physical, biological, hydrological, chemical and socioeconomic contributions to the society which the modern day scientific investigation explore (Barbier, Acreman, & Knowler, 1997a; Williams, 1991).

As scientific understandings of the wetland have increased, more wetlands goods and services have become known, perhaps, this vital ecosystems are increasingly considered as an environment where the water land and the air together with the flora and fauna resources interact in a delicate way that has drew the attention of the scientific community, which subsequently creates the need for their sustainable use and conservation (Ghosh & Mondal, 2013; Williams, 1991).

Undoubtedly, from all the ecosystems in the world, wetlands were the only one to attract international convention tagged, the Ramsar convention. The convention derived its name the ancient city of Ramsar, Iran where the convention was held in 1971, which attracted interested parties from governments and non-governmental organisations with interest in wetlands and sustainability of biodiversity resources. The convention came into action in 1975 as a conservation treaty, where the parties created a multilateral environmental agreement (MEV) that provides a framework for international cooperation on wetland conservation. The essence of this treaty was primarily because of the recognition of the role of wetlands and their importance as habitat for migratory species so as to ensure effective conservation and sustainable usage of the resource (Barbier et al., 1997a; Gardner & Davidson, 2011; Turner et al., 2000).

On what constitutes a wetland, there are divergent views among scientific scholars mainly because of the dynamic nature of wetlands and the difficulties in precisely delineating their boundaries (Turner et al., 2000). With many definitions of wetlands currently available in the literature, the most popular one that conveys the important information concerning the characteristics and complexity of wetlands is the definition proposed by the Ramsar convention. It is the most globally accepted definition that describe wetland as areas of fen, marsh, peat land or water, whether artificial or natural, permanent or temporary, with water that is static or flowing, fresh, brackish or salt including areas of marine water, the depth of which at low tide does not exceed 6 m (Ramsar 2008).

In addition to that, wetlands were described as “the kidneys of the landscape”, mainly because of the role they are playing in both chemical and hydrological cycles, and were also termed as “biological supermarkets” because of their support on rich biodiversity, ecological functions and extensive food webs (Barbier et al., 1997).

Generally, wetlands are the transitional type of ecosystem occupying an area between land and water bodies. Coastal wetlands for instance are important areas where the sea, freshwater and land meets in an interesting way. This transitional role of wetlands delivers many important ecosystem services that includes; decomposition of organic matter, shoreline protection, flood control, carbon sequestration, nutrient cycling, water quality improvement, habitat for migratory birds and important shelter for wetlands animals. Other services rendered by the wetlands includes the regulation of water and nutrients, particles (Ghosh & Mondal, 2013).

Wetlands are viewed as multifunctional resources providing a multitude of ecological good and services with important attributes or characteristics such as the biological diversity. The wetland characteristics and functions provide humans with numerous goods and services that have a great value, which can be estimated in terms of uses. Direct use involve (intensive or extensive) use of the resources or the

extraction of wetlands products such as; fodder and fish or provisions of some services such as; recreational activities for human satisfaction (Roggeri, 1995).

In Africa, wetlands serve as an essential source nutrients and water that supports productivity of agriculture, which supply human population with food that sustain many communities. This function of wetland form what is termed as an economic value to the local people and those outside the periphery of the wetland, consequently, human welfare, safety and health of many African society largely depend on the sustainable wetlands management (Schuyt, 2005).

Nowadays, there is growing concern about the importance of wetland ecosystems and the wide variety of goods and services provided by them such as biodiversity or freshwater in human welfare (Schuyt, 2005). Most natural services, such as water purification and aesthetics, provided by wetlands cannot be valued in terms of market price (Lindemann-Matthies et al., 2010). This characteristic put them at high risk of underestimation of their actual value to human. As a result, when economic development such as industries, extensive agriculture, dam construction, and other forms of urban developments are more profitable, and the opportunity cost of losing the important services provided by wetlands has been overlooked or discounted, the markets force will tend to priorities wetland conversion at the detriment of wetland conservation (Kaffashi et al., 2012).

As seen in many part of the world, the same thing goes with African wetlands, despite the numerous benefits they are providing to millions of people, their resources are faced with problems of conversion, overexploitation and modifications for upstream developments. These forms of modifications alter the pattern, the scale and quality of water that feeds into the wetland. Studies have suggested that one of the major factors contributing to these destructions is lack of understanding and insufficient information pertaining to economic values of wetland by the decision makers. As a result, protection of wetland may be ignored in favor of other developments since the wetland values often unknown (Ghosh & Mondal, 2013), in some cases, wetlands are more often than not considered to have insignificant or less value in comparable to other uses that may produce immediate and a more tangible economic value (Schuyt, 2005).

In addition, wetlands degradation and loses have continued despite the fact that there is growing recognition on the need to protect it from serious economic and social pressure. This present condition of the world's wetland is because of the ignorance of its value, or even viewing it as a liability with negative value to society.

Brander, Florax, and Vermaat (2006) explained that the public-good nature and the open-access characteristics of the wetlands are often regarded as the key reasons for their undervaluation especially in decisions concerning their use or conservation. Thus, the decisions affecting them are often made without adequate knowledge of

public attitudes or their true economic values (Stevens, 1995). According to Turner et al., (2000), lack of awareness of the value of wetlands have forced them to be considered as low priority resources in the decision-making process, which leads to their destructions and conversion to other alternative uses.

Making decisions about wetlands without proper knowledge about the attitudes of the locals and their practices concerning resource uses often rendered conservation effort unsuccessful. Therefore, valuation study of this vital resources should encompasses attitudinal and resource-use pattern of the locals for effective wetland management (Dimitrakopoulos et al., 2010; Jenkins, Murray, Kramer, & Faulkner, 2010). As the services provided by wetlands are numerous and usually doesn't have price like traded market good, estimation of economic value of wetlands can only be accomplished using the famous techniques of non-market valuation such as the CVM and CE (Woodward & Wui, 2001).

Fundamentally, from the management point of view, effective integration, combination of different incompatible, inconsistent and contrast values are difficult tasks that related to environmental goods and services or public goods such as wetlands. Various management options related to public decision making need multi-criteria decision-support procedures of valuation technique like Choice Modelling (Arabamiry, 2013).

According to Carlsson et al. (2003), choice modelling as a technique for economic valuation provides additional information regarding the multiple services provided by wetlands. Thus, recommended it as a more superior technique than the other valuation methods. Moreover, other researchers have emphasis that when valuation study is design, eliciting information about the respondents' attitudes is essential for expanding the understanding of the experts with regards to the nature of values and motives behind attaching such value (Milon & Scrogin, 2006).

The alternative management strategies provided in choice modelling (CM) using different attributes and level makes it the most suitable tool for valuing multi-attribute resources such as wetland (Milon & Scrogin, 2006). Choice modelling as a new and promising valuation technique appeared to be an alternative method that can provide reliable estimates about resources. For the respondents, this refers to individuals preferences between one group of attributes or services at a given cost, and other attributes and services at the other different cost levels. For instance, in this study, certain attributes were determined after focus group discussion with relevant stakeholders. These wetland attributes include; improvement in biodiversity of the wetland area, improvement in ecological functions provided by the wetland, maintaining beautiful natural scenery, enhancing tourism and recreation potentials of the wetland and improvement in the productivity of the wetland in terms of increase in fish stock, grazing land and availability of water for irrigation.

Moreover, Kenyon and Hanley indicate that policy makers are more interested in generating a combination of multi-criteria analyses, general public approaches, and environmental valuations (e.g. CBA). Seemingly, CM is the best procedure because other methods such as the CVM which are sensitive to scale and not capable for valuing multi-attribute resources in separate manner are not suited for valuing resources with multiple functions and attributes. Scale itself can be an attribute in the Choice Experimental (CE) procedure (Hanley, Mourato and Wright, 2001). Economic efficiency can be considered through checking the robust of the analysis for best policy suggestion, although, cost benefit analysis technique is the main approach for evaluating economic efficiency of policy options (Arabamiry, 2013).

In this regard, valuation of wetland, with the sole aim of ensuring effective resources conservation without compromising human welfare requires that information should be provided pertaining resource harvest, the marginal net benefit to society for alternative use and the status of the wetland as whole. This is especially, as the information regarding economic value resources form an integral part of cost benefit analysis estimates (Barbier et al., 1997a; Do & Bennett, 2009; Turner et al., 2000).

1.2 Problem Statement

As established in the literature, the most diverse and biologically productive ecosystems on the planet are the natural flood plain wetlands. However, despite this known benefits of wetlands for sustaining human welfare, they are the most threatened of all ecosystems (Ambastha, Hussain, & Badola, 2007). Numerous threats affecting wetlands were observed globally, ranging from intensive agriculture, pollution, urbanizations and industrializations. Other challenges also includes; the over-exploitation of resources, decrease in flow of water resources mainly due to dam constructions, the establishment and construction large scale irrigations schemes and other agricultural purposes as well as climate change (Arabatzis & Grigoroudis, 2010).

It is believed that lack of adequate information about wetland values and absence of reliable data about ecological functions and services they provide are part of the major causes of their destructions and conversion, as policy makers especially in developing countries often consider development of such areas as a more lucrative option (Mmopelwa, Kgathi, & Molefhe, 2007). Apart from the incomplete information, other major causes of wetland conversion identified include higher cost of their maintenance, problem of who should enjoys the benefits of the conversion or maintenance and who should bear the costs as well, absence of recognised property right and collapse of traditional management structures (Ambastha et al., 2007).

Globally, there have been many valuation studies of wetlands to estimates their economic value; however, the attention of majority of these studies were in developed countries. However, virtually few cases that focuses on wetlands in

developing countries were reported and what is more worrisome is the dearth in literature about African wetlands that suffers underrepresentation in such valuation excises despites having important number of wetlands comparable to North America and Europe (Schuyt, 2005).

Kabii, (1996) stated that the numerous threats facing African wetlands has significant impact on global biodiversity status. The importance of conserving these pristine resources for survival and welfare of the local population is widely acknowledged. Although, despite recognition of the benefits of wetlands especially to local people, in Africa, pressure from the society is anticipated to increase on the available wetlands in the continent, as population explosion is predictably growing into the future and the demand for resources to carter for the society increases (Schuyt, 2005).

At present, many African wetland are facing serious pressure from the society notably from extreme exploitation by local people, drainage for agriculture, and poorly planned developmental activities mainly due to lack of awareness and knowledge the about the activities of people living in surroundings of the wetlands and lastly, lack of proper monitoring and from the government (Olalekan, Abimbola, Saheed, & Damilola, 2014).

In Nigeria for instance, the floodplains and wetlands are known to support millions of people due to their richness. However, the adjoining communities surrounding the wetlands have been suffering an untold hardship mainly due to mismanagement of these important ecosystems (Muslim, 2008). This severely affects the water resources status and hydrology of the wetland environment in the country, with much adverse effect on the wetland resources and the anticipated ecosystem service benefits to the society in general (Nwankwoala, 2012).

The Hadejia-Nguru wetlands, which is regarded as Nigeria's renowned wetland is believed to have shrinking for the past decades. Reduction in water flow within the Hadejia and Jama'are river basin has diminished the area of wet season inundation within the wetlands. For instance, Schultz, (1976) stated that in the wet seasons of 1969, the inundated area of the wetland was estimated at 2350 km², while in 1974 it was shrunk to 2004 km². In later years, aerial surveys undertaken by the Hadejia-Nguru Wetland Conservation Project have revealed that in the 1991 wet season, flood extent of the wetland area was 962 km², while later in two years' time, it was 525 and 413 km² was believed to be inundated respectively (Thompson & Hollis, 1995).

A study by Dami, Kuchali, and Mayomi (2016) on Landuse/ Landcover Changes of Nguru wetlands between 1972 to 2009 using remote sensing data and GIS technique have shown that between 1972 and 1986, 27.68% of the wetland area was allocated for agriculture, which had a major impact on land cover of the area. The result of

their study (Table 1.1) also shows that the area coverage of settlement has significantly increased from 18.22km² in 1972 to 65.35km² in 2009. This clearly shows how urbanization and population growth is taking over the wetland area.

More recently, it was asserted that the Hadejia-Nguru wetlands is believed to have shrunk by more than two third of its original size within the last 30 to 40 years (Muslim, 2008). The shrinkage can be attributed to the various developmental projects that causes major hydrological changes such as the dam construction in the upstream, river diversion, irrigation scheme, farming and fishing and effect of climate change, notably the draught.

Table 1.1 : Trend of Landuse/ Landcover Changes of Nguru Wetlands (1972-2009)

Land use	1972		1986		2000		2005		2009	
	Area (km ²)	Area (%)	Area (km ²)	Area (%)	Area (km ²)	Area (%)	Area (km ²)	Area (%)	Area (km ²)	Area (%)
Water body	52.65	5.69	31.56	3.39	61.69	6.67	83.23	9.00	48.81	5.28
Settlements	18.22	1.97	34.90	3.77	36.00	3.89	48.34	5.23	65.35	7.07
Woodland	4.91	0.53	8.64	0.93	16.81	1.82	12.33	1.33	39.46	4.27
Bare Surface	93.14	10.07	101.82	11.01	151.51	16.38	124.99	13.51	353.32	38.20
Grassland	379.47	41.03	437.88	47.34	332.16	35.91	420.86	45.50	272.42	29.45
Swamp	158.08	17.09	54.16	5.86	63.54	6.87	36.86	3.99	36.55	3.95
Agriculture	218.47	23.62	255.98	27.68	263.23	28.46	198.33	21.44	109.03	11.79
Total	924.94	100	924.94	100	924.94	100	924.94	100	924.94	100

Adapted from (Dami, Kuchali, and Mayomi 2016)

The various large-scale dam constructions in the upstream have considerably change the natural pattern of the flooded water to the wetland, which causes serious environmental threats to the wetland ecosystem. Because of this anthropogenic changes, expanse of land for farming and grazing together with fishing spots along the diverted channels have slowly been dried out, while other areas were dominated with invasive grass specie (the Typha grass). This development has forced the local farmers, fishermen and grazers to exert more pressure on the little available resources, and encroach other areas that are protected (Kaugama & Ahmed, 2014).

The Hadejia-Nguru, despite its reputation as wetland sanctuary of international importance, it is under continuous manmade pressures, mainly because the benefits it provided to the society have not yet been quantify in monetary terms. This is particularly worrisome considering the benefit associated with the wetland and the society underestimates their importance due to the absence of real market, thereby creating the possibility of market failure for ecotourism and other uses.

In terms of economic benefits associated with wetlands, generally in Nigeria, little is known about the benefits associated with the wetlands' goods and services, in this

regard, the actual value of the country's wetland resources is not known. The absence of valuation studies have made it almost impossible to appreciate the significance of conserving this vital resources in favour of other development activities that have the potential for higher turnover in the long run (Ambastha et al., 2007). For instance in Hadejia-Nguru wetland, no economic valuation study was conducted that captures real value of the natural resources. The only study related to wetlands valuation was a partial valuation conducted by Barbier, (1993), who employed the "market price approach", and thus relied on only on market value of the some extractive wetlands resources. However, information regarding the non-market values and their estimates remain unattended.

Furthermore, Barbier et al., (1997) stated that among the main motives behind the excessive resource exploitation of wetland resources is usually the failure to effectively consider the inclusion of their non-market values in decisions making. This incomplete valuation subsequently failed to give detail information on the true wetland value that can be inferred or compare with other studies from different geographic location, hence limit possibility for carrying out benefit transfer in future. This study therefore, fills in this research gap by quantifying the economic value of the wetland using two different non-market valuation techniques and more especially, as it measures it measures separately both the use value and non-use value of the wetlands.

In conclusion, this study open new window of research with regards to wetland and other natural resource valuation in Nigeria using non-market valuation approach in Nigeria. It set the pace in valuation exercise that quantify the wetland value in monetary terms, which can demonstrate the economic benefits of the Hadejia-Nguru wetlands to local and regional authorities on the need for reclamation, restoration and conservation to at least appreciable level possible.

1.3 Objective of the Study

The study objectives are twofold; the general objectives and specific objectives.

1.3.1 The general objective

The general objective of this study is to evaluate the economic benefit associated with resource conservation and the households' preferences on the attributes of Hadejia-Nguru wetland

1.3.2 Specific objectives

1. To determine the respondents' level of attitude, perception and awareness about the environment
2. To estimate the users and non-users mean willingness to pay amount for conservation of the wetland
3. To explore the respondents' preference on the attributes of the wetland
4. To estimate the total benefit of conservation in Hadejia-Nguru wetland

1.4 Significance of the Study

Before the emergence of valuation studies in environmental field, the environmental systems are considered irrelevant in policy decisions, which rendered the environmental resources susceptible to various forms of destruction and degradation. The economic analysis of resource especially wetlands, using a scenario-based approach, provides impetus to the relevant stakeholders on the potential consequences of planned development (cost and the benefit) and scepticism about the land use options. This therefore, revealed the importance of information regarding the economic value of various policy changes to the decision makers, and helps in making appropriate policy decisions regarding various developmental options and resource conservation.

In time of financial crises, decisions regarding allocation of limited government resources on environmental programs like conservation are always very difficult. By way of economic valuation, estimates about ecosystem benefits to people provide information base for decision-makers about the benefit associated with resource conservation activities. This baseline information formed an integral part of the costs benefits analysis of alternative resource management approaches that will allow policy makers to make an informed decision which may perhaps be in favor of environmental investment. The environmental valuation exercise therefore, is an important instrument for decision making if policy makers wants to justify spending of tax payers' money on conservation programs. Also, it enhance efficiency in distribution of available financial resources for prudent resource management (Barbier et al., 1997a; Do & Bennett, 2009; Lambert, 2003).

Producing an accurate estimate for biodiversity and ecosystem related services of a wetland have the potential to reduce the careless use of often undervalued natural resources of the area. It also demonstrates the importance of wetlands and its contribution to the country's economy and by gaining a stronger political support from the locals for sustainable use of resources. In light of this, it is imperative to estimate the value of the wetland and communicate this value to the policy makers and local communities for them the appreciated the valuable contribution of the wetlands and the need to improve its wise use and conservation.

In order to propose potentially implementable policy for wetland conservation that would be successful, it is important to consider all segments of the society that interact with the wetland. Some earlier studies on wetland valuation usually focus attention on just one section of the wetland attribute such as direct use (eg. Goose hunting), and they ignore other attributes and the interaction between the various components of the wetlands with human population. Because of that, the study often recommends improvement of the wetlands in terms protection and enhancement of the condition of that particular component they measured, thereby favouring some set of beneficiaries and by ignoring other users. This research therefore, filled in this gap by providing valuable information (identified the most important wetland attribute to the public), which would help in formulating wetland conservation policies. This would go a long way in addressing the conservation issue not only from the perspective of one segment of the society (users), but also from wider perspective that consider all the stakeholders who to some extent, have influence on the sustenance and survival of the wetland.

Additionally, there is dearth in the literature about the application of choice modeling for natural resource valuation in Africa, especially in the area of wetland valuation. The application of CVM and CM not only for wetland valuation but also for natural resource valuation in general has not yet been reported from Nigeria. Therefore this research will go a long way in enhancing knowledge and providing information about the applicability of choice modeling technique in area of environmental valuation which will serve as a standard for future research on wetlands valuation in Nigeria and other African countries. Furthermore, by applying choice modeling technique in this study, both the willingness to pay for improvement in each of the attributes of the wetland and the willingness to pay for advancing from the status quo to the various wetland management alternatives were easily obtained. Hence the WTP estimated in this study can serve as an input into the list of global wetland value that can be reliably referred to, and help to bring the economic value of an important Ramsar site into the limelight.

This research would open a new window of research and will potentially contribute to the literature in the field of wetland valuation by supplying useful information to the policy making body which will guide them in identifying the benefits of resource use and conservation and elucidate the need to incorporate wetlands conservation into development planning policies. Besides that, it will help to explore the contribution of various resource beneficiaries of the wetland, and proffer a better and economically viable way to secure sustainable financial support, by attracting investments and incentives for the wetland conservation (i.e. users pay principle).

Despite the recognition of the status of Hadejia-Nguru wetland as an area of international importance (RAMSAR site), information about its use and non-value is virtually absence. Also, there is lack of information regarding the economic benefits of the various wetland attributes such as the biodiversity and associated ecosystem function. This research intend to fill in the information gap by identifying the various wetland attributes that are socially, ecologically and economically important to the

society and estimates their economic values, explicitly, the estimates of willingness to pay for conservation of the different wetland attributes.

In conclusion, as Barbier et al., (1997) pointed out that among the major reasons for wetland degradation is the failure of the society to consider non-market values of the wetlands in development decisions. Applying non-market valuation techniques particularly choice modelling to measure the economic value in Hadejia-Nguru wetland would demonstrate the importance of the wetland in a language that is more familiar and would easily be understood (In economic terms) by the key decision makers.

1.5 Scope of the Study

This study intended to measure the use and non-use values of Hadejia-Nguru wetland. Scope of this study is limited to the households in communities surrounding the wetland and primarily those who relied on the wetland for survival. For non-user category, households in only those communities that are located in the upstream and are not far away from the wetland within 200km are considered. Methodologically, the study uses only non-market valuation techniques of estimation (CVM and CM) and thus, did not consider market-based approach.

1.6 Organization of the Thesis

This thesis is organized based on chapters. The first part was chapter 1, which gives the general introduction of the research, giving the wetland definition, wetlands resources, values, and the services they provide. It explains general status of the wetlands, the need for economic valuation as well as suitable economic tools for their valuation. The chapter also describes the problems and issues that necessitate the study, the key objectives, and the significance of the study.

Chapter 2 discusses the literature related to the key aspect of the study which includes general overview of the worlds' wetland, wetland conservation in developing countries and Nigeria and the Hadejia-Nguru wetland. The chapter also provides an insight into the economic valuation of natural resources, the economic valuation techniques, theoretical and conceptual frame work as well as the empirical studies of wetland valuation.

Chapter 3 gives the methodological approach of the study. This includes the background of the study area, the sampling frame, research design, model specification, and data analysis.

In chapter 5, results are presented and discussed based on the findings.

REFERENCES

- Adamowicz, W., Louviere, J., & Williams, M. (1994). Combining Revealed and Stated Preference Methods for Valuing Environmental Amenities. *Journal of Environmental Economics and Management*, 26(3), 271–292. <http://doi.org/10.1006/jeem.1994.1017>
- Adekola, O., Whanda, S., & Ogwu, F. (2012). Assessment of policies and legislation that affect management of Wetlands in Nigeria. *Wetlands*, 32, 665–667. <http://doi.org/10.1007/s13157-012-0299-3>
- Agbasi, M. N. (2016). The Legal Framework for the Protection of Wetlands in Nigeria. *Journal of Law, Policy and Globalization*, 54(June 2015), 40–49.
- Ambastha, K., Hussain, S. A., & Badola, R. (2007). Social and economic considerations in conserving wetlands of indo-gangetic plains: A case study of Kabartal wetland, India. *Environmentalist*, 27, 261–273. <http://doi.org/10.1007/s10669-007-9003-1>
- Arabamiry, S. (2013). Choice Modelling Stated Preference Valuation Technique in Perhentian Island Marine Park Environmental Goods. *International Journal of Business and Social Science*, 4(6), 179–188.
- Arabatzi, G., & Grigoroudis, E. (2010). Visitors' satisfaction, perceptions and gap analysis: The case of Dadia–Lefkimi–Souflion National Park. *Forest Policy and Economics*, 12(3), 163–172. <http://doi.org/10.1016/j.forpol.2009.09.008>
- Arrow, K., Solow, R., Portney, P. R., Leamer, E. E., Radner, R., & Schuman, H. (1993). Report of the NOAA Panel on Contingent Valuation. In *NOAA Panel Report* (pp. 4601–4614). Washington, DC: US Federal Register.
- Baltas, G., & Doyle, P. (2001). Random utility models in marketing research: A survey. *Journal of Business Research*, 51(2), 115–125. [http://doi.org/10.1016/S0148-2963\(99\)00058-2](http://doi.org/10.1016/S0148-2963(99)00058-2)
- Banerjee, A., & Chaudhury, S. (2010). Statistics without tears: Populations and samples. *Industrial Psychiatry Journal*, 19(1), 60. <http://doi.org/10.4103/0972-6748.77642>
- Baral, N., Stern, M. J., & Bhattarai, R. (2008). Contingent valuation of ecotourism in Annapurna conservation area, Nepal: Implications for sustainable park finance and local development. *Ecological Economics*, 66(2–3), 218–227. <http://doi.org/10.1016/j.ecolecon.2008.02.004>
- Baral, S., Basnyat, B., Khanal, R., & Gauli, K. (2016). A Total Economic Valuation of Wetland Ecosystem Services : An Evidence from Jagadishpur Ramsar Site , Nepal. *The Scientific World Journal*, 2016.

- Barbier, E. B. (1993a). Sustainable use of wetlands Valuing tropical wetland benefits: economic methodologies and applications. *The Geographical Journal*, 159(1), 22–32. Retrieved from <http://www.jstor.org/stable/3451486>
- Barbier, E. B. (1993b). Sustainable use of wetlands valuing tropical wetland benefits: economic methodologies and applications. *Geographical Journal*, 159(1), 22–32. Retrieved from <http://www.jstor.org/stable/3451486>
- Barbier, E. B., Acreman, M., & Knowler, D. (1997a). *Economic valuation of wetlands: A guide for policy makers and planners*. Gland, Switzerland: Ramsar Convention Bureau.
- Barbier, E. B., Acreman, M., & Knowler, D. (1997b). *Economic Valuation of Wetlands: A guide for policy makers and planners*. Ramsar Convention Bureau.
- Barbier, E. B., Hacker, S. D., Kennedy, C., Koch, E. W., Stier, A. C., & Silliman, B. R. (2011). The value of estuarine and coastal ecosystem services. *Ecological Monographs*, 81(2), 169–193.
- Barrio, M., & Loureiro, M. L. (2010). A meta-analysis of contingent valuation forest studies. *Ecological Economics*, 69(5), 1023–1030. <http://doi.org/10.1016/j.ecolecon.2009.11.016>
- Bateman, I. J., Carson, R. T., Day, B., Hanemann, M., Hanley, N., Hett, T., ... Loomes, G. et al. (2002). *Economic valuation with stated preference techniques: a manual*. Cheltenham, UK: Edward Elgar Publishing Ltd. Retrieved from <http://www.cabdirect.org/abstracts/20043091507.html;jsessionid=6679C81040131FA63E1C739D0BFF7E18>
- Ben-Akiva, M., McFadden, D., Abe, M., Böckenholt, U., Bolduc, D., Gopinath, D., ... Steinberg, D. (1997). Modeling Methods for Discrete Choice Analysis. *Marketing Letters*, 8(3), 273–286. <http://doi.org/10.1023/a:1007956429024>
- Bennett, J. and Blamey, R. (2001). *The Choice Modelling Approach to Environmental Valuation*. Edward Elgar Publishing. Retrieved from <http://books.google.com/books?hl=en&lr=&id=8-KLGW9yT6QC&pgis=1>
- Bennett, J., & Birol, E. (2010). *Choice Experiments in Developing Countries: Implementation, Challenges and Policy Implications*. Cheltenham, UK: Edward Elgar Publishing limited.
- Bhandari, A. K., & Heshmati, A. (2010). Willingness to Pay for Biodiversity Conservation. *Journal of Travel & Tourism Marketing*, 27(6), 612–623. <http://doi.org/10.1080/10548408.2010.507156>
- Bhat, C. R. (1997). An Endogenous Segmentation Mode Choice Model with an Application to Intercity Travel. *Transportation Science*, 34–48.

- Birdlife International. (2008). State of the World's Birds - indicators for our changing world. *Database*, 28.
- Birol, E., Karousakis, K., & Koundouri, P. (2006). Using a choice experiment to account for preference heterogeneity in wetland attributes: The case of Cheimaditida wetland in Greece. *Ecological Economics*, 60(1), 145–156. <http://doi.org/10.1016/j.ecolecon.2006.06.002>
- Blamey, R. K., Bennett, J. W., Louviere, J. J., & Morrison, M. D. (1999). Validation of choice model involving green product choice. *Choice Modelling Research Reports*.
- Blamey, R. K., Bennett, J. W., Morrison, M. D., Louviere, J. J., & Rolfe, J. C. (1998). *Attribute Selection in Environmental Choice Modelling Studies : The Effect of Causally Prior*. *Choice Modelling Research Report No. 7*.
- Bliemer, M. C. J., & Rose, J. M. (2010). Construction of experimental designs for mixed logit models allowing for correlation across choice observations. *Transportation Research Part B: Methodological*, 44(6), 720–734. <http://doi.org/10.1016/j.trb.2009.12.004>
- Boxall, P. C., & Adamowicz, W. L. (2002). Understanding Heterogeneous Preferences in Random Utility Models : A Latent Cl ... *Environmental and Resource Economics*, 23(4), 421–446.
- Brander, L., Brouwer, R., & Wagtendonk, A. (2013). Economic valuation of regulating services provided by wetlands in agricultural landscapes: A meta-analysis. *Ecological Engineering*, 56. <http://doi.org/10.1016/j.ecoleng.2012.12.104>
- Brander, L. M., Florax, R., & Vermaat, J. (2006). The empirics of wetland valuation: a comprehensive summary and a meta-analysis of the literature. *Environmental and Resource ...*, 33, 223–250. Retrieved from <http://link.springer.com/article/10.1007/s10640-005-3104-4>
- Brander, L., & Schuyt, K. (2010). Benefits transfer: The economic value of world ' s wetlands. *The Economics of Ecosystems and Biodiversity*, 1–3.
- Brouwer, R. (2009). *MULTI-ATTRIBUTE CHOICE MODELLING OF AUSTRALIA ' S RIVERS AND WETLANDS : A META- ANALYSIS OF TEN YEARS OF Socio-Economics and the Environment in Discussion CSIRO Working Paper Series 2009-05*.
- Brouwer, R., Job, F. C., van der Kroon, B., & Johnston, R. (2015). Comparing Willingness to Pay for Improved Drinking-Water Quality Using Stated Preference Methods in Rural and Urban Kenya. *Applied Health Economics and Health Policy*, 13(1), 81–94. <http://doi.org/10.1007/s40258-014-0137-2>
- Calia, P., & Strazzera, E. (2000). Bias and efficiency of single versus double bound

models for contingent valuation studies: a Monte Carlo analysis. *Applied Economics*. <http://doi.org/10.1080/000368400404489>

Carlsson, F., Frykblom, P., & Liljenstolpe, C. (2003). Valuing wetland attributes: an application of choice experiments. *Ecological Economics*, 47(1), 95–103. <http://doi.org/10.1016/j.ecolecon.2002.09.003>

Carson, R., & Hanemann, W. (2005). *Contingent valuation*. *Handbook of environmental economics*. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1574009905020176>

Carson, R. T., Flores, N. E., & Meade, N. F. (2001). Contingent Valuation: Controversies and Evidence. *Environmental and Resource Economics*, 19(2), 173–210. <http://doi.org/10.1023/A:1011128332243>

Chaikumbung, M., Doucouliagos, H., & Scarborough, H. (2016). The economic value of wetlands in developing countries: A meta-regression analysis. *Ecological Economics*, 124, 164–174. <http://doi.org/10.1016/j.ecolecon.2016.01.022>

Chaikumbung, M., Scarborough, H., & Doucouliagos, C. (2014). *Incorporating cultural values and preferences in wetland valuation and policy*.

Champ, P. A., & Bishop, R. C. (2001). Donation payment mechanisms and contingent valuation: an empirical study of hypothetical bias. *Environmental and Resource Economics*, 19, 383–401. Retrieved from <http://link.springer.com/article/10.1023/A:1011604818385>

Champ, P. A., Bishop, R. C., Brown, T. C., & McCollum, D. W. (1997). Using Donation Mechanisms to Value Nonuse Benefits from Public Goods. *Journal of Environmental Economics and Management*, 33, 151–162. <http://doi.org/10.1006/jeem.1997.0988>

Christie, M., Fazey, I., Cooper, R., Hyde, T., & Kenter, J. O. (2012). An evaluation of monetary and non-monetary techniques for assessing the importance of biodiversity and ecosystem services to people in countries with developing economies. *Ecological Economics*, 83, 67–78. <http://doi.org/10.1016/j.ecolecon.2012.08.012>

Christie, M., Fazey, L., Cooper, R., Hyde, T., Deri, A., Hughes, L., ... Reyers, B. (2008). *An Evaluation of Economic and Non-economic Techniques for Assessing the Importance of Biodiversity to People in Developing Countries*. Defra, ... Retrieved from [http://users.aber.ac.uk/mec/Publications/Reports/Defra valuation BD in DC final report.pdf](http://users.aber.ac.uk/mec/Publications/Reports/Defra_valuation_BD_in_DC_final_report.pdf)

Chung, J. Y., Kyle, G. T., Petrick, J. F., & Absher, J. D. (2011). Fairness of prices, user fee policy and willingness to pay among visitors to a national forest. *Tourism Management*, 32(5), 1038–1046.

<http://doi.org/10.1016/j.tourman.2010.08.016>

- Cooper, P., Poe, G. L., & Bateman, I. J. (2004). The structure of motivation for contingent values: a case study of lake water quality improvement. *Ecological Economics*, 50(1–2), 69–82. <http://doi.org/10.1016/j.ecolecon.2004.02.009>
- Costanza, R., Arge, R., Groot, R. De, Farber, S., Grasso, M., Hannon, B., ... Sutton, P. (1997). The value of the world ' s ecosystem services and natural capital. *Nature*, 387(May), 253–260.
- Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. *Research design Qualitative quantitative and mixed methods approaches*. <http://doi.org/10.1007/s13398-014-0173-7.2>
- Cummings, R. G., & Taylor, L. O. (1999). Goods : Unbiased Value Estimates for Environmental A Cheap Talk Design for the Contingent Valuation Method. *American, The Review, Economic*, 89(3), 649–665.
- de Bekker-Grob, E. W., Donkers, B., Jonker, M. F., & Stolk, E. A. (2015). Sample Size Requirements for Discrete-Choice Experiments in Healthcare: a Practical Guide. *Patient*, 8(5), 373–384. <http://doi.org/10.1007/s40271-015-0118-z>
- Dimitrakopoulos, P. G., Jones, N., Iosifides, T., Florokapi, I., Lasda, O., Paliouras, F., & Evangelinos, K. I. (2010). Local attitudes on protected areas: Evidence from three Natura 2000 wetland sites in Greece. *Journal of Environmental Management*, 91, 1847–1854. <http://doi.org/10.1016/j.jenvman.2010.04.010>
- Do, T. N., & Bennett, J. (2009). Estimating wetland biodiversity values: a choice modelling application in Vietnam's Mekong River Delta. *Environment and Development Economics*, 14(2), 163. <http://doi.org/10.1017/S1355770X08004841>
- Dumitraş, D. E., Arion, F. H., & Merce, E. (2011). A Brief Economic Assessment on the Valuation of National and Natural Parks : the Case of Romania. *Not Bot Hort Agrobot Cluj*, 39(1), 134–138.
- Dunlap, R. E., Liere, K. D. Van, Mertig, A. G., & Jones, R. E. (2000). Measuring Endorsement of the New Ecological Paradigm : A Revised NEP Scale. *Journal of Social Issues*, 56(3), 425–442. <http://doi.org/10.1111/0022-4537.00176>
- Ellingson, L., & Seidl, A. (2007). Comparative analysis of non-market valuation techniques for the Eduardo Avaroa Reserve, Bolivia. *Ecological Economics*, 60(3), 517–525. <http://doi.org/10.1016/j.ecolecon.2006.07.014>
- Erdogan, N. (2009). Testing the new ecological paradigm scale : Turkish. *African Journal of Agricultural Research*, 4(10), 1023–1031.

- Freeman, M. A. (1993). *The Measurement of Environmental and Resource Values*.
- Gardner, R. C., & Davidson, N. C. (2011). The Ramsar convention. In *Wetlands* (pp. 189–203). Springer.
- Gelso, B. R., & Peterson, J. M. (2005). The influence of ethical attitudes on the demand for environmental recreation: Incorporating lexicographic preferences. *Ecological Economics*, 53, 35–45. <http://doi.org/10.1016/j.ecolecon.2004.01.021>
- Ghermandi, A. (2008). *The Economic Value of Wetland Conservation and Creation : A Meta-Analysis*.
- Ghosh, P. K., & Mondal, M. S. (2013). Economic valuation of the non-use attributes of a south-western coastal wetland in Bangladesh. *Journal of Environmental Planning and Management*, 56(9), 1403–1418. <http://doi.org/10.1080/09640568.2012.724667>
- Greene, W. H., & Hensher, D. A. (2007). Heteroscedastic control for random coefficients and error components in mixed logit. *Transportation Research Part E: Logistics and Transportation Review*, 43(5), 610–623. <http://doi.org/10.1016/j.tre.2006.02.001>
- Groot, D. (2006). *Valuing wetlands: Guidance for valuing the benefits derived from wetland ecosystem services*. Gland, Switzerland. Retrieved from <http://www.ramsar.org/document>
- Gurluk, S. (2006). The estimation of ecosystem services ' value in the region of Misi Rural Development Project : Results from a contingent valuation survey. *Forest Policy and Economics*, 9, 209–218. <http://doi.org/10.1016/j.forpol.2005.07.007>
- Haab, T., & McConnell, K. (2002). *Valuing environmental and natural resources: the econometrics of non-market valuation*. Edward Elgar Publishing. Retrieved from http://books.google.com.my/books?hl=en&lr=&id=akELpkNetLkC&oi=fnd&pg=PR1&dq=valuing+environmental+and+natural+resources:+econometrics+of+non+market+valuation&ots=YeOzSNdmDZ&sig=rPdTOAvv-pXC-YGjihdft_D7q0A
- Hall, J., Viney, R., Haas, M., & Louviere, J. (2004). Using stated preference discrete choice modeling to evaluate health care programs, 57, 1026–1032. [http://doi.org/10.1016/S0148-2963\(02\)00352-1](http://doi.org/10.1016/S0148-2963(02)00352-1)
- Hanemann, M. W. (1994). Valuing the Environment Through Contingent Valuation. *The Journal of Economic Perspectives*, 8(4), 19–43.
- Hanemann, W. M. (1984). Welfare Evaluations in Contingent Valuation Experiments with Discrete Responses. *American Journal of Agricultural*

Economics, 66, 332–341. <http://doi.org/10.2307/1240800>

- Hanley, N., Barbier, E. B., & Barbier, E. B. (2009). *Pricing Nature: Cost-benefit Analysis and Environmental Policy*. Edward Elgar Publishing. Retrieved from <http://books.google.com/books?hl=en&lr=&id=Ojg9u-fS9dAC&pgis=1>
- Hanley, N., Mourato, S., & Wright, R. E. (2001). Choice Modelling Approaches : a Superior Alternative for Environmental Valuation? *Journal of Economic Surveys*, 15(3), 435–462. <http://doi.org/10.1111/1467-6419.00145>
- Hanley, N., Wright, R. E., & Adamowicz, V. (1998a). Using Choice Experiments to Value the Environment. *Environmental & Resource Economics*, 11, 413–428. <http://doi.org/JEL classification: Q23, Q26>
- Hanley, N., Wright, R. E., & Adamowicz, V. I. C. (1998b). Using Choice Experiments to Value the Environment. *Environmental & Resource Economics*, 11(3–4), 413–428. <http://doi.org/JEL classification: Q23, Q26>
- Hanley, N., Wright, R. E., & Alvarez-Farizo, B. (2006). Estimating the economic value of improvements in river ecology using choice experiments: an application to the water framework directive. *Journal of Environmental Management*, 78, 183–193. <http://doi.org/10.1016/j.jenvman.2005.05.001>
- Harju-autti, P., & Kokkinen, E. (2014). Open Access Research Article A Novel Environmental Awareness Index Measured Cross-Nationally For Fifty Seven Countries Abstract: Motivation Environmental awareness Knowledge Skills. *Universal Journal of Environmental Research and Technology*, 4(4), 178–198.
- Hejazi, R., Shamsudin, M. N., & Rahim, K. A. (2014). Journal of Environmental Planning and Measuring the economic values of natural resources along a freeway : a contingent valuation method. *Journal of Environmental Planning and Management*, 57(4), 629–641. <http://doi.org/10.1080/09640568.2012.758628>
- Hensher, D. A., Rose, J. M., & Greene, W. H. (2005). *Applied Choice Analysis: A Primer*. New York: Cambridge University Press, New York.
- Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing and Health*, 31, 180–191. <http://doi.org/10.1002/nur.20247>
- Hill, R. (1998). WHAT SAMPLE SIZE is “ ENOUGH ” in INTERNET SURVEY RESEARCH? *Nterpersonal Computing and Technology: An Electronic Journal for the 21st Century*, 6(3), 1–10.
- Hosseinnezhad, F. (2017). A Study of the New Environmental Paradigm Scale in the Context of Iran. *European Journal of Sustainable Development Research*, 1(2), 1–8. <http://doi.org/10.20897/ejosdr.201714>

- Isaac, S., & Michael, W. B. (1995). *Handbook in Research and Evaluation*. San Diego, CA: Educational and Industrial Testing Services.
- Israel, G. (1992). *Determining Sample Size*. University of Florida Cooperative Extension Services, Institute of Food and Agriculture Sciences (Vol. 85). <http://doi.org/10.4039/Ent85108-3>
- James, D., & Predo, C. (2015). *Principles and Practice of Cost–Benefit Analysis. Cost-Benefit studies of natural resource management in Southeast Asia*. <http://doi.org/10.1007/978-981-287-393-4>
- Jenkins, W. A., Murray, B. C., Kramer, R. A., & Faulkner, S. P. (2010). Valuing ecosystem services from wetlands restoration in the Mississippi Alluvial Valley. *Ecological Economics*, 69(5), 1051–1061. <http://doi.org/10.1016/j.ecolecon.2009.11.022>
- Johanson, G. a., & Brooks, G. P. (2010). Initial Scale Development: Sample Size for Pilot Studies. *Educational and Psychological Measurement*, 70, 394–400. <http://doi.org/10.1177/0013164409355692>
- Jones-Walters, L., & Mulder, I. (2009). Valuing nature: The economics of biodiversity. *Journal for Nature Conservation*, 17(4), 245–247. <http://doi.org/10.1016/j.jnc.2009.06.001>
- Kabii, T. (1996). *An overview of African wetlands*. <http://hdl.handle.net/1834/457>. Retrieved from <http://hdl.handle.net/1834/457>
- Kaffashi, S., Nasir, M., Radam, A., Rusli, M., Abdul, K., & Yazid, M. (2012). Economic valuation and conservation : Do people vote for better preservation of Shadegan International Wetland? *BIOLOGICAL CONSERVATION*, 150(1), 150–158. <http://doi.org/10.1016/j.biocon.2012.02.019>
- Kaugama, H. H., & Ahmed, B. A. (2014). Prospect and Challenges of Farming along the Hadejia- Nguru Wetland in Jigawa State Nigeria. *International Journal of Academic Research in Economics and Management Sciences*, 3(6), 43–52.
- Keddy, P. a., Fraser, L. H., Solomeshch, A. I., Junk, W. J., Campbell, D. R., Arroyo, M. T. K., & Alho, C. J. R. (2009). Wet and Wonderful: The World’s Largest Wetlands Are Conservation Priorities. *BioScience*, 59(1), 39–51. <http://doi.org/10.1525/bio.2009.59.1.8>
- Kontoleon, A., Pascual, U., & Swanson, T. (2007). Biodiversity Economics. In *Biodiversity Economics* (1st ed., pp. 417–436). Cambridge University Press.
- Kotchen, M. J., & Reiling, S. D. (2000). Environmental attitudes, motivations, and contingent valuation of nonuse values: a case study involving endangered species. *Ecological Economics*, 32(1), 93–107. [http://doi.org/10.1016/S0921-8009\(99\)00069-5](http://doi.org/10.1016/S0921-8009(99)00069-5)

- Kumar, M., & Kumar, P. (2007). Valuation of the ecosystem services:, 4. <http://doi.org/10.1016/j.ecolecon.2007.05.008>
- Kuriyama, K. (1998). *Measuring the Value of the Ecosystem in the Kushiro Wetland : An Empirical Study of Choice Experiments.*
- Lambert, A. (2003). *Economic valuation of wetlands: an important component of wetland management strategies at the river basin scale. Conservation Finance Guide, Washington.* Retrieved from http://www.unepscs.org/Economic_Valuation_Training_Materials/06_Readings_on_Economic_Valuation_of_Coastal_Habitats/07-Economic-Valuation-Wetlands-Management.pdf
- Lancaster, K. J. (1966). A new approach to consumer theory. *Journal of Political Economy*, 74(2), 132. <http://doi.org/10.1086/259131>
- Laurila-pant, M., Lehtikoinen, A., Uusitalo, L., & Venesjärvi, R. (2015). How to value biodiversity in environmental management ? *Ecological Indicators*, 55, 1–11. <http://doi.org/10.1016/j.ecolind.2015.02.034>
- Lee, C., & Han, S.-Y. (2002). Estimating the use and preservation values of national parks ' tourism resources using a contingent valuation method. *Tourism Geographies*, 23, 531–540.
- Lee, C., & Mjelde, J. W. (2007). Valuation of ecotourism resources using a contingent valuation method: The case of the Korean DMZ. *Ecological Economics*, 63(2–3), 511–520. <http://doi.org/10.1016/j.ecolecon.2006.12.011>
- Leschine, T. M., Wellman, K. F., & Green, T. H. (1997). *The Economic Value of Wetlands. Ecological Publication. No.97-100.* Washington, DC. Retrieved from <http://www.wa.gov/ecology>
- Lienhoop, N., & MacMillan, D. (2007). Valuing wilderness in Iceland: Estimation of WTA and WTP using the market stall approach to contingent valuation. *Land Use Policy*, 24(1), 289–295. <http://doi.org/10.1016/j.landusepol.2005.07.001>
- List, J. a, & Taylor, M. H. (2006). Advances in Economic Analysis & Policy Using Choice Experiments to Value Non-Market Goods and Services : Evidence from Field Experiments Using Choice Experiments to Value Non-Market Goods and Services : Evidence from Field Experiments *. *Advances in Economic Analysis and Policy*, 6(2), XXX–XXX.
- Lockwood, M., & Tracy, K. (1995). Nonmarket Economic Valuation of an Urban Recreation Park. *Journal of Leisure Research*, 27, 155–167.
- Loomis, J., Brown, T., Lucero, B., & Peterson, G. (1997). Evaluating the Validity of the Dichotomous Choice Question Format in Contingent Valuation. *Environmental and Resource Economics*, 10, 109–123.

- Loomis, J., Kent, P., Strange, L., Fausch, K., & Covich, A. (2000). Measuring the total economic value of restoring ecosystem services in an impaired river basin: results from a contingent valuation survey. *Ecological Economics*, 33(1), 103–117.
- Loureiro, M. L., & Umberger, W. J. (2007). A choice experiment model for beef: What US consumer responses tell us about relative preferences for food safety, country-of-origin labeling and traceability. *Food Policy*, 32(4), 496–514. <http://doi.org/10.1016/j.foodpol.2006.11.006>
- Louviere, J. J., & Hensher, D. A. (1982). DESIGN AND ANALYSIS OF SIMULATED CHOICE OR ALLOCATION EXPERIMENTS IN TRAVEL CHOICE MODELING. *Transportation Research Record*, (890), 11–17. Retrieved from <http://trid.trb.org/view.aspx?id=189334>
- Louviere, J. J., Hensher, D. A., & Swait, J. (2000). *Stated choice methods: Analysis and Applications*. <http://doi.org/10.1017/CBO9780511753831.008>
- Mäler, K.-G. (1992). *Production function approach in developing countries*. Beijer International Institute of Ecological Economics, the Royal Swedish Academy of Science.
- Mangham, L. J., Hanson, K., & McPake, B. (2009). How to do (or not to do)...Designing a discrete choice experiment for application in a low-income country. *Health Policy and Planning*, 24(2), 151–158. <http://doi.org/10.1093/heapol/czn047>
- McFadden, D. (1973). Conditional logit analysis of qualitative choice behavior. *Frontiers in Econometrics*. <http://doi.org/10.1108/eb028592>
- McFadden, D. (1986). The choice theory approach to market research. *Marketing Science*, 5(4), 275–297. <http://doi.org/10.1287/mksc.5.4.275>
- Meduna, A. J., Ogunjinmi, A. A., & Onadeko, S. A. (2009). Biodiversity Conservation Problems and Their Implications on Ecotourism In Kainji Lake National Park, Nigeria. *Journal of Sustainable Development in Africa*, 10(4), 59–73.
- Miller, C. A. (2006). *Public Awareness and Perceptions of Wetland Loss in Coastal Louisiana*.
- Milon, J. W., & Scrogin, D. (2006). Latent preferences and valuation of wetland ecosystem restoration. *Ecological Economics*, 56, 162–175. <http://doi.org/10.1016/j.ecolecon.2005.01.009>
- Mitani, Y., Shoji, Y., & Kuriyama, K. (2008). Estimating economic values of vegetation restoration with choice experiments: A case study of an endangered species in Lake Kasumigaura, Japan. *Landscape and Ecological Engineering*, 4(2), 103–113. <http://doi.org/10.1007/s11355-008-0049-0>

- Mitchell, R. C., & Carson, R. T. (1989). *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington, DC: Routledge. Retrieved from <http://books.google.com/books?hl=en&lr=&id=dXGMAQAAQBAJ&pgis=1>
- Mitsch, W., & Gosselink, J. G. (2015). Wetlands of the World. *Wetlands*, 45–110. Retrieved from http://samples.sainsburysebooks.co.uk/9781119019794_sample_1009801.pdf
- Mitsch, W. J., & Gosselink, J. G. (2015). *Wetlands* (5th ed.). Hoboken, New Jersey: John Wiley & Sons Inc.
- Mmopelwa, G., Kgathi, D. L., & Molefhe, L. (2007). Tourists' perceptions and their willingness to pay for park fees: A case study of self-drive tourists and clients for mobile tour operators in Moremi Game Reserve, Botswana. *Tourism Management*, 28, 1044–1056. <http://doi.org/10.1016/j.tourman.2006.08.014>
- Moeltner, K., & Woodward, R. (2009). Meta-functional benefit transfer for wetland valuation: Making the most of small samples. *Environmental and Resource Economics*, 42, 89–108. <http://doi.org/10.1007/s10640-008-9205-0>
- Mohd Rusli, Y., Alias, R., Khairil, W., & Ahmad, S. (2009). Contingent valuation of ecotourism in Marine Parks, Malaysia: implication for sustainable Marine Park revenue and ecotourism management. *World Applied Sciences Journal*, 7(12), 1474–1481. Retrieved from <http://www.cabdirect.org/abstracts/20103090701.html>
- Mohd Rusli, Y., Alias, R., Khairil, W., Ahmad, S., & Mohd Rusli, Y. Alias, R. Khairil, W. and Shuib, A. (2009). Contingent valuation of ecotourism in Marine Parks, Malaysia: implication for sustainable Marine Park revenue and ecotourism management. *World Applied Sciences Journal*, 7(12), 1474–1481. Retrieved from <http://www.cabdirect.org/abstracts/20103090701.html>
- Mohd Rusli, Y., Alias, R., & Shuib, A. (2009). A Contingent Valuation Study of Marine Parks Ecotourism: The Case of Pulau Payar and Pulau Redang in Malaysia. *Journal of Sustainable Development*, 2(January 1999), 95–105. Retrieved from <http://ccsenet.org/journal/index.php/jsd/article/viewFile/3012/>
- Montes, C., Benayas, J., & Martı, B. (2007). The non-economic motives behind the willingness to pay for biodiversity conservation, 9. <http://doi.org/10.1016/j.biocon.2007.06.005>
- Morrison, M., Bennet, J., & Blamey, R. (1999). Valuing improved wetland quality using choice modeling. *Water Resources Research*, 35(9), 2805–2814.
- Muslim, I. (2008). Damming Nigeria's Wetlands People. *World Rivers Review*, 23(2).

- National Bureau of Statistics. (2010). *NATIONAL BUREAU OF STATISTICS ANNUAL ABSTRACT OF STATISTICS*, Federal Republic of Nigeria.
- Nijkamp, P., Vindigni, G., & Nunes, P. A. L. D. (2008). Economic valuation of biodiversity: A comparative study. *Ecological Economics*, 7, 217–231. <http://doi.org/10.1016/j.ecolecon.2008.03.003>
- Nwankwoala, H. (2012). Case studies on coastal wetlands and water resources in Nigeria. *European Journal of Sustainable Development*, 1(2), 113–126.
- Olalekan, E. I., Abimbola, L. M., Saheed, M., & Damilola, O. A. (2014). Wetland Resources of Nigeria : Case Study of the Hadejia-Nguru Wetlands. *Poultry, Fisheries & Wildlife Sciences*, 2(2). <http://doi.org/10.4172/2375-446X.1000123>
- Othman, J., Bennett, J., & Blamey, R. (2004). Environmental values and resource management options: a choice modelling experience in Malaysia. *Environment and Development Economics*, 9(6), 803–824. <http://doi.org/10.1017/S1355770X04001718>
- Pascual, U., Muradian, R., Brander, L., Gómez-baggethun, E., Martín-lópez, B., Verma, M., ... Turner, R. K. (2010). *The economics of valuing ecosystem services and biodiversity*.
- Pearce, D., & Moran, D. (1994). *the Economic Value of Biodiversity Iucn — the World Conservation Union. Diversity*. Earthscan Publications Ltd, London. Retrieved from <http://books.google.com/books?id=RdH6DRZY0KIC>
- Peter, V. L., Mike, C. B., & Wilson, J. (2013). The valuation of wetland conservation in an urban / peri urban watershed. *Reg Environ Change*, 13, 939–953. <http://doi.org/10.1007/s10113-012-0393-3>
- Peterson, G. L., & Sorg, C. F. (1987). Toward the measurement of total economic value. *General Technical Report RM (USA)*, 148, 44. Retrieved from <http://agris.fao.org/agris-search/search.do?recordID=US8918310>
- Ramsar. (2008). Ramsar sites information service. Retrieved October 11, 2016, from www.ramsar.org/rsis
- Reynisdottir, M., Song, H., & Agrusa, J. (2008). Willingness to pay entrance fees to natural attractions: An Icelandic case study. *Tourism Management*, 29(6), 1076–1083. <http://doi.org/10.1016/j.tourman.2008.02.016>
- Richer, J. (1995). Willingness to pay for desert protection. *Contemporary Economic Policy*, 13(4), 93–104. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/j.1465-7287.1995.tb00735.x/full>
- Ridker, R., & Henning, J. (1967). The determinants of residential property values with special reference to air pollution. *The Review of Economics and*

Statistics, 49(2), 246–257. Retrieved from
<http://www.jstor.org/stable/1928231>

- Rogerson, C. (2006). Pro-Poor local economic development in South Africa: The role of pro-poor tourism. *Local Environment*, 11(1), 37–60. <http://doi.org/10.1080/13549830500396149>
- Roggeri, H. (1995). *Tropical Freshwater Wetlands: A Guide to Current Knowledge and Sustainable Management*. <http://doi.org/10.1007/978-94-015-8398-5>
- Schuijt, K. (2002). *Land and Water Use of Wetlands in Africa : Economic Values of African Wetlands*. Laxenburg, Austria.
- Schultz. (1976). *Hadejia River Basin Study Development Plan: Final Report*. Vancouver, Canada.
- Schuyt, K. D. (2005). Economic consequences of wetland degradation for local populations in Africa. *Ecological Economics*, 53, 177–190. <http://doi.org/10.1016/j.ecolecon.2004.08.003>
- Sedgwick, P. (2015). Multistage sampling. *BMJ (Online)*, 351(July), 1–2. <http://doi.org/10.1136/bmj.h4155>
- Seongseop, S., Wong, K. K. F., & Cho, M. (2007). Assessing the economic value of a world heritage site and willingness-to-pay determinants: A case of Changdeok Palace. *Tourism Geographies*, 28, 317–322. <http://doi.org/10.1016/j.tourman.2005.12.024>
- Shabmana, S. S. B. & L. A. (1982). Estimating the economic value of wetlands: Principles, methods, and limitations. *Coastal Zone Management Journal*, 10(3), 255–278. <http://doi.org/10.1080/08920758209361920>
- Sharma, B., Rasul, G., & Chettri, N. (2015). The economic value of wetland ecosystem services: Evidence from the Koshi Tappu Wildlife Reserve, Nepal. *Ecosystem Services*, 12, 84–93. <http://doi.org/10.1016/j.ecoser.2015.02.007>
- Smyth, R. L., Watzin, M. C., & Manning, R. E. (2009). Investigating public preferences for managing Lake Champlain using a choice experiment. *Journal of Environmental Management*, 90(1), 615–623. <http://doi.org/10.1016/j.jenvman.2007.12.016>
- Stevens, T. H. (1995). Public Attitudes and Economic Values for Wetland. *Wetlands*, 15(3), 226–231.
- Surendran, a., & Sekar, C. (2010). An economic analysis of willingness to pay (WTP) for conserving the biodiversity. *International Journal of Social Economics*, 37(8), 637–648. <http://doi.org/10.1108/03068291011060661>

- Sutton, S. (2009). Encyclopedia of Survey Research Methods. *Library Journal*, 134, 89. <http://doi.org/10.4135/9781412963947.n529>
- Swamy, P. A. V. B., Board, F. R., Greene, W. H., Hall, S. G., & Tavlas, G. S. (2016). Removing Specification Errors from the Usual Formulation of Binary Choice Models *. *Econometrics*, 4(26), 1–21. <http://doi.org/10.3390/econometrics4020026>
- TEEB. (2008). *The Economics of Ecosystem and Biodiversity*. Brussels.
- Thea Sinclair, M., & Stabler, M. (1997). *The Economics of Tourism* (first edit, Vol. 19975443). London: Routledge. <http://doi.org/10.4324/9780203195437>
- Thompson, J. R., & Hollis, G. E. (1995). Hydrological modelling and the sustainable development of the Hadejia-Nguru Wetlands , Nigeria Hydrological modelling and the sustainable. *Hydrological Sciences Journal*, 40(1), 97–116. <http://doi.org/10.1080/02626669509491393>
- Togridou, A., Hovardas, T., & Pantis, J. D. (2006). Determinants of visitors' willingness to pay for the National Marine Park of Zakynthos , Greece. *Ecological Economics*, 60, 308–319. <http://doi.org/10.1016/j.eco>
- Turner, R. K., Bergh, J. C. J. M. Van Den, Soderqvist, T., Barendregt, A., Straaten, Jan van der, Maltby, E., & Ierland, E. C. va. (2000). THE VALUES OF WETLANDS: LANDSCAPE AND INSTITUTIONAL Ecological-economic analysis of wetlands: scientific integration for management and policy. *Ecological Economics*, 35, 7–23.
- Turner, R. K., Pearce, D., & Bateman, I. (1994). *Environmental economics: an elementary introduction*. Hemel Hempstead, UK: Harvester Wheatsheaf. Retrieved from <http://www.cabdirect.org/abstracts/19931861592.html>
- Venkatachalam, L. (2004). The contingent valuation method: a review. *Environmental Impact Assessment Review*, 24(1), 89–124. [http://doi.org/10.1016/S0195-9255\(03\)00138-0](http://doi.org/10.1016/S0195-9255(03)00138-0)
- Wang, P.-W., & Jia, J.-B. (2012). Tourists' willingness to pay for biodiversity conservation and environment protection, Dalai Lake protected area: Implications for entrance fee and sustainable management. *Ocean & Coastal Management*, 62, 24–33. <http://doi.org/10.1016/j.ocecoaman.2012.03.001>
- Wang, Y., Yao, Y., & Ju, M. (2008). Wise use of wetlands: Current state of protection and utilization of chinese wetlands and recommendations for improvement. *Environmental Management*, 41(6), 793–808. <http://doi.org/10.1007/s00267-008-9072-z>
- Wattage, P., & Mardle, S. (2008). Total economic value of wetland conservation in Sri Lanka identifying use and non-use values. *Wetlands Ecology and Management*, 16, 359–369. <http://doi.org/10.1007/s11273-007-9073-3>

Williams, M. (1991). The human use of wetlands. *Progress in Human Geography*, 15(1), 1–22. <http://doi.org/10.1177/030913259101500101>

Woodward, R. T., & Wui, Y. S. (2001). The economic value of wetland services: a meta-analysis. *Ecological Economics*, 37(2), 257–270. [http://doi.org/10.1016/s0921-8009\(00\)00276-7](http://doi.org/10.1016/s0921-8009(00)00276-7)

Zaccheaus, O. O. (2012). Multiple Utilizations of Wetlands for Sustainable Food and Water Cycling Production in Nigeria. *Science Journal of Agricultural Research and Management*, 2012.

