ASSESSING DAM INFRASTRUCTURE AND HAPPINESS OF RURAL DWELLERS: A CASE OF SHIRORO HYDRO ELECTRICITY DAM COMMUNITY IN NIGERIA

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ABSTRACT

Since independence, Nigeria has adopted the central planning approach to development and structural transformation as a deliberate strategy to influence and control the principal sectors of the economy in order to achieve growth and development for the well-being of the citizenry. It was in this spirit that the Shiroro Hydro Electricity Dam was installed in Shiroro village within Niger State in 1990. However, important aspects like the happiness of the host community and the internal security of the installed dam and the likely repercussions such as vandalization of the dam by the host community has often been ignored. The idea behind this research work therefore, is to ascertain the impact of the Shiroro Hydro Electricity Dam on the happiness of the Shiroro community. In order to accomplish this research objective, the study analyzed the socio-economic variables of state of mind, household per capita income, physical environment and social amenities as yardsticks of generating happiness from the treatment and control groups. The study used the Propensity Score Matching technique and the Binary Probit Model to analyze the data. The result obtained indicates that the income level of the community has increased by 18 per cent. However, the community's happiness status is found to be negative due largely to the loss of farmland, and environmental predicaments like flood and inadequate rural infrastructure amenities. Therefore, the study recommends that the government introduce a flood forecast structure of early warnings to minimize flood damage, introduce farm-education schemes to change the community's perception of their proneness to local resources opportunities, and introduce a Rural Infrastructure Trust Fund to overcome the social amenity predicament in the community. It is concluded that these support schemes would not only serve as compensation to the dam- created negative externalities but also would go a long way at reducing violence and crime, hence improving the happiness of the host community.

Keywords: happiness, infrastructure, host community, Shiroro dam

ABSTRAK

Sejak merdeka, Nigeria menerima pakai pendekatan perancangan pusat dalam pembangunan dan transformasi struktur sebagai strategi untuk mempengaruhi dan mengawal sektor ekonomi utama dalam mencapai pembangunan dan pertumbuhan ekonomi bagi tujuan kesejahteraan rakyat. Berdasarkan semangat berkenaan, Empangan Hidro Elektrik Shiroro dibina di perkampungan Shiroro di dalam negeri Niger pada tahun 1990. Bagaimanapun, aspek penting seperti isu kebahagiaan masyarakat tuan rumah dan keselamatan dalaman untuk empangan yang dipasang serta kemungkinan kesan vandalisme yang dilakukan oleh masyarakat tuan rumah ke atas infrastruktur yang dibina seringkali diabaikan. Objektif utama penyelidikan ini, adalah untuk melihat kesan Empangan Hidro Elektrik Shiroro ke atas kebahagiaan masyarakat Shiroro. Dalam usaha untuk mencapai objektif penyelidikan, kajian ini menganalisis pemboleh ubah sosio-ekonomi seperti keadaan minda, pendapatan isi rumah per kapita, persekitaran fizikal dan kemudahan sosial sebagai ukuran kebahagian ke atas kumpulan rawatan dan kawalan. Kajian ini menggunakan teknik skor kecenderungan sepadan dan model probit binari dalam menganalisis data. Hasil kajian menunjukkan bahawa paras pendapatan masyarakat telah meningkat sebanyak 18 peratus. Bagaimanapun, status kebahagian masyarakat adalah berkurangan, sebahagian besarnya disebabkan oleh masalah kehilangan ladang, masalah alam sekitar seperti banjir dan masalah kemudahan infrastruktur luar bandar yang tidak mencukupi. Oleh itu, kajian ini mencadangkan agar pihak kerajaan memperkenalkan struktur amaran awal peramalan banjir bagi meminimumkan kesan kerosakan banjir, mengadakan skim pendidikan ladang bagi mengubah persepsi masyarakat daripada kawasan bencana kepada peluang sumber tempatan dan memperkenalkan tabung dana amanah infrastruktur luar bandar bagi mengatasi masalah kemudahan sosial di luar bandar. Kesimpulannya, kesemua skim sokongan ini bukan sahaja dapat menampung ganti rugi disebabkan oleh pembinaan empangan tetapi juga membantu dalam mengurangkan jenayah dan keganasan dan seterusnya meningkatkan tahap kebahagian masyarakat tuan rumah.

Kata kunci: kebahagiaan, infrastruktur, masyarakat tuan rumah, empangan Shiroro

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LIST OF ABBREVIATIONS

AHI	Average Happiness Index
ATE	Average Treatment Effect
ATT	Average Treatment effect on the Treated
ATU	Average Treatment effect on the Untreated
BC	Before Christ
CHI	Chinese Happiness Inventory
ECN	Electricity Corporation of Nigeria
FCT	Federal Capital Territory
GDP	Gross Domestic Product
GHN	Gross National Happiness
GNP	Gross National Product
GPP	Global Poverty Project
HDI	Human Development Index
HHY	Household Per Capita Income
ILO	International Labour Organisation
KGM	Kernel Gaussian matching
LGA	Local government Area
MHS	Marital Happiness Scale
NDA	Niger Dam Authority
NDP	National Development Plan
NEEDS	National Economic Empowerment and Development Strategy
NEPA	National Electric Power Authority
NESCO	Nigerian Electric Supply Company
NNNPC	Nigerian National Petroleum Corporation
NNM	Nigerian Electric Supply Company

NSG	Niger State Government
OECD	Organization for Economic Co-operation and Development
OHI	Oxford happiness Inventory
PEV	Physical Environment
PHCN	Power Holding Company of Nigeria
PSM	Propensity Score Matching
QOL	Quality Of Life
RM	Radius Matching
SAP	Structural Adjustment Program
SIA	Social Impact Assessment
SOM	State Of Mind
UNICEF	United Nations International Children's Emergency Fund
USA	United States of America
WDR	World Development Report
UK	United Kingdom

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CHAPTER
INTRODUCTION

1.1 Introduction

> *"All men seek happiness. There are no exceptions. However different the means they may employ, they all strive towards this goal. The reason why some go to war and some do not is the same desire in both, but interpreted in two different ways. They will never take the least step except to that end. This is the motive of every act of every man, including those who go and hang themselves" - Alexander Pope in (Ahmed, Teferra, Yuya, & Melese, 2014; Kesebir & Diener, 2009).*

Early man began his keen economic desires wandering all day for survival on natural resources. The act of wandering for livelihood came to a halt when he realized fruit seeds grow around his immediate environment. This marked the beginning of farming, formation of city-states and man's attempt to dominate earth – technology and growth.

Infrastructure is one of the major pilots of growth in every economy. The services provided by infrastructural capital stock are fundamental to global political economy as it provides social and economic benefit to the global community (Ness, 2007). The impact of infrastructure on economic growth has been marvellously spelt out by some past studies in some big economies of the world like UK, Japan, USA etc (WDR, 1994), that investment in this aspect leads to reduced cost of production which translates to economic growth.

Global political economy is the relations of economy to broader social conditions, including the distribution of power (and its sources) and the ways by which individual lives are bring together to the demands of social transformation. Hence, Political economy at all times work toward growth and development, which is important within broader contexts of social and economic change. Of course, it is

important to make up to people for doing them harm in the processes. However, political economy has paid little attention to the consequences of infrastructure projects like dams in growth and development especially, in the area of rural people's well-being or happiness (Wilmsen, Webber, & Duan, 2011).

The global economy is propelled to an appreciable standard of productivity through ongoing advancement. For instance, in line with regional economy development, Chinese government invests abundantly to protect the environment in Three Gorges (Dam) reservoir area. Along with the dam construction, there occurred regional infrastructure improvement, 20 counties around the dam experienced improved economic development as shown by increase GDP of 259% from 1996 to 2007. Other enormous benefits of the dam include; flood control, energy production, increased navigability and indirect reduction of greenhouse gas (carbon dioxide) emission at a rate of over 3.3 million tons annually from 2004– 2008 (Fu et al., 2010).

These advancements although, increases global standard of living, yet it is relentlessly destroying the natural environment in the process. Scholars have perpetually revealed that material gain alone is not enough to fulfil our deepest needs. Material life must be harnessed to meet human needs, most importantly to promote the end of suffering, social justice, and the attainment of happiness. To attain all these human needs, natural environment requires due attention too. The challenge is real in all parts of the world (Helliwell, Layard, & Sachs, 2013).

Paradoxically, all over the world, peoples' lives have improved over the years as a result of natural resource exploitation but in most cases the host communities whose lives are parasitic to the resource are themselves excluded and sometimes even

displaced. Natural resources exploitation marks the beginning of alienating the ancient right of people to nature as a source of subsistence. This process has not only created unhappiness; new poverty lines but also threatens the survival of natural resources as nature's renewability is mostly violated. For instance, the installation of Bakun Dam, in Malaysia robbed the indigenous communities land use patterns; the suburb house farmland (*temuda*), farmland facility of hunting and gathering (*menoa*), nutritional value (*menoe),* craft and distance farming opportunity (*damp*) and protected forest area (*pulau*) for water catchments (Choy, 2004). The story is the same for Kaptai dam community in Bangladesh where their traditional means of subsistence and homelands submerged in an installed dam, forcing them to migrate into North East India, where they become refugees and surviving in conflict with local communities (Mahanta, 2010).

Dams have emerged as symbols of modernity in a developing economy and have proved to be an effectual way for harnessing water resources to meet energy needs, irrigation and alleviate flooding. They are often considered as a nation's critical infrastructure and key resource (Mahanta, 2010). In Nigeria for instance, hydro potential sources as exemplified by her large rivers, small rivers and stream, and the various developed river basins. Nigerian rivers are distributed all over the country with these potential sites for hydropower scheme. These are looked upon, as essential infrastructure in the same category as roads, telecommunication and water. In fact, it is banked upon as the life-blood of national development and industrial growth (Zarma, 2006).

According to Frey and Stutzer (2002a) growth and development however, does not necessarily mean improved happiness of the people. Everybody wants to be happy but economic activities such as production of goods and services is of course not an

end to happiness *per se* but has values that it contributes to human happiness. At the time of Adam Smith, major economic issues were simply how to meet human needs for food, shelter, and clothing. However, subsequent development of industrialization made these needs available but led to rising aspirations that, to some extend cancelled the benefits to well-being that associates with economic growth (Diener-Ed & Martin, 2009).

Aristotle is quoted to have said ".... Man should seek to *eu prattein*, live or fare well, and thus experience *eudaimonia* (happiness)… that is only chosen as an end, never as a means… they (man) should take positive steps to live well; that they should have a *plan* of life… this mean that ideally they should adopt the plan of life that involves reference to *the* final end" (Barrow, 2012).

Happiness to majority is the main and the ultimate objective of life. Aristotle is quoted to have said that "the highest of all goods achievable by human action is happiness" latter translation for the Greek word *eudaimonia* (Ryff, 1989). In Frey and Stutzer (2000) it is cited that 'happiness can be understood to mean a lasting complete and justified satisfaction with life as a whole'. The questions now are that, does our formations, say dam installations by our policies for growth and development give room or consider our happiness? What happen to our individual plans to happiness as said by Aristotle in the effort to these installations?

Nigeria adopts central planning approach to development and structural transformation from early 1960s. This approach was a deliberate effort by government to influence, direct, and in some cases, control principal sectors of the economy in order to achieve economic growth and development for the well-being of all citizens. It is in line with this approach, that electricity sub-sector was a regulated

provision, and an institution of the government. This therefore, led to among others construction or installation of electricity generating plants such as dams and thermal stations in different locations of the country. These installations have a direct impact on the lives of people in such locations and the nation in general.

1.2 Problem Statement

At political independence in 1960, Nigeria as a new nation was keen at rapid economic growth and development. The immediate strategy employed was National Development Plan (NDP). Initially, there were four different development plans from 1962 - 1985 and subsequent other Rolling plans as strategies of development (Marcellus, 2009). It was in the framework of these development plans and the enthusiasm for growth and development that Nigeria provided hydro electricity dams and other thermal electricity generation plants as public infrastructures.

Although, advancement and modern infrastructure has accompanied 'anthropocene' (Greek words of "anthropo," for human; and "cene," for new or technology), that is, depletion of environment as serious problem that imperils global happiness (Helliwell, *et al.*, 2013). Damming of rivers has been important to man. It reduces flood hazard and allowed humans to settle and farm productive alluvial soils on river flood plains. Dams are harnessed for moving water for commerce and industry; and they have created reservoirs to augment the supply of water for irrigations (Poff & Hart, 2002). It also influences income increase and attracting other social amenities to host communities. The three Gorges dam influenced to host counties with social amenities and income increase of 159 percent between 1996 – 2007 (Fu, *et al.*, 2010).

Apart from the three major hydro power plants in Nigeria, recent studies potrayed that over 278 unexploited sites with total potentials of 734.3 MW hydropower

potential sites are distributed in 12 States (Zarma, 2006). But Nigerian economy has being surviving on deficit infrastructural provision hence waxes in common challenges of low GDP, unemployment problems, increased poverty level, low performance in non oil sector of the economy, and poor public service delivery (Gaillard, 2010).

The installations of the available infrastructures are mostly politically motivated or by proximity in projects like dams. However, political decisions on public expenditure or infrastructure installations in most cases have little or no consideration for host communities (happiness) or public interest (Ayogu, 2000). Most of the times, these are accompanied with lots of political promises as acceptance gimmicks. Therefore, host communities' live in high expectation from the installations, which in some cases generates tensions between government, and the host communities, as most of the promises are usually not fulfilled.

Literatures on economics of infrastructural tend to be more concerned or measures impacts of infrastructure in communities in terms of some specific socio economic issues such as pollution, improved education, health, employment and improved production say in agriculture, wealth and income, etc. Torrisi (2009) reported that infrastructure is largely being measured with particular respect to its economic impacts. Fourie (2006) said urban planners and engineers narrows impact of infrastructure to specific benefits that accrues to the immediate locality. Embrahimnejad, Mousavi and Seyrafianpour (2010) measures 'critical infrastructure' as risk associated to damage of machines (as result of say terrorism), human lives and environment. Indian Advisory Committee on Irrigation and Multipurpose Projects (ACIMP) considers economic cost and benefit ratio of infrastructure (specifically dams) to be the cost of building the dam and agricultural

benefit due to the project (Duflo & Pande, 2005) and; state perception of induced growth from (Bakun dam) dam is economic maximization – sales of electricity and industrial spillover effect (Choy, 2004) etc.

Important aspect like the happiness of the host community and internal security for the installed infrastructure *per se* on the likely repercussions such as vandalization of infrastructure by the host community is often ignored. This is often experienced when government or project agents neglect or underrate consulting or involving host communities in project decisions. ‘’The causality between infrastructure development and security has not been fully explored in academic literatures’’ (Frischmann, 2005).

It is however, becoming glaring in developing countries particularly in Nigeria that, there is need for consideration for host communities’ happiness before installation of infrastructures to avoid reactionary devastating attitude of local communities as language of demand for happiness. Infrastructures installed in localities are ordinarily expected to bring happiness to the host communities and beyond. That is not always the case, there are cases where host communities attempt to or vandalizes existing infrastructure or kidnap site worker and even cases of lost of lives in Nigeria as a result of conflict of interest over expectations and yearnings of the parties. “Conflicts between oil companies and local communities in the Niger Delta - Nigeria have basically revolved around land ownership and compensation for land appropriation as well as compensation for environmental damages due to oil operations’’(Oyefusi, 2007).

Bakolori irrigation dam that was aimed at improving the standard of living of over 50,000 farm families turned to devastating consequences of lost of lives. As crisis

between government and the host community escalated by the end of June 1980, the loss of lives recorded was not less than three hundred and eighty six people simply because the host community was not happy and resisted (Yahaya, 2002).

Another good example in recent time, could be the 'crisis waiting for opportunity' experienced on 25th August, 2011 in Nigeria when 12 people were killed and more than 100 trucks belonging to Dangote Groups Company were burnt down (NewsWatch, 2011). The reason being that government's privatization of Benue Cement Company to Dangote Group Company did not go down well with the host community.

Such host community's reaction is not only sympathetic and psychologically unhealthy but also anti developmental. Conflicts are capable of affecting growth and development of any nation. It goes to mean that with conflict violence all kinds of economic activities are distorted including environment and happiness is worsened until peace is restored. Welsch (2008) found that civil conflict affects subjective wellbeing or happiness directly via health, psych related fear, suffering and indirectly through reduced income related to work days and work morale.

In summary:

- Dams has been important to man in the areas of farming/fishing, water provision for commerce and industry, attraction of infrastructures to host communities, etc.
- Nigeria although, in dear need of infrastructure but has not adequately explore her advantages (damming) of abundant natural resources to fill this gap, and where she eventually do, happiness of the host community is not always considered.

- Therefore, projects that are expected to bring happiness to people in most cases result to violence with devastating consequences.

In other words, policies in the area of infrastructural impact and installations in Nigeria have been silent in the aspect of considerations for happiness of the host communities hence endangers the security of the infrastructure *per se*, lives and properties to aggrieved and unhappy host community's hostile reactions. In line with the issues raised, this study seeks to ascertain the impact of Shiroro Hydro Electricity dam on the happiness of the host community.

1.3 Research Questions

The questions for this research work are as follows:

1. What is the communities' State of Mind as a result of installed dam?
2. What is the status of Household Income per capita in Shiroro Hydro Electricity Dam community?
3. What is the status of the Shiroro Hydro Electricity Dam community's happiness in terms of their physical environment?
4. How has the installed Shiroro Hydro Electricity Dam influence the happiness of the host community in terms of Social Amenities?

1.4 Objectives of the Study

The general objective of this study is to examine the impact of Shiroro Hydro Electricity Dam on the happiness of its host communities. This is ascertained with aid of the community's State of Mind, Household per Capita Income, Physical Environment and Social Amenities.

The specific objectives are as follows:

1. To ascertain whether the installed Dam has affects the community's State Of Mind.
2. To measure the effect of Shiroro Hydro Electricity Dam on Household per Capita Income.
3. To measure the happiness status of Shiroro Hydro Electricity Dam community in terms of Physical environmental changes.
4. To ascertain whether Shiroro Hydro electricity Dam is able to enhance happiness status of the host community as measured by Social Amenities (rural infrastructure).

1.5 Significance of the study

It is a common phenomenon that ordinary issues causes' violence of high magnitude in Nigeria that in most cases results to lose of lives and properties. These issues range from ethnic, religious, political to economic issues. The most recent popular experiences of violence in Nigeria include the Jos political, religious cum ethnic crisis, the Niger Delta politics of oil crises, and the recent most bombing and mass killing experiences of 'Boko Haram' religious sect. These melancholic issues are detrimental to Nigeria's happiness. According to Stryker et el,.(2008) ".repeated cycles of conflict and violence exact other human, social, and economic costs that last for generations". "Unhappy people are more likely to find themselves in unproductive or even destructive conflict than happy people and conversely for happy people" (Pearlstein, 2012). In line with the above:

1. The study goes into fact finding about the happiness of a rural community not only to unveil their happiness status but may also reveal their tensions that might lead to violence. Thus, the study will not only serve as source of handy knowledge of particular rural fraction of the country but also understanding

of these facts will go along way at serving as source of information to policy makers.

2. Sensitive policy reactions as result of handy knowledge from the study would go a long way to subdue Nigerian social problems such as conflict and poverty. Poverty is already a pronouced macroeconomic problem in Nigeria – 63 percent of Nigeria's population fares on earnings of less than 1 US Dollars per day (AEO, 2012). According to Global Poverty Project (GPP, 2012), "violent conflict is development in reverse. It destroys society and a shortcut to extreme poverty". Therefore, policy reactions would go along at solving Nigerian poverty problems.
3. To the academics, most of the studies in the area of dams in Nigeria paid more emphasis to immediate measurement of externalities – positive or negative with most of their methods centered on the dam gorges and the immediate suburb beneficiaries. This work is different and could be beneficial to the academics in some ways. In the first place a new method of Propensity Score Matching technique is used in the analysis of the Shiroro hydro Electricity dam community. Secondly, in developing countries and Nigeria in particular, studies on happiness are not common.
4. The community on the other hand, would enjoy exceptional effect of happiness information about their locality or community unlike other parts of Nigeria.

1.6 Scope of study

The study focused on infrastructure as it affects rural socio-economic well-being. Particularly, it focused installed Shiroro Hydro Electricity Dam and reconciled how

it impact on the happiness of rural society – Shiroro Hydro Electricity Dam community. The study is confine to ascertaining the economics of rural dwelling communities around Shiroro Hydro Electricity Dam within Niger State. That is, villages' around the catchment area of the dam as the focal point of the study. These villages include among others Guri, Jenii-shiroro, Shanga, Alaiyi, Egbolo, Gussoro, Emjita, Baha, Palali, Gurmana, Gutalu, Kuwaiti, Erena, Gijiwa, Beri, Maikakaki, MantaLuwa, Gungu, Galadiman-Kogo ,Dnakpala, Kuta, Zumba, Dnabaro, Shakwodan, Dnami, Angwan-soro, Sarkin-pawa, Guni, Kuchi and chibani. Other villages in the downstream axis include Zumba, Gwada, Kuta, Galadima-kogo, Gussoro, Gurmana, Erena etc.

The study however, establish another Control Group data collection point in Gurara River gorge in some other villages around Gawu in Gurara Local government Area outside the dam's catchment area. The rationale is to enable the study to compare the present socio-economic behavior of the communities in the treatment group (Shiroro communities) to a similar control group that has no treatment. The choice of River Gurara gorge in Gurara Local Government Area is to meet up with views that a study that involve control group and treatment group must have common agro-climate and socio-economic characteristics (Frankfort-Nachmias & Nachmias, 2007; Sengupta, Coondoo, & Rout, 2007). This case, meets the condition as the two locations are within the state with distance of about 70km apart.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This section of the work is divided in to three parts. The first part discusses brief background of Nigerian economy, the second part dwells on infrastructure and the third part is on happiness. The fourth aspect of the review dwells on literatures on happiness as captured in the title in relation with the variables of the study. In other words, each of the measuring variables are discussed one after the other base on the past studies.

2.2 A brief back ground of Nigeria economy

The Nigerian territory came into being as a result of the amalgamation of Northern and Southern protectorate by the British colonial administration in 1914. The country then was administered under three regions in 1946 – 1963 and to four regions between 1964 - 1966. By 1967 - 1975, the country was administered under twelve states, nineteen states in 1976 – 1986, twenty one in 1987 – 1990, thirty states in 1991 – 1995 and thirty six states in the year 1996 till date. These states belong to country's six geo-political zones with 776 local governments as categorize in 1996 and 1999 (Akinwale, 2010).

Nigeria as a political unit has one of the best resource endowments in Africa - with abundant human and natural resources. The natural resources include land, water resources, oil, tar sand and others. Nigeria has the seventh largest oil reserve in the world, estimated at 21 billion barrels, 185 trillion cubits of gas reserve, and tar sand put at 35 billion barrel of oil equivalent, Coal reserves at 2.75 billion metric tons among others (CBN, 2000; Iwayemi, 2008). These mentioned fossil fuel reserves at the present are more than enough to fuel the whole Sub Saharan Africa energy needs

for decades. Also, Hydro energy resources estimate are put at 14,750 Megawatts, biomass estimate put at 144 million tons per year, Solar radiation is put at 3.5-7.0 Kilowatt-hour/m2 per day and wind energy 2.0-4.0 m/s, wind energy at 150,000 Terra Joule per year (Iwayemi, 2008). The Nigerian Agricultural sector has 72 million hectares of arable land, out of which 66 percent is still unutilized (UNICEF, 2001) and more than 140 (2006 census) million human inhabitants.

Agriculture was the dominant sector of the economy until discovery of crude oil in 1958. Subsequently, the oil boomed in the 1970s led to industrial revolution in the same period all combined together result to gradual neglect of agricultural sector (Anwana, 2010). Over the years, several initiatives such as Green Revolution, Structural Adjustment Programme (SAP), National Economic Empowerment and Development Strategy (NEEDS) diversification policies among others to disburden or reduce the over dependence on the oil sector of the economy were initiated, yet oil sector still account for the lion share of the nation's foreign exchange earnings. Notwithstanding, agricultural sector is very vital in the Nigerian economy, not only for the fact that it serves as source of employment of large share of more than 50 percent the economy's labour force, but also because it's a source of food to the economy. Apart from the fact that Subsistence farming and other agricultural production of beverage and food dominate output, federal government and several other state governments look on to the sector to revive commercial agriculture (Stryker, *et al.*, 2008).

Oil sector is the major income earner of Nigerian economy and currently account for 75 percent of her annual national earnings. Since independence, Nigeria's oil sector has been under the management of Nigerian National Petroleum Corporation (NNPC). The sector just like other sectors, have challenges of adequate

infrastructural facilities and maintenance hence instrumental to the economy's flaring gas to the tune of 12 percent of global total gas flares which is 51 percent of the total gas production. Nigeria has five government owned domestic refineries with daily capacity of processing 450,000 barrels, yet, for maintenance reason and others, export her crude to imports back more than 75 percent domestic petroleum products requirements. The refineries have never worked in full capacity before – less than 40 percent since inception (Iwayemi, 2008; Olaseni & Alade, 2012).

Nigerian economic growth has been impressive in the last decade averaged about 7.4 percent annually driven by the non-oil sectors, particularly telecommunications, manufacturing and agriculture, construction, hotels and restaurants, trade, wholesale and retail. Although, Economic growth has been impressive, poverty and unemployment remained high. Two third of the population still lives on less 1 US Dollar per day and unemployment rate as at 2011 was 23.9 percent (AEO,2012).

Despite the natural resource endowment, human population resources and favourable growth in recent times, the Nigerian nation has been operating under different kinds of problems; deficit infrastructural facilities, violent conflicts, corruption and other macro economic problems.

2.3 Infrastructure in Nigeria

Modern infrastructure in Nigeria could be traced to the era of slave trade and colonization when rails and roads were designed to suit the purposes of the colonial masters. Nigerian leaders attempted to improve on the infrastructural legacy after political independence in1960, but their effort meet with some predicaments – the elites failed to trust their local capacities and their marriage to the legacy of colonial exploitation has also been an impediment hence minimum achievement recorded over the years (Akinwale, 2010).

The present day Nigerian economy has been surviving on deficit infrastructural facilities which are generally common features in the economy. This ranges from road, electrification, communication, water and sanitation; and the likes to support modern life. This work will rather briefly discuss only road, rail and electricity to be able to portray the state of infrastructure in Nigerian economy

Road transport is the apex means of transport in Nigeria. It is responsible for 90 percent movement of goods, people and services. The current network of road is estimated to be 196, 000 kilometers 20 percent of which is paved or federal roads, 13 percent unpaved or state roads, main rural roads 37 percent, urban roads 11 percent, and village access put at 19 percent. The federal roads are burdened with 70 percent of Nigeria's total freight (Adetola, Goulding, & Liyanage, 2010).

The roads however, are engulfed with large scale problems of maintenance, poor drainage system, poorly designed, severe pressure, harmful parking etc (Adetola, *et al.*, 2010). Other problems include misallocation of bulk traffic which ordinarily supposed to be carried by rail, low safety and poor service provisions and lack of strict regulation of the industry (Ogwude, 2011).

Nigeria has been tying in terms of allocation of resources to federal or paved road rehabilitation, but do care less to have enough reserve for preventive maintenance. In between 2001 and 2006, Nigeria spent over $700 million on federal or paved network per year but network simulations revealed that annual budget of around $580 million would adequately rehabilitate and maintain the roads within a five-year horizon. The higher spending result may simply mean a more accelerated rehabilitation (may be corruption) program, or relatively high unit cost. Although the recent spending development shows near standard spending habit but the

maintenance effort of only $50 million per year is too small compare with the benchmark requirement of $240 million (Foster & Pushak, 2011).

Nigeria has one of the most wide spread net work of national railway in Africa; she could be said to be second to South Africa in terms of length. Nigerian Railway lines run to the northeast, northwest, southeast and southwest (single lane network of 3,505 km) of the country. Nigeria's railway in history was one of the best in West Africa linking the sea ports with the hinterland which is very good market in terms of moving both passenger and freight across the country but it has since been neglected (Foster & Pushak, 2011).

The current imbalance with road carrying the burden of the Nigerian movements began in 1960s. Up till then, rail was the major carrier of Nigerian freight with 60 percent of the freight tonnage unlike today, that it has grossly reduced to less than 5 percent (Ogwude, 2011). The decline has been due to deficient performance and seesaw service delivery. Over the years the traffic volumes declined from 3 million tonnes in 1960 to 15,000 in 2005 and on the side of passenger traffics, it declined from 3 million to 500,000 in the same period. Today the traffic density is only around 15,000 tonnes per kilometre (Foster & Pushak, 2011).

The deterioration in the state of railways resulted from insufficient budgetary provision by the Federal Government, poor management by the operators – Nigerian Railway Corporation, poor states of coaches and the use of management consultant (Ogwude, 2011) .

Power supply in Nigeria has been the responsibility of Federal government and since independence in 1960; National Electric Power Authority (NEPA) manages the power sector of Nigeria until 2005 when government attempted to deregulate the

sector due to poor performance. NEPA was transformed to Power Holding Company of Nigeria (PHCN) to administer the power sector for 18 months before full deregulation but till date this is on the pipe line (Olaseni & Alade, 2012).

According to Akinwale, (2010), Nigeria's electricity service requirement is 20,000 megawatts but has been surviving on less then 6'000 megawatts. Only about 40 percent of Nigerians have access to electricity services and only about 20 percent of rural populace is part of this wagon. Nigeria faces a lot of energy crisis resulting from shortages in gas supplies due largely to system collapse from vandals in Niger Delta, huge public investment in the refineries with contrast resultant output and institutional charges that are below equilibrium price. Olaseni & Alade (2012) cited that Nigeria produces power at the cost N 23 Billion but sell at N 9 billion to the public. Other problems apart from the aforementioned and under capacity utilisation, there are prevalence regime of price control and serious challenges of transmission and distribution losses, which by international standard is about five to six (among the highest in the world) times losses obtainable in well-run systems. This portrays the crisis and level of illegal access to power in the sector (Iwayemi, 2008).

Power outage has been harmful for it adds to cost of production of business sector of the economy. The bulk infliction of cost comes from acquisition and management of backup generators. In industrial and residential places, studies put cost of outages at $1.27 to $22.46/kWh, $21.46 and $0.02 to $14.61/kWh of unavailable electricity respectively. In the retail and office buildings, the outages cost ranges from $5.02kWh to $21.73kWh (Adenikinju, 2005). This poor state of power and other infrastructural provisions leads to increase cost of doing business has been instrumental and is still to relocating of industries to other West African countries (Olaseni & Alade, 2012). Babatunde, Afees and Olusunkami (2012) cited that

enterprise surveys revealed that power outages experiences in Nigeria sum to over 320 lost days in a year with $13 billion as annually cost or expenditure on generator fuel.

2.4 Economics of Infrastructure

According to Rankin (2009) the word infrastructure was used by French to refer to French railroad engineering in the late nineteenth century before it became universally accepted term in the 1950s. The concept became universally accepted a result of two reasons: the first reason is that the World Bank and the development theories of the 1940s and1950s (like the big push and the steady-state theories) used social overhead capital for government as a productive economic agent, private sector as partners in progress and as providers of most vital factors of production. That now marked a point between social overhead capital and infrastructure.

Rankin (2009) further link between social overhead and infrastructure can be viewed from two positions. The first position is overhead capital summed a particular theory of state where political division between public and private is perceived as secondary in terms of economic division and productivity. Secondly, the World Bank and the writings of some social scientist say Rostow found it hard to demarcate or line of definition for social overhead capital and productive costs which the later upsurge term - infrastructure was more comfortable.

Concept infrastructure can be traced to development institutions and the politics of infrastructure *per se*. In the 1940s and 1950s, also development economists began to suggest that social overhead was the key icon to economic growth. After the creation of World Bank at Bretton Woods, a committee of aid to the underdeveloped countries was put in place to spread science and technology. It was this committee that radicalized the ambiguities of social overhead capital, making infrastructure

seem to be more suitable used in place of social over head capital. The report was the first to employ the French word *infrastructure* into English-speaking developmental issues (Rankin, 2009).

2.5 Socio-economic impact of Dams

Building of dams has long history traceable to Sadd-el-kafara Dam in Egypt which is believed to be the world's oldest dam. It was built in about 2700 B.C. on the Nile River about 20 miles south of Cairo. In about 1000 B.C. the Assyrians built dams across the Tigris River near Samaria and Mesopotamia and Romans also did build many dams in the history, the best of which is the Coronado earth dam. The advanced in the technology of building dam to appreciable height and reasonable volume capacity became possible after the development of cement concrete and the mechanization of earth-moving and material-handling equipment in the 20th century. By 1940s, the world witnessed about 5000 large dams three quarter of which was in the industrialised nations. Today, the number has increased to 45,000 dams all over the world with 22,000, 6,390, 4000 and 1,200 in China, United State of America, India and Japan respectively (Etiosa, 2006).

Dam is said to have advantages of instigating and fosters regional development in so many ways. It makes water available for both domestic and industrial use uses, provides highest energy efficiency, source of revenue generation via tourism, irrigated agriculture, leisure, sports, etc. It also have positive social cost such as creating opportunities for capacity building by local/indigenous governments, companies and individuals, often provides flood protection, may augment navigation conditions and creates employment opportunities particularly during the construction phase (Usman & Ifabiyi, 2012).

Dam also has histories of displacement. It is cited in Morvaridi (2004) that dam displacement can be viewed in two perspectives: the reformist-managerial school and the radical-movementist school. The managerial approach treats displacement people as an inevitable pain taken of past and future development. The cause of disagreement of this school of thought is how to manage the inadequacy characteristics of resettlement to minimise its negative impacts on the people. The school advocates development on the ground that it necessitates changes, though, recognizes the vulnerability of the forcefully or inevitably resettled to risk of policy failures, but emphasized strategies of forceful resettling of people. The radical-movement school of thought considers displacement to be evidence of development that could take dimension of uneven distributions. This approach does not suggest how resettlement can be done better rather, concerns more with fundamental political issues like rights and governance. This approach tends to give less emphasis to local people's right, economic and social well-being.

Social Impact Assessment (SIA) is a holistic plan aimed at predicting, intervening and management of both human and environment to subdue consequences of dam infrastructure. Tilt, Braun, and He (2009) introduced the SIA tool and emphasis on its usefulness for understanding social impacts of large dam projects. They sited a survey of 50 large dams conducted around the world found that rarely settlers get better off rather experience increased poverty. The two cases of SIA projects introduced in their study to establish better understanding: the Lesotho Highlands Water Project in Southern Africa and the Manwan Dam in China are not any better. The communities all suffered different kinds of pain, especially the women. The way forward suggested by the study is the best practices such as empowering stakeholders and adhering to "rights and risks evaluation approach.

International Labor Organization (ILO) and World Bank Operational Directive provided for and required states to protect right of ownership of local people but these agreements are rarely binding (Namy, 2007). The Rogun Hydropower Plant (HPP) project upstream is a treat to socio-economic and environment activities of the downstream country, Uzbekistan. This is because Uzbekistan homes almost half of the population of Central Asian region, she is against the project and has legal backing of UN Protection and Use of Trans boundary Watercourses and International Lakes Law (that stipulates that in the vent of large dam project in trans boundary rivers the down and up streams countries must agree). Other reasons include; old Soviet specialist's earlier survey discovered the site has a hundred meters salt thick layer beneath the base of the dam, there is scientific prediction of earthquake in the Rogun HPP project location etc. But the same World Bank in 2010 carried out an independent assessment of the Rogun HPP construction project and began work which was expected to have been completed by 2013 (Askarov, 2012). In other words, same World Bank makes law to protect the weak in the society, turnout to break same Law proving that agreements that are rarely binding.

Common social arguments by politicians put in place to garner support for dam projects in developing countries are electricity generation, reasons of agricultural irrigations and loss of lives avoidance by flood control. These reasons no longer provide enough justification to perpetuate construction of dam infrastructure in developed worlds today. The politicians will always refuse to consider harmful impacts under the auspices of aforementioned even when many of the benefits claimed by these project proponents are sometimes grossly exaggerated. For example, reservoir fisheries and increase production's acclaimed benefits to local population in some cases fails to become reality. This imply that even when accurate

cost benefits analyses as ethics towards sustainable development suggest otherwise, it carry's little weight in combating political intends behind dam projects especially when international financiers are involved (Beck, Claassen, & Hundt, 2012).

Khan, Islam, and Hayat (2011) focused their work at ascertaining the socio economic impact on the development of farmers in Pothwar, a rural area in Pakistan. The result of the study revealed that famers in the rural area waxes in better conditions as result of the constructed mini dams in their locality. The general improvement in income was 873 percent higher than what was obtainable before dam constructions, therefore, socio economically better off. However, the study was silent about the number of the questionnaires administered to reveal the popularity and extent of scope of the study and also, silent about the environmental negative externality of the dam to the locality compare to construction's positive marvelous impact.

A study of Shiroro Hydro Electricity Dam project (Nigeria) on the immediate community affected their economic infrastructure, family size and culture. The improvement in road network appeared to be the major positive impact of the project to the community. The impact of road on social economic lives has multiple effects on trade, social interaction and so on with no effect on electricity supply and other infrastructure to the community. There is a changing family size in the community as smaller family sizes are now noticed as result of increasing poverty (Usman & Ifabiyi, 2012).

Dam caused flood is a regular phenomenon in Nigeria. Releases from Kainji and Jebba dams are always discharged in peak periods to the downstream areas thereby leading to flooding as the only alternative left to protect the dams from collapse as at those times. For instance, a total cost effect of $3.1 million was estimated damage

during the 1994 flood to Bachita Sugar Cane Company, increase to $3.7 and $3.3 million in 1998 and 1999 respectively due to the re-occurrence of the same flood effect. Apart from the damages to water conveyance structures, the existing flood protection embankments, impaired roads and caused displacement of settlements and communities along River Niger (Olukanni & Salami, 2012).

Similar studies in USA (1975 – 1995) covering 48 treated counties revealed that presence of large dams tends to stimulate manufacturing employment and earnings, agricultural productivity and output as result of irrigation, tourism, services like insurance, transport, communication, and retail trade in the affected counties. However, targeted objective of dams in some cases determines its production trend. Dams aimed at flood control tend to have less stimulating effect at production and employment (Aleseyed, Rephann, & Isserman, 2003).

Building of dams and its associate character of resettling or relocation of mostly peasants from their original settlement to another have its psychological pains. Apart from the associated pains, the benefits or compensations made for the beneficiaries are in most cases not satisfactory. It's either commandeered by the stake holders or hi jacked by the influential members of same community. Peasants in Yichang municipality (Three Gorges Dam - China) accessed less than half of the compensation fund made for them because of corrupt tendencies of the stake holders (Webber, 2011). In the case of Ilisu Dam in Turkey, 'Aga' the influential traditional landlords maximized compensation using their political insight information knowledge (plant thousands of fruits trees and plantations) and the longtime government plan of llisu dam at the detriment of the majority peasant (Movaidi, 2004).

The historical traditional political settings can also be a factor, exclusion, human right violation and extreme unequal distribution of compensation. The compensation criteria in Ilisu Dam (Turkey) project for instance was based on individual perceived looses – houses, land and other resources. Aga people historically, dominates ownership of the landed property hence dominated the compensation profile living the majority with little or nothing (Movaidi, 2004). Government policy of grass root leaders as resettler compensation agents and the Chinese tradition and feudal view of women as accessories to men denied women resettler status in the resettlement associated with the Three Gorges Project. This has increased gender inequalities and has made women more prone to poverty (Tan, Hugo, & Potter, 2005).

Kariba Dam (Zambia) as at when officially commissioned in 1960 was the largest in the world; unfortunately, it was installed without any environmental and social impact assessment. About 57,000 Tonga/Korekore people of the Zambezi Valley were displaced and relocated outside Zambezi River banks. Consequently, the beneficiaries wallow in socio economic repercussions. Although, efforts at solving their problems was invigorated as from 1990s, the host communities of kariba dam still suffer the consequences of their resettlement undertook in the last 5 – 6 centuries (Tumbare, 2008).

The Leijiaping and Changjiang community of Three Gorges Dam has experiences of displacement due to the project hence caused households to lose assets; many lost land and whatever savings they had, their access to common property resources diminished thus faced a loss of income, especially farm income that increased poverty. There was also forced migration of families to join their new job locations, no standard compensation to households that lost their houses - values of lost land

were not considered hence less happiness experience in the community (Wilmsen, *et al.*, 2011).

Social and economic studies have demonstrated Merowe Dam (Sudan) project marginalization of local ethnic minorities who are mostly lose their land and livelihood through displacement caused by dam construction. The population of more than 50,000 Manasir and the Shaiqiya tribes were removed from the riverine area without any consultation and resettle in the hot and lifeless desert location. This provoked poverty level of the rural voiceless peasants from 10 percent before dam installation to 65 percent after. This government policy tempered with the happiness of the populace (Hafsaas-Tsakos, 2011).

2.6 Happiness

Happiness has been interesting topic for many centuries; date back to ancient Greek philosophy, through post-Enlightenment Western - European moral philosophy (especially Utilitarianism) to the current quality-of-life and well-being researches in social, political and economic sciences. Today, the concept happiness is widely embraced by most people. It tends to be valued more than the pursuit of money, moral goodness or going to heaven. Researches in fields of social sciences have turned its attention towards the study of happiness and well-being in recent past for three reasons. The standard of living in the western world has surpassed critical level so that survival is no longer an issue, personal happiness is now a vital issue due to growing trends towards individualism and a number of valid and reliable measures of happiness have been developed (Boniwell, 2008).

The Aristotelian eudaimonia if translates into the English means *happiness*. The word stands to be the Greek's expression for the highest end that humans can attend. In his words 'what is the highest of all goods achievable by action'. Eudaimonia

therefore, is an end 'which is in itself worthy of pursuit more final than that which is worthy of pursuit for the sake of something else . . . for this we choose always for self and never for the sake of something else'. In other words, that makes happiness 'the best, noblest, and most pleasant thing in the world'. That make all goods thing of life – money, wealth, education beautiful marriages a ladder to reach happiness (Bruni, 2006).

Although, English classical political economist, Adam Smith did not specifically emphasis public happiness in his work - wealth of nations, its distribution, creation and growth, but the word "happiness" cannot be rule out. He occasionally brings in the issue of causes that affects the happiness of nations. ". . . I am sufficiently aware of the near connection of these two subjects and that the causes which tend to increase the wealth of a state tend also, generally speaking, to increase happiness" (Bruni, 2007). In other words, more wealth is instrumental to happiness, which is in line with contemporary thought with developing countries scenario. Off course, the reason is not farfetched, the global economy then have a lot in common with the present developing nations.

John Stuart Mill a classical economist also believed that to look for happiness is a direct way towards unhappiness. He observed in his work that happiness is the test of all rule of conduct, and the end of all one will want in life. To him however, "that end was only to be attained by not making it the direct end". Those that are happy have their minds fixed on some other things rather than own happiness – pursuit of happiness of others, pursuit of improvement of mankind, pursuit of some art or investment and the likes (Bruni, 2007; McMahon, 2008). Subsequent studies by contemporaries supported Mill's life observations. Mihaly Csikszentmihalyi, (one out of them) found same as Mill in the 1990s and invoked "we cannot reach

happiness by consciously searching for it but only indirectly, by the by" (McMahon, 2008).

Happiness is the fundamental goal of people being the ultimate of all wants in itself. One want or struggle to get good income, job security, freedom, status and the likes not because one want them for themselves but because one want to be happier (Frey & Stutzer, 2000). In the same vein, Bruni (2007) reported that economic performance is only important because it's a means to an end and that matter only, when they make society happier. Money is wanted because it has a means to happiness, for money *per se* has nothing to offer. In other words, happiness is all that we pursue around every day in different nomenclatures of life endeavours.

Scholars have different opinions about the concept. (Kimball & Willis, 2006) opined that happiness is a product of two components – 'elation' meaning short run happiness, which depends on recent current news about utility of lifetime, and 'baseline mood' meaning long run happiness. Baseline mood is a 'valuable commodity" or product of indirect outcome of household's production function like entertainment, health, or nutrition. In other words, while elation is a sudden pleasurable feeling as result of an activity, news or the like; baseline mood is a pleasurable feeling as products or yields from one's labour and favourable environmental factors over time.

Nettle (2005), however, thought happiness has three different senses or levels. The first level of happiness involved a sudden emotion or feeling, something like joy or pleasure (expected or otherwise). The second level of happiness is a hybrid of emotion, and judgement about emotion. This is when people say they are happy with their lives, which does not necessarily mean that they are literally joyful or

experiencing pleasure, all of the time, rather, a reflection of dominance of pleasures over pains on the balance sheet of life's pleasures and pains.

He further said the third level is broader senses of happiness. It involves Aristotle's ideal of the good life, *eudaimonia* that is translated as happiness. *Eudaimonia* is a life in which people flourishes, or fulfils their true potential. This could involve a lot of positive emotion but it is not the definition. There is no single thing that denotes achievement *eudaimonia*, since everyone's potential is different.

2.7 Concept of Happiness

> *Happiness is a handmaiden to evolution's purposes here, functioning not so much as an actual reward but as an imaginary goal, that gives us direction and purpose. That goal may never get any nearer, but it may not need to. Jefferson's fundamental right, after all, was not happiness itself, but the pursuit of happiness. Nothing, not even a Utopia, can necessarily make the pursuit of happiness a successful one that ends in capture. The best society can merely allow every individual to flourish in the pursuit (Nelson, 2004).*

Happiness has no single definition. The definitions depend on different perceptions of scholars in different aspects of social sciences. The word happiness is a description of many different things because people's intuitions vary widely. One person's intuitions may favour identifying happiness with life satisfaction, some others may lean toward a hedonistic account and some may feel the pull of both views (Haybron, 2008b).

Etymologically, the word *hap* could be trace to the word "happen." Which could be refer to "luck that happens" which can be associated with good luck. Happiness is highly valuable to humanity especially those who care about it. Many terms are often used interchangeably in place of happiness - bliss, pleasure, ecstasy, and contentment

which are more of feelings or emotions but not part of pillars of happiness (Nettle, 2005; Pearlstein, 2012).

Oishi, Graham, Kesebir and Galinha (2013) are of the view that most philosophers and historians define happiness as a concept around good luck and fortune. For example, the *Classic of Rites*, compiled in between 1st and 5th century BC, observed that "fu" (福) was used to mean "fortunate, lucky, smooth and free of obstacles". The Greek term *eudaimonia* that is translated to mean happiness in English was first used by the poet Hesiod as "Happy and lucky the man". Thus, in ancient Greece, happiness was deemed to be beyond human intervention, controlled mainly by luck and the gods. They further reported McMahon to have declared: "happiness is what happens to us, and over that we have no control". In the same vain Tenagia (2007) reported that in ages, "Daimones are the keepers of men and shelter them from evil". Therefore, Eudaimon (which is the origin of Greek word, *eudaimonia*) is for those who enjoy the gods' favour. In other words, happiness is the enjoyment of benefits of fate, that is to say the lucky ones. The meaning of this from the Greek tradition is that men's condition on earth depends on deep uncertainty i.e. man can only be happy when the gods will so - fortune.

Historically, the Japanese have many words for happiness. These words include *sachi* and *fuku*. According to the "Record of Ancient Matters" of 712 AD, the words denote 'plentiful harvest (of the fruits of the land and the sea)' and these goes to mean welfare, good luck, fortune or without complaint. By extension, *kōfuku* also means happiness. It is an umbrella Japanese word, consisting of *kō* 'lucky' and *fuku* 'fortune (Coulmas, 2010). Happiness is defined as 'leading a virtuous life', in which the person behave in accordance with society's ethics of morality and proper conduct. This definition is silent in the trend of people's feelings or emotions, instead

emphasis good behaviour or moral integrity as source of happiness (Sheldon & Lyubomirsky, 2007).

"Happiness is a cognitive state primarily associated with the state of mind of individuals but also significantly related to a social dimension". This is for the reason that the 'settled' cognitive state associated with happiness often derives from social perceptions about the rationality of goals and the sufficiency of means (Porta & Scazzieri, 2007). Happiness is a fact, in particular a feeling, a state of mind to us. For one to distinguish the subject matter happiness from other things commonly called happiness, one may call this state of mind psychological happiness. So construed, happiness is a purely psychological (Haybron, 2001; Haybron, 2008b).

Tenaglia (2007) further expatiated that happiness stems from feelings that originate and persist endogenously within the minds of human beings. According to this theory, happiness could be a result of feeling in union with God, serene indifference towards the material world, or a state of harmony with the universe. To him attainment of happiness, is only fate and, as such, it is as changing as fortune that gives a feeling of greatness. The Greek word *mákar,* which means happiness, has a root, connected to mégas, meaning great.

Oishi, Graham, Kesebir and Galinha (2013) infer that contemporary Americans view happiness as something over which they have control and actively pursue. Thomas Jefferson's 1776 Independence Declaration included the pursuit of happiness along with life and liberty as an indisputable right, marked a beginning of stark contrast of happiness from good luck or fortunate as in previous definitions. The emphasis on an active pursuit of happiness by Jefferson meant the pursuance of private property and wealth. This also goes to mean shifting view of happiness from point of view of

religious to secularism. The upsurge of immigrants whom lacked opportunity to pursue wealth in home countries and viewed the US as the land of opportunity; and the rapid industrialization and economic growth in the 1880s and 1890s fast tracked the shift in the meaning of happiness from external factors say luck, fortune or religion to pursuable factor of accumulation of material wealth.

Caulmas (2010) reported Marx that: "The overcoming of religion as the *illusory* happiness of the people is the demand for their *real* happiness" the triumph of capitalism has promoted material affluence as the major goal in life edging out religion and replacing it with materialism a source of "human happiness as the new god on earth". The twentieth century's multiple fold economic expansion and rapid population explosion made material pursuit almost inevitable access of happiness. Bekhet Zauszniewski and Nakhla (2008) reported happiness definitions to be "a lasting, complete, and justified satisfaction with life as a whole". Also, as "the belief that one is getting the important things one wants, as well as certain pleasant affects that normally go along with this belief" and as "a positive inner experience, the highest good, and the ultimate motivator for all human behaviours".

Nietzsche understood happiness of a social scientist to be in a state of pleasure or satisfaction. The Greek word eudaimonia in book of Aristotle and its English translation mean happiness. This is translated by scholars to mean, "something like flourishing human living, a kind of living that is active, inclusive of all that has intrinsic value and complete, meaning lacking in nothing that would make it richer or better". Aristotle however, argued that pleasure is not identical with happiness, but it usually (not always) accompanies the activities that constitute happiness. He justified that though, it is a pleasure for a "happy warrior" to be happy in the act, but this involve pain and loss (Nussbaum, 2005).

In the same vein, (Tenaglia, 2007) reported Stoics and Cynics to have defined happiness to be "accept our own fate, adapting our desires and expectations to what happens. The way to reach happiness is to be self-sufficient". These scholars believed that the way to happiness is not gods but human beings with their conduct can generate happiness.

Modern psychologists defined happiness as "the separable components of subjective well-being" that stick together in understandable ways. These components include life-satisfaction - global judgments of one's life, satisfaction with important life domains - satisfaction with one's work or income, natural environment, health, marriage and the like, positive affect - dominance of positive emotions and moods, and negative affect – weak negative emotions and moods (Kesebir & Diener, 2009; Ryff & Keyes, 1995; Tenaglia, 2007).

Diener *et el* in Bruni (2006) presumed that component of the good life is happiness. Unfortunately, the nature of happiness has no single definition. Happiness can mean pleasure, positive emotions, life satisfaction, a feeling of contentment or a meaningful life, among other concepts. Normally, the surveys are based on questions on how happy one tends to be at a particular time. This mostly is justified with the help of likert scale options of three or more say up to even ten – e.g. very happy, pretty happy and not too happy etc.

Veenhoven (2009) defined overall happiness as "the degree to which an individual judges the overall quality of his life-as-a-whole favorably". Thus, the concept happiness appears as an attitude towards one's own life, which must involve related feelings and beliefs. These feelings and beliefs are components of happiness. In other words, it is the components that are used to evaluate the Hedonic level of

affect: feelings, emotions and moods (such as active - inactive and pleasant – unpleasant) to be able to realise how well we feel the pleasantness in feelings, in emotions, as well as in moods at a particular time.

MacKerron (2012) reported distinguished five account of well beings to be *preference satisfaction*, meaning freedom and resources one needs to meet his/her wants and desires. The second is *basic needs*, which mean ability to fulfilment a fixed set of material wants - psychological and social needs. The third is *flourishing* (or *eudaimonic*), as realization of one's potent along dimensions such as autonomy and personal growth. The fourth is *hedonic* (or *affective*), which have to do with positive affect balance, relative dominance of positivism in moods and feelings and *evaluative* (or *cognitive*), in which is individual's assessment of own life according to some positive standard.

This study therefore, adopts "subjective well-being" which in component means "life satisfactions" as a result of improvement in life for the following reasons:

1. The then president of the Federal Republic of Nigeria, Ibrahim Badamasi Babangida on the commissioning ceremony of Shiroro Hydro Electricity Dam on the 21st June 1990, declared that "the expansion of power supply is not only for Economic development, but also to enhance the quality of living of the citizens" (Ayilla, 1990). In other words, right from the word go, the speech was a pointer to expansion of wealth or quality of life, which is synonymous to happiness in the direction of wealth as a definition.
2. Veenhoven (1994) in a study of quality of living conditions for 30 countries found higher happiness in countries that provide better conditions of living. The study used material comfort of the citizens,

system's political freedom, citizens access to knowledge and degree of equality demonstrated were found comparable performance indicators. However, economic affluence happens to be the strongest predictor of happiness in these nations.

3. The issue of the Easterlin Paradox is not applicable to Nigeria where this study is taking place. In other words, provisions of basic needs of life are still very low in Nigeria and therefore, increase in income of any community will increase the level of happiness of the community.

Many terms are used to denote happiness. Happiness is interchangeably used with life satisfaction, well-being, and quality of life. Happiness, which however, reflects satisfaction, is like or similar to but have no any reference to a state of mind. That is, success may be accompanied by a positive mental state and the absence of success might not be; but mental state is not a defining attribute of satisfaction. Therefore, one can be satisfied or dissatisfied with specific aspect of life say health, housing, finances and so on while happiness is a more global construct.

The interchangeable use of well being with "happiness" is common but the focus of well-being is broader than happiness. This includes health, contentment, prosperity, and wellness as well as Quality of life (QOL). QOL is another concept although, broader than happiness but interchangeably used with happiness too. QOL is defined to have four critical attributes of feelings of satisfaction with life in general, self mental capacity to evaluate one's life as satisfactory or otherwise, an acceptable state of physical, mental, social, and emotional health as determined by the individual, and an objective assessment by others that one's living conditions are adequate with no

life threatening aspects. Therefore, happiness is contained within QOL (Bekhet, *et al.*, 2008).

Frey and Stutzer (2002b; MacKerron & Mourato, 2013a; McCabe & Johnson, 2013) also said that terms like substantive utility, subjective or reported well-being, quality of life and life satisfaction are used in place of happiness. Although, these terms tend to have their meanings when critically looked into, this work will however, employs the terms happiness, well being and subjective well-being interchangeably as terms to connote happiness as done by so many scholars in the field of happiness.

2.8 The classical theories of happiness

The two traditions of *hedonic* and *eudaimonic* are two distinct views of human nature and of what constitutes a good life in all society. The two words are the different explanations on how development and social activities relate with people's well being or happiness.

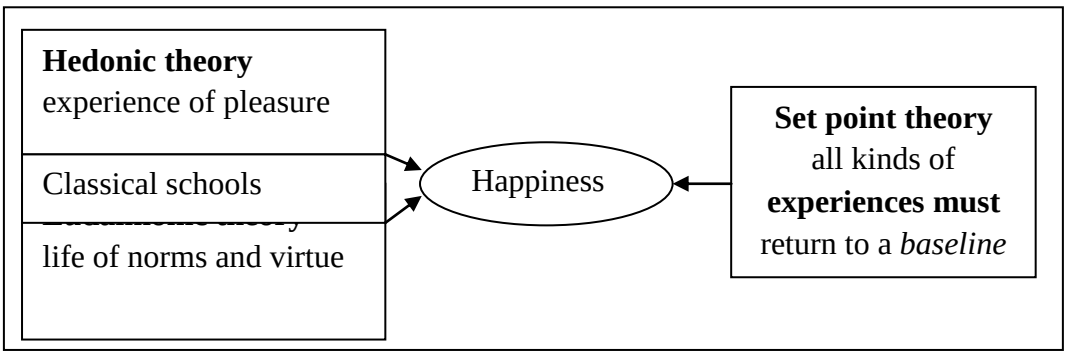

Figure 2.1
Link of Theories to Happiness

2.8.1 The Hedonic theory

This simply means experience of pleasure or happiness. Historically, hedonic can be traced to the words of Aristippus, a Greek philosopher of Four century BC "the goal of life is to experience the maximum amount of pleasure, and that happiness". Others are Hobbes who argued that "happiness lies in the successful pursuit of our human appetites", and De Sade's view that it is "pursuit of sensation and pleasure is the ultimate goal of life" among others (Ryan & Deci, 2001). They further reported other Psychologists views in a broader perspective that tent to adopt the hedonic view that embraces the preferences and pleasures of the body and of the mind. In fact, the popular views of hedonic psychologists is that well-being comprises of subjective happiness which is made of experiences of pleasure in one end and displeasure on the other which broadly mean conclusions about the good or bad elements of life. It could be in other words, be defined as "what makes experiences and life pleasant and unpleasant" which suggests the term well being and hedonism as equivalents.

Jeremy Bentham (1748 - 1832) who is the modern ancestor of utilitarianism - was of the view that our life is governed by two main principles - the principles of pleasure and pain. Naturally, one aims at pleasure and avoids pain. Therefore, all our voluntary actions are at the end motivated by our desire to pursue pleasure and avoid pain. By this statement, Bentham is seen as a representative of the school of psychological hedonism (Nordenfelt, 1996).

Some scholars view the theory differently. Haybron (2005) have two problems with hedonism, first, it incorporates only the experience aspect of emotional conditions.

However, our emotion goes beyond experience. There could also be irritable mood that could not just be called experience, but usual or a temperament that lash out at minor provocations. Secondly, hedonism considers pleasure and displeasure as happiness, yet many pleasure seem insignificant or superficial and hence making no difference in one's happiness. For instance, eating a cracker, and say sudden drop of one's pencil and so on are forms of pleasant or unpleasant experiences but does not add to one's happiness or unhappiness. Sometimes even significant or intensely pleasant experiences can also fail to impact on happiness. For instance, notoriously or unethical sexual activity can leave one cold and unhappy.

2.8.2 The Eudaimonic theory

The ultimate good in life was calIed *eudaimonia* by Aristotle which literally means "being blessed with a good daimon" (Nordenfelt, 1996). Aristotle considered hedonic happiness to be a crude idea making people blind followers of desires and said the true happiness is in the expression of virtue—that is, doing good or ethical things that are worthy. In other words, optimal well being need to distinguish between needs that are subjectively felt whose satisfactions leads to brief pleasure and those that have to do with human nature whose achievement is favourable to growth and produces eudaumonia - well being. The term eudaimonic is valuable because it is well-being from happiness *per se*. Eudaimonic theories argued that, not all outcomes of one's desires that one values, would yield well-being when achieved. Although, these outcomes may be pleasure producing, some are not good enough to promote wellness for people (Ryan & Deci, 2001). They further reported that whereas happiness is hedonic, the eudaimonic conception of well-being enjoy people to live in accordance with their true self or values. It is under this condition that personal growth and development is achieved unlike hedonic that are more related to being

relaxed and happy. The eudaimonic leads to personal growth and development which represent the achievement of one's true potentials, thus, more of psychological well being that could be measured with six aspects of human actualisation – personal growth, autonomy, self acceptance, mastery, life purpose and positive relatedness.

The Aristotle's eudaimonia can literally be translated to mean that, whoever is favoured and guarded by the gods, and who in general, live in good circumstances lives the best life might be misleading picture of Aristotle's theory. To him the purpose of the existence of a human being is to perform a function, which means to acting according to the norms of virtue. A virtuous human being, active and continuously practising virtue is the same as exercising the human function, thus, lives a life in eudaimonia and be said to be happy (Nordenfelt, 1996). This to him is not the complete answer rather rank eudaimonia in deferent degrees. The different degrees of virtuous life could be different degrees of eudaimonia, which does not mean how often or to what extent one perform virtuous actions. Aristotle proposes a hierarchy of virtues to be predominantly of a spiritual character solely performed by ones soul, being higher ranked in the hierarchy. The second is characterised and performed by the body. To perform well with one's body is good, but better with one's soul. This aspect distinguishes one from the animals. In other words, external and internal conditions must be fulfilled for one to reach a high degree of eudaimonia. The conditions include some certain minimal degrees of health, physical protection, economic platform and minimum of social life. All these necessary conditions are not sufficient for eudaimonia but must include act - must be active according to a rational and virtuous principle (Nordenfelt, 1996).

To sum this up, in whatever way a theory tries to put forward happiness as a concept, it must fall within two categories: happiness as a result of external stimuli (outer

oriented) or as internal stimuli (inner oriented). The polarity goes to mean that hedonic theory is more to do with outer stimuli because pleasure is part of human being's fulfilment of desires and needs hence, what matters to hedonic category is "to have something" and not "to be something". Therefore, it is arguable that the concepts of happiness from these points of view are objects of external stimulus. Whereas, eudamonic theory as concepts of happiness have to do with virtue, acting well and relation with god and therefore, more of interior feeling than exterior goods, as such, internal stimulus (Tenaglia, 2007).

2.9 Set-Point theory

Brickman and Campbell in 1971 propounded set point theory with the idea of adaptation level of well-being. The scholars detected that most individuals returned to a baseline of happiness after a fortunes or misfortunes of life (Headey, 2007). This is an idea of "hedonic treadmill" that suggests that the impacts of psychological well being (feelings) cannot be constant or permanent. The feelings goes up or down and eventually return to the set point or a baseline which is like equilibrium level of happiness (Headey, 2007; Robertson & Cooper, 2011). That is, external factors that is capable of changing overall happiness of individuals such as death of beloved one, spouse, and pains from illness or permanent disability and the likes or in the event of winning a large sum in a lottery. In these instances, individuals get adapted with live within the limitations, pains of the loose, or injury or otherwise. But Easterlin (2005) argued that set-point theory in the field of psychology have a negligible role to play as theory of happiness. This he said is due to empirical evidences that proved that, there are no complete adaptations in some cases. For instance, deterioration in health and dissolution in unions say marriages has permanent negative effect on

happiness. The happiness is found not return to the said set point. The theory is therefore, not generally applicable to all cases.

2.10 Easterlin Paradox of Happiness

Professor Easterlin (1973, 1974) in a study of Economics of Happiness discovered sign of dissatisfaction with the current state of economics known as the income paradox (also known as the ‘‘Easterlin paradox’’). It explains the relationship between income growth and happiness in the industrial countries (Pasinetti, 2005a).

The average happiness varies always directly with individual income and over time, it is truism that a general rise in individual incomes increases the societal averages. Therefore, increase in happiness that one would have expected to accompany individual’s increased income is often impeded by a decrease in happiness due largely to the accompanied rise in the life averages. The subsequent evidences from time series studies of the United States, nine European countries, and Japan and another analysis of data from 45 happiness different surveys conducted between 1946 and 1977 proved the Easterlin paradox right, that is, people are not any happier with increase in national income (Easterlin, 1995; Pasinetti, 2005b). In other words, growth in nation’s income with all the sophistications of life would not positively influence the general happiness of the people.

2.11 Valuing Happiness

According to Martin (2012) happiness and morality are linked in four main junctures. These are right to pursue happiness, happiness as a good, the duty to pursue happiness, and the virtues that promote and are promoted by happiness. In other words, the four ethical traditions are rights ethics, utilitarianism, duty ethics, and virtue ethics.

i. Right to pursue happiness

Jefferson's Declaration of Independence proclaims: "We hold these truths to be self-evident; that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness." Regardless of our general view of rights, one clear thing is, right *to pursue* happiness is not a right *to be* happy or *to be made* happy. The distinction is marked in an saying ascribed to Benjamin Franklin: "the constitution only gives people the right to pursue happiness".

ii. Happiness as a good

Happiness is a self-interested or prudential goods that is worth having because it contribute to our personal well-being. Happiness could be said to be greatest subjective good, for it encompasses both enjoyments and a sense of meaning in manners that makes us love our lives overall, although, sometimes these myriad desires may include evil intentions as that might mean happiness to some individuals. But most importantly, the desire for happiness helps to adjust those other desires, not as a secret motive or rationale for them, but as part of our desire to pursue a good life.

iii. Virtues that promote and are promoted by happiness

Happiness is also a moral good; it contributes essentially to good lives because it interwoven with the virtues and other moral values. A happy person always have good quality mind to interpret situation that is characterised by harmony that accommodates union with other values. For instance, readiness to contribute to

solving social problems, environmental protection and the likes are moral goods. However, happiness is not a moral good if its source is immoral, in situations like that; a good is being used for evil.

iv. Duty to pursue happiness

It is part of our responsibilities to be happy as an aspect of good lives. Self-respect is a foundation to moral good. When one has self-respect, he cares for self-health, respect others, abide by laws and care for others rights. These are duties, moral goods, which are by-product of happiness. Elizabeth Telfer in Martin argued 'People have not merely a moral right to pursue their own happiness, but also a duty to do so … anyone who makes respect for the individual his guiding moral principle will be committed thereby to regarding *himself* as one of these valuable individuals who ought to be cherished'.

2.12 Measurement of Happiness

There are several ways of measuring happiness. Some of these ways of measuring them include the following:

2.12.1 Subjective and Objective measurement of happiness

Frey and Stutzer (2002b) are of the opinion that the concept of happiness has two polar measurements: subjective and objective measurements of happiness. The subjective measurement of happiness is a psychological measure captured by surveys with the help of a single question (single item) or several questions (multi item) of global self reports. This makes it possible to generate statistics of individuals' evaluation of happiness or life satisfaction.

The objective measurement on the other hand, is referred to as physiological approaches, which are in two forms. The first objective happiness measurement

involves technical procedures that identify the extent of happiness of an individual by measuring the person's brain waves. The second objective measure of happiness captures subjective well being or happiness by experience sampling measures, typically carried on periodic bases say several times a day for many days, ascertain condition or moods, emotions, other feelings and the likes at random moments in individuals' everyday life. An objective measure, is seen to reduce the memory biases in the adaptation problem that is common in subjective happiness. Physiological and moment based measures is said to rely more on normative judgments. That is to say, objective happiness is assessed according to fixed rules and standard.

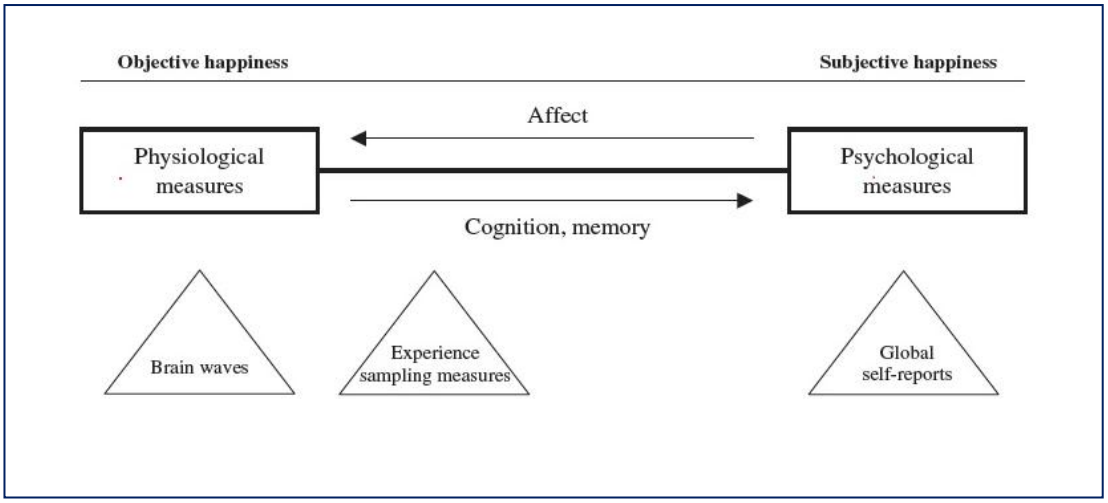

Figure 2.2
Subjective and Objective happiness measures
Source: Frey and Stutzer, 2002

Sizer (2010) have similar view with Frey and Stutzer on the notion of measurement of happiness. The author is of the view that happiness measurements are either objectively or subjectively done. Objective measurement identifies happiness with conditions of life. A happy life is one that is lived well which has to do with certain non psychological states of affairs. The identification of objective measurement with good life goes to mean that happiness requires more than pleasant thoughts and

feelings. One must fare well either by one's own standards (and visible to others) or an objective standard of value to be called happy. Subjective measurement on the other hand identifies happiness with a psychological state. This happiness is a feeling or declared emotion or set of judgments that one's important desires are satisfied. This state or kind of happiness however differs among individuals.

2.12.2 Social Indicator

Although, subjective measurement of happiness tends to the best way to ascertain happiness levels in individuals as in Frey and Stutzer, (2002), Social Indicator is also an accepted norm in the area of measurement of happiness. The basic idea behind social indicators is that the availability and access to particular goods and services connotes welfare or happiness of a people. Normal goods in this class are housing, health, education, nutrition and the quality of the environment. Note should be taken that social indicators are not measured in terms of money because of problems say difficulty at assessing their relative importance for well-being.

There are three types of "classical" social indicators widely used: school enrolment, life expectancy, and access to fresh water. In the classes of these indicators, the developed world tops with developing world lagging behind. China is a good example of case of people's lives on average of 70 years, 70 percent have secondary education and 90 percent access to fresh water.

Other 'indicators' are GNP per capita. This is comparison of purchasing power using purchasing power parities (PPP) of nations. There is the Human Development Index popularly employed by World Bank and the Index of Social Progress (which are directly or indirectly related to the first three indicators). And, Amartya Sen's Functioning and Capacities which have to do with the alternative combination of opportunity available and various things individuals manages to do or be in the

course of leading his or her life. He believed that happiness or well-being is a combination of various "doings" and "beings" (Frey & Stutzer, 2002b; Sen, 1993).

Argyle (2001) have same opinion with Fry and Stutzer. The author opined that although, subjective measure of happiness is the generally accepted measure of happiness, alternative accepted form of measure of happiness is objective measurement or Social Indicator. This approach is not employed to assess individual by asking on how well they feel or how happy as in the case of World Value Survey, but by finding out what people can do, how much restriction they encounter etc. The approach is used in diverse ways such as comparisons of nations or cities using indices such as education, income, environment and the like to assess individuals as well as country's differences. Objective Social Indicator can also be use to study historical changes in well being that take place in a particular community, region or location. The approach has been successful or applicable both physically, psychologically and socioeconomically.

The good happiness measurements in psychology literatures have been based on self-reported measures, which depend on four factors: circumstances, person's mood or personality outlook, aspirations and comparisons with others. Recorded happiness over time is demonstrated to have been correlated with characteristic such as unemployment, person's recall of positive and negative life-events, evaluation of one's happiness by his/her friends and family members and by spouse, duration of true smiles, by stress and illness such as headache and prefrontal brain activity (Blanchflower & Oswald, 2004).

Constitutional democracies influences citizen's happiness for the ruler ship favours the general interest of the people. The citizens are prone to freedom to participate in

the political system for treat of re election. Frey and Stutzer (2002a) reported detailed measure of freedom, with a three point measure of happiness in 38 countries mostly developed nations, the result of which shows that happiness and freedom are positively related. The three index of the measurement of freedom and happiness are: first, political measures which have to do with citizen's involvement in democratic process or otherwise. They have two sub indexes of political right and freedom of speech. The second index is economic freedom, that is, the opportunity of citizens to free exchange of goods, services and labour, free enterprise, freedom from unnecessary taxation, and undertaking monetary transfers at ease. The third index is personal freedom, which means private life like religion, travel, marriage etc. All these indices have their respective items to enable the measurement of happiness in societies.

2.12.3 Gross National Happiness (GNH)

Gross National Happiness (GNH) was first coined in the kingdom of Bhutan and unlike Gross National Product (GNP), GNH is a measure of the quality of a country in more holistic way. That is, expression that development of human society takes place when both material and spiritual progress experiences occur hand in hand. Bhutan's GNH is unique when compared to the western concept of happiness: it is multidimensional – not focused only on subjective well but including other dimensions and it also internalizes other regarding motivations i.e. serve as policy and programme screening tools. The Bhutan's GNH have 9 domains, 33 clustered indicators, with several 124 variables (Ura, Alkire, Zangmo, & Wangdi, 2012).

Figure 2.3
Domains and indicators of Gross National Happiness index

Source: (Ura, *et al.*, 2012).

The domains and the indicators of GNH as in Ura *et al* (2012) can be summarised as below:

i. *Psychological Wellbeing*

Psychological wellbeing categorized indicators are life satisfaction with is the subjective assessments of individuals contentment levels with respect to occupation, health, family, standard of living. Others in this category are life balance positive emotions such as pride and joy, life's negative emotions such as pain and worry and spirituality, which is a description of one's personal judgement of spirituality range.

ii. *Health*

Health as a domain is the measure of relational balance between mind and body, between persons and their natural environment. One is said to be well only when there is no both pain in the body and sorrow from the mind. The indicators are self reported health status which proxies' objective health and nutrition states, healthy days that measures number of healthy enjoyed in a month, long term disability proxies objective health and nutrition states and mental health that measures possible depression, anxiety, confidence and concentration levels.

iii. *Education*

Education as a domain measures conventional formal education, traditional knowledge, common values and skills of creating good human beings. The indicators are literacy, educational qualification, knowledge for both learning within and without formal education and values.

iv. *Culture*

This domain handles the level of people's identity and negative impact of modernisation on the identity. Culture as a domain is more specific on issues that relates to language, festivals, ceremonies, traditional arts and crafts, drama, music, dress and etiquette and spiritual values that people share. The indicators are language, artisan skills and socio cultural participation.

v. *Time use*

A flexible working life is critical for the wellbeing or happiness of workers, their families and the community in general. Therefore, this measures the balance between

paid work, unpaid work and leisure's importance to one's wellbeing. The indicators are working and sleeping hours.

vi. *Good Governance*

Good governance measures effective and efficient governance which have to do with respect for fundamental rights, performance of the governmental institutions, political participation and trust in institutions. The indicators are political participation, political freedom, service delivery and government performance.

vii. *Community vitality*

This measures of people's ability to support and interact positively with one another within a community i.e. cooperative relationships and social networks within the community. The indicators are social support, victims of crime, community relationships and family.

viii. *Ecological Diversity and Resilience*

This domain recognized the vital role environmental factors play in human development and the roles individuals play at protecting the natural environment. The indicators of this domain are ecological issues, urban issues, responsibilities towards environment, and wildlife damage to crops.

ix. *Living Standards*

This living standards domain has to do with the measurement of the material wellbeing of the people. It ensures standard of basic material needs for a good living. The indicator embraced here are assets, household per capita income and housing conditions.

It should be noted that one does not need to be sufficient in all variables of the domain and indicators before he/she is said to be happy. People are diverse in the ways and means by which they fulfil life and so not all variables have universal applicability, therefore, freedom of choice of what one does to fulfil life matter to his/her happiness.

2.12.4 The Chinese Happiness inventory (CHI)

CHI is a measure of happiness that consists of 48 items 28 of which is adopted from Oxford Happiness Inventory (OHI) and the other 20 items derived from a qualitative study carried out in Taiwan. The 20 items (Taiwan) subscales in to six places: satisfaction of material needs, harmony of interpersonal relationships, achievement at work, praise and respect from others, downward social comparisons and peace of mind. The remaining (OHI) was sub scaled into seven places: optimism, positive effect, social commitment, contentment, fitness, mental alertness and self-satisfaction. The CHI items have four response options representing levels of choice subjective experiences of happiness for respondents which are coded as 0, 1, 2, and 3 (Bekhet, *et al.*, 2008).

2.12.5 The Marital Happiness Scale (MHS)

MHS is a happiness measurement scale designed to provide information or report on marital happiness in the 10 areas of marital interaction: household's responsibility of children up keep, social activities, money, sex, communication, academic or occupational progress, spouse independence and personal independence. It is designed for couples in the ages of 23 – 56 years. The 10 areas of marital interactions have 10 items scaled categories blending scores on self-reported happiness that ranges from 1"completely unhappy" to 10 "completely happy". The higher the scores, the higher the level of happiness and vice versa (Bekhet, et al., 2008).

2.13 The variables of the study

The Genuine Wealth model is a philosophy that originated from our genuine well-being and happiness that account for all conditions of life. Measurement of Genuine Wealth attributes could be done at levels depending on the circumstance at stake. The measurement could be at individual, family, community, region and state levels. However, in the case of community level, the characteristics necessary for the measurement of genuine Wealth or people's happiness are to assess their overall quality of life conditions. That is, social, environmental and economic conditions of the community (Anielski, 2007). "…happiness is constituted by affects based on our values, and that our values are constituted by our sentiments" (Wren-Lewis, 2010).

Human beings share certain common features, such as physical and mental characteristics that affect their pattern of behaviour. Thus, all humans have basic needs, mainly concerned with survival: needs for food, shelter, safety and companionships. Unlike animals, humans reveal a higher range of needs that make life worthy of living and might otherwise be a meaningless world. These needs are exploratory, creative and self-fulfilling activities of many and varied forms. In consequence, a common feature of all human behaviour is that their concerned is to satisfy these needs (Tyson, 2006).

Nature has not left the gratification of such crucial needs to intentional reasoning alone, particularly not because the ability to think is a late evolutionary development. Rather, seems to have safeguarded need-gratification by linking it to pleasant affects; pleasant and unpleasant. Unpleasant affect signals deficiencies hence, threaten functioning and slows down activism. Pleasant affect on the other hand, signals gratification and encourages happiness that triggers current activity to go on positively (Veenhoven, 1991).

Table 2.1
Variables of the study

Dependent Variable	Independent Variables
State Of Mind	• Household dignity • Household human right • Economic decline • New provided land • Flood compensation • Compensation • Lose of culture due to dam/river • Lose of culture due to religion/modernisation • Conflict and violence
Household Per Capita Income	• Household landed asset • Household farm extension services • Household access to credit facilities • Household farm technology • Household increase production • Household housing • Household life stock
Physical Environment	• Dam/no Dam (Treatment and Control Groups) • Flood Externality • Environmental change • Farming risk • Urban influence • Decline wild life • Infections
Social Amenities	• School • Road • Electricity supply • Water supply • Health care facility

2.13.1 State Of Mind

Happiness is a fact, in particular a feeling, a state of mind to us. For one to distinguish subject matter happiness from other things commonly called happiness, one may call this state of mind psychological happiness. So construed, happiness is a purely psychological (Haybron, 2001; Haybron, 2008b). Furthermore, Tenaglia (2007) expatiated that happiness stems from feelings that originate and persist endogenously within the minds of human beings.

However, in Ura *et al* (2012) portrays that State of Mind is said to be psychological, and psychological well being is one of the domains of happiness. This aspect of happiness deal with subjective well being, life's balance of positive emotions such as pride and joy, life's negative emotions such as pain and worry and spirituality. This is in line with Hybron (2008a) who said more commonly, "happiness" bears a simply psychological meaning, showing some broad and typically lasting aspect of the individual's state of mind.

State of mind therefore, is like affectivity. Affectivity as defined by Hefferon and Boniwell (2011) as the extent at which an individual experiences positive/negative moods. In other words, positive effect is said to have occurs when someone experiences joy, contentment, and so on, whereas in the case of negative effect, feelings such as sadness or fear and the like might have occurred. Diener and Seligman (2009) used positive and negative emotions to explain same as above. Therefore, State of Mind could construe happiness.

Authentic happiness theory portrays one's happiness to be informed by the conditions of one's life and autonomously. This reflects the values that are truly one's own and not the result of manipulation or oppressive social conditioning. Happiness in this perspective is like subjective well-being that involves both global attitudes of life satisfaction and positive affect or simply life satisfaction account. The rationale of the theory is that "one's happiness should reflect a response of one's own, to a life that is one's own" (Haybron, 2008a).

Process theory suggests that pleasure and pain are intimately connected. According to the theory, "loss of something good leads to unhappiness and the loss of something bad lead to happiness". In addition, predictions could be made about the

magnitude of affect, if a person gets accustom to a good or bad object, the outcome will bring less happiness or unhappiness with repeated exposure (Diener, 2000).

Subjective well-being is psychological and has link to individual's daily objective activities such material wealth and cognitive (life satisfaction) components. These objective components affect state of mind because psychological or subjective well-being contains emotional components like joy and pride; the hedonic appealing physical pleasures associated with wealth and greater access to all the goodies of life. It further contain cognitive (life satisfaction) component such as valued goals that could contribute to increased happiness and unhappiness of people Diener in (Biswas-Diener, 2008).

Although, happiness has two components that is, emotional conditions of positive and negative balance, the emotional condition would have to show sufficiently favourable positive balance against negative and to be unhappy one's emotional condition must show sufficiently unfavourable balance of positive against negative (Haybron, 2005).

Literature shows that Happiness is a product of social economic activities within communities. Some of the activities that result to happiness/unhappiness sometimes emanates from government policies (say like Dam in Shiroro community) that tempers with community values, source of income and the likes. Political and economic policies may create happiness or offensives result.. This could include undemocratic approaches to decision-making, responses of migration of the affected, decline wealth, lose of cultures and vice varsa.

Happiness after America's Indepence Decreation was mainly justified and measured on materialistic grounds. For instance, Hume is reported to have pointed out that

happiness is increased by international trade for the fact that it facilitates opportunity of consuming variety of goods. However, Adam Smith was the leading advocate who connected happiness to the living standard in an economy. He consciously related the dependence of general welfare to the living standard of the labourers where he said "No society can surely be flourishing and happy, of which the far greater part of the members are poor and miserable" (Drakopoulos & Karayiannis, 2007).

Data from a variety of sources proved the idea that living a materially abundant life affects psych that positively associates with increased happiness. In a study, Biswas-Diener (2008) received reports of happiness from 49 individuals from the Forbes list of the wealthiest Americans worth more than $100 million U.S. dollars at different geographical areas and found the scores significantly higher happiness or life satisfaction.

Ahuvia (2002), found in his study that asset or material needs play more vital role in human happiness then income in the developed nations. He found that when basic needs are met - food, roof over head, a good job increases in income at this junction generally explain less than 1% of the variance of ones happiness. In other words, individuals are more concern on basic needs, which goes to mean that their impact on happiness is higher.

Other school's thought is different; adaptation is very important reason that determines levels of happiness. Amartya Sen in Guardiola, González-Gómez, García-Rubio, and Lendechy-Grajales (2013) said "adaptation refers to the fact that people who seem to have adapted to the harshest conditions still report high levels of subjective well-being". They found Mayan people to have considered a situation of material scarcity to be normal way of living therefore, lack of it does not matter to

their happiness. Similarly, Graham (2009) identify this as happy peasant and frustrated achiever' problem - the poorest people who are not most frustrated or unhappy with their accessed services, reports high levels of well-being, while otherwise report from much wealthier ones.

It is popular believe or agreement among scholars involved in international comparisons that material aspirations of people vary positively with the level of economic development. As peoples provisions improve, they aspire for better or more. However, it's now well-established fact that international comparisons of happiness and income are significantly influenced by cultural factors (Easterlin, 1995). Frey and Stutzer (2007) found that higher happiness with material things wears off with time. Satisfaction or happiness depends on change and disappears with continued consumption, which reduces the hedonic effects of repeated stimulus. This is adaptation, and it makes people strive forever-higher aspirations that degenerate to unhappiness. This could also be because of relativity of the people towards Nabors or the like.

There is a positive relationship between social contact and well being or people's happiness. A government policy for instance that facilitates geographical mobility weakens networks of family and friends. Dolan, Peasgood and White (2008) reported that geographical mobility has significant positive small effect on happiness on family and friends, for instance, global satisfaction is reported to be lower when contact involves have no care from friends and family. Graham (2009) found that friendships and relatives matter more to the well-being of the average Latin American than employment, or personal assets, health slightly less than food security, especially the poor. Friendships most likely provide important coping mechanisms for the poor in the absence of public provisions.

Immigrants are mostly less happy because it is in most cases actions towards trying to better their lives at some sacrifice. The process of acquiring agency can be painful. For example, urban migrants in China provide support for that interpretation. The rural counterpart are happier than urban migrants, compare their present situation with their rural situation in the past (Graham, 2009).

In line with Dolan at el., Richard Layard in Pacek (2009) said the ideal approach of a policy maker that could possibly improve the happiness of citizens is by targeting economic policy at income increases and security, family policy at strengthening family bonds, and community policy would at enhancing the bonds of citizens within and across their communities.

Poverty and homelessness are common predicament in all societies. Studies have shown that homelessness is associated with strained family relationships, higher exposure to trauma, increased anger and depression and the negative unhappiness due to social stigma (Biswas-Diener, 2008). A study of homeless individuals in Fresno (California) and Portland (Oregon) reported negative satisfaction with life (Diener & Biswas-Diener, 2005).

Yamamoto in Biswas-Diener (2008) conducted 480 interviews with rural tribal Amazonian people, and urban folk living in Peru on the rate of importance attach to goals related to achievement, basic physical needs, and social harmony. The author found sharing and support were valued with esteem in preindustrial groups, as opposed to accumulation of material goods as the emphasis in urban areas. These indicate relatively modest material resources of the tribal Amazonians influential on their overall happiness by structuring their personal aspirations and values.

Psychologically, institutions and values also play vital roles at enhancing positive emotions or happiness of societies. Helliwell (2006) found that people prone to higher self-esteem seem less likely to suffer from depression and vice versa. Similarly, political participation can have a positive effect on individuals - sense of self-worth and autonomy, increasing knowledge, competence, and awareness hence heightened sense of satisfaction (Pacek, 2009).

Diener and Seligman (2009) reported that nations with democratic governments score as high as 0.78 correlation with individual happiness. They further reported that effective and trustworthy governance that provide for service and allows for participation translates to psychological emotions or happiness that also correlates with the well-being of nations, that is more effective over and above those of democracy.

Tavits (2007) supports the above, used survey data from Europe that finds voters to be significantly happier than non voters, regardless of their choice. Frey and Stutzer (2000) found direct democracy to confer power to "check and challenge the political class" by the citizens themselves, and this leads to political decisions more in line with voters hence happier citizenry.

Helliwell (2003) found low corruption, effective rule of law and freedom to translate to greater happiness or life satisfaction of the people. Veenhoven in Diener and Saligman (2009) found that economic freedom had a stronger effect on happiness of poor nations. They further report that people are happier in neighbourhoods that are characterised conflict free and where social capital is high. In other words, where people at peace, trust one another and are mutually helpful with high rates of

volunteer activity, club membership, church membership, social entertaining etc are happier.

Violent conflict has the tangible effects of destructions and intangible effects in terms of psychic costs such as fear, and agony, as well as sympathising with relatives, friends and other persons mourning victims. In a study of 44 countries using average happiness by country from representative surveys, Frey (2011) found that the current number of conflicts significantly reduces the happiness of the population. The equivalent of the pains in terms of calculations on the average equals to about 108,000 US dollars. In other words, income increase must be up to 108,000 dollars to leave happiness constant when one additional person dies.

Welsch (2008) found civil conflict as social capable of affecting average subjective well-being or happiness in of a community or country. It does so through direct psychological effects and indirectly via reduced income. The direct effects include suffering, fear, altruism which tend to be larger than the indirect effect from reduced income due largely to tension and reduced workdays.

A poorer perceptions or expectations of one's current financial situation are usually associated with lower happiness or life satisfaction. Perceptions of change in financial circumstances, as opposed to current circumstances, may also be important for well-being. Brown, Taylor, and Price (2005) found that people have lower happiness scores when they perceive their current financial situation to be worse than previous year and when forecast next year to be even worse.

Happiness depends only partly on comparison, more on gratification and even standards of comparison do not fully adjust to circumstances. To a great extent happiness depends on the gratification of innate bio-psychological needs which do

not adjust to circumstances: needs mark in fact the limits of human adaptability. The better these needs are gratified the better we feel and the happier. People are not happy in chronic hunger, conflict and isolation. To the extent that happiness depends on need-gratification it is not relative (Veenhoven, 1991).

Sometimes evaluations of our lives are appropriately determined by factors that are outside happiness. Some people reasonably get dissatisfied with life when things are going well and just as reasonably satisfied on another occasion when things are going much worse**.** The first group of such people consider how and what they ought to be or live life, if not, no matter what, they are not happy. The second group assess life in relation to "perspective of gratitude" where life is assessed from different perspectives and none of which is pre eminently authentic or otherwise authoritative. People often assess life by reference to those less fortunate in the society say the poor, the afflicted by natural disaster or the likes, or even the dead. Therefore, such norms are orthogonal to the question of personal welfare, making inferences from life satisfaction to well-being deeply and inherently problematical (Haybron, 2005).

In the same vein, suffering can also be a reason of happiness. Suffering is good if it can become part of happy lives, which is supposed to be. Happiness is the feeling that power is growing which is same as liveliness (abundance physical and mental energy), self-mastery and self-love which all compatible with suffering. Therefore, to refuse to give up requires suffering and suffering per se is part of creativity that turns to true happiness. "Suffering is the twin of happiness which grow together" therefore, the conclusion that one is living creatively is the deep love of life shown in ones willingness to perpetuate forever (Martin, 2012).

People tend to choose happiness over unhappiness in self-reported even when life is hard at the most basic level, perhaps as a survival mechanism. Avoidance of negativism for positivism keeps man surviving. Man as a social animal, his survival as a species, need emotional strength and to avoid apathy that negative mood states creates. Despite man's problems, his network of social interaction as team, group, clan, tribe and nation has much greater efficacy in his life. Therefore, their dependence on each other and positive outlook toward life give man happiness (De Vries, 2009).

2.13.2 Household per Capita Income

Aspiration theory is an explanation of increase income and happiness puzzle. The theory states that people derive utility not from the absolute value of income but from the difference between achievement and some norm (aspiration level). As a society experiences growth and development, it has not only resulted to completion and accompanied choices available to consumer but the norm increases, which offsets the desired satisfaction. This is also known as social comparison on income. It is responsible for non-income goods, such as mental status, family life, health, basic human rights, fighting unemployment etc that impedes the values of income hence decrease happiness. In other words, people compare themselves to others in respect with non-income goods hence erodes happiness of the society despite increase income (Tian & Yang, 2005).

Economists popularly use simplifying assumption that income can be a proxy for utility. Therefore, the claim that pursuit of individual earnings promotes aggregate welfare/happiness. This effort could easily be measured by individual income hence serve as indices that captures well-being. Although, some scholars found little effect

of income on reported happiness over time, some clearly found positive relation between income and happiness.

Kaun (2005) argued that income gets rid of all man's problem with a conclusion that income *per se* provides a profound source of satisfaction. "It's the getting and getting rid of income where problems arise." The author report Frank to have said, 'one can hardly exclude increasing real income from this illusive commodity as an a priori source of (happiness) subjective well being'. Also, increase taxes which reduces personal income if its instrumental to increase public services, it enhances happiness or well-being (Dolan, *et al.*, 2008).

Gross National Product per capita (GDP) and Human Development Index (HDI) are both yardsticks for measuring average national happiness. While GDP is criticised to have deficiencies as yardstick of measuring happiness, HDI is look upon as the better alternative measure of happiness that responds to the deficiencies. HDI see happiness to depend on investment levels in education for knowledge, health facilities for healthy life and structures of income for better living standard (Dipietro & Anoruo, 2006).

Aschauer in Tay, Morrison and Diener (2014) have same notion with the openion, they posit that greater national income could bring about investment in better infrastructural facilities such as communication, transportation, sanitation, and health-care systems that improves individual's standard of living that enhances happiness in the society.

Diener and Diener in Tian and Yang (2005) found in a study of 101 nations that income was correlated significantly with 26 out of the 32 indices chosen as indicators of happiness and concluded that there was higher happiness in wealthier nations.

They also reported that the relation between average happiness and average per capita income across nations have reasonable correlations, ranging from about 0.50 to 0.70

Frey and stutzer (2002b) observed that positive correlation between income and happiness may be produced by other factors than income as such. Particularly, countries with higher per capita incomes tend to have stable democratic structures than poor countries hence such relations ship may be largely due to more developed democratic conditions. Other conditions with improved income that result to positive correlation include the resultant more secured human rights, better average health and the more equal the distribution of income.

Dipietro and Anoruo (2006) used cross country regression to ascertain GDP/HDI (better) measure of Average National Happiness (ANH). They found that GDP per capita clearly appeared on top. While GDP per capita accounts for about 27.5 percent variation in happiness, HDI could not account for any variation in the national happiness. Meaning that "...a gift in kind is inferior to a gift in income..." because income is not resistive – one buys from options to increase ones happiness and not what others thinks that really give one happiness.

However, in line with aspiration theory, others argue that increased national income or absolute income does not matter to national happiness. If there is increase standard of living or national income, it does not have powers over adaptation. Increase in social and physical infrastructure that results to the increase income may have its attachments of say increase hours at work places, traffic congestions, environmental pollutions etc. USA/Japan's (Easterlin paradox) episodes of happiness are considered as a good example of a onetime poor country in the 1960s. After then, they has

improved technology that is instrumental or raised their GDP several folds, yet their reported happiness is no any better than 1960s (Frank, 2005; Helliwell, *et al.*, 2013; Kacapyr, 2008).

Gravin and Mason (2004) are of the opinion that the quest for a better well being increase the vigour of Americans at work. The average employed person in US currently work 163 hours more than those employees of 1960s. This means an increase of additional one-month work experience annually, and as work hours increases, the leisure time decreases too hence increase wealth without increase happiness.

Bruni and Stanca (2006) argued that television (TV) viewing contributes the Easterlin paradox since it erodes higher income impact. They used 56,000 individual data from the World Value Surveys and ascertained evidence that portray TV's influence on income is an additional explanation of income-happiness paradox. As the living standard of people increases, the wide spread and vital role of TV viewing in the life of people significantly contributes to raising people's aspirations on worldly material acquisitions from advertisements and the likes hence lowering the effect of higher income on people's happiness.

Tay, *et al.*, (2014) proved Frank's work statistically. They found that national wealth enhances life evaluations over and above individual income. National income has positively relation with positive feelings (b = 0.04), while individual income had a stronger link with positive feelings (b = 0.12). These findings by implication connote that that national wealth had negative spill over effects on positive feelings. In the case of negative feelings, negative spill over is large. Greater national income is associated with higher negative feelings (b = 0.02), whereas greater individual

income was linked to lower negative feelings (b = −0.08). Floyd (2011) earlier on argued that Economic growth and further globalisation leads to associated increase pollution, increase child labour and human trafficking hence a limited measure of happiness.

Frank (2005) and Frey and Stutzer (2000) argued further, that although, measurement of happiness don't change with general income rise, the rich are always happier then the poor. This goes to mean that relative income is a better predictor of happiness than absolute income. Absolute income cannot make a good predictor because by human nature, there is the power of adaptation to all sought of circumstances. The depressed disabled accident victim who might have said, "i wish i died than to be in this state" gets adapted in time and become happier. Furthermore, lottery winner with lots of enthusiasm go back to former degree of happiness few weeks after.

On the other hand, Christopher, Wood, Banks, Clark and Brown (2013) studied increase and decrease income effect on happiness. They found that a 1-unit rise in log-transformed income is accompanied by a life-satisfaction increase of 0.05 SD, whereas an equivalent income reduction was accompanied by a life-satisfaction reduction of 0.11 SD. By implication, an increase in income have a much lower effect on well-being than equal decreases in income, and treating them in the same way would lead to misspecification.

Veenhoven (1994) has no rigid position but a double standard posit in respect to Easterlin paradox. While some countries' happiness has persistently remained unchanged for decades despite the multiple folds in economic growth, some other countries however, have a diverse experience where happiness has changed

considerably over decades with rapid economic development. For instance, 26 percent of Germans characterized themselves as unhappy, in 1954 and by 1984, only 10 percent did. Likewise, Brazil's ratings of unhappiness was 4.6 in 1960, by 1975 it rose to 6.2 percent. He further said, others with similar experiences of rapid growth with increase happiness include France, Greece, Spain and Italy.

Di Tella and MacCulloch (2008) studied Organisation for Economic Co operation and Development countries (OECD) and have a different notion about Easterlin paradox. They found that increase happiness is attributable to increase income considering other omitted (accompanied pollution, hours worked life expectancy and the likes) variable by Easterlin. In other words, the study introduced omitted variables which made the unexplained happiness data larger, worsen the income growth status and made the status of happiness higher with increase national income in the study. Therefore, it's evidenced that people care about other variables besides income which goes to support the idea of inadequate nature of GDP as measure of welfare or happiness.

Unlike in the rich nations where Easterlin paradox works, in poor countries, increase in national income increase levels of national happiness. Income growth in rich countries is only vital at enhancing happiness in the early stages of growth. When development process say in terms of infrastructural and other basic needs provisions increases till critical income level is reached, any additional income no longer enhance happiness. In other words, once income reaches a critical income level, further increase in income would have minimum or no effect on happiness. (Tian & Yang, 2005; Veenhoven, 1991).

Ideally, researches have suggests that in order to maintain balanced levels of happiness or wellbeing, individual's monthly pay should be approximately $5000; anything more will do little or nothing to enhance happiness (Hefferon & Boniwell, 2011). Using the World Value Survey to compute the correlation between average life satisfaction and the GDP per capita of countries, restricting the analysis to countries with per capita GDP above US$10,000, the correlation was 0.08, meaning small effect of further income once a moderate level of income is achieved (Diener-Ed & Martin, 2009).

Interestingly, Hefferon and Boniwell (2011) reported research findings that income is correlated with happiness in men, not in women. Furthermore, low personal income is related or leads to depression for husbands, not wives and low income also related to depression for singles but not married women. People with high income are associated or perceived as more intelligent and successful but also as more unfriendly and cold.

2.13.3 Physical Environment

The concept of sustainable happiness was developed by Catherine O'Brien in 2005 to draw attention to the cost of externalities individuals, communities, and nations embark on in the pursuit of happiness. The concept is defined as "happiness that contributes to individual, community and/or global well-being without exploiting other people, the environment or future generations". The concept made it clear that people are interconnected and interdependent with all life on the planet and even life yet unborn. It is also about ensuring that basic needs, such as providing affordable homes and safe streets and giving people the chance to realize their potentials through good education, information and participation, good health and employment. Sustainable happiness requires a strong economic base to create the wealth that takes

care of needs to be fulfilled at present and in the future. Therefore, sustainable happiness is an invitation on reflections about sustainability issues, opportunities to enhance quality of life and contribute to individual, community, and global happiness (Mohit, 2013; O'Brien, 2008; O'Brien, 2010).

Usman, and Ifabiyi (2012) cited that the question of sustainable development via a viz environment have two schools of thought – the strong and weak. The strong school believes that pursuit of development must not be injurious on the environment, and that resources are better left untapped. The weak school opined for give and take. There should be just exploitation where trade-off between resource development and deployment to a limit that permits harmonious coexistence between the social, economic and the environment.

The world have entered a new phase, termed the *Anthropocene* by the world's Earth system scientists. The anthropocene (invented term that combines two Greek words of "anthropo," for human; and "cene," for new or technology) connotes world's technological curiosity age, its population of 7 billion burdens and their implication on the natural environment. These has not only contributed to major changes of the Earth's physical systems that includes the climate, the carbon cycle, the nitrogen cycle, the water cycle, and biodiversity, but has also become a source of poverty, anxiety, and unhappiness in substantial position of global economy (Helliwell, *et al.*, 2013).

The implication of these environmental threats to human happiness is already attracting policy attention in some countries of the world. His Majesty King Jigme Singye Wangchuck, in 1980s articulated the concept of "Gross National Happiness" (GNH**)** and outlined in the Bhutan National Human Development Report 2000 that:

"Ultimately, a happy society is a caring society, caring for the past and future, caring for the environment, and caring for those who need protection. Establishing such a society will require a long-term rather than a short-term perspective of development. Much will depend upon how well the country's environmental resources are harness and managed. Happiness in the future also will depend upon mitigating the foreseeable conflict between traditional cultural values and the modern lifestyles that inevitably follow in the wake of development" (Zurick, 2006).

Helliwell, Layard, and Sachs (2013) is of the opinion that economic growth is a short run gains to well beings with long run cost or pains to environment, which is detrimental to natural environment and happiness. The U.S. GNP per capita has increased by about three folds since 1960 but the average happiness remained same over this half a century due to resultant large scale environmental damage via greenhouse gas concentrations and human-caused climatic change without much effort to change the well being of Americans.

Damming affects environment, ecology and social and economic activities. According to Sophie (2007) 60 percent of major rivers in the world are dammed thus, gave birth to a lot of social ills such as displacement of 40 – 80 million people worldwide. Mostly, dam victims usually have weak voices, experiences loss of ecological species, loss tradition and cultural practices. Governments in most cases notoriously ignored human and ecological implications in hydropower or dam projects hence "led to irreversible loss of species and ecosystems" that are detrimental to people's happiness

Other ills include denial of basic rights of ownership of considerable areas of agricultural land, grazing land and forest, and fishing ponds. The usual densely

populated river valleys suffer cultural losses of valuable traditional knowledge systems and destroys part of the world's cultural heritage, abandonment of symbolic markers such as grave sites and ancestral lands that impedes linkages with the past causes psychological pains and unhappiness of host communities (Beck, *et al.*, 2012).

Chinese rural population suffer this loss land and environmental degradation caused by dam projects more than any part of the world. In the 1990s alone, 10.2 million people living in rural communities were displaced by hydropower projects, alarmingly in 2007, Premier Wen Jiaboa's report on dam projects reported 23 million people displaced by dam projects. All these displacements contribute not only negatively to happiness of the Chinese people but experiences of environmental cost of near shore landslides, large reservoirs tectonic instability say catastrophic 2008 Wenchuan earthquake and distortion of agrarian lifestyle of resettled farmers. Although, they were allocated lands for resettlement, but inadequate to fully support agriculture (Beck, *et al.*, 2012).

Dams often lead to the spread of communicable diseases, say water-borne diseases as result of reservoirs and their associated irrigation works. The diseases associated with dams include yellow fever, schistosomiasis, river blindness, malaria and liver fluke infections. Furthermore, it is also a fact that argues that dams reduced quality of drinking water in the host communities and beyond (Mudzengi et al., 2012).

The Dams removal is a new experience especially in the developed worlds. It is a pointer at solving or emanating happiness problems resulting from dam installations. In USA for example, dam removal is a result of change in public opinion regarding the utility of these structures in environment and also an eye opener to improvement

of happiness. Policies at the latter part of twentieth century have slowly shifted the emphasis of public debate to the negative impacts of dams. The Wild and Scenic Rivers Act of 1968, National Environmental Policy Act of 1969, Clean Water Act of 1972, and Endangered Species Act (ESA) of 1973 were all targeted at improving the happiness or protection of riverine habitats and species (Beck, *et al.*, 2012)

MacKerron and Mourato (2013a) provides a new line of evidence on the links between nature and happiness. They found estimated relationships of happiness greater in natural environments. Also moderate global warming with higher winter temperatures increases happiness levels of people living particularly in the North and vice versa. Higher mean temperatures in the coldest month increase happiness, whereas higher mean temperatures in the hottest month decrease happiness depending on the location of the people (Rehdanz & Maddison, 2005). Behaviours that are physically and mentally beneficial to human body system such as recreation, physical exercise and social interaction in natural environments increase happiness as cted in (MacKerron & Mourato, 2013b).

According to Costley, Friend, Meese, Ebbers, and Wang (2011) close relationships and good natural environments without technological distortions contributes to women sense of happiness. They used photographs and perception interviews in their study and found that being and eating together with beloved relations and friends plays a supportive role in happiness of a women. The freedom and Peace women feel in natural environment balances their stresses; nourish their lives and ignites their happiness. They fortunately feel bored, frustrated and unhappy with ongoing damages to nature as result of development.

Nature relatedness is a significant positive predictor of happiness. The findings suggest that nature relatedness is distinct in producing happiness and could even be increased if nature relatedness is facilitated (Zelenski & Nisbet, 2014). Materialism is found to negatively associate with both pro-environmental attitudes and behaviours. Materialists are less likely to believe that humans need to change their attitude to protect their environment for happiness and are more likely to engage in higher levels of environmentally damaging behaviour. The more materialistic people tend to be, the worse their environmental behaviour and the less likely they are likely to protect the environment for well being (Hurst, Dittmar, Bond, & Kasser, 2013).

Evidences suggest that all kinds of pollution, as measured by nitrogen dioxide, has a detrimental impact on overall happiness of a people. Dolan *et al.,* (2008) reported findings that environmental problems in one living place reduce life satisfaction. Noise pollution is also detrimental to community happiness. Weinhold (2012) used happiness regressions to impute a monetized value of residential noise pollution. He put the compensation amount varying from €22/month to €2,246 depending on wealth status of individuals. Nelson (2004) imputed noise cost of a house which will sell at $200,000 would rather sell for $20,000–$24,000 less if exposed to airplane noise.

2.13.4 Social Amenities (infrastructure)

Theory of infrastructure is all about long run development based on public infrastructure as catalyst of growth. Prudence of government in provision of infrastructure ensures a sufficient degree of efficiency of public investment that result to both direct and indirect growth impact. Directly through, growth promoting impact via lower cost of production, the productivity of private inputs, and the rate of return on capital. Indirectly through other means, say access to good water improves

health, access to education, health care facilities, access to electricity etc all improves happiness hence improve productivity in all fields of endeavor. If there is an increase in the share of spending on infrastructure (financed by a cut in unproductive expenditure) would facilitate the impetus of progress from a low growth equilibrium, characterized by low productivity and low savings, to a high growth steady state (Agénor, 2010).

Infrastructure enhances quality of life by increasing productivity and by providing amenities that are intermediate input of production whose impact increase profitability of production. Their service also raises the productivity of other factors (labor and other capital). For instance, transition from manual to electrical machinery, reduces work time commitment time that enhances quality of life of workers (Kessides, 1993). Economic returns of infrastructure are generally high especially in the in low-income countries. The returns on projects averages 30–40 percent for telecommunications, over 40 percent for electricity and about 80 percent for roads infrastructure (Estache, 2008).

Pacek (2009) reported Aristotle's opinion that "the state was an aggregate of friends and companions, and therefore, had a critical role to play in advancing wellbeing". Hence, "the state is a creation of nature 'originating in the bare needs of life, and continuing for the sake of a good life". Pacek further said scholars contend that, magnitude of government expenditure affects pursuit of happiness. Government with expanded growth in structures and machinery might not be able to pursue the happiness of citizenry adequately. Curini Jou, and Memoli (2014) reported that government intervention in the provision of services to the citizenry in an economy enhances satisfaction by boosting a social safety net thus, makes citizens happier.

The manner of government functions in terms political participation and service delivery matters as possible determinant of subjective wellbeing or happiness. Helliwell and Huang (2006) used operation of democratic process and service delivery and found that there is positive strong relationship between the quality of government and happiness. Where there are freedom of speech and political stability and effectiveness, regulatory quality, rule of law and control of corruption there is bound to be increase happiness of the citizens. Happiness scholar Richard Layard in Pacek (2009) put forward that best society is the one where people are the happiest and the best way is policy action that produces the greatest happiness. His emphasis specified areas like education curriculum, social welfare programs mental health and tax policy.

In developing nations, rural infrastructure, specifically road, play a vital role in marketing of agricultural commodities (farm to market). This excluding stages of processing, account for 25 - 60 percent of final prices for foodstuffs. In Nigeria, for example, 30 - 40 percent of market prices of say food crops consist mainly of transport costs. Road transport infrastructure improvements effectively reduce distances between origin and destination points hence reduce delay, increases passengers and fright carriages, traffic congestion and in so doing lowers travel times (Kessides, 1993; Kumudu, William, & Lakshmanan, 2008; Sengupta, *et al.*, 2007).

Faiz, Faiz, Wang and Bennett, (2012) sees rural road as the panacea for meeting global fast growing population's massive supply food needs and marketing systems. A study of improved rural road in Nigeria revealed significant positive impact of a 12 percent agricultural output and 2.2 percent increase total household income (Inoni, 2009). These meant happiness to communities involved. Positive socio-economic well-being accrues to the rural population living around the National

Highway 2 in India. These include improved mobility, earnings and employment opportunities, poverty status, asset holding, access to other infrastructures such as education and health services and the overall well-being (Sengupta, *et al.*, 2007).

The above is in line with the findings of Zaid, and Popoola (2010) who reported that the quality of life of the people in rural Nigeria, specifically, Ekiti state is clearly low which is a manifestation of government's laxity at social amenities provisions. Resultantly, rural dwellers cannot afford a decent home, lack access to portable water at home for safe drinking, cannot afford children fees and even unable to afford medical expenses of the family.

In contrast openion, basic social amenities does not account for the variability found in happiness of group of people of different need backgrounds. Diener Saligman (2009) reported Forbes list of the 400 richest Americans who proved relatively high happiness just like the Maasai of East Africa. The Maasai are traditional herding rural dwellers who have neither electricity nor running water (social amenities) rather live in huts made from dung. In a similar work, extremely poor and homeless individuals in Calcutta, India, are also found with high levels of happiness (Diener & Biswas-Diener, 2002).These results thus, underscore luxury/social amenities as necessary for high happiness.

Mullen, (2007) however, discovered negative impact on the manufacturing and services sectors rural counties as result of road infrastructure. Chandra & Thompson (2000) focused lose in earnings in the adjacent counties as the newly installed roads draws business activities from the adjacent counties - lose in regional economy. Unlike the above cases, Iacono and Levinson (2012) studied three rural Highways (Minnesota Trunk Highway 731, US Highway 71 and US the aggregate evidence of

earnings and employment in the counties fails to be large enough to the level of statistical significance. Faiz et el,.(2012) however, conversely sees improved rural roads to make access to a locality easier hence accelerates depletion of natural capital like deforestation, loss of cultural heritage and diversity (due to blend or social cohesion) and decline in political capital say through corruption and misuse of public office funds. In other words, road could be a factor or source of unhappiness. Veenhoven (2000) reported a different view, that there is no relation between the size of the welfare state and the level of well-being or happiness.

Today's technological device (soft infrastructure) dominance perceived as happiness improving has been factor of eroding away more humanistic and ecological aspect of economics life that are traditional and of rural values like communal activities, settlement pattern and ecological solidarity that offers an aspect of common happiness. Today, modern economics is based on wealth and consumption brought by technological devices than the wealth loss (like a kind of happiness) because of the technological dominance. The issue with technological devices dominance simply reflect economic systems of nations and their origins compounded by the craze for fast development via modern public policy such as subsidies (say for industrial and farm subsidy), sugar coated words and attractive compensation to install some forms of devices in spite their extreme consequences to happiness (Dotson, 2012). In other words, modern technology device dominance plays double standard roles of improved happiness and instrumental to deterioration of values that originally offer a lot of happiness.

A case of general acceptability of soft infrastructure (say TV) into household system is one prominent social event that is believed to impact on happiness in twentieth century. TV produces higher material aspirations thereby lowers the levels of

happiness or well being of the society. It makes people prone to improved products and pictures that of wealthier societies that enhance aspiration hence reduce level of happiness (Bruni & Stanca, 2006). Frey (2008) looked at TV technology viz a viz happiness in a dimension of its consumption at microeconomic level. TV viewing makes people worse off in terms of happiness because of over consumption due largely to control problem that affect other social activities like education.

The study of ownership of technological devices of cross section of 29 European countries using self-reported life satisfaction, proved to be important to happiness or well being. Widespread use and ownership of technological devices such as land line fixed phone infrastructure, mobile phone, compact disk player computer, and internet connection infrastructure are significantly associated with higher levels of happiness. The coefficients of the aforementioned indicating life satisfaction increases by 5.8 percent, 0.7 percent (larger than land line), 4 percent and 3.3 percent but if connected to internet have coefficient increase of about 50 percent more respectively (Kavetsos & Koutroumpis, 2011).

2.14 Other Empirics of Happiness

Empirical researches on happiness over the years found that levels of happiness are determined by some few factors. These factors are demographic and circumstantial, social status and class, and the last dominant factor is genetic factor or personality trait. This personality traits as reported in Sheldon and Lyubomirsky (2007) appear to be hereditary or traceable to peoples' basic settings on core biological features including approach, activation, avoidance, and inhibition.

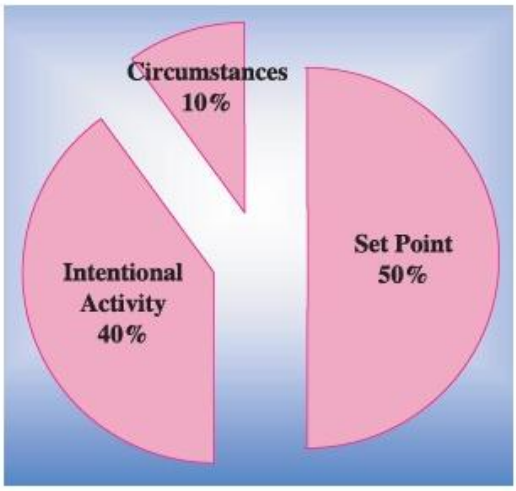

Figure 2.3
A graphical representation of the factors affecting happiness

Source: Sheldon and Lyubomirsky, 2007.

Sheldon and Lyubomirsky (2007) summarized that 10 percent of the variance in subjective well being or happiness can be explained by relatively static demographic and circumstantial factors (health, loss of a job, marriage, the birth of a child, death of a loved one and say retirement). Set point does about 50 percent by genetics (that is, unchanging personality or temperament) and the remaining 40 percent of the variance inevitably comes from what people do, say the activities with which people do in their days that leads to degrees of losses, successes and even enjoyment (Sheldon & Lyubomirsky, 2007). The graph above connotes the summary.

In the same vein, unemployment is like a waste of valuable human resources where real output falls short of potential output. Since income or earnings is instrumental to happiness lack of it brings unhappiness. Unemployment affects even the happiness of the employed for the fact that the employed feel bad about the situation of the unemployed which may likely befall them too, feel bad for likely tax increase and even the social consequences of crimes and tensions (Frey & Stutzer, 2002a). Mental distress is two times high among the unemployed comparing to the employed and in

the episodes of suicides among unemployed men in the lowest social class, one out of twenty try to kill self in a given year .

The effect of unemployment on happiness of individual is strongly negative and highly statistically significant ($p < 0:01$). The marginal effect of unemployment is found to be -0.284 meaning that the probability of an unemployed person reporting his highest level of happiness is (ceteris paribus) 28.4 percent lower than the employed person (Frey & Stutzer, 2000).

In life happiness is greatest at midlife, but not on the average, it rises somewhat, as people progress from ages 18 to 51 and declines thereafter. This result however, depends on the scale of measurement. On the three-option happiness scale (very happy, pretty happy and not too happy) there is upward shift over the first 33 years of adult life cycle (ages of 18 - 51) of 7 percent of the population from category, "pretty happy" to "very happy." Likewise in the older ages of 89 happiness drops at about the same rate as it previously rose with about 9 percent signifying that movement in subjective well being or happiness is actually occurring (Easterlin, 2006). Likewise as in Easterlin, Blanchflower and Oswald (2004) found that happiness and life satisfaction are U-shaped in age. Other things held constant in both Britain and the US, wellbeing or happiness reaches a minimum around the age of 40. Frey and Stutzer (2000) also found U shape happiness in demography with young happier than people around 30 years of age after which happiness rises with age.

However, corresponding studies that carefully control for health as intervening factors, found a different result. The result posits that the happiness of old persons strongly depends on their health status. A case of Britain with health control connotes that happiness is lowest around age 40 (men, age 43; women, age 40).

People tend to be happier when they are younger as well as well as older ages. This decline and rise in self-professed happiness may be as a result of adaptation and people giving up aspirations for enjoyment at later ages (Frey & Stutzer, 2002b).

Interestingly, in United States and Britain married people reported rising happiness or well being with coefficient of 0.005 and on the contrary, the unmarried people have a flat time-trend. This finding can be interpreted as happy people are more likely to stay married. To 'compensate' in terms of calculation, it was found that a lasting marriage is worth $100,000 per annum when compared with staying as widowed or separated (Blanchflower & Oswald, 2004).

Using German Socio-Economic Panel, with data on reported subjective well-being between 1984 – 2000, Stutzer and Frey (2006) found that married people are happier with their life. They found that by the age of 30 both singles who will marry and those that will not marry reported no difference in happiness and until age 34, married people on average, report higher happiness than those singles who will get married later. Frey and stutzer (2010) argued that two reasons make married people to live a happier life: Marriage provides additional sources of escape rout of stress from other parts of life endeavours and it tend to make people suffer less from loneliness.

In summary, although the literatures of the work is diversified to cover different aspects to reconcile with issues raised in the objectives and statement of the problem, literatures on happiness are found to have been mostly compiled or investigated using subjective survey approaches (Blanchflower & Oswald, 2004; Frey & Stutzer, 2002b). Frey and Stutzer even went further to say, self-reported happiness tends to be the best indicator of happiness. Since (Social Indicator) objective approach is also an

acceptable approach at ascertaining happiness (Argyle, 2001; Frey & Stutzer, 2002b; Ura, *et al.*, 2012), it fashioned a notch at using both subjective and objective approaches at ascertaining happiness in the study area especially that the subject matter is strange in Nigeria.

Generally, the study of happiness is very limited in Africa which include Nigeria (Graham, 2009). This means that very little study is carried out in the subject matter in some of the African countries. Related literature in happiness in Nigeria is rare throughout, especially in the area of infrastructure viz a viz happiness is not available at all. In other words, happiness study is virgin area in Nigeria, and this has made it a gap and interesting subject matter of study.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This aspect of the work focuses on the method employed by the researcher to ascertain the impact of Shiroro Hydro Electricity Dam on happiness of the host communities. The first part of the chapter discusses the theoretical framework. The second part discusses conceptual framework, which is followed by the methods employed at the study. Others are Research Design, Population and Sampling Technique, Research Hypothesis and Model Specification.

3.2 Theoretical Framework

The aspect of the study explains some theories in relation to the happiness study. It begins with theoretical link of utility theory with happiness. Happiness is a two polar concept: subjective happiness and objective happiness, which are captured by global self report and external rules respectively (Frey & Stutzer, 2002b). It is the case of utilitarianism; its goal is to find an objective index of 'the good,' meaning that which makes an action objectively better or worse. This involves at least two criteria of decision utility and experience utility. Decision utility is revealed via choice and experienced utility is measured through psychophysical methods (Read, 2004). Secondly, it further explains the conceptual rubric of theories that link to micro econometric happiness function that forms the bases for the measurements happiness.

3.2.1 Utility Theory

Jeremy Bentham (1748–1832) who is widely considered the father of Utilitarianism is a British jurist and a critic of his time who advocated for legal reforms. He belonged to the camp of rationalist and humanist traditions who disagreed with the notions of natural rights, believing rather that the purpose for those in authority is to

make political change stem from human needs in relation to pain and pleasure. He believed utmost in liberalism, individualism, rational action and utility (Burnett, 2011).

To him, utility is defined as principle, which approves or disapproves of every action whatsoever according to the tendency it appears to have to augment. “I say of every action whatsoever, and therefore not only of every action of a private individual, but of (community) every measure of government”. Utility is that property in any object, which tends to produce benefit, advantage, pleasure, good, or happiness. In other words, utility prevents the happening of mischief, pain, evil, or unhappiness to the party whose interest is considered be it individual or community (Bentham, 1781).

Happiness research is “old wine in new bottle”. It is a novel way of “testing the basic assumption of the economic approach and of approaching a new understanding of utility in economics” (Frey & Stutzer, 2005b). Bentham’s utilitarianism was an era for advocating of ‘concrete liberties (that) must be embodied in legislation to be meaningful’ and such change in the political economy could then be described as the nineteenth century’s epitome of new world progressivist, realistic and practical approach to modern happiness (Burnett, 2011).

Jeremy Bentham’s moral philosophy is centered on two assumptions. The goodness or badness of experience should be computable, and the quantities so obtained can be added across people. In other words, there is measurability in utility. The second assumption is that, individual degrees of value can de add up resulting to a measure of social good (Read, 2004).

3.3 Conceptual Frame work

3.3.1 Econometric happiness function

It is on the bases of *utility theory* that Neo-classical economists conclude from reasoning that individual's utility derive from a consumption of goods and services from the decisions made reveals his happiness. Revealed preference in market behaviour is a best measure of happiness or well-being. It is based on this premise that individual's utility or well-being is seen as the level at which the individual's preferences are satisfied. They are assumed to be rational, well informed and seeks utility maximisation, therefore, choice is defined as expected utility (Dolan, *et al.*, 2008).

In other words, Economists deal more with observed behaviour rather than subjective state of mind. Individual utility depend on tangible factors i.e. goods and services, which must have been deduced from revealed preferences and in turn would be, use to explain the choices made. The '**modern' positivists** therefore, believed the axiomatic revealed preference method not only used to derive individual utility, but as measure of social welfare (happiness). Household's derivation of social welfare comparison is based on consumption behaviour, which is realized using parametric translog indirect utility function. 'Modern' views, sees subjective experiences captured by survey on happiness as `unscientific', for the fact that, it's not objectively observable - believed that choice portrays picture of human aspect that can be visibly observed (Frey & Stutzer, 2000).

In recent time, great progress of contrast opinion from "**contemporary economists"** or scholars has been attained in the field of economics that portrays that happiness can be measured with the aid of its many determinants. The contrary opinion from the above notion much cherished or emphasised that revealed preferences only

accurately reflect individual utility. In happiness studies, instead of deducing utility from data on prices and income, people could be directly asked about their happiness or subjective well-being. Survey on happiness over time has shown proves of reliability beyond reasonable doubt.

The statistics on happiness are collected, for example, in the Euro-Barometer Survey, with questions like: "*On the whole, are you satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead?* This yields a four-scale index of happiness. The US General Social Survey asks the question: *`Taken all together, how you would say things are these days could you say that you are very happy, pretty happy, or not too happy?'* This yields a three-scale index of happiness"(Frey & Stutzer, 2000), and the results of the researches has been reliable especially in the issues of economic interest (Frey, 2008). Mahadea and Rawat (2008) reported that "measures of subjective well-being have high consistency, reliability and validity as well as a high stability over time".

The contemporaries therefore, challenged the revealed preference as welfare theory from different aspects and conclude that based on the importance of the following facts, the use of subjective measures of happiness is better.

i. Numerous issues of economic interest cannot be adequately captured by objectivist measurement. These include; say expression of emotions such as regret, self-esteem, goal of completion, misery or status etc.
ii. Revealed preference theory assumes independent utilities, although interdependent utilities fit better some observed behaviours. In other words, the assumption of interdependent utilities questions traditional welfare ideas.

iii. Revealed reference or utility emphasis the value of outcomes rather than observed decisions, which distinguished utility into categories. They are of the opinion that normally, outcomes are extended over time and valued at different points in time. One of types of utilities is instant utility that measures 'hedonic and experience' which is derivable from report of current subject. This conflict the meaning of utility' pleasure associated with past outcomes'.

iv. Psychologists are of opinion that choices are not *always* rational and individual and social welfare indicators are unable to integrate the broader parts of experience and procedural utility. Thus, sole reliance on objectivist economic theory is doubtful both theoretically and empirically (Frey, 2008; Frey & Stutzer, 2000).

Based on the aforementioned facts, happiness can be modelled by a **micro econometric happiness function** as $W_{it} = \alpha + \beta X_{it} + \varepsilon_{it}$ (Frey, 2008; Frey & Stutzer, 2008). They further said that the function can be estimated with ordered logit or probit estimation techniques.

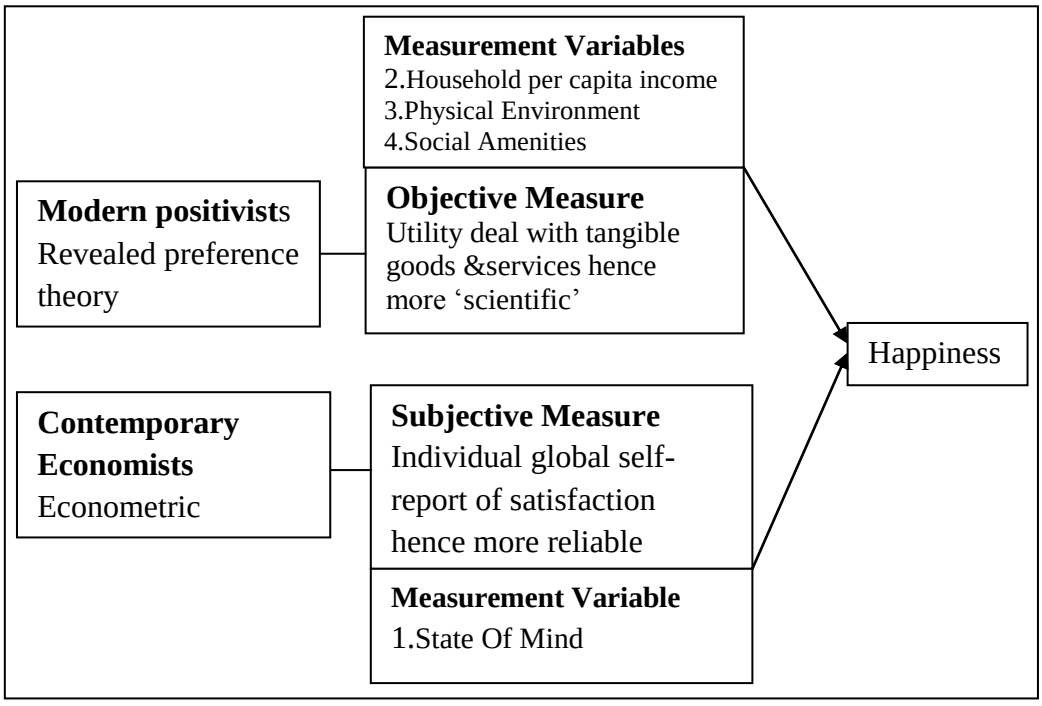

Figure 3.1
Conceptual Framework

3.4 Model Specification and Hypothesis of the study

The analyses of the variables are based on probit binary responses with values of zero and one as indications of occurrence/no occurrence of happiness in the study area. The first two variables estimate the Average Treatment Effect of Shiroro Hydro Electricity Dam on the community using (probit) Propensity Score Matching technique. Scholars in various fields of research employ this method in data analysis. They are (Ahmed, *et al.*, 2014; Becerril & Abdulai, 2010; Cluver et al., 2013; Serrano-Domingo & Requena-Silvente, 2013; Shehu & Sidique, 2014; Stuart, Lee, & Leacy, 2013) among others.

The last two variables however, employed probit binary choice models to ascertain the probability of the impact of the dam on the happiness of the affected community. This was made possible through interaction model as employed by scholars in various fields of research data analysis. Few among them include (Ai & Norton, 2003; Greene, 2010; Melgar, 2012; Norton, Wang, & Ai, 2004)

Probit model is preferred as the model of the study because Frey and Stutzer, (2008) suggested that, it is appropriate model for measurement of happiness studies. To meet the assumption of the model being dichotomous, the questionnaire was structured to two point-likert scale with options of zero and one (0 and1). Propensity score matching technique is also an aspect of probit model. This aspect was also employed because it is appropriate for the adopted World Value Survey question for SOM that is four likert scaled. This necessitated all others questions of the variable to four likert-scaled. In fulfilment of the model's dichotomous assumption treatment group (1) and control group (0) served the roles of one and zero.

3.4.1 Propensity Score Matching Model

The standard problem of treatment evaluation involves the '*inference of a causal*' connection between the treatment and the intended outcome (Chirwa, 2010). Therefore, for a given intervention, we observe the following:

$$(y_i, x_i, D_i)\ i = 1....N \quad (1)$$

Where y_i = outcome or Dependent variable

x_i = independent variables and

D_i = treatment group = 1 and control group = 0 (counterfactual)

To measure the effect of a treatment or intervention requires constructing a measure that compares the average outcomes of the treated and non-treated groups. Therefore, given a population or sample of household the **propensity score** or the conditional probability of receiving a treatment given **x***i* is:

$$P(x) = pr\{D=1/x = E[D/x] \quad (2)$$

Having known the propensity score, the measure of Average Treatment Effect on the Treated (ATT) therefore, is:

$$\begin{aligned} ATT &= E\{y_{1i} - y_{0i}/D = 1\} \\ &= E\{E\{y_{1i} - y_{0i}/D_i = 1, p(x)\}\} \\ &= E\{E\{y_{1i}/D_i = 1, p(x) - E\{y_{0i}/D_i = 0, p(x)\}/D_i = 1\} \quad (3) \end{aligned}$$

Thus, (3) is used for the first variables as below:

3.4.1.1 State Of Mind (SOM)

Conceptually, happiness is sometimes defined as state of mind (Haybron, 2008b; Tenaglia, 2007). Tenaglia expatiated that SOM is an interior process, which implies that happiness stems from feelings that originate and persist endogenously within the minds of human beings resulting from union with God, a serene indifference towards the material world, or a state of harmony with the universe. The name SOM

therefore, is deliberately employed as variable name for happiness in this study to measure the subjective happiness of Shiroro hydro Electricity Dam community.

SOM measures the degree to which individual household judge the quality of life base on the pleasure or feelings, emotions as well as moods as a result of Shiroro Hydro electricity dam installed in the community. In other words, SOM measures the community's heartily burdens or feeling to ascertain the dominating sensation - positive or negative emotion due largely to the installed dam in the community.

The observable or independent variables are the household characteristic, which are used to measure the predicted propensity scores. Questionnaires of four-pointer likert scaled with questions on some of the household characteristics are specifically used for SOM variable. Questions on SOM are capped with World Value Survey question of *Taken all together, how happy would you say you are: very happy, quite happy, not very happy, not at all happy?*

The independent variables in relation with rural community that take care of most of the entire rural activities, essential value that a rural community has is her socio economic activity and their attached psychological feelings are express in literatures. These include: low public service provision, corruption and mismanagement of scarce resources and low income among others could form subjects of grievance that could lead to conflict violence (Collier & Hoeffler, 2004). Feelings of inequality, authoritarianism and economic decline all of which associates negatively with economic development (Boswell & Dixon, 1993). Unhappy people are associated with conflict violence (Pearlstein, 2012). Personality traits where people are denied desire of control or experience restriction or feeling of lack of self esteem there is bound to be problem of happiness (Zauszniewski & Nakhla, 2008). People with

higher self-esteem suffer less depression and engagement in religious activities positively relates to happiness (Dolan, *et al.,* 2008). Thus, Household Dignity (HHDIG), Household human Right (HRHT) economic decline or take over land (TOFLAND), provided new land (NWLAND), flood compensation (FLDCOMP), compensation (COMP), lost of culture due to dam/river (DRCUL) lost of culture due to religion/modernization (RMCUL), Conflict (CFT) and violence (VIO) are measuring tools for State of Mind – psychological or subjective measurement of happiness. Others are demographic variables – gender, age, educational attainment, marital status, occupation and religion.

To include these outcome variables, model (3) could be extended as:

ATT = E{E{SOM_1/1, *p*(HHDIG, HRHT, TOFLAND, NMLAND, FLDCOMP, COMP, DRCUL, RMCUL, CFL,VIO)} – E{SOM_0/0, *p*(HHDIG, HRHT, TOFLAND, NMLAND, FLDCOMP, COMP, DRCUL, RMCUL, CFL,VIO)}/1} (4)
Where 1 = Treatment, 0 = Control Group, p = probability and E = Expected.

On the statement of hypothesis, authentic happiness theory portrays one's happiness to be informed by the conditions of one's life and autonomously. This reflects the values that are truly one's own. Happiness in this perspective is like subjective well-being that involves both global attitudes of life satisfaction. The rationale of the theory is that "one's happiness should reflect a response of one's own, to a life that is one's own" (Haybron, 2008a). However, there are inconsistencies in the literatures about determinants of happiness. For instance, according to Biswas-Diener (2008), living a materially abundant life increases happiness. Drakopoulos and Karayiannis (2007) cited that no nation flourishes and live happily if greater number of the people is poor. Economic freedom determines the happiness of the people in poor countries (Saligman, 2009); and Guanrdiola *at el,* (2013) opined that material does not determine happiness of people for those that lack and get adapted to hash conditions

of life reported high level of happiness. Thus, the statement of Null hypothesis (H_o) and Alternative hypothesis (H_1):

1. H_o: The installed Shiroro Hydro Electricity Dam does not significantly affect the communities' State of Mind.

   H_1: The installed Shiroro Hydro Electricity Dam does significantly affect the communities' State Of Mind.

3.4.1.2 Household per Capita Income (HHY)

HHY is the measurement of amount of money or earnings per person in a family. HHY is the average per person income for a family in region of or country – in this case a rural community. This can be use as an evaluating parameter of the living conditions and quality of life of a people. Household income per capita is a better measure of household income since its measurement includes household size (Datta & Meerman, 1980).

In order to subdue measurement sticky situation, Household per capita expenditure however, tend to be the emphasis of the study, which serve as a proxy for Household per Capita Income as a variable. This information gathering strategy is sourced via household annual consumption expenditure by the family size. This step was a deliberate strategy employed to subdue the difficulties faced at sourcing respondent's income status information of the household in the community.

The dependent variable is the HHY against the observable or independent variables, which are the household income characteristic. These are used to measure the predicted propensity scores.

To obtain the independent variables, literatures supposed that factors such as access to credit, extension services, access and size of land and technology influence (positive bias) output and income of Agrarian community are important (Gajigo & Lukoma, 2011). Iganiga and Unemhilin (2011) are of the view that determinants of agricultural output includes total commercial credits to agriculture, value of output, human capital and annual average rainfall. Agricultural productivity depend on factors such as climate change and land degradation, low soil fertility, land ownership, illiteracy, improve seedling and fertilizers, traditional farming methods, technology, entrepreneurship in agricultural zone, weak agrarian structure, and droughts (Masood, Ellahi, & Batool, 2012). Absolute increase in income and economic growth enhances happiness (Di Tella & MacCulloch, 2008; Tian & Yang, 2005).

Since the factors as viewed by scholars overlap in one way or the other because of say different environments of operations, the study therefore, considers the more related Household income per capita characteristics to the study area as independent variables for the study. Thus, land as an asset (HHFMLAND), extension services (HHFMEDU), access to credit (HCTFAC), farm technology (HFMTEC), increase output (HHPRODUC), condition of living house (HHOUSIN) and household life stock asset (HHLIFSTOC) stands to be the measuring tools for Household per Capita income variable.

Thus, if included as outcome variables into the model (3) it would be extended as:

$$ATT = E\{E\{SOM_1/1, p(HHFMLAND, HHMEDU, HCTFAC, HFMTEC, HHPRODUC, HHOUSIN, HLIFSTOC)\} - E\{SOM_0/0, p(HHFMLAND, HHMEDU, HCTFAC, HFMTEC, HHPRODUC, HHOUSIN, HLIFSTOC)\}/1\}. \quad (5)$$

Where 1 = Treatment, 0 = Control Group, p = probability and E = Estimate.

On statement of hypothesis, absolute income theory postulates that, people always know what is best for them and make decisions accordingly. Therefore, people's satisfaction depends on what they have in absolute terms; that is, higher income provides higher satisfaction. Relative income theory, on the other hand postulates that individual well-being is determined by the gap between aspiration and achievement (Frey & Stutzer, 2005a). Other inconsistencies in previous literatures have a role to play in the formulation of the hypotheses - Null hypothesis (H_o) and Alternative hypothesis (H_1). For instance, Wealth is related to many positive outcomes in life (Diener & Biswas-Diener, 2002). Easterlin paradox demonstrates the laggardness in the trend of happiness even though, improved income growth over time (Easterlin, 2005; Pasinetti, 2005b). Tian and Yang (2005) are of the opinion that increase income brings happiness to developing nations. Thus, the hypothesis is;

2. H_o: The installed Shiroro Hydro Electricity Dam does not significantly improved host community's Household per Income.

   H_1: The installed Shiroro Hydro Electricity Dam improved host community's Household per capita Income.

3.4.2 Binary Probit Model Equation

The estimation of the last equation (equation 6) is based on probit model where y is a binary response, taking on the values zero and one, as an indication whether certain event has occurred. Whatever, is the definition of y, traditionally, y = 1 is referred to as success and y = 0 as a failure (Wooldridge, 2010).

Specifically, probit model is run where independent variables are dichotomous but estimated coefficients cannot be interpreted directly. For one to be able to interpret one would have to work out the marginal effect. However, in this case, to achieve the

objective of ascertaining the impact of dam on socio economic variables, there is the need to interact the independent variables with Dam as a variable. But it's worthy to note that, it's wrong to use marginal effect to interpret interaction effects, rather computed with Stata command *inteff* (Ai & Norton, 2003; Norton, *et al.*, 2004).

There are four important implications of interaction for nonlinear models - the interaction effect could be nonzero, even if the two interact variables = 0. The statistical significance of the interaction effect cannot be tested with a simple *t* test on the coefficient of the interacted. Others are the interaction effect is conditional on the independent variables and the interaction effect may have different signs for different values of covariates i.e. β_{12} (Ai & Norton, 2003; Norton, *et al.*, 2004). In other words, the sign of the interacted variables does not necessarily indicate the sign of the interaction effect.

In a probit model where dependent variable y is a dummy variable, the conditional mean of the dependent variable is as thus:

$$E\{y/ x_1,x_2,\mathrm{X}\} = \Phi(\beta_1 x_1 + \beta_2 \mathrm{x}_2 + \beta_3 x_1 x_2 + \mathrm{X}\,\beta) = \Phi(u) \qquad (6)$$

Where Φ is the standard normal cumulative distribution, u denotes the index $\beta_1 x_1 + \beta_2 x_2 + \beta_{12} x_1 x_2 + \mathrm{X}\,\beta$ and $\mathrm{X}\,\beta$ denote other variables and the error term.

3.4.2.1 Physical Environment (PEV)

The physical environment includes land, water, plants, animals, and all of the natural resources that provide opportunities for social basic needs for communities. It is the natural environmental scenario or setting is where people dwell within the structure of their socio economic values without sudden intervention or change. Healthy physical environment is important for subjective and objective happiness of people. Although, change in environment is inevitable with man's habitation, clean and

beautiful natural environment with no negative treat is important for people's sense of happiness or wellbeing.

Measurement of happiness in terms of physical environment was via questionnaire that provided for a two optioned likert scale of 1 and 0 (yes for 1 or positive response and no for 0 or negative response). The dependent variable in the model used at measuring physical environment is *Happiness*. This is a product of collided 4-point likert scale of the World Value Survey in the questionnaire. The first 2 – Very happy and Quite happy as 1; and Not very happy and Not at all happy as 0. This made the dependent variable to assume binary functions with options of 1 where positive response (yes) and 0 where otherwise (no).

The independent variables are the household characteristics in relation to the physical environment of the communities. These individual household environmental characteristics are run against the dependent variable to obtain the happiness status of the community in terms of physical environment.

To obtain the independent variables, literatures supposed that world population and the keen perpetual interest at discoveries of better conditions of living result to anthropocene. This leads to deterioration of life support systems that threatens global happiness (Helliwell, *et al.*, 2013). Dams are associated with diseases that include yellow fever, schistosomiasis, river blindness, malaria and liver fluke infections (Mudzengi, *et al.*, 2012). Women feel stress free and nourish in natural environment, which ignites their happiness. They fortunately feel bored, frustrated, and unhappy with ongoing damages to nature as result of technological advanced mass production and consumption (Costley, *et al.*, 2011). Dam victims usually have weak voices, experiences loss of ecological species etc (Sophie, 2007). Thus,

installed Dam and no Dam (GRP_DAM), flood externality (ENVFD), change in the environment (ENVCHNG), change or alternating job for risk in Agriculture (ENVAGRSK), influence of urbanisation (ENVURBN), decline wild life (ENVBMIT) and infections (ENVILNES) are measuring tools for physical environment. Thus, to include these outcome variables, model (6) could be extended as:

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{ENVFD}, \text{ENVCHG}, \text{ENVAGRSK}, \text{ENVURBN}, \text{ENVBMIT}, \text{ENVILNES}) = \alpha + \beta_1\text{GRP\_DAM} + \beta_2\text{ENVFD} + \beta_{12}\text{GRP\_DAM}.\text{ENVFD} + \beta_3\text{ENVCHG} + \beta_4\text{ENVAGRSK} + \beta_5\text{ENVURBN} + \beta_6\text{ENVBMIT} + \beta_7\text{ENVILNES} + X\beta$$

Where X β stands for other demographic variables.

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{ENVFD}, \text{ENVCHG}, \text{ENVAGRSK}, \text{ENVURBN}, \text{ENVBMIT}, \text{ENVILNES}) = \alpha + \beta_1\ \text{GRP\_DAM} + \beta_2\text{ENVCHNG} + \beta_{12}\text{GRP\_DAM}.\text{ENNCHNG} + \beta_3\text{ENVFD} + \beta_4\text{ENVAGRSK} + \beta_5\text{ENVURBN} + \beta_6\text{ENVBMIT} + \beta_7\text{ENVILNES} + X\beta$$

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{ENVFD}, \text{ENVCHG}, \text{ENVAGRSK}, \text{ENVURBN}, \text{ENVBMIT}, \text{ENVILNES}) = \alpha + \beta_1\ \text{GRP\_DAM} + \beta_2\text{ENVAGRSK} + \beta_{12}\text{GRP\_DAM}.\text{ENVAGRSK} + \beta_3\text{ENVCHG} + \beta_4\text{ENVFD} + \beta_5\text{ENVURBN} + \beta_6\text{ENVBMIT} + \beta_7\text{ENVILNES} + X\beta$$

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{ENVFD}, \text{ENVCHG}, \text{ENVAGRSK}, \text{ENVURBN}, \text{ENVBMIT}, \text{ENVILNES}) = \alpha + \beta_1\ \text{GRP\_DAM} + \beta_2\text{ENVURBN} + \beta_{12}\text{GRP\_DAM}.\text{ENVURBN} + \beta_3\text{ENVCHG} + \beta_4\text{ENVAGRSK} + \beta_5\text{ENVFD} + \beta_6\text{ENVBMIT} + \beta_7\text{ENVILNES} + X\beta$$

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{ENVFD}, \text{ENVCHG}, \text{ENVAGRSK}, \text{ENVURBN}, \text{ENVBMIT}, \text{ENVILNES}) = \alpha + \beta_1\ \text{GRP\_DAM} + \beta_2\text{ENVBMIT} + \beta_{12}\text{GRP\_DAM}.\text{ENVBMIT} + \beta_3\text{ENVCHG} + \beta_4\text{ENVAGRSK} + \beta_5\text{ENVURBN} + \beta_6\text{ENVFD} + \beta_7\text{ENVILNES} + X\beta$$

E(Happiness/GRP_DAM, ENVFD, ENVCHG, ENVAGRSK, ENVURBN, ENVBMIT, ENVILNES) = $\alpha + \beta_1$ GRP_DAM + β_2ENVINES + β_{12}GRP_DAM. ENVILNES + β_3ENVCHG + β_4ENVAGRSK + β_5ENVURBN + β_6ENVBMIT + β_7 ENVFD + $X\beta$

The concept of sustainable happiness is all about pursuit of happiness that contributes to individual, community and/or global well-being without exploiting other people, inflicting the environment or future generations (Mohit, 2013; O'Brien, 2008; O'Brien, 2010). However, literature has been inconsistent on steps toward growth, happiness of people viz a viz the environment. For instance Halliwell *at el*,(2013) is of opinion that growth and development could bring happiness but in a short run with long run unhappiness resulting from distortions to natural environment. Happiness is greater in a a natural environment (MacKerron & Maourato, 2013); while Coustly *at el*, (2011) found that women live bored, frustrated and unhappy in a technologically advanced with distorted natural environment. Thus, the statements of hypothesis are:

3. H_o: The installed Shiroro Hydro Electricity Dam does not significantly improved host community's happiness as measured by physical Environment.

   H_1: The installed Shiroro Hydro Electricity Dam does improve the host community's happiness as measured by physical Environment.

3.4.2.2 Social Amenities (rural infrastructure)

Social amenities are the governments or corporations' infrastructural provisions for common use say for rural dwellers. The provisions could also be call civic amenities. Some common examples of social amenities are water supply, electricity, roads, health care centers, rural schools and the likes. These are the commonest needed amenities by rural and even urban dwellers.

Questionnaire was instrumental at measuring happiness in terms of Social Amenities that provided for a two optioned likert scale of 1 and 0 (yes for 1 and no for 0 or nagetive response). The dependent variable in the model used at measuring Social Amenities is *Happiness*. This was a product of collided 4-point likert scale of World Value Survey. The first two – very happy and Quite happy as 1; and the last two - Not very happy and Not at all happy as 0. It is a binary variable with options of 1 where positive response (yes) and 0 where otherwise (no). The independent variables on the other hand are the household characteristics in relation to the Social Amenities of the communities.

To obtain the independent variables as in some literatures, absence or very low levels of social infrastructural provisions in a locality or community where a resources is being explore for national growth and revenue generation create feelings of corporate exclusion, thus people feel aggrieved (Oyefusi, 2008). Rural access is a key factor to poverty alleviation and it's often closely associated with rural livelihood outcomes like increased incomes from agricultural surplus, tradable etc, increased social well-being such as non material goods access to health and nutrition, education, etc, and improved food security by access to markets (Faiz, *et al.*, 2012). Thus, schools provisions (SCHOL) provided access road as (ROAD), power supply (ELECTR) pipe borne water supply (WATERSS) and health care services (HTHCARE) are used as measuring tools for this variable. Others are the demographics – gender, age, educational attainment, marital status, occupation and religion. Thus, if they were included as outcome variables into the model (6) it would be extended as:

$$E(\text{Happiness}/\text{GRP\_DAM}, \text{SCHOL}, \text{ROAD}, \text{ELECTR}, \text{WATERSS}, \text{HTHCARE}) = \alpha + \beta_1\text{GRP\_DAM} + \beta_2\text{SCHOL} + \beta_{12}\text{GRP\_DAM. SCHOL} + \beta_3\text{ROAD} + \beta_4\text{ELECTR} + \beta_5\text{WATERSS} + \beta_6\text{HTHCARE} + X\beta$$

Where Xβ stands for demographic variables

$$E(Happiness/GRP\_DAM, SCHOL, ROAD, ELECTR, WATERSS, HTHCARE) = \alpha + \beta_1 GRP\_DAM + \beta_2 ROAD + \beta_{12} GRP\_DAM.\ ROAD + \beta_3 SCHOL + \beta_4 ELECTR + \beta_5 WATERSS + \beta_6 HTHCARE + X\beta$$

$$E(Happiness/GRP\_DAM, SCHOL, ROAD, ELECTR, WATERSS, HTHCARE) = \alpha + \beta_1 GRP\_DAM + \beta_2 ELECTR + \beta_{12} GRP\_DAM.\ ELECTR + \beta_3 ROAD + \beta_4 SCHOL + \beta_5 WATERSS + \beta_6 HTHCARE + X\beta$$

$$E(Happiness/GRP\_DAM, SCHOL, ROAD, ELECTR, WATERSS, HTHCARE) = \alpha + \beta_1 GRP\_DAM + \beta_2 WATERSS + \beta_{12} GRP\_DAM.\ WATERSS + \beta_3 ROAD + \beta_4 ELECTR + \beta_5 SCHOL + \beta_6 HTHCARE + X\beta$$

$$E(Happiness/GRP\_DAM, SCHOL, ROAD, ELECTR, WATERSS, HTHCARE) = \alpha + \beta_1 GRP\_DAM + \beta_2 HTHCARE + \beta_{12} GRP\_DAM.\ HTHCARE + \beta_3 ROAD + \beta_4 ELECTR + \beta_5 WATERSS + \beta_6 SCHOL + X\beta$$

On statement of hypothesis, theory of infrastructure posits that long run development rest on public infrastructure as catalyst of growth. Prudence of government in provision of infrastructure ensures a sufficient degree of efficiency in both direct and indirect growth impact – productivity at low cost and services delivery for better living standard. Literatures in the area of rural infrastructure are however, not consistent. Start (2001) said road infrastructure opens and make prone rural markets to urban competition hence erode away the nonfarm previous advantages. Kumudu, *at el*., (2008) found that road has positive externality of cheaper and better services hence provides advantages of economies of scale – agglomeration benefits hence improvement in income. However, Faiz *at el*,.(2012) improved rural roads accelerate depletion of natural capital like deforestation of the localities. Infrastructure caused community's grievances, which ignited proliferation of groups of militant militia in Niger Delta region, hence violent attack on people and the oil infrastructures (Paki & Ebienfa, 2011). Khan, Islam, and Hayat (2011) found that rural area waxes in better

conditions resulting from constructed mini dams while Usman and Ifabiyi (2012) found that, dam infrastructure contributions are more of negative effect to host community. These diverse opinions or findings in the literatures form the bases of the hypothesis as thus;

4. H_o: Shiroro Hydro Electricity Dam does not impact positively on happiness of host community as measured by Social Amenities.

   H_1: Shiroro Hydro Electricity Dam does impact positively on happiness of host community as measured by Social Amenities.

3.5 Study Area

Shiroro rural community is located in Niger State in the middle-belt region of Nigeria. Niger State is one of the 36 states of Nigeria, created out of the defunct North Western state in 1976 (Figure 1.1). The state is situated in the North central geo-political zone, shares borders with republic of Benin (West), Kogi (South), Kwara (South West), Zamfara State (North), Kebbi (North-West), Kaduna (North-East) and the FCT (South-East). Niger State is sub divided into 25 Local Government Areas and grouped into 3 administrative zones: Zones A, B and C with each zone having 8, 9 and 8 Local Government Areas (LGAs) respectively (NSG, 2011).

Niger State is one of the largest states in Nigeria (Figure 3.2). The state has land mass covering about 86,000km2 i.e. about 8.6million hectares that represents about 9.3% of the total land area of the Country. The State's major rivers are Niger, Kaduna, Gurara, Ebba, Ega, Gbako, Eko, Mariga and their tributaries. The commonest fishes found in these rivers are: Nile Perch (Lates) Trunck fish,

Osteoglosid, Tilapia, Synodontis, Cat fish, Tiger fish, Moon fish, Mormyrid and Electric fish (NSG, 2011).

By the 2006 census, the State's population is 3,950,249 comprising 2,032,725 males (51.5 percent) and 1,917,524 females (48.5 percent). The easily identifiable major ethnic groups are Nupes, Hausa, Gbagyi as the three dominant tribes. Other minorities are: Kadara, Kambari, Dukkawa, Fulani, Abewa, Koro, Bassa, Kamuku, Ingwai, Fangu, Bisan, Achifawa, Dakarkari, Kakanda, Gungawa, Bauchi, Bariba, Urah, Boko, Bokobaro, Bauchnu, Ganagana, Dibo and numerous non native tribes. The major economic activity is agriculture: farming, fishing, and cattle rearing. Other economic activities, though in small scale includes banking, trading, transportation, local arts and crafts with Bida's famous brass work. Niger State is a peaceful state reputable for its hospitality and good neighbourliness (NSG, 2011)

Shiroro Hydro Power Station is situated in farmer village that gave its name to the gorge where the project is located (Figure 3.3). It is sited on the confluence of River Kaduna with its tributary, Dinya River 60 kilometers away from Minna, the State capital of Niger State. The contract to Shiroro Hydro Electricity Dam was awarded in 1978, it however suffered a delay till 1988 when the presidency intervened and appointed a Presidential Coordinator to resume site. The installation of Shiroro Hydro Power Station was completed by 1990 and commissioned by President Ibrahim Badamsi Babangida by 20th June, 1990. Shiroro dam is located on latitude 9o 58` 25`` North and Longitude 6o 50` 6``east. It is presently owned by Power Holding Company of Nigeria (PHCN), and situated 550 meters downstream of the confluence of Kaduna River (Usman & Ifabiyi, 2012).

The dam is of the rock-fill type and stands 115 meters high above the original riverbed elevation, across Shiroro Gorge for a crest length of 700 meters (Figure 1.2). The width of the dam at its wall is over 300 meters while its top that accommodates the road is 7.50 meters wide. The top of the dam has a heavy reinforced concrete parapet wall of about 5 meters high, designed to protect the top of the dam from the waves. The body of the dam has no central unreceptive core; the solidness of the structure is ensured by a continuous reinforced concrete slab, placed with a extraordinary method on its upstream face. The reservoir covers a total surface area of 320 sq. kilometers with a gross storage capacity of 7 billioncu.Metres (Usman & Ifabiyi, 2012).

The station has a total installed capacity of 600 MW from 4 generating units rated at 150 MW each at a head of 97 meters. Each unit comprises a vertical Francis hydraulic turbine unit controlled by an electro hydraulic governor. The turbine drives a synchronous generator of salient pole construction having a net output of 150 MW. The generator is excited by a static self-excitation system. The speed of rotation for the unit is 150 r/min. These turbine generators are capable of independent operation. Power is generated at 16-kv voltage level. A generator-transformer steps up the voltage to 330-kv voltage level for connection to the national grid through the agency of a 330-kv switchyard. Hydrological Analysis of Shiroro operational data from 1990 to 2007 connoted a very high relationship between the energy produced, inflows and the turbine discharge. However, when the relationship between the energy generated and inflows was examined, a fairly poor correlation was observed which showed inconsistency operation of the reservoir over the years suggesting that the water in the reservoir has been grossly underutilized (Usman & Ifabiyi, 2012).

Shiroro community is spread across six districts in two local government of the state; the districts are Chiri, Galadiman Kogo, Sarkin pawa and Zumba. Right back in the early 1980s, the people of Shiroro village were moved away from their settlements to make way for the installation of Shiroro Hydro Electricity Dam by the National Electric Power Authority (NEPA). The communities were made to believe that construction or installation of the Dam will bring Development to the community (Ziri, 1996).

Figure 3.2
Map of Nigeria, Niger State highlighted
Source: http://www.ibbu.edu.ng/node/85

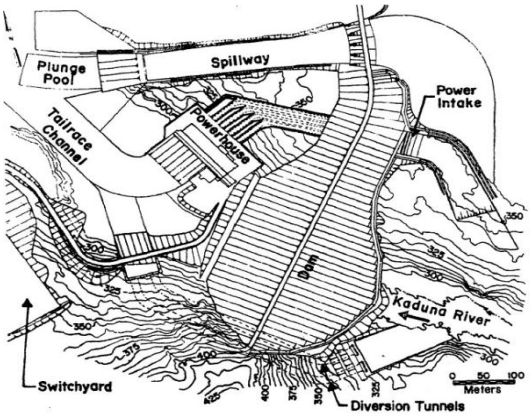

Figure3.3
Shiroro Hydro Dam Project Plan
Source: Ekpo and Adigunwa, 2011

The history of electricity power generation in Nigeria date back to 1896 with construction of 30 kilowatts (KW) generating plant in Ijora, followed by a privately owned generating plant called Nigerian Electric Supply Company (NESCO) built in Kurra – Jos in 1925. The Federal government on sitting the need for proper coordination of electricity generation and distribution in Nigeria established Electricity Corporation of Nigeria (ECN) in 1951 with the responsibility overseeing and developing the electricity sub-sector of the economy. After independence, in 1962, Niger Dam Authority (NDA) was established to develop hydro-electric power generation in Nigeria. This gave birth to Kanji Dam in 1968; Jebba Dam followed decades later in 1986 and later Shiroro Hydro Electricity Dam in 1990. The

challenges in the sub-sector however, led to the merger of ECN and NDA to form the unified regulating authority - National Electric Power Authority of Nigeria (NEPA) in 1972.

There are two forms of electricity generation in Nigeria, thermal and hydro; electricity is generated in eight stations around the country. Three of these stations are hydro generated while five are thermal. The hydro power stations are the Kanji, Jebba and Shiroro which accounts for 34% of power generations while the thermal plants (Ijora, Afam, Delta, Sapele I and II) generates the remaining 64 percent

3.6 Research Design

Inadequate or lack of available statistical data in developing nations is a common problem. The study area is not in exception of this same predicament. As a result of this predicament of standby rural statistics on the mentioned variables, generation of data for analysis for this study is sorted through questionnaires and interaction with rural communities.

The questionnaires is prepared in such a way that each construct contained chains of questions or items to ascertain the impact of Shiroro Hydro Electricity Dam on the happiness of the communities. In other words, each questionnaire contained questions that have to do with after the construction of dam to be able to ascertain the aftermath impact of Shiroro Hydro Electricity Dam on the happiness of the communities. The measurement of each item in the dummies had options of 'Yes' and 'No' to give required information about the construct in line with both (Frey, 2008; Oguzor, 2011). However, in the case of the variable State of Mind, likert scale was introduced in the questionnaire to enable subjective measurement of happiness of the community as other variables were targeted at objective measurement.

The administration of questionnaire covered two focal groups – treatment group and control group. The treatment group is Shiroro communities and the suburb or catchment areas where the dam externalities are pronounced. This includes villages that currently remain around the dam and those that were resettled not too far from the dam. Whereas the control group is along River Gurara gorge in Gurara local Government Area in Gawu-Babangida community and the suburb villages or catchment area around the river.

The rationales behind the choice of Gurara River as control group are two. In the first place, river Gurara is only one among the three major rivers (rivers Niger, Gurara and Kaduna) that pass through Niger State that is free of dam (no treatment) and River Kaduna on the other side enjoys (Shiroro dam) treatment. Secondly, it fulfills the selection criteria of likely distance of 60 – 70 mile between the two points and same socio economic characteristics (even language) as in (Aleseyed, *et al.*, 2003; Bryceson, Bradbury, & Bradbury, 2008; Frankfort-Nachmias & Nachmias, 2007).

The first part of the evaluation (the first two variables) method is the Propensity Score Matching (PSM). PSM uses information from a pool of groups that do not participate in the intervention or policy to identify what would have happened to participating groups in the absence of the intervention or policy. This information might not be easy to come by. Therefore, comparism of two groups outcomes (participants and nonparticipants) make it possible to estimate the effects of the intervention or policy program (Carolyn, Maffioli, & Vazquez, 2010).

The general idea of matching is straightforward. In absence of an experimental design, assignment to treatment is frequently non-random, and thus, treatment and control groups may differ not only in assigned treatment but also in other

characteristics that affect both participation and the outcome of interest. In order to get rid of biases that this may generate, matching methods find a control group that is "similar" to a treatment group, allowing an estimate of the intervention's impact as the difference between a treatment and the matched comparison case. And, at the end, the method provides an estimate of the mean program impact for the participants (Carolyn, *et al.*, 2010).

The second part of the evaluation (the last 2 variable) method is probit models with the binary dependent variable (also called dummy). This takes values of 0 or 1. In other words, the options of measuring instrument are "Yes" = 1 = happened and "NO" = 0 = not happened. The outcome therefore, is obtained via probit regression - a nonlinear regression model that makes the output (predicted values) to be either 0 or 1. Probit models estimate the probability of the dependent variable to be 1 (Y=1). This is, to say the probability that some event happens.

It is also important to note that, this study further interacted the independent variables to one independent variable Group = Dam to be able to estimate the influence of dam on the dependent variable. Interaction terms are often applied to infer the effect of one independent variable on the dependent variable, which depends on the magnitude of another independent variable. This is to ascertain the impact of Shiroro Hydro Electricity Dam on the happiness of the communities.

3.7 Population and Sampling technique

The focus of the study covered three Local Government Areas. Shiroro Local Government Area where the dam is built, the next dam affected Muya Local Government Area and a control group point in Gurara Local Government. Since the method employed for the study has to do with treatment and control groups, Gawu-Babangida is chosen as control group point. The choice of Gawu-Babangida as a

control group along River Gurara gorge, in Gurara Local Government Area is to make the control group of the study in line with the views of Bryceson, et el., (2008) and Frankfort-Nachmias and Nachmias (2007). They both opined that the control group and treatment group must have common or similar characteristics before the treatment – in this case, before the dam was built.

Population by villages is not available statistically in Nigeria. The smallest unit of population available is by local government Area. The populations of Shiroro, Muya and Gurara Local government areas are 235,665, 103,461 and 90,879 respectively (NPC, 2010). In line with the above, population of the sampling frames were determined via ascertaining the numbers of small political units called wards in each of the local Government Area. The frames were then found by dividing the total population of the Local Government Area by the number of wards in the LGA to arrive at the average population of each ward. The small political units called wards are 15 in Shiroro, 11 in Muya and 11 in Gurara Local government Areas. Therefore, the average populations per ward are 15711, 9,406 and 8,262 respectively.

The population frame in treatment Group is 75,351 (3 wards in Shiroro and 3 wards in Muya LGAs) and 41,310 (5 wards) in the control Group. The sampling units are the villages of Zumba, Shiroro, Gusoro, Gurmana, Manta in Guoro/Zumba, Gurmana, and Manta wards in Shiroro LGA. Waloto, Kapana, Guni, Kutchi and Sarkin-Pawa are in Sarkin-Pawa, Kutchi and Guni wards in Muya LGA. The units in the Control Group are the villages of Gawu, Bonu, Izom, Kpau, Tochi, Kwakwa, Lambata, Kokogbe, and Padawa in 5 wards of Gurara, Gwaribaba Ednu, gawu and Izom wards of Gurara LGA. Each of these 10 villages in the groups ware selected to form the sampling units.

The sampling method employed in the study is judgment sampling technique which is a technique whereby selection of units of population is done base on the knowledge and the feeling that the elements are the most representatives of the population (Anderson, Sweeney, & Williams, 2011; Sekaran & Roger, 2010). The study used (judgment sampling technique) or considered only districts with villages within 5 kilometers from the river/dam and village of such are randomly picked as sampling units. The rationale behind using judgment sampling technique is to maximize the quality of the output of the result since the selected units are most affected by the externalities of the Dam/river. In other words, the units around the river/Dam are randomly sampled for data collection.

In line with Baron and Kenny in Sekaran and Bougie (2010), 383 and 380 sample sizes are adequate viz a viz the above sample frames for both treatment and the control groups respectively. The researcher however, administered a total of one thousand and sixty-eight (1068) questionnaires across the two groups. The increase is a provision of 40% increase (in questionnaires) against non response in line with Kotrlik and Higgins (2001) and Nigeria's attitude of poor response rate to questionnaires (Adomi, Ayo, & Nakpodia, 2007).

3.8 Data collection procedure

Distribution of the questionnaires was targeted at heads of families or the most senior person in a particular family as at the time of the administration in both catchment and control groups. The technique of the administration of the questionnaires was double faced - filling of questionnaire and a follow up interaction with the communities. In other words, household members of a compound are gathered for further focal group discussions after the fill of the questionnaires. The tail part of the questionnaires (section c) provided room for writing or jotting of their opinions.

The researcher with the help of research assistants from the localities consent the village heads in the sampling units for permission to ask the villagers for information via these avenues. The respondents were followed with the questionnaires into their respective households and since majority of the villagers are illiterates, the research assistants interpreted and fill in their views in the questionnaires where needs be. One research assistant per sampling unit was employed, tipped and to completed his/her work in two weeks.

The variables of measurement have their respective items that are tie to either A Short Guide to Gross National Happiness Index of the Centre for Bhutan Studies as in Ura, et al (2012) or to the Gross National Happiness Abridged Survey Questionnaire developed by the Centre for Bhutan Studies . Both of the material has nine domains and the later has explicit questionnaire in relation to measurement of happiness.

The items are tie to the Gross National Happiness Abridged Survey Questionnaire base on the requirement of the studies. In other words, the items are adapted to suit rural happiness studies.

3.9 Techniques of Data Analysis

Binary choice models particularly probit model is used for the analysis of the study. Obviously binary choice models are functional when outcome variables of interest is binary – in this case, treatment group where there is a dam and a control group where there is no dam that is, dichotomous as in the assumption of the model. The study first of all applied or run propensity score matching techniques (also probit model) in the first two variables and probit model run for the last two variables.

a. Propensity score matching techniques

The first one is propensity score matching (PSM) technique. PSM is defined as the probability that a group in the combined sample of treated and control groups receives the treatment, given a set of observed variables. If all information relevant to participation and outcomes is observable to the researcher, the propensity score (or probability of participation) will produce valid matches for estimating the impact of an intervention. Therefore, rather than attempting to match on all values of the variables, cases can be compared based on propensity scores alone (Carolyn, *et al.*, 2010).

It is a great challenge to evaluate any intervention or program with accurate estimate of the counterfactual i.e. what happen to treatment units if they had not participated. It is always difficult to observe the counterfactual. Therefore, a feasible solution to this problem is to estimate the counterfactual outcome based on a control group of nonparticipants. The calculated mean difference between the groups makes the impact of the intervention, in this case, the estimate of the happiness status.

There are two assumptions for PSM: Unconfoundedness or conditional independence given the propensity score i.e. treated and control units should be on average observationally identical and in order to calculate the difference in mean outcomes for each value, the groups should be matched. If some groups are not, it would not be possible to establish the counterfactual (Becker & Ichino, 2002; Carolyn, *et al.*, 2010). Rephann, Dalton, Stair and Isserman (1997) added that the distance between the treatment and control group must be reasonable (60 miles) to avoid spatial interdependence, must not have data gaps caused by say data disclosure restrictions, must be similar to the treatment group in demographics, economic growth and structures.

i. Types of Matching Algorisms

There three techniques most widely used matching algorisms - Nearest Neighbour Matching (NNM) Radius or Calliper Matching (RM) and Kernel Gaussian Matching (KGM).

NNM is a straightforward matching procedure. Individual from the control group is chosen as a match for a treatment group individual. The choice could be in terms of their closest propensity score or observed characteristics. Variants of nearest neighbour matching include "with replacement" and "without replacement," meaning, in the former case, an untreated individual can be used more than once as a match and, in the latter case, is considered only once.

RM is a situation where similarity callipers, are ranked according to potential control groups' similarity in terms of variables with a given treated group using Mahalanobis distance metric to measure similarity. The basic idea of radius or calliper matching is that, it uses not only the nearest neighbour within each calliper, but all of the comparison group members within the calliper. In other words, it uses as many comparison cases as available within the calliper, and avoids poor matches (based on specified distance).

KGM estimators compares the outcome of each treated person to a weighted average of the outcomes of all the untreated or control group, with the highest weight being placed on those with scores closest to the treated individual. KGM use a weighted average of all nonparticipants to construct the counterfactual match for each participant. When applying kernel matching, one chooses the kernel function and the bandwidth parameter. (Carolyn, *et al.*, 2010; Khandker, Koolwal, & Samad, 2010).

Note that, there is no clear rule for determining which algorithm is more appropriate or superior to the other. Nevertheless, the key issue considered is that the selection of the matching algorithm implies a bias/efficiency trade-off. That is, different points on the frontier of the trade-off between quality and quantity of the matches, and (Becker & Ichino, 2002; Carolyn, *et al.*, 2010; Morgan & Winship, 2007).

ii. Steps in the implementation of PSM

According to Caliendo and Kopeining (2008) the first thing to do before step one is for decision on which model to use either probit or logit that will have specification with no any of the high order terms. To fulfil one primary conditions of the technique, one run the data to achieve balancing property of the groups satisfied. It's after then that one test for the average propensity score of treated and control units to ensure it does not differ. This test could be several involving all the types of the algorisms till a test that the means of each characteristic do not differ between treated and control units which is a necessary condition for the Balancing Hypothesis.

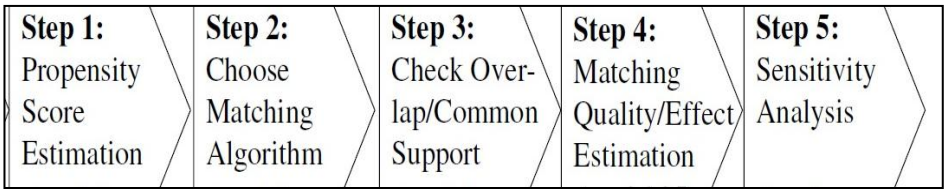

Figure 3.4
Implementation steps of PSM
Source: Adapted from Caliendo and Kopeining (2008)

In step 2, the choice of algorism depends on the outcome that is able solve the problem of self-selection bias, connoting that no pre treatment difference between the groups. In step 3, the common support condition ensures that any combination of characteristics observed in the treatment group can also be observed among the control group, which is visible graphically.

In the 4th step, the estimation of average treatment impact is interpreted with specific attention on the significant level and signs of the estimate. In addition, lastly, other algorisms are put to trials to see the robust standard of the chosen algorism of the study.

b. Binary probit model

The last two variables are estimated with probit model equation (equation 6) where 'y' is a binary response. The two variables take on the values of zero and one, which indicate whether an event has occurred. Traditionally, the definition 'y' is refer to y = 1 as a success and y = 0 as a failure (Wooldridge, 2010). In the case this study, the y = 1 = treatment group = Dam and y = control group = 0.

There linear probit model where the y values can only be 0 or 1 on a straight line fit through the points to predicted y values outside the range 0-1. This work however, is more consigned with nonlinear probit model.

CHAPTER FOUR
RESULTS AND DISCUSSIONS

4.1 Introduction

The focus of this chapter is to provide the result of the research, which include data presentation, analysis and discussion. The chapter present finding based on the data collected from the rural dwelling community of Shiroro Hydro Electricity Dam and Gurara River community. The findings of the study are discussed based on the research objectives that are formulated in line with the research questions. Four variables are involved in the study. Propensity Score Matching (PSM) technique is used for findings and analysis of first two variables: State Of Mind and Household per Capita Income, while probit model is used for the analysis of the last two: Physical Environment and Social Amenities.

4.2 Features of the respondents

A total of 1068 copies of questionnaires were administered in both treatment and control groups. Out of the said total, 798 copies were returned, relatively high response rate of 75 percent was achieved due largely to insider (within research unit) employed research assistance strategy. However, out of the returned, 21 copies (15 and 6 copies from treatment and control groups respectively) were wrongly filled and rejected for the analysis. This therefore, made the remaining number for analysis to be 777 (390 and 387 copies for treatment and control groups respectively). This formed near equal valid returned response rate of 50.19 and 49.81 percent respectively (Table 4.3).

The descriptive analysis of gender revealed that 74 and 26 percents were male and female respectively. This lop sidedness could not be unconnected with the local

reason of regarding the male as the head of family. The age descriptive statistics also revealed that are 5.41, 31.04, 39.64, 16.73 and 6.82 percents of the respondents are in the ranges of 18 – 25, 26 – 35, 36 – 45, 46 – 55 and 56 & above respectively. This indicates that the majority of respondent are in the ranges of 26 – 35 and 36 – 45 years old (Table 4.1).

Table 4.1
Descriptive statistics of respondent demography

S/N	Items	Frequency	Percentage
1	Gender		
	Male	575	74
	Female	202	26
2	Age		
	18 – 25	42	5.41
	26 – 35	244	31.04
	36 – 45	308	39.64
	46 – 55	130	16.73
	56 &above	58	6.82
3	Years of Education (Educ yrs)		
	0	413	53.15
	6	83	10.68
	12	150	19.31
	15	102	13.13
	18	29	3.73
4	Marital Status (mrstatus)		
	Single	85	10.94
	Maried	622	80.05
	Divorced/widow	70	9.01
5	Occupation (occptn)		
	Farming/fishing	454	58.43

	Trading	102	13.00
	Civil service	114	14.67
	Others	102	13.13
	Unemployed	6	0.77
6	Religion		
	Islam	617	79.41
	Christianity	158	20.33
	Others	02	0.26

Table 4.2
Cross tabulation Responses of Variables and Happiness (whs) in Percentages

	Happiness (WHS)				
Gender	NH	NVH	QH	VH	Total
Male	16.72	43.38	23.69	16.20	100
Female	26.73	31.68	18.32	23.27	100
Total	19.33	40.34	22.29	18.04	100
Age2					
18 - 25	11.11	33.33	28.28	27.27	100
26 - 35	18.60	44.19	24.58	12.62	100
36 - 45	27.00	40.00	16.50	16.50	100
46 - 55	21.82	49.09	10.91	18.18	100
56 - above	27.27	31.82	18.18	22.73	100
Total	19.33	40.34	22.29	18.04	100
Occupation					
Farm/fishing	19.16	42.07	25.11	13.66	100
Trading	26.73	31.68	19.80	21.78	100
Civil	8.85	41.59	23.01	26.55	100
Service					

Others	25.49	39.22	12.75	22.55	100
Unemployed	0.00	50	0.00	50	100
Total	19.33	40.34	22.29	18.09	100
HYY					
Lower	18.31	41.78	23.94	15.96	100
Middle	19.89	39.78	21.16	19.17	100
Upper	10.00	40.00	21.0	29.00	100
Total	19.33	40.34	22.29	18.04	100

Where NH = Not at all happy, NVH = Not Very Happy, QH= Quit Happy and VH = very Happy

In Table 4.2 above, gender statistics, male shows that 16.72 percent are not at all happy, 16.20 percent are very happy. If all options are merged to arrive, two options of very happy and not at all happy, 60 percent of the male are not at all happy while minority of 40 percent is very happy. In the female category, 23.73 are not at all happy while 23.27 are very happy. If the extremes are merged, 55.41 are not at all happy while 44.59 are very happy. Meaning the female in the locality are more happy than the male.

The age brackets in Table 4.2 also show that, 11.11 percent ages of 18 – 25 are not at all happy while 27.27 are very happy. This is in line with the literature. That younger people have less burden of life are more happy. The age of 26 – 35 is not at all happy at 18.60 percent while very happy at 12.62 percent. The age of 45 – 55 is also not at all happy at 21.82 percent while very happy at 18.18 percent. These are in line with the literature for these age ranks are more aspiring in life, which is burdensome hence make people unhappy. The age of 56 and above is not at all happy at 27.27 percent and very happy at 22.73 percent.

In the occupation segment, farming/fishing as the largest occupation is not at all happy at 19.16 percent and very happy at 13.66 percent. The trading occupation is not at all happy at 26 percent and very happy at 21.78 percent while civil servant is not at all happy at 8.85 percent and very happy at 26 percent. The high-level expressed happiness in this category might not be unconnected with occupational value attachment. In other word the group is not directly, involve with tilting of land for means to an end. In the income/happiness category, 18.31 are not at all happy and very at 15.96 percent, the middle income are not at all happy at 19.89 percent and very happy at 19.17 percent. The upper income echelon is not at all happy at 10 percent and very happy at 29 percent. In nutshell larger percentages of the cross-tabulation of happiness and variables connotes that the host community are more of unhappy.

Table 4.3
Summary of Group's Respondents

GRP (Dam)	Respondents	Percentage
0	387	49.81
1	390	50.19

Note: where 1 = treatment group and 0 = control group

Table 4.1 connote that 53.15 percent of the respondent are without any formal education experience. Those with highest experience of Islamic and primary school experience constituted 10.68 percent while 19.31 percent of the respondent have experiences of secondary school and its equivalent. Others consist of 13.13 percent for diploma/National Certificate for Education and 3.73 percent for degree certificate and above education experience respondents. The zero education experience of 53.15 percent topping the segment is a connotation that majority of the rural dweller in the study area are illiterates.

On marital status, respondents that are single constitute 10.94 percent while 80.05 percent of the respondents are married making the respondents that are married dominant the segment. On the occupation of respondents, farmers/fishermen comprises the majority with 58.43 percent, 13.00 percent for traders who mostly trade in agricultural produce and 14.67 percent are civil servant, mostly, primary and secondary school teachers. Other respondents in this sample are people of different craft or skill who constitute 13.13 percent and Unemployed respondent in the sample are only 0.77 percent. More than half of the respondents are farmer which connote the major occupation of the people in the study area.

4.3 Estimation of the model

The analyses of the variables are grouped into two. The first two variables – State of Mind (SOM) and Household Income per Capita (HHY) are analyse using Propensity Score Matching (PSM) technique while the last two variables – physical Environment and Social Amenities (rural infrastructure) are analysed using binary probit model. The first variable dwells on subjective measurement of happiness while the last three has to do with objective measurement of happiness of the study area.

This study is aimed at ascertaining the impact of the installed Shiroro hydro electric Dam on the happiness of community. However, Gurara community (Gurara River community) is employed as the control group and a benchmark to measure the effects of Shiroro Hydro Electricity Dam on the happiness of the community i.e. the treatment group, since the two groups are ordinarily similar in terms of socio-economic characteristics before the advent of the dam in Shiroro community.

4.3.1 State Of Mind

The variable State Of Mind measures subjective happiness status of the community. Conceptually, happiness is sometimes defined as state of mind (Haybron, 2008b; Tenaglia, 2007). Tenaglia further said SOM is happiness within the minds of human beings resulting from union with God, a serene indifference towards the material world, or a state of harmony with the universe. The name SOM therefore, is deliberately employed as variable name for happiness, which is focused at subjective measurement of happiness.

PSM technique is employed to measure the happiness status of Shiroro community. The method compares the happiness of dam community with that counterfactual community that lack similar dam experience. Propensity score is defined as P (T_1) as a condition of receiving treatment given pre treatment household characteristics.

P (T_1) ≡ prob ($D_{1=}1/T_1$) = E (D_1/T_1); P (T_1) = F (T_1)

where T_1 is the household pre treatment characteristics, D is the treatment, E is the expectation from the treatment and F (T_1) is the distribution of the cumulative frequency.

The estimated PSM measures the treatment effect or policy impact of individuals in the treatment group. In PSM analysis, the Average Treatment Effect on the Treated (ATT) is the major interest (Ahmed, *et al.*, 2014; Becker & Ichino, 2002). In this case, therefore, ATT is used to assess the impact of Shiroro hydro electricity dam on the happiness of the suburb community.

To ensure that the conditioning covariate is not different across the treatment and control groups, a test of balancing property is conducted and the result found the balancing property satisfied. The study further conducted balancing test (*pstest*) to

ascertain the quality of matches between households in Shiroro and Gurara communities. The result matches of balancing test for the propensity score matching analysis is in line with Table 4.4 below.

Table 4.4
Balancing Property for Propensity Score Analysis

	I	II	III	IV	V
Independent variables	p-value (unmatched)	p-value (matched)	Mean absolute bias (unmatched)	Mean absolute bias (matched)	Absolute bias (reduction)
Gender	0.060	0.251	-13.5	-8.1	39.6
Occptn	0.917	0.637	0.7	-3.3	-347.6
Hhdig	0.345	0.000	-6.8	-25.8	-280.0
Hrht	0.000	0.084	64.5	-13.7	78.8
Tofland	0.000	0.281	218.8	7.2	96.7
Comp	0.000	0.119	216.1	-9.2	95.7
Drcul	0.000	0.957	- 178.8	-0.4	99.8
Rmcul	0.883	0.439	- 1.1	5.5	-417.3
Cof	0.103	0.596	11.7	-3.7	68.6
Vio	0.000	0.000	81.9	32.2	60.7

The columns I and II in the above table shows the result of joint significance of chi squire test of the covariates used in the probit model before and after the match. The test after the match, demonstrates that the probability values of the covariates are not jointly significant. Meaning, the household's pre treatment differences between treatment and control groups' are eliminated after the match. In other words, the self selection bias issue is eliminated hence meeting the matching requirement for computation of treatment effect. Note that three of the variables stubbornly (vio, Hhdig and Hrht) refused to meet up matching requirement after various improvement

trial efforts. This experience is normal as it could occasionally happen no matter the effort at improvement trials (Carolyn, *et al.*, 2010).

In trying to measure policy impact using different approaches of PSM, considerations evolve around three things: magnitude of the ATT point estimate, their signs and statistical significant levels (Venetoklis, 2004). Based on the aforementioned, to enable the study ascertain happiness status of the Shiroro community, Nearest Neighbor Matching (NNM) method happened to be most suitable for the analysis of the variable SOM.

Table 4.4 show that the population of the Shiroro community is less happy by (-0.588) 58 percent if compare to Gurara community counterpart. This is as result of installed Shiroro hydro electricity dam; the result indicates negative and significant Average Treatment effect on the Treated (ATT) of Shiroro Hydro Electricity Dam on the happiness of the community. This simply mean the host community has lower State of Mind.

Table 4.5
Average Treatment Effect on the Treated (ATT)

Variable	Sample	Treated	Control	Difference	S.E.	T. test
Hap (whs)	Unmatched	2.036	2.747	-0.711	0.067	-10.67
	ATT	2.039	2.637	-0.588***	0.201	-2.93
	ATU	2.746	1.966	-0.780		
	ATE			-0.684		
On support		388	386			
Off support		1	1			

*, ** and *** represents significant levels at 10%, 5% and 1% respectively.

The Average Treatment Effect on the Untreated (ATU) measures the pain Gurara community would have had if Dam is installed on Gurara River and the Average

Treatment Effect (ATE) is the effect of the dam on the happiness of the individuals randomly drawn from the overall population.

In order to verify the validity of the matching estimation, the common support or overlap condition of the probability of both groups values of X are found to have positive probability of being treatment and control (figure 4.1) for the study.

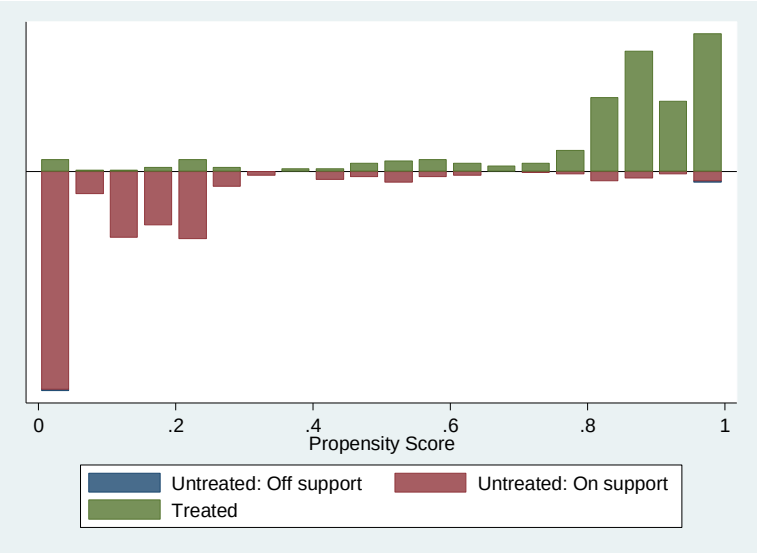

Figure 4.1
SOM common support condition

According to Heinrich *et al*, (2010), mere visual inspection of the balance in propensity score histogram or density distribution plot is enough verification of the validity.

To check the robustness of the NNM algorithm used, sensitivity test is conducted using Radius Matching (RM) and Kernel Gaussian Matching (KGM) techniques. The results from the alternative matching techniques, as shown in Table 4.6 confirms that the results of the NNM technique are robust.

Table 4.6
Sensitivity of Matching Algorithms

Technique		ATT	Treated on-support	Off-support	Control on-support	Off-support
RM	Hap	-0.707*** (0.066)	388	1	386	1
KGM	Hap	-0.579*** (0.259)	389	1	388	1

*, ** and *** represent 10%, 5% and 1% significant level while the Standard error in parenthesis

Results of the RM and KGM methods in Table 4.5 the ATT are 70 percent and 57 percent with significant levels at 1 percent respectively. These posit that the NNM approach is quite robust and not sensitive to other matching methods. In other words, NNM matching method is consistent with other techniques. That is, at the different estimation methods it is observed that no method generates result, which differs exceptionally from the other algorithms.

The State Of Mind ATT is negative that is,-0.58 as in Table 4.5 and statistically significant at 1 percent. This is in line with the findings of focus group discussion with Shiroro community dwellers who expressed disappointments, and that the dam impacts their happiness negatively. This negative impact might not be unconnected with the feeling of breach community's fundamental human right - breach of right to land, taken over of their land with little or no new land provision, distortion of cultural activities, conflict with neighborhood and feeling of going violence with the authorities.

This is also true in the cross tabulation Table 4.2 of the demographics. To be to attain the statistics in blocks, the two extremes are added to ascertain the percentages of categories of happy and unhappy sets. For instance, in line with the result, 60.13 percent of the male are less happy and 58.41 percent of female category is less happy. Meaning majority of the population has decline happiness. In the age

distribution intervals, the youth of 18 – 26, 55.57 percent are happy. This is in line with literatures that it's the ages of less burdens of life. The ages of 26 – 35, 36 – 45, 46 – 55 and 56 and above are all less happy at 63 percent, 67 percent, 71 percent, and 59 percent respectively. The aged of last category is not in line with the theory. This simply due to accompanied pains of the dam especially lost of friends and relations say children to migrations.

The cross tabulation result also connote that in the occupation category, 61 of farmers, which is major occupation are less happy. Putting all the occupations together, 60 percent have decline happiness while the remaining 40 are. Meaning, the table is in line with the result of the study.

The community was not involved in the decisions of the installed dam and other subsequent activities that directly affect the socio economic life of the community. The feeling of no involvement of the community members in the decisions of resettlement and compensation suggest respective negative psychological costs that translates to uncertainty, idleness and frustration that lowers the state of mind or happiness of the community.

The focus groups interactions also revealed that, in reaction to distortions; loss land mass to dam and the authority, the people take to migration from their home community mostly to Nupe communities of katcha, Lapai, Mokwa, Agaie and Bida or other locations in search of better farming opportunity within Niger State and beyond. This by implication caused psychological negative burdens or lowers the state of mind due largely to loss friends, relations, pair groupings and associates.

Others are attributed to loss of cultures and traditional practices. Practices like traditional ritual places (mostly jointly practice with other popular two religions) are

either submerged in the dam or forced to leave the structures behind for a new settlement. Practices like traditional age rank congregational farming and traditional festivals such as Abwagyi and zakwolotu festivals are no more in practice due largely to distortion of the original settlements and opening up of the community to urban practices. These have their respective psychological burdens that cause lower happiness or state of mind in Shiroro community.

There is also the feeling of lacking enough peace among the community members. It has now become a common phenomenon that families and community members occasionally have land dispute among themselves. The recent most is the case of resettled Zumba community cum immigrant Fulani nomads[1]. Although, it isn't yet violent because of court intervention, families and communities sometimes experiences violent conflicts over land.

In the literatures, economic freedom is found to have a stronger effect on happiness of poor nations Veenhoven in (Diener & Seligman, 2009). Government policy aimed at improving happiness of citizens should not hinder income increase and security, family strengthening bonds, and community enhancing bonds of citizens within and across their communities (Pacek, 2009). Government policies which facilitates geographically mobility weakens networks of family and friends hence affects happiness (Dolan, *et al.*, 2008). People are happier in conflict free neighbourhoods and where social capital is high (Diener & Seligman, 2009). Frey (2011) found that

[1] The Fulani nomads settled on small water left over piece of land in the old Zumba village. Resettled Zumba village still claim that the surviving small piece of land left behind is still theirs and want to stretch or be going (due to land scarcity) back to farm in the old settlement. But the Fulani nomads are resisting their claim insisting that Zumba community was paid compensations to leave the place therefore; they are not ready to move with a claim that the land is for government.

income increase must be up to $108,000 dollars to leave happiness constant in a conflict violence community when one additional person dies.

Therefore, facts from the respective literatures suggest that lower state of mind in Shiroro community as negative psychological burdens that simply connote that the community is not happy. In other words, the objective socio economic activities have negative subjective impacts that generate lower state of mind or unhappiness in the entire Shiroro community.

4.3.2 **Household Income per Capital (HHY)**

Household income per capita is a better measure of household income since its measurement includes household size (Datta & Meerman, 1980). Household per Capita Expenditure however, used for data collection for the study, which serve as a proxy for HHY as a variable. This information gathering strategy is sourced via household annual expenditure by the family size. This step was a deliberate strategy employed to subdue the difficulties faced at sourcing respondent's income status information.

HHY is estimated using Propensity Score Matching (PSM) technique. This is to measure or ascertain Shiroro community's income status. The method is workable via treatment group (dam community) and a control group (counterfactual community where no treatment) to be able to arrive at the income status of the treatment community. Propensity score is defined as P (T_1) as a condition of receiving treatment given pre treatment household characteristics.

$P(T_1) \equiv \text{prob}(D_{1=}1/T_1) = E(D_1/T_1)$; $P(T_1) = F(T_1)$

where T_1 is the household pre treatment characteristics, D is the treatment, E is the

expectation from the treatment and F (T_1) is the distribution of the cumulative frequency.

To ensure that the conditioning covariate is not different across the treatment and control groups, first test of balancing property is conducted and the result found the balancing property satisfied. Furthermore, to ascertain, the quality of matches between households in Shiroro and Gurara communities balancing test (*pstest*) is conducted, and the result for the propensity score matching analysis is as in Table 4.7 below.

Table 4.7
Balancing Property for Propensity Score Analysis

	I	II	III	IV	V
Independent variables	p-value (unmatched)	p-value (matched)	Mean absolute bias (unmatched)	Mean absolute bias (matched)	Absolute bias reduction
Educyrs	0.011	0.388	-18.2	-6.0	66.9
Mrstatus	0.022	0.465	16.4	5.1	68.
Occptn	0.893	0.678	1.0	-2.9	-201.3
Religion	0.000	0.686	33.3	3.2	90.5
Hhfmland	0.000	0.745	94.0	-2.3	97.6
Hhfmedu	0.077	0.843	12.7	1.4	89.2
Hctfac	0.132	0.476	-10.8	4.9	54.3
Hfmtec	0.256	0.237	8.2	-7.9	3.3
Hproduc	0.090	0.310	-12.2	-7.4	39.5
Hhousin	0.889	0.479	1.0	-4.9	-388.8

In Table 4.7, columns II and I illustrates the result of the joint significance of chi squire test of the covariates or independent variables used in probit model before and after the match. The result of after the match illustrates that the probability values of

the independent variables are not jointly significant. Meaning that, there are pre treatment differences between treatment and control groups in some cases but eliminated (see columns I&II). In other words, the self-selection bias is eliminated after matched to enable the data meet matching requirement for computation for treatment effect estimation.

The major interest in PSM technique analysis, is the Average Treatment effect on the Treated (ATT) which form the policy impact of individuals in the treatment group (Ahmed, *et al.*, 2014; Becker & Ichino, 2002). In scanning through the approaches for the most suitable algorithm for ATT, considerations evolve around three things: magnitude of the ATT point, estimate their signs and statistical level of significance (Venetoklis, 2004).

In line with the above opinion, Kernel Gaussian Matching (KGM) approach happened to be more appropriate for analysing the HHY of Shiroro Hydro Electricity dam community. The result in Table 4.8 connotes positive (increase) and at 1 percent significant level Average Treatment effect on the Treated (ATT) by 18 percent. This indicates increase household per capita income in Shiroro hydro electricity dam resulting from the dam.

Table 4.8
Average Treatment Effect on the Treatment (ATT)

Variable	Sample	Treated	Control	Difference	S.E.	T. test
HHY	Unmatched	4.769	4.712	0.0580	0.034	1.73
	ATT	4.769	4.584	0.185***	0.063	2.92
	ATU	4.707	4.770	0.063		
	ATE			0.125		
On support		389	382			
Off support		0	5			

*, ** and *** represents 10%, 5% and 1% respectively.

The result connotes that the population of the Shiroro hydro electricity dam community has increased HHY if compared to the Gurara community counterpart as a result of installed dam (Table 4.8). Average Treatment effect on the Untreated (ATU) measures the increase/decrease in income per capita of Gurara community if they have had Dam installed on Gurara River. The result shows that the mean difference of 6 percent indicating income increase which would have been experienced if dam were installed on River Gurara. The Average Treatment Effect (ATE) as shown in the result is 12 percent. This is the effect of the dam on the income per capita of the individuals randomly drawn from the overall population.

In order to verify the validity of the matching estimation, the common support or overlap condition of the probability of both groups values of X are found to have positive probability of being treatment and control (Figure 4.2) for the study. According to Heinrich *et el,* (2010) mere visual inspection of propensity score histogram or density distribution plot is enough verification of the validity.

Sensitivity analysis of Kernel Gaussian Matching (KGM) method is also carry out using NNM and RM techniques to ascertain whether KGM is robust to other methods. The results in the Table 4.9 confirm to robustness and non-sensitivity of KGM to other matching methods. In other words, although, KGM estimates of Shiroro Hydro Electricity dam effect on the happiness of suburb community is consistent with other methods.

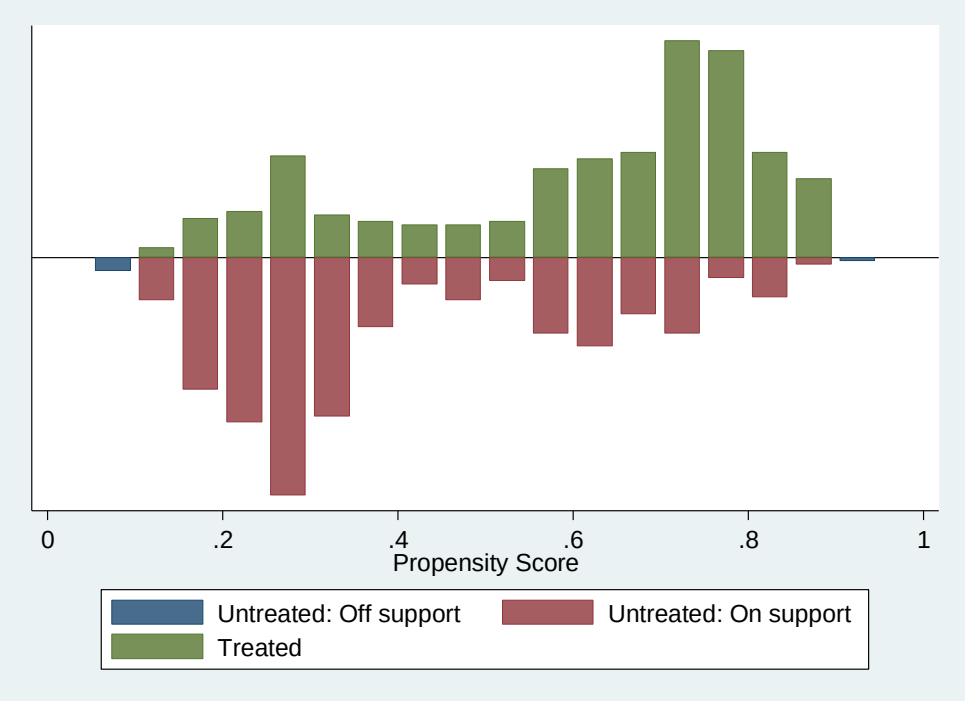

Figure 4.2
HHY common support condition

Table 4.9
Sensitivity of matching Algorithms

Technique	Variable	ATT	Treated on-support	Off-support	Control on-support	Off-support
NNM	HHY	0.177*** (0.051)	389	0	382	5
RM	HHY	0.062* (0.033)	389	0	382	5

Standard error in parenthesis, *, ** and *** represent 10%, 5% and 10% significant levels respectively

According to findings in the household focus group discussions, even though, household had their hectares of farmland, which is the pointer to rural income submerged in Shiroro dam, the community has increased farm education, housing and farm technology. The reason of this increased income might not be unconnected with increase assets that relate directly or indirectly with the dam. The improved technology or modernization has put a touch to rural asset over the years compare to before. The issue of proliferation of communication appliances' in the early 1990s,

(after dam construction) particularly handsets are now use by few farmers, trader and others to enhance their jobs. If one reconciled this factor with the popular Gwada market that is a big asset to Shiroro community and the dam, originated new market called "kasuwan Kwata"[2] meaning riverside market is a pointer in one hand. On the other hand also is the road infrastructure that is supper imposed from the state capital to the Dam site, which makes accessibility of the rural product to cheap market feasible, hence, forms pointers to the improved income in the locality.

Furthermore, access to and application of chemicals as source of biological farming are now more in use, access to fishing nets and resultant access to more water body (dam for fishing and irrigation) are comprehended as technical assets that aid increased household per capita income in Shiroro community if compare to Gurara community.

Focus group findings also portrayed that, the community is not happy too. Apart from the fact that the community expressed bitterness of lose of farmland and dam instigated physical environmental problems, migration of friends and relations, land compensation was small and unevenly distributed. While some households did not get at all, some got as small as N200 (then $ 1 = N 8) and some others got up to N2000. The compensation was generally bias in favor of the people of Galadima kogo because the community had more educated elite. This findings are in line with Usman and Ifebiyi, (2012) and Ziri, (1996) who both found that some households were give mere pea nut as compensation.

[2] This new mobile market shifts with water levels. Water level shift towards the upland during raining seasons and subsides to the lower channels in the dry seasons. This market started from mere selling of fish every morning and later some few agricultural crops. Today it's a big market that serves as an asset to the community as a whole.

The cross tabulation Table 4.2 also connotes that 60 percent of lower income earners, 62 percent of middle class and 51 percent of upper class has lower happiness. In reconciliation with this and first variable, which revealed that the community is not happy, literature also, did not simply conclude that increase income increase happiness. Increase income does not just increase happiness. If there is increase standard of living or national income, it does not have powers over adaptation considering the manners at which the increased income comes into being. Increase income may have follow up burdens of say increase hours at work places, environmental pollutions, relocation of settlements etc as established by Easterlin paradox episodes of income happiness contrast behavior (Floyd, 2011; Frank, 2005; Hefferon & Boniwell, 2011).

Frey and Stutzer (2002b) found that the correlation between happiness and income are as low as 0.20 and Ahuvia (2002) found income to have explained but less than 1% of the variance in ones happiness. Change in income can only affects certain sphere of life but limited effect on happiness (Peiro, 2006). Therefore, if the first variable (SOM) found negative happiness in Shiroro community, focus group findings also more of negative happiness, then, increase income experience might not have influential strength to bring community happiness due to either or more of the aforementioned theories.

4.3.3 Physical Environment (PEV)

The physical environment is the natural environmental scenario or setting where people dwell within the structure of their socio economic values. This includes land, water, plants and animals and all of the natural resources that provide opportunities for social basic needs for the rural dwellers. Healthy physical environment is important for both subjective and objective happiness of people.

In order to estimate happiness of Shiroro community from physical environment perspective, probit model is ran twice with robust – first to ascertain the coefficient of the independent variables and second to determine the marginal effect for magnitude of the coefficients as in Table 4.10 below.

Table 4.10
Probit estimates of happiness in terms of PEV with marginal effect

Variables: Dep. Var: Happiness Indep. Variables	Probit coefficient	Marginal Effect
grp_dam	-0.984*** (0.103)	-0.363*** (.035)
envfd	-0.232** (0.118)	-0.087** (0.043)
Envagrisk	-.214** (0.111)	-0.081** (0.041)
Envbmit	0.180 (0.124)	0.068 (0.046)
Envurban	0.228** (0.117)	0.086** (0.043)
Envchnge	-0.331** (0.172)	-0.120** (.058)
Envilnes	0.009 (0.104)	0.003 (0.040)
Gender	0.022 (0.119)	0.009 (.045)
Age	-0.140*** (0.057)	-0.053*** (.0218)
Edu	0.098*** (0.036)	0.037*** (0.014)
Maristatus	0.110 (0.105)	0.042 (0.040)
Occpn	0.012 (0.051)	0.005 (0.120)

Rel	-0.196* (0.120)	-0.075* (0.046)
Pseudo R^2	15%	-
Wald Chi^2	142.02***	-

Standard error in parenthesis, *, ** and *** represent 10%, 5% and 1% significant levels respectively.

It is important to note that the signs of the estimated parameters in Table 4.9 are associated with the probabilities of increase or decrease in happiness of Shiroro community due largely to physical environment. The coefficients of grp_dam, envfd, envagrisk, envchang, age and rel have negative values which connote decline or decrease happiness status of the community due to physical environment within conventional levels of significance. Variables envurban and edu have positive values that connote a significant increase in happiness of the community. Environmental flood, farming risk, change in natural environment, age and religion connote decline or lower happiness status of the community within conventional levels of significance at 8, 8, 12, 5, and 7 percents respectively. Urban influence and education both have increase probability of happiness in the community at 8 and 3 percents respectively.

The coefficient of the variable envurban has positive value, indicating that the probability of being happy in the community has increase by 8 percent. This by implication portrays the popularity and linkage of the locality resulting from the Shiroro hydro electricity dam. In other words, the locality has advantages of access to the township for essential commodities and ready market for the local farm produce.

The variables envbmit and envilnes have positive values indicating that decline wild life and more experiences of sickness (say malaria fever) in the locality are more likely to increase the probability of being happy. These outcomes are not only

unconvincing but also not in line with literatures. However, both variables are not significant.

But marginal effect is a wrong estimate where variables of measurement are to be interacted for further information. Marginal effect are for magnitude of single variable but are wrong for interpretation of interacted variables (Ai & Norton, 2003; Norton, *et al.*, 2004) which is the case in this work.

In order to get to know how Shiroro hydro electrify dam impact on the happiness of the community via physical environment, the variable grp_dam (Dam) is interacted with all other independent variables, one after the other for interaction effect. For example, where grp_dam is interacted with envfd, that is grp_dam.envfd = Genvfd ("G" signifies combination of dam to other variables) and if the coefficient is positive or negative, the effect of the dam is said to have increase or decrease respectively. Probit model for interactions is for concerned variable after which (*inteff)* Stata command is invoke to generate interaction effect. The results of the interaction effects are as in Table 4.11 below.

Table 4.11
Probit Estimates of Happiness in Terms of PEV with Interaction Effect

Variables Dep. Var: Happiness Indep. Variables	Probit Coefficients	Interaction Effect
Genvfd	-0.632***	-0.165***
	(0.256)	(0.048)
Genvagrisk	0.560***	0.202***
	(0.209)	(0.048)
Genvbmit	-0.555***	-0.200***
	(0.229)	(0.038)
Genvurban	-0.169***	-0.223***
	(0.215)	(0.037)
Genvchnge	-0.250	-0.030
	(0.363)	(0.049)

Genvilnes	-0.443**	-0.148***
	(0.203)	(0.037)

The standard error in parenthesis, *, **, *** represents 10%, 5% and 1 % significant levels respectively.

Table 4.11 present the result of computed interaction of independent variables with treatment variable (grp_dam) to ascertain the interaction effect. The model was run six times with grp_dam. In other words, each independent variable was single out against the installed dam as a variable to be able to ascertain the degree of influence it has on each of the independent variables. Each interaction has two graphs that connote the interaction effect and significant levels. The graphs are the explicit picture of the interaction effect as it concerned all the observations or households. This might not necessarily be the same with the interaction terms, that is, as in the table (Norton, *et al.*, 2004).

i. flood

The coefficient of variable environment's flood interacted (Genvfd) with the dam (Table 4.11) is negative and significant at 1 percent (-0.632). On magnitude command of *inteff,* the value of interaction effect is negative (-0.165) and varied widely in the observations from 0 – beyond 0.8 (see Figures 4.3). Meaning, flood constitute a physical environmental problem that likely lowers the happiness of the community.

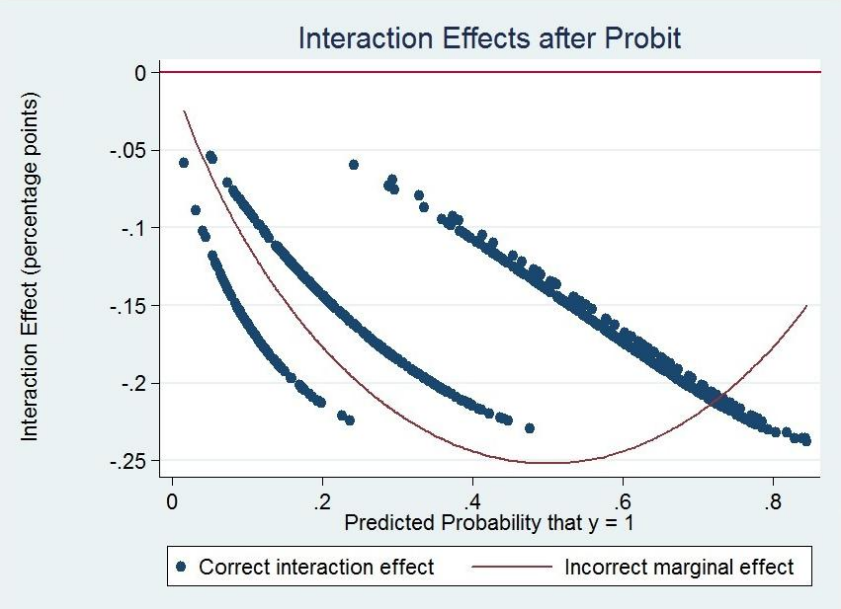

Figure 4.3
Interaction effect of environmental flood

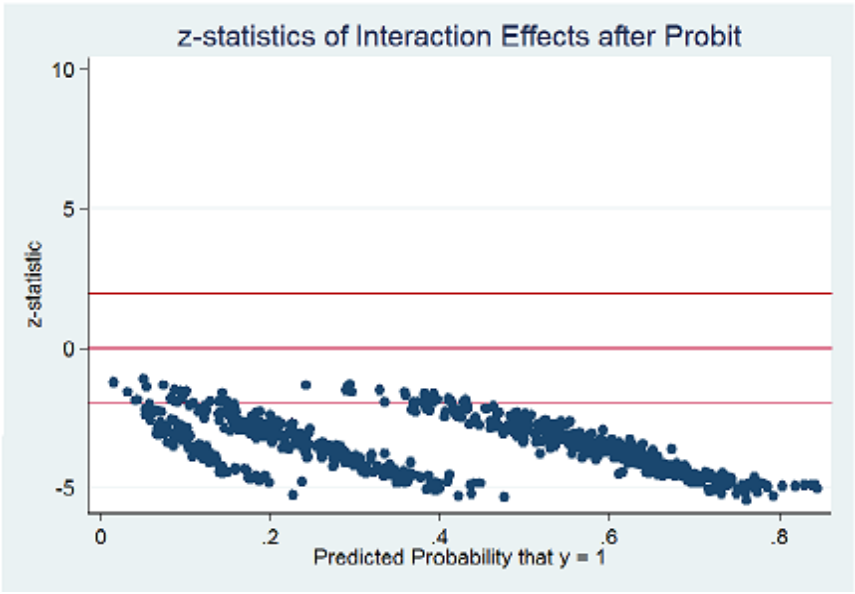

Figure 4.4
z-statistics of interaction effect of environmental flood

The interaction effect is negative and statistically significant in the community and varied widely. The result indicated that people's predicted probability of happiness is lower in respect with dam prompt flood in the community and this stretch from 0 to beyond 0.8 (Figure 4.4).

From focus group discussions findings, flood is a physical environmental problem that occasionally torment farmers who live by river banks. They do experience large scale flood and have their season's crops submerged in water during pick period of rainy season. Sometimes, this type of flood experiences submerges plants and crops for days and harms not only the plant and crops but the entire ecosystem. This has not only contributed to the destruction of the environment but also increase poverty level of the community. In other words, the families get distorted subsistence during flood year and survival becomes very hard as there is always no compensation from the dam authority.

ii. Changes in environment

The probability of decline or lower happiness of the community (Table 4.11) resulting from visible changes in the physical environment (Genvchnge) is negative in the interaction terms. The result is (-0. 250) but it's not statistically significant.

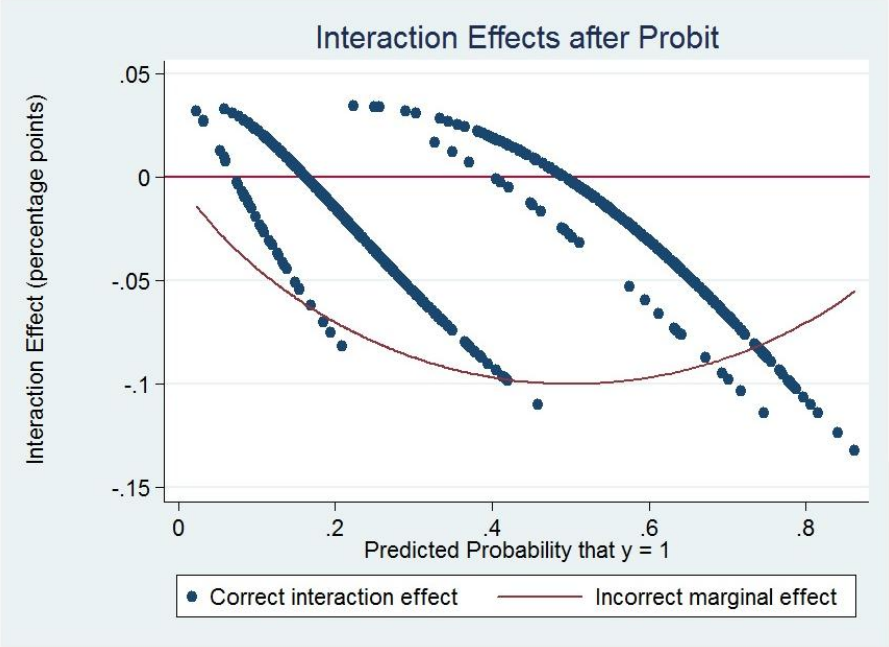

Figure 4.5
Interaction effect of changes in environment

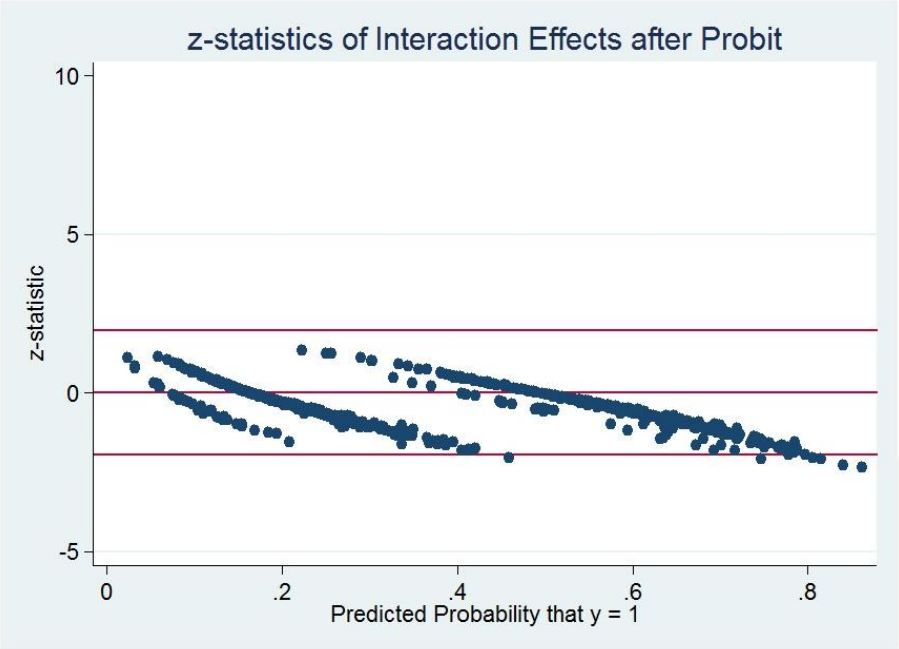

Figure 4.6
z-statistics of interaction effect of changes in environment

Although, the interaction effect value is negative and statistically insignificant (-0.030) too, the interaction effect as in Figure 4.5 is not the same. The effect of the interaction actually connotes that majority of the household have declining happiness resulting from change of environmental physical features as portray in the statistical value. However, few house hold with predicted probability of happiness around 0 - 0.5 have positive effect (Figure 4.5). But in contrast with the statistical value, the effect is statistically significant (Figure 4.6) for most of the observations. This indicates that changes in environmental features might favor few but statistically, it has likely decline happiness effect on Shiroro community. In other words, looking on to the table alone might not give the real picture of situation at hand rather misleading.

From the focus group findings, the probability of decline happiness by implication is that, even though, Shiroro Hydro Electricity Dam brought along with it increased irrigation and fishing opportunities, the typical Gbagi (natives) farmer is more interested in the subsistence upland farming. Therefore, the resultant reaction from

these problems is migration of the Gbagis of the dam community to Nupe and other communities of the State in search of farm land. The Gbagis who are known to be confined to their home land before treatment are now all over neighboring Nupe land of the state, majority of who are now settled in villages around Lapai, Agaie, Bida, Mockwa and katcha. The migration is sometimes done by entire extended family while in some cases it involves only a portion of the extended family especially the youth.

Importantly, the implication of the migration is that, the dam has brought with the environmental problems that have succeeded in separating families and friends of the community which in turn has negative consequence on the happiness of the community. In line with Donan *et al.,* (2008), government policy which facilitates geographically mobility weakens networks of family and friends hence affect happiness.

iii. Farming risk

Farming risk due largely to environmental problems that serve as basis of some household change of job or combining more than one job (Genvagrisk) has positive effect at 1 percent significant level in the interaction term (0.560 - Table 4.11). This result implies, changing job or depending on more than one job due to environmental problems are threatening to farming or risk to farming occupation have probability of increase happiness in the community.

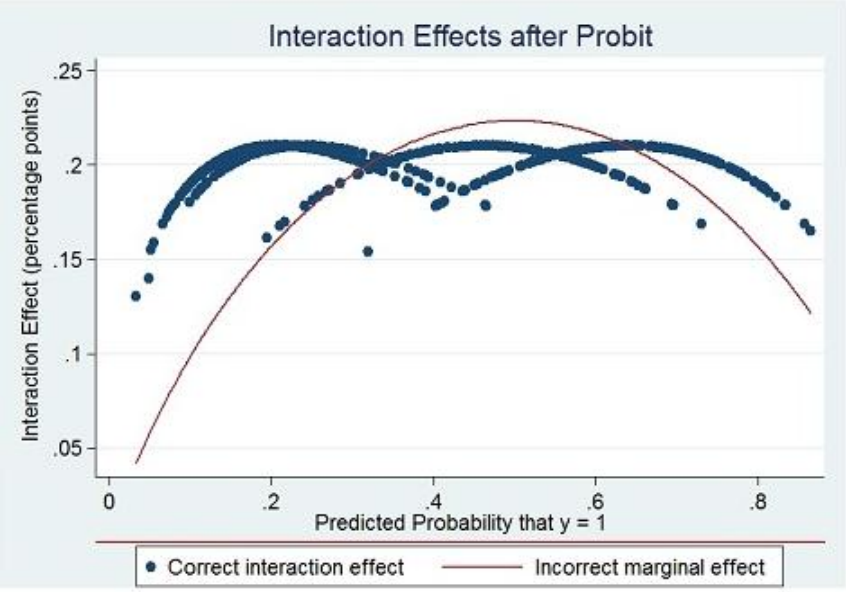

Figure 4.7
Interaction effect of risk in farming environment

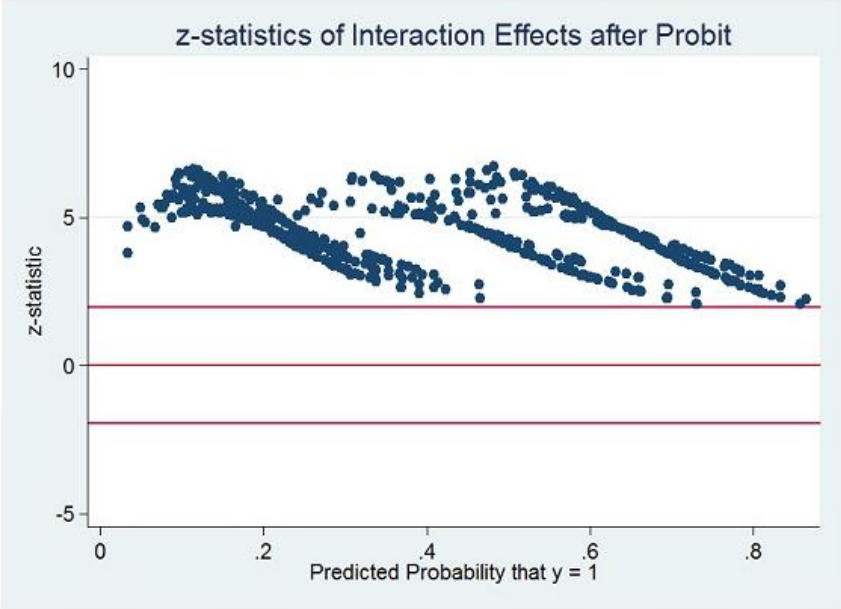

Figure 4.8
z –statistics of the interaction effect of risk in farming environment

The mean interaction effect connotes positive effect and varied widely covering from 0 to beyond 0.8 (Figure 4.7). In terms of significant effect of the interaction, the graph portrays that all the observations predictions of happiness status of community in respect to farming risk is not statistically significant. Therefore, depending on information on the table solely is sometimes misleading.

Group discussion revealed occupational problems. The first problem as found out is distortion in the shifting cultivation farming system that has been in existence. Now, large proportion of farm land is consumed by the dam therefore, land can no longer go round enough to accommodate the known farming system. Furthermore, some few settlements, like part of Guni, Kapana and Zumba that were resettled had no accompanied enough farm land provision to accommodate the known farming system.

There is also alluvia plain flood which is well known annual risk. Farmers' plant maize on the alluvia plains or river banks at beginning of every raining season knowing full well that it may be consume by flood. The early rainfall moist keeps the river banks moist for about 3 months before the real rainy season proper begins. Farmers patronize the alluvia plain of the river banks for advantage of early season Maize yield. As rainfall is vagary of nature, if rainy season comes earlier in a particular year, the probability of flood consuming all early season maize would be more that year and vice versa.

These aforementioned problems are occupational risk that sometimes compels farmers to combine farming jobs with others like fishing, trading, craft works etc or even change job for the risky nature of farming seasons. Therefore, this might have made up the positive effect in the Figure 4.7 above. However, the fact is flood is nuisance which constitutes a major treat or risk to farming - dominant occupation within the community and therefore, the positive effect of the interaction is not statically significant (Figure 4.8) due largely to pain taken or uncertain situation of the farmers in the community in particular season of the year.

iv. Wild life decline

The effect of the interaction terms (-0.555) between group and decline wild life (Genvbmit) is negative and statistically significant at 1 percent (Table 4.11). This implies that the probability of the predicted happiness in terms of decline wide life is lower. On invocation of *inteff* for the magnitude, the mean interaction effect remained negative (-0.200) with varied observation across - 0 to beyond - 0.8 (Figure 4.9).

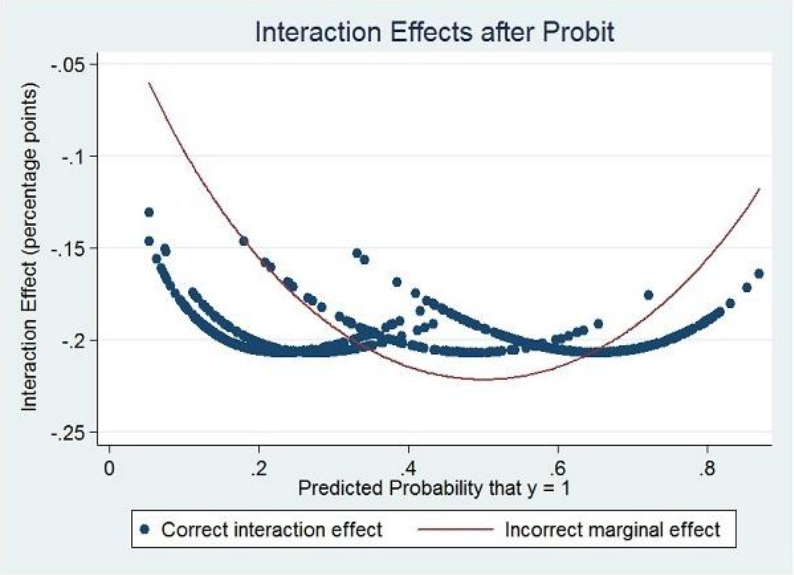

Figure 4.9
Interaction effect of decline wild life

In terms of statistical significance of the interaction effect, just as in Table 4.12, the graph connotes that all observation of the household prediction is statistically significant (Figure 4.10). In other words, there is likely lower happiness in the community resulting from decline wild life.

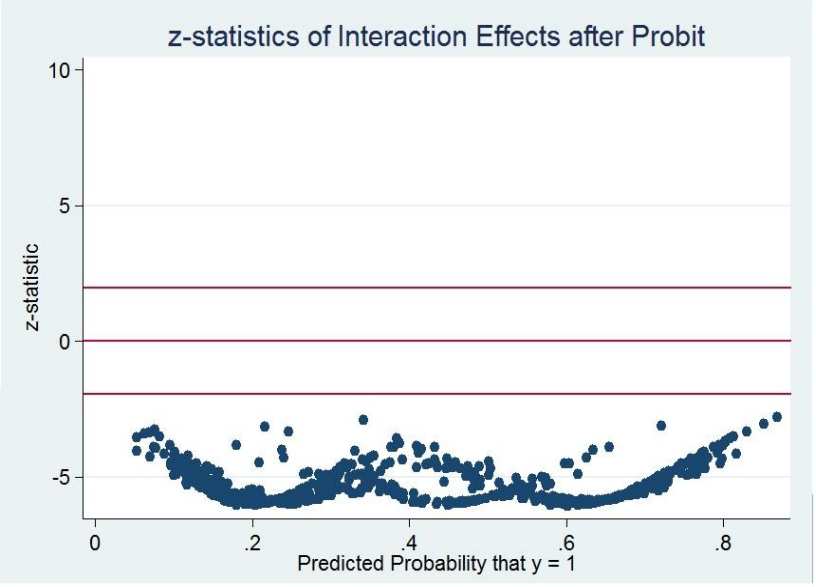

Figure 4.10
z statistics of interaction effect of decline wild life

From the focus group discussions, this lower happiness might not be unconnected to gross decline in animals and their species in the locality due largely to dam's distortion of the ecosystem. This distortion affect the community's occupation of hunting which rightly affect their income streams negatively. In the words of Ezeazu (1998) "…the people were given just N2000 (then about N8 to $1) as compensation per adult persons while being re-located to sites less favorable for farming, fishing and hunting." There is gross reduction in the number of wide life as compared to before dam because of sudden change in the ecosystem. Hunters in the communities are no longer in business as usual because water submerged the wild life's homes and hide out that were along the river banks. Hunting use to be famous occupation (even though combine with farming) in villages of Katehi, Guni, Sarkin-Pawa, Gofa, Ibro, Kaure, Maigu, Lagedo but with the installed dam, the formation are no more and that aspect of life is diminishing gradually.

v. Urban influence

The coefficient on the interaction terms between group (dam) and urbanization or urban influence is negative (-0.169 as in Table 4.11) and statistically significant at 1 percent. This implies that the probability of house hold prediction of happiness is lower in respect with urban influence. The negative effect is demonstrated clearly as in the graph (Figure 4.11).

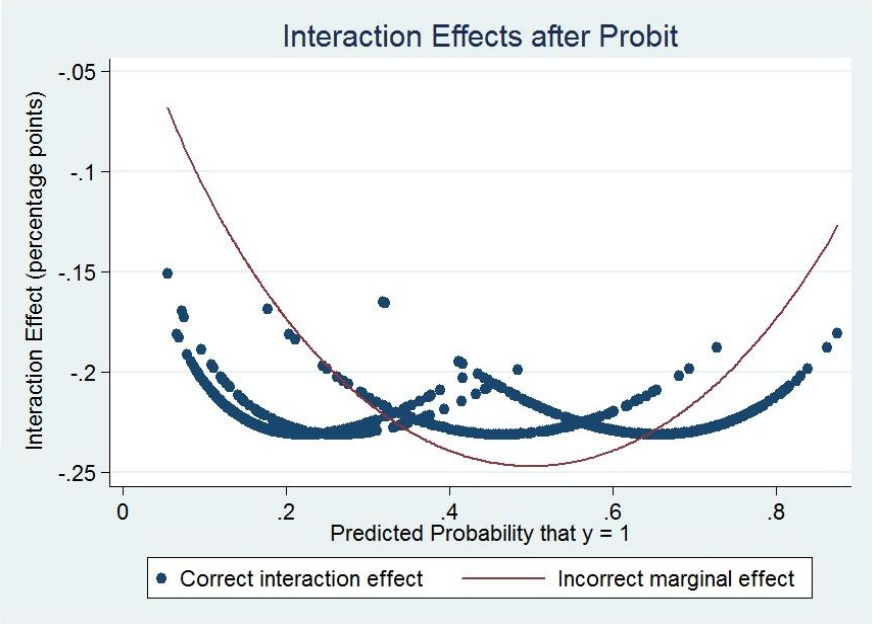

Figure 4.11
Interaction effect of urban influence

In terms of significance of the interaction effect in Figure 4.11, the whole household's predicted probability is statistically significant. That is, the effect connotes lower probability of happiness in respect with urban (Genvurban) influence. Household focus group discussions also reveal lower happiness. This might not be unconnected with the threat of armed robbers and thieves that occasionally disturbed the community dwellers.

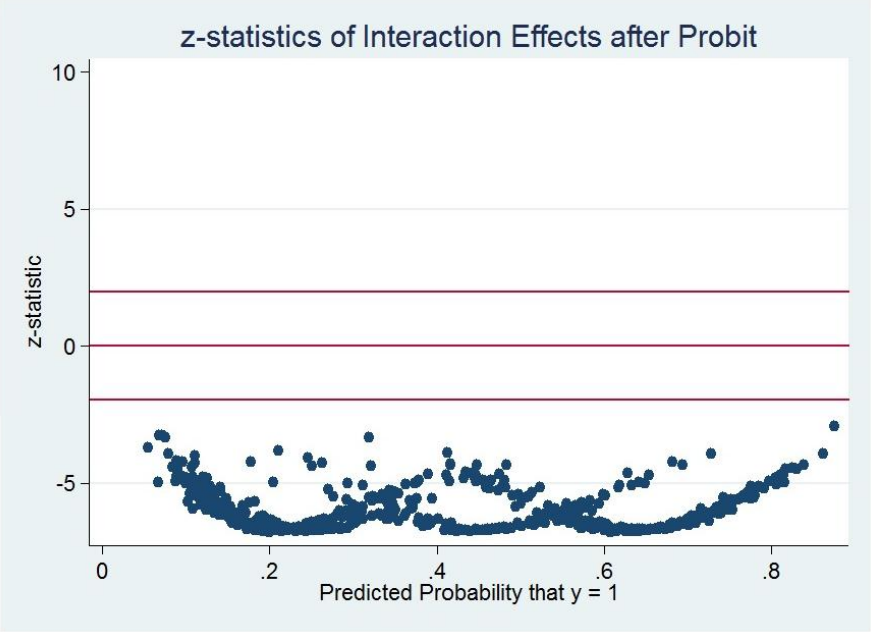

Figure 4.12
z statistics of interaction effect of urban influence

It is a popular believe that Dogon daji or Dajin Gomna (between Alawa and Tegina to Kabata) harbors thieves who terrorizes the community occationally. This they believe is due largely to the opening up of the community to the urban as a result of the dam, especially with the new bridge. The theft experiences is common with farm produce particularly yam and animals like sheep and cows. The thieves usually use small trucks to the farms in the night and steal yam (major crop of the community) tubers and in the morning, the farmer is reduce to zero. This made a new problematic culture of shifting yam tubers from farm to home after harvest and vice versa at planting season as against farm storing habit.

Locally reared animals (mixed farming) like cows and sheep that usually wander around the villages with little or no control are stolen away in the night's occasionally. This also extent to the nomads in the community experience occasional armed robbery cases where they are forced to part with their animals. These are all associated with opening up or urban influence.

vi. Water borne diseases (malaria)

The interaction term between group (dam) and water borne disease is negative i.e. -- 0.448 at 5 percent significant level (see Table 4.11). This implies that the community's probability of happiness is lower in respect with water borne diseases most especially malaria. 0n invocation of *inteff* for interaction effect, the result is same - negative effect with 1 percent significant level. Although, the result portrays same negative effect in the graph (Figure 4.13), the predictions varies across 0.1 to beyond 0.8.

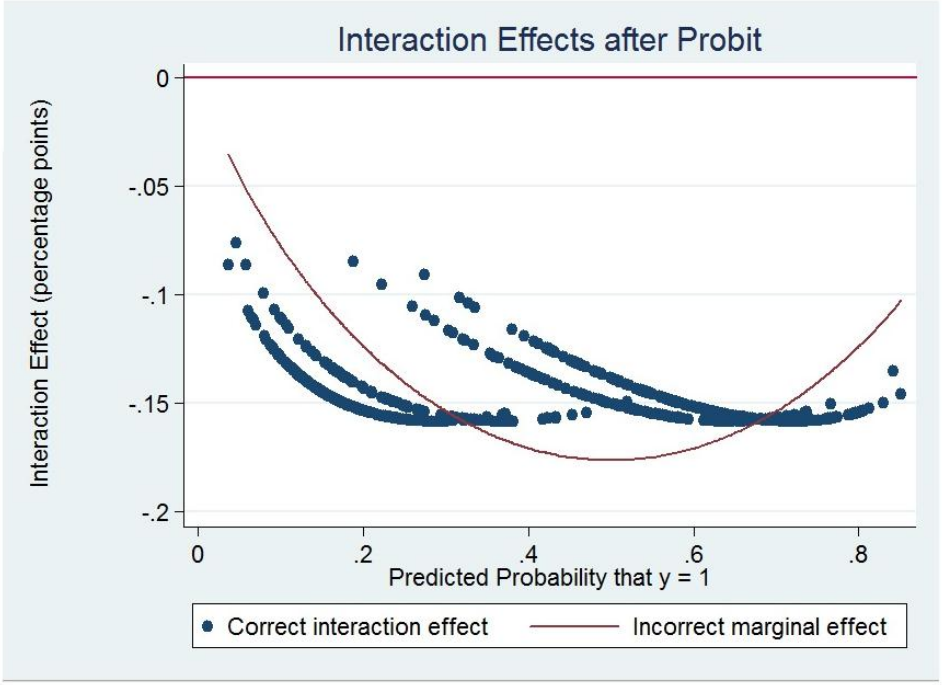

Figure 4.13
Interaction effect of water borne disease

In terms of statistical significant, the predicted probability of all the observations is statistically significant (Figure 4.14). That is, from 0.1 – beyond 0.8 are statistically significant.

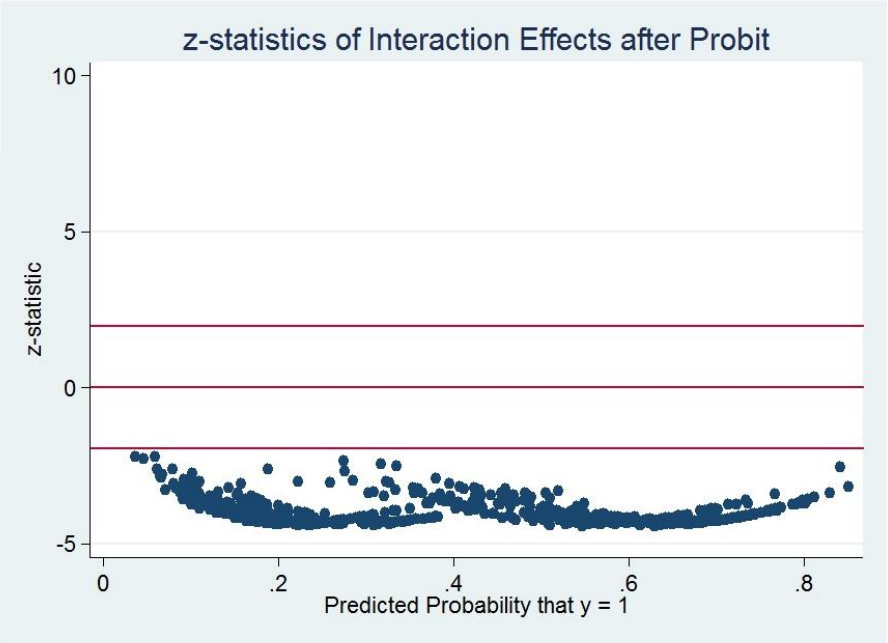

Figure 4.14
z-statistics of the interaction effect of water borne

From the findings, this might not be unconnected with the occasional problem of water borne diseases because of dependence of the rural populace on the river for domestic use, and increase cases of malaria fever due largely to over flooding during raining seasons that leave behind waterlog or spongy environment that houses mosquitoes.

In summary, these findings connotes that the community in terms of Physical Environment is not happy. This are in line with some facts in the literatures, dam victims usually, are found to have weak voices, experiences loss of ecological species, loss tradition and cultural practices that are detrimental to people's happiness (Sophie, 2007). The displaced Chinese rural communities not only suffer environmental cost of near shore landslides, earthquake (catastrophic 2008 Wenchuan) but also distortion of agrarian lifestyle. The resettled farmers, although, allocated lands for resettlement but inadequate to fully support agriculture (Beck, *et al.*, 2012).

In line with the literatures, an increased environmental problem goes to mean loose of ecological species and cultural practices, economic decline via distortion in the agrarian systems and deprivation of nourished relationship with the natural environmental contacts. These are all detrimental to happiness, which, goes to authenticate that Shiroro community are less happy not only in terms of subjective factors but in terms of objective factors resulting from sudden change in their natural environment due largely to the installed dam.

4.3.4 Social Amenities (Infrastructures)

Social amenities are the governments or corporations infrastructural provisions for common use say for rural dwellers. The provisions could also be called civic amenities. Some common examples of social amenities are water supply, electricity, roads, health care centers, rural schools and the likes.

In order to estimated the happiness of Shiroro community in relation with social amenities provisions, probit model was ran twice with robust – first to ascertain the coefficient of the independent variable and second to determine the marginal effect for magnitude of the coefficients as in Table 4.12 below:

Table 4.12
Probit Estimates of Happiness in Terms of Social Amenity with Marginal Effect

Variables: Dep. Variable: Happiness Indep. Variables	Probit coefficient	Marginal Effect
grp_dam	-0.979***	-0.360***
	(0.103)	(0.035)
School	0.075	0.029
	(0.155)	(0.059)
Road	0.346*	0.134*
	(0.185)	(0.072)
Electr	-0.251**	-0.095**
	(0.119)	(0.0450)
Waters	-0.255**	-0.098**
	(0.124)	(0.048)
Hthcare	-.298**	-0.109**

	(0.139)	(0.049)
Gender	0.036	0.013
	(0.118)	(0.045)
Age	-0.150***	-0.057***
	(0.058)	(0.022)
Edu	0.076**	0.029**
	(0.035)	(0.033)
Maristatus	0.109	0.042
	(0.103)	(0.039)
Occpn	0.006	-0.002
	(0.049)	(0.019)
Rel	0.189	-0.072
	(0.118)	(0.045)
Pseudo R^2	15%	-
Wald Chi^2	150***	-

Standard parenthesis, *, **, and *** represent 10%, 5% and 1% significant levels respectively.

The signs of the estimated parameters in Table 4.12 are associated with the probabilities of increase or decrease in happiness of Shiroro community due largely to resulting social amenities in the community. The coefficients of group (dam), power supply, pipe borne water supply and health care provisions have negative values which connote decline or lower happiness status of the community within conventional levels of significance. Variables road and almost all the demographic variables have positive values that connote a significant increase in happiness of the community.

When the magnitude command *mxf* (marginal effect) invoked, the variables group (dam), power supply, pipe borne water supply and health care provisions have negative values that connote decline or lower happiness status of the community (within conventional levels of significance) at 9, 25, 25, and 29 percents respectively. Road infrastructure and education both have probability of increase happiness in the community at 34 and 7 percents respectively.

In order to ascertain the effect due largely to the dam installed in the locality, there is the need for interaction effect. The resultant decrease or increase happiness from the marginal effect however, could not serve a correct interpretation where there is need for interaction of more than one variable (Ai & Norton, 2003; Norton, *et al.*, 2004). Therefore, to achieve whether dam is able to influence social amenities to community that might have augmented the happiness of all in Shiroro community, group (dam) is interacted with the social amenities or independent variables all through and the result is as in Table 4.13 below:

Table 4.13
Probit Estimates of Happiness in Terms of Social Amenity with Interaction Variables:

Dep. Var.: Happiness Indep. Variables	Probit Coefficients	Interaction Effect
Gschol	0.310	0.098
	(0.214)	(0.068)
Groad	0.374*	0.107
	(0.230)	(0.076)
Gelectr	-0.380**	-0.100
	(0.207)	(0.064)
Gwaterss	-0.538***	-0.164***
	(0.217)	(0.064)
Ghthcare	-0.413	-0.073
	(0.302)	(0.070)

Standard error in parenthesis, *, ** and *** represent 10%, 5% and *** 1% significant levels respectively.

Table 4.13 shows the result of computed interaction of social amenities independent variables with treatment variable (grp_dam) to ascertain the interaction effect. The model is run five times with grp_dam, that is, each independent variable was single out against the installed dam as a variable. This is to be able to ascertain the degree

of influence it has on each of the independent variables. Latter "G" signifies combination of group or dam to other variables.

i. Schools (Gschol)

The coefficient of interaction terms between dam and schools (that provides for education) of the locality is positive but not statistically significant (0.310) in Table 4.13 above. This implies that schools as social amenity have probability of increase happiness in the community, though not statistically significant. On running for impact or magnitude, the result connotes mean interaction effect to be positive also. Meaning, more likely happiness (Figure 4.15) in the community in terms of school service viz-a-viz installed dam.

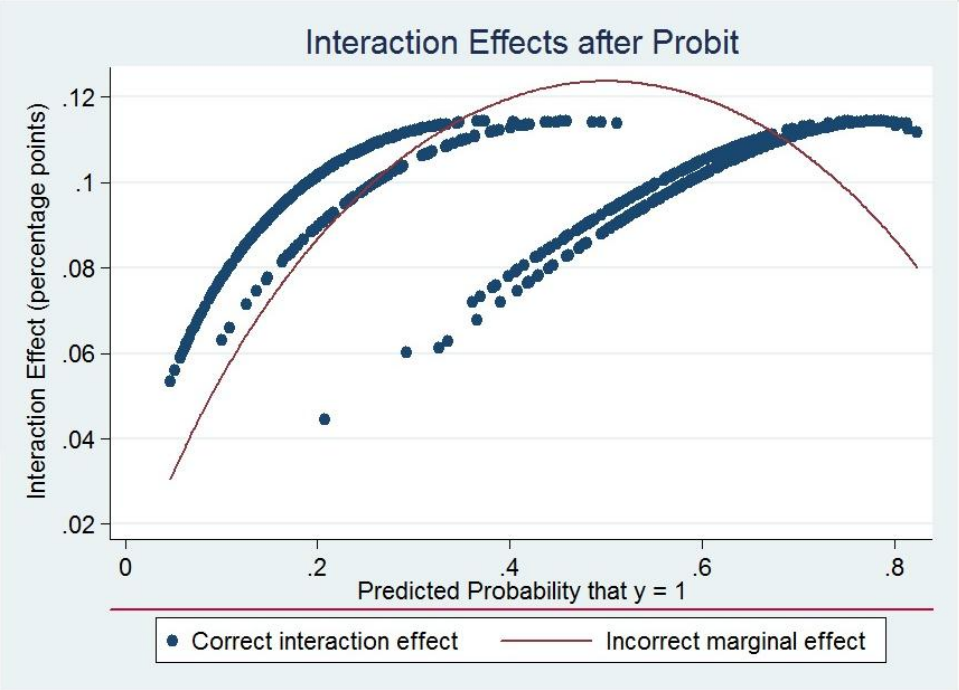

Figure 4.15
Interaction effect of school as social amenity

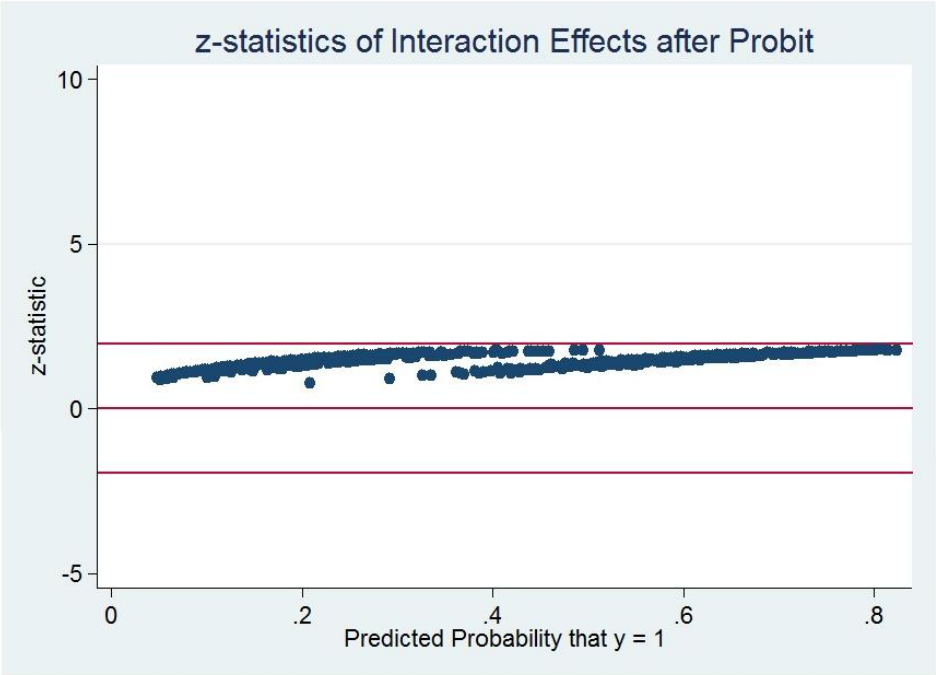

Figure 4.16
z-statistics of the interaction effect of school as social amenity

The significance of the interaction effect on the other hand indicates that the predicted probability of happiness with respect to school is statistically not significant across all the household observations (0 – beyond 0.8 as in Figure 4.16).

This result might not be unconnected with the household focus group discussions findings which revealed that little attention is being given to rural schools despite the dam installed in Shiroro community. The commonest infrastructural facility in rural Nigeria is structures called schools most of which lack facilities and enough teachers. The situation is same in the Shiroro community. The structures are dilapidated to the level of collapse without maintenance (see primary school structure in LGA Head Quater Figure 4.18). In other words, household recognizes schools as subject of happiness but realized that the provision is not only limited but of inferior standard around the community (Figure 4.17 &18). It takes some village's community effort to built primary school for self, a good example is new Shiroro village as in Figures4.17 and 4.18 below.

Figure 4.17
School structures in Shiroro LGA
.
Shiroro village Community Primary School. The blocks in the scene is the government effort to rebuild the school in 2014 (after more than 20 years of the dam's existence)

Figure 4.18
School structures in Shiroro LGA
.
Bodo Islamia Primary School, Kuta. Shiroro Local Government Head Quarters

i. Road (Groad)

The coefficient of the interaction term between road infrastructure and Dam is positive and statistically significant at 10 percent (0.374). This implies that the household's probability of being happy increase with road infrastructure. In terms of interaction effect, the value is positive but not statistically significant (0.107 as in Table 4.12 above). Figure 4.19 also connotes the positive effect of road infrastructure in the community.

The z-statistics of interaction effect is not statistically significant (Figure 4.20). This connotes that looking at result in table alone is not enough, it could be misleading.

From focus group discussions, the positive value of the result of road as in Table 4.13 might have been connotation of the enthusiasm of the community over the road

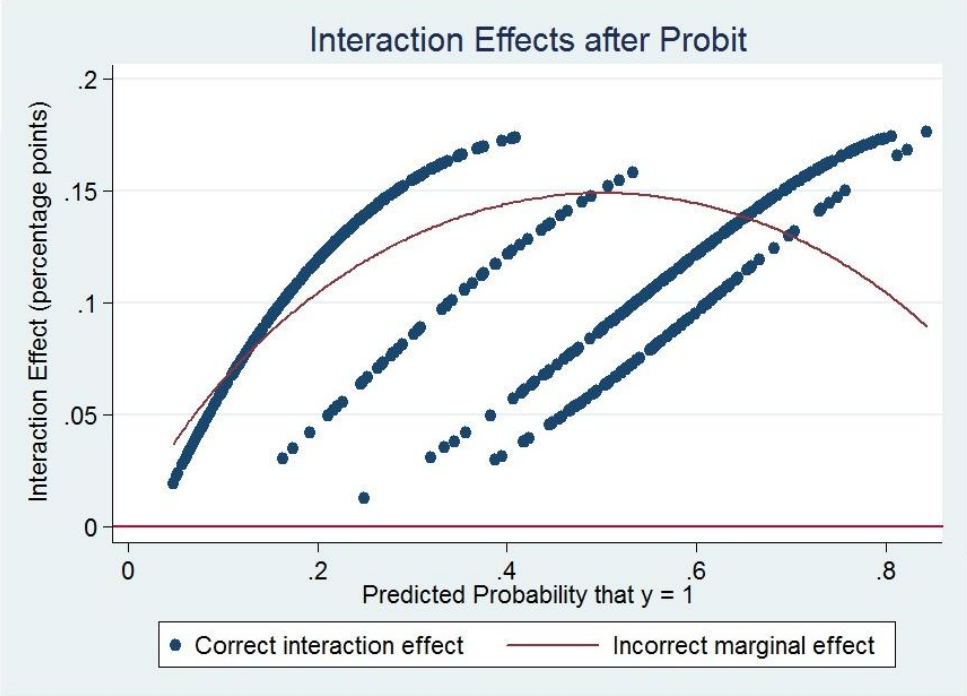

Figure 4.19
Interaction effect of road infrastructure

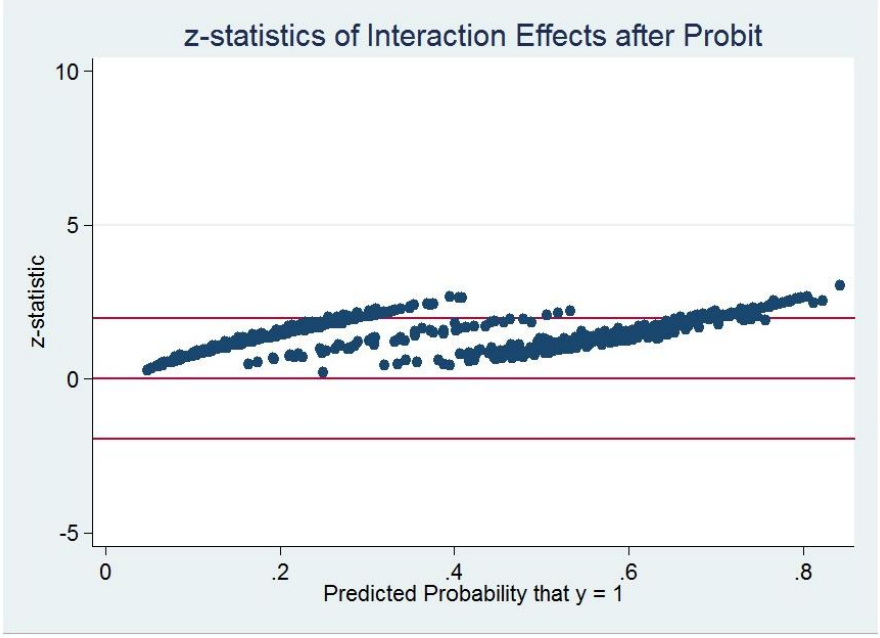

Figure 4.20
z-statistics of road infrastructure interaction effect

built by government to the Dam site or appreciation of the importance of the road to their happiness. The road connecting the locality to the state Capital – Minna to the Dam site is the major good road in the locality.

Since the study involved the locality, mostly villages around the river banks who strugles to get to this main road, the result in the graph (Figure 4.20) might have been the role of the responses from this groups. For instance, there has not been road linking (bridge across the river say to Erina) both sides of the river in the past 23 years of the dam not until 2014 (Figure 4.21). This therefore, has constituted a problem for long period of time to the community.

Furthermore, villages around the riverine areas have no good road link to the major road. These therefore, might probably be the reasons responsible for increase happiness because there is road to the locality as shown in the graph (Figure 4.19) but statistically insignificant (Figure 4.20) for the aforementioned reasons.

Figure 4.21
Shiroro Dam Bridge under construction in 2014

ii. Electricity (Gelectr)

The coefficient of electricity and dam is negative, value -0.380 with statistical significance at 5 percent (Table 4.13). This implies that the predated probability of household happiness is lower. In other words, installed dam is not able to influence to host community, enough power supply to impact their happiness. In terms of

interaction effect, the mean interaction effect is also (-0.100) negative (Figure 4.22 below) and varied widely.

In terms of significant level of the interaction effect, the predicted probability of happiness of electricity is statistically insignificant (Figure 4.23). However, graphically, the groups of household with probability of about 0 – about 0.8 are all statistically significant.

From focus group findings, the lower happiness in connection to electricity in the host community might not be unconnected with the long wait with high expectation of electricity supply to the community and subsequent payment saga. Villages like Zumba, Gusoro and Sarkin-pawa got electricity earlier enough i.e. during dam reservoir building process in 1980s. But majority of other suburb villages like

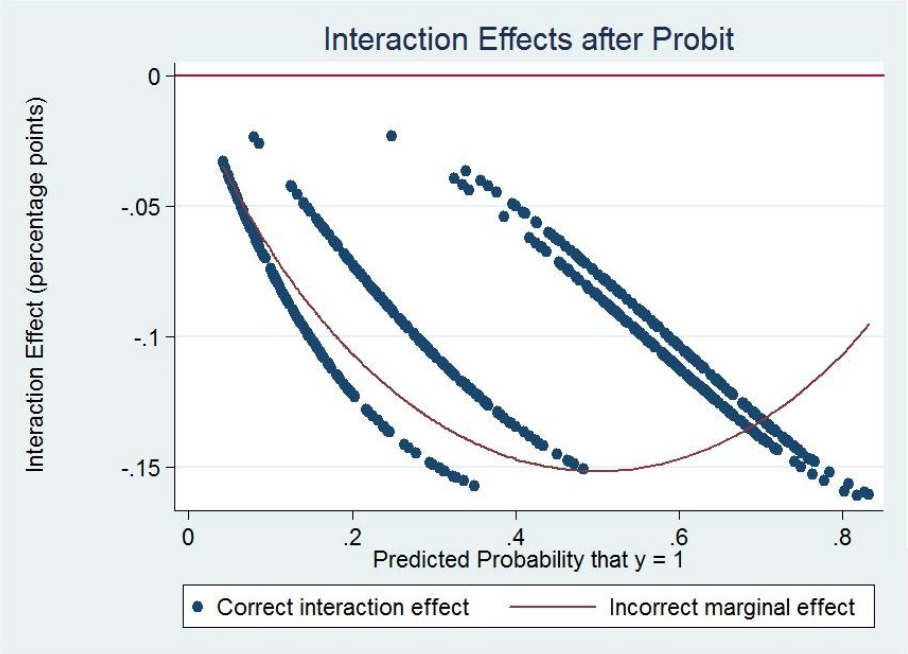

Figure 4.22
Interaction effect of Electricity as a social amenity

Shiroro Village, Guni, Galadiman-kogo and Erena got theirs in 2000s - during rural electrification policy in the state i.e. about 10 years after the installation of the dam. This policy however, did not cover every village in the host community.

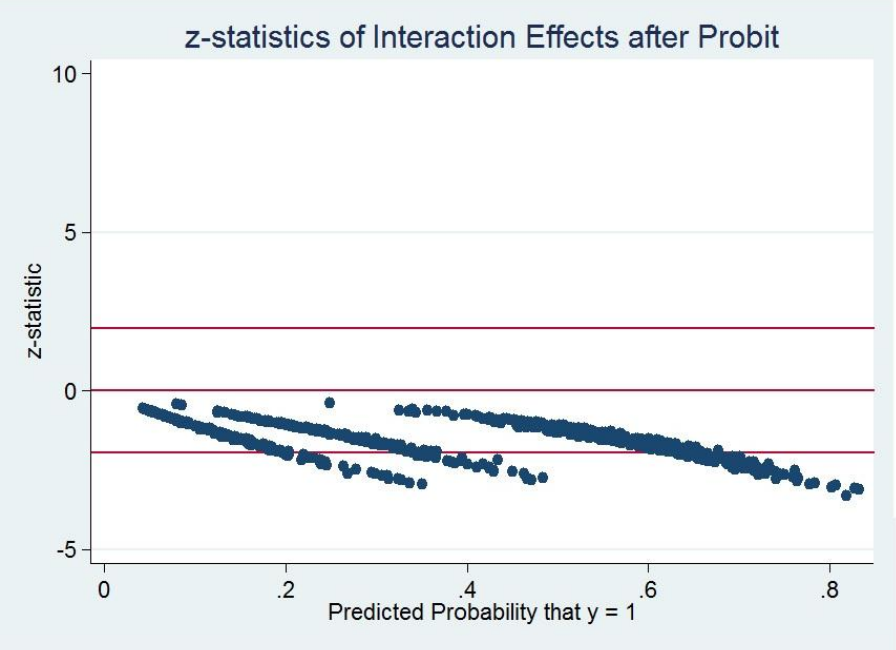

Figure 4.23
z-statistics of the interaction effect of Electricity as a social amenity

Furthermore, the earlier beneficiaries enjoyed free electricity supply before they began payment of N500 (about N160 to $1) per house per month. The later beneficiaries did not benefit from expectation of free power supply rather pay N500 per house and immediate increase to N1000 i.e. 100 percent increase. These changes might not be unconnected with the ongoing privatization policy of the dam which did not go down well with the community consumers of power supply.

iii. Pipe borne water

The coefficient of the interaction term of pipe borne water and dam is negative (-0.538 as in Table 4.13) at 1 percent significant level. This main effect implies that the probability of household's happiness in terms of pipe borne water supply is lower. Meaning, the dam is not able to influence to the host community enough pipe

borne water supplies to impact on their happiness. In terms of interaction effect, the mean interaction is negative (-0.164) and varied widely (as in Figure 4.24).

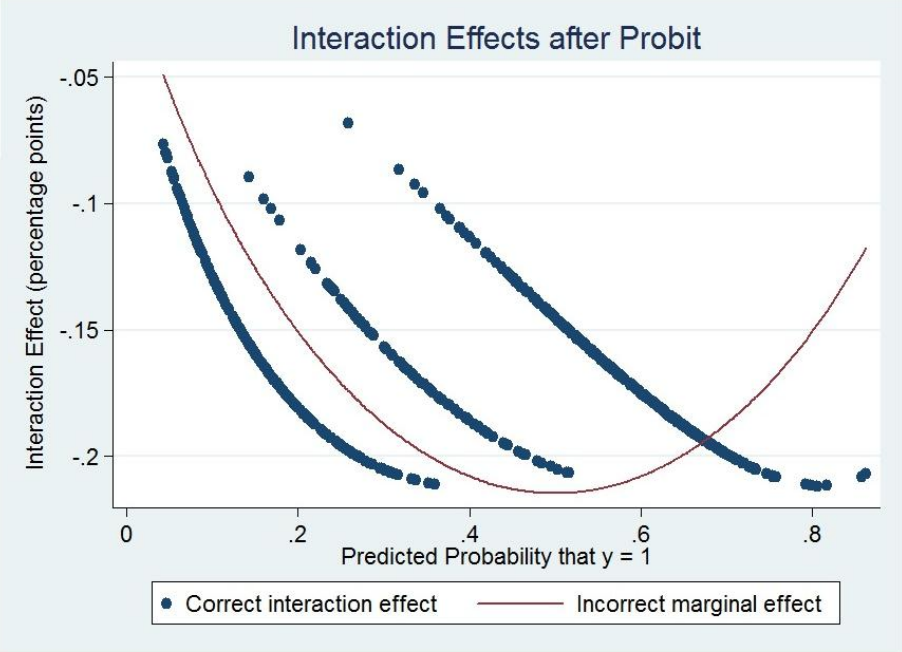

Figure 4.24
Interaction effect of pipe borne water as social amenity

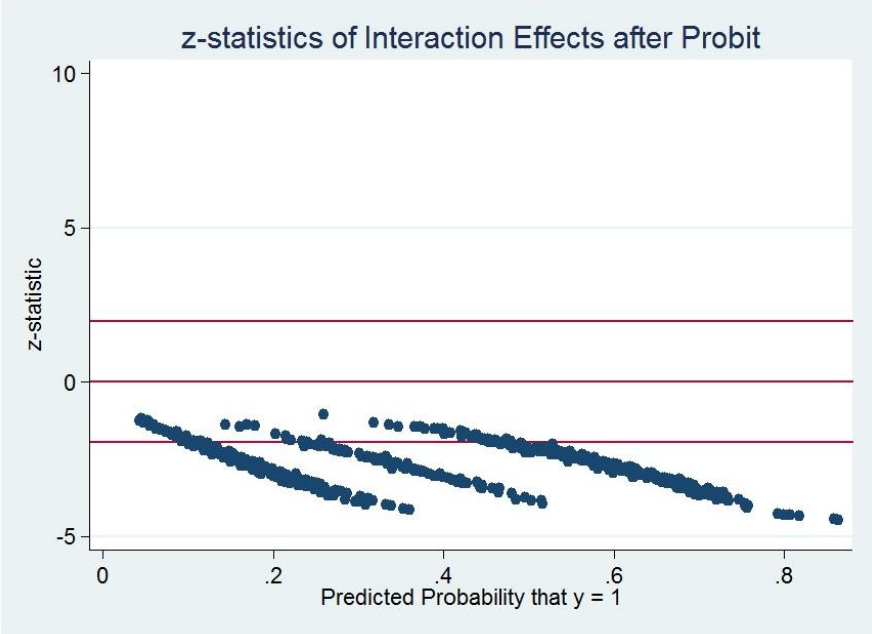

Figure 4.25
z-statistics of interaction effect of pipe borne water as social amenities

The result of the significance of the interaction effect connotes that the predicted negative probability is statistically significant and varied from the observation of 0 – beyond 0.8 (Figure 4.25).

The decline happiness in with pipe borne water might not be unconnected with the community's lack of tap-water. The major water access is the installed public manual bore bole in some strategic places in the villages for household use. These bore holes in most cases are not regularly maintain and therefore, when collapse get abandon for long time. Again, the rural dwellers fall back to the streams for their domestic consumption.

iv. Health care

The coefficient of interaction of health care and dam is negative i.e. -0. 413 which is not statistically significant (Table 4.13). This main effect implies that the predicted probability of heath care provision portrays decline happiness in the host community. In other words, installed dam in community is not able to influence to the host community enough health care services that would have impacted on their happiness. The mean interaction effect on the other hand is negative in Table 4.12 (-0.073), and not statistically significant. Figure 4.26 connote some few households around 0 – 0.4 whose interaction effect is positive.

In terms of statistical significant effect of the interaction, almost all the predicted probability of the households is statistically significant (Figure 4.27). The exception few group of people whose predictions are around 0 – 0.4 that have insignificant statistics. In other words, the graph attests that the Dam's host community has decline happiness in respect with health care provisions.

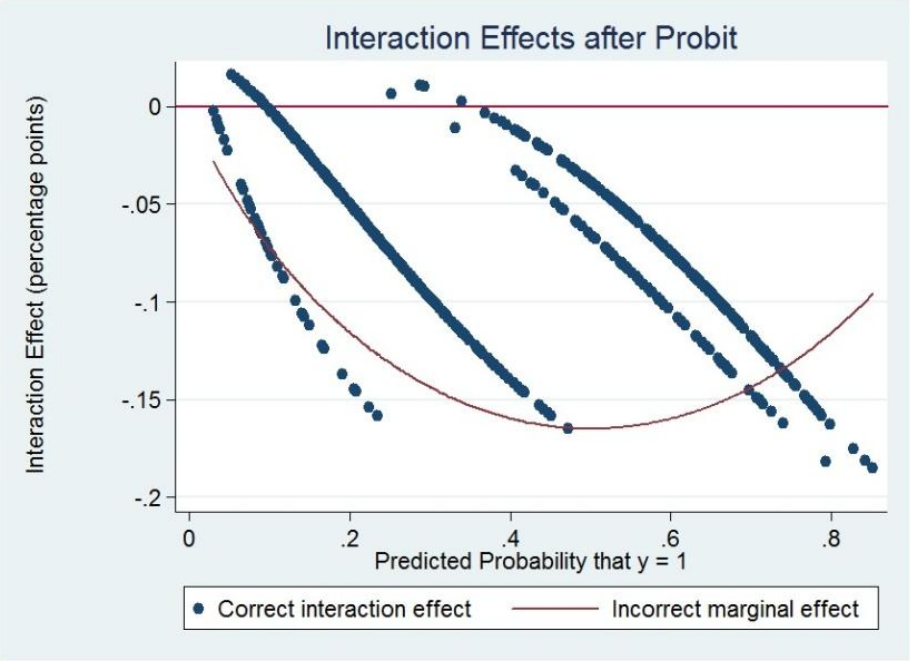

Figure 4.26
Interaction effect of health care as social amenity

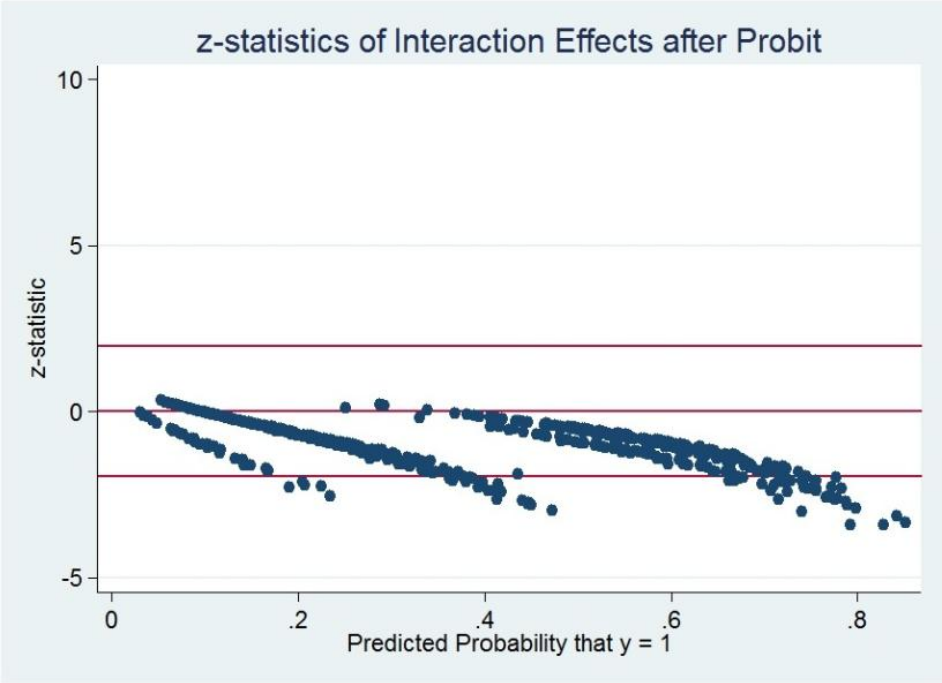

Figure 4.27
z-statistics of interaction effect of health care as social amenity

This might not be unconnected with extreme inadequate of functional rural health centres. Some of the villages have outfit called dispensary, which are hardly

functional. Some villages go extra miles to build local structures to attract or encourage government provide at least human resource required (e.g. Shiroro Village) to be able to fulfil the need (Figure 4.28) but in most cases, the villagers wallow in disappointment. However, with community road, serious health challenges are easily rushed to the local government head quarters – Kuta or even the state capital, which is less than 100 kilometres from the community.

Figure 4.28
Shiroro Village Community Dispensary

By implication, Shiroro community is not happy in terms of social amenities. Of course road infrastructures attract happiness as ealier found because that is the only provision the dam was able to attract to the community. However, this is not community intended rather; dam construction needed road to be able to accomplish the installation. Usman and Ifabiyi (2012) in earlier study of Shiroro Hydro Electricity Dam found that the dam impacted negatively on the value of the people and not able to attract neither other infrastructural services nor the authorities able to encourage the community to take advantage of the dam to improve their farming systems.

CHAPTER FIVE
SUMMARY AND RECOMMENDATION

5.1 Introduction

The chapter discusses research findings and offers policy recommendation of the study. In addition, the chapter also makes prone the limitations, conclusion and suggestions of future research in the study.

5.2 Summary of findings

The general objective of this study is to examine the impact of Shiroro Hydro Electricity Dam on the happiness of the host communities. In order to achieve this objective, two locations were involved for the study – Shiroro community where the dam is installed (treatment group) and Gurara community with similar river but no dam (control group). The control group serves as reference point or standard of measurement (counterfactual unit).

The study employs four different variables to capture the measurement of happiness. The variables are State Of Mind (SOM), Household Per Capita Income (HHY), Physical Environment (PEV) and Social Amenities. SOM is targeted at ascertaining the heartily burden/joy of the host community due to installed dam – subjective measurement of happiness or inner happiness. The rest of the three variables have to do with those things that physically bother/benefit the host community due to the installed dam. This is referred to objective measurement of happiness or outer happiness.

The study further employed two methods to achieve the objective. The methods are propensity score matching (PSM) method and binary probit model. The PSM uses information from a pool of groups that do not participate in a policy to identify what

would have happened to participating groups in the absence of the intervention. By comparing how outcomes differ between participants relative to control group (similar nonparticipants); it is possible to estimate the effects of the intervention. The first two variables – SOM and HHY are analysed with this method.

The last two variables (PEV and Social Amenities) are analysed with binary probit models where 'y' is a binary response. The variables take on the values of zero and one as indication of whether an event occurred or not. Traditionally, the definition of 'y' is referred to y = 1 as a success and y = 0 as a failure. Therefore, y = 1 = treatment group and y = 0 = control group.

The study assessed the happiness of Shiroro Hydro Electricity Dam host community with four specific objectives. The first objective was to ascertain whether the installed dam has affected community's State Of Mind with regard to happiness. This was based on the research question 'what is the communities State Of Mind as a result of installed dam'. Since major interest in PSM technique is the Average Treatment effect for the Treated (ATT). The result of ATT of the variable SOM, revealed less 58 percent happiness at 1 percent significant level. In other words, due to installed dam, the Shiroro community is less happy by 58 percent if compare to Gurara community. This finding therefore, fulfilled the mentioned objective, which also answers the research question of the aspect of the study.

The statement of null hypothesis of the first variable is 'the installed Shiroro Hydro Electricity Dam does not significantly affects the community's State Of Mind with regard to happiness. It is evident from the research as stated above that the installed Shiroro Hydro Electricity Dam affects the community's State Of Mind. Meaning, the

community is less happy by 58 percent. Therefore, the study reject the null hypothesis that the installed Shiroro Hydro Electricity Dam does not significantly affects the community's State Of Mind with regard to happiness.

The second objective is to measure the effect of Shiroro Hydro Electricity Dam on Household per Capita Income. This was based on the research Question 'what is the status of Household Per Capita Income in Shiroro Hydro Electricity Dam community'. The result of ATT of the variable HHY revealed 18 percent household per capita income increase at 1 percent significant level. In other words, due to installed dam, Shiroro community household experienced 18 percent increase per capita income if compare to Gurara community. The finding therefore, fulfilled the aforementioned objective, which answers the research question of the aspect of the study.

The null hypothesis statement of the HHY is 'the installed Shiroro Hydro Electricity Dam does not significantly improve the household per capita income of the community. The evidence from the result as aforementioned, the installed Shiroro Hydro Electricity Dam has brought about increase income by 18 percent at 1 percent significant level in the host community. Therefore, the study rejects the null hypothesis that the installed Shiroro Hydro Electricity Dam does not significantly improve the household per capita income of the community.

Probit model is used to analyse the PEV as a variable. The variable has seven independent variables and other demographics. The independent Variable grp_dam is interacted with other six independent variables to generate six models. Each of the interacted models is run independently to ascertain the interaction effect of dam on the happiness of the community in respect with environment (characteristics). The

interacted models has to do with flood, risk in farming occupation, decline in wild life population, urban influence, environmental chances and dam caused diseases (say malaria).

The third objective is to measure the happiness status of Shiroro Hydro Electricity Dam community in terms of Physical Environmental changes. This was based on the research question 'what is the status of the Shiroro Hydro Electricity Dam community's happiness in terms of their physical environment'. The results of interaction effects are; the mean coefficient of interaction of flood (Genvfd) is –0.165 and significant at 1%, farming risk (Genvagrisk) is 0.202 and significant at 1%, decline wild (Genvmit) is -0.200 at 1% significant level, urban (Gurban) influence is -0.223 at 1% significant level, environmental change (Genvchang) is -0.030 (not significant) and diseases (Genvilnes) is -0.148 at 1% significant level (Table 4.12). The findings revealed five independent variables with negative predicted happiness against one positive variable. Meaning, the community is not happy in terms of Physical Environment. These findings fulfilled the aforementioned objective, which answers the mentioned research question of the study.

The statement of null hypothesis of PEV is 'the installed Shiroro Hydro Electricity Dam does not significantly improve host community's happiness through physical environment. The evidence from the results of PEV as aforementioned proved that Shiroro Hydro Electricity Dam community has lowered predicted probability of happiness of the host community. Therefore, the study accept the null hypothesis that the installed Shiroro Hydro Electricity Dam does not significantly improve host community's happiness through physical environment.

Like the above, probit model is used to analyse Social Amenities (rural infrastructure) as a variable. The Social Amenities has six independent variables equations. The independent variable grp_dam is interacted with the rest five independent variables to generate five models. The interacted models are run independently to ascertain the interaction effect of dam on the happiness of the community in respect of Social Amenities (rural infrastructures). The interacted models has to do with School (Gschol), Road infrastructure (Groad), Rural electricity (Gelectr), Rural pipe borne water supply (Gwaterss) and Rural health care (Ghthcare).

The results of interaction effects are; the mean coefficient of interaction of Gschol is 0.098 and statistically insignificant, Groad is 0.107 and statistically insignificant, Gelectr is -0.100 and statistically insignificant, Gwaterss is -0.164 and statistically significant at1 % and Ghthcare is -0.073 and statistically insignificant (Table 4.15). Although, the result of Groad, Gelectr, Ghthcare are statistically not significant, pictorially, Figures 4.17b, 4.19b and 4.21b connotes that household's predicted probability are actually statistically significant. Out of the five variables, two of the variables show positive signs, which means higher predicted happiness while the last three shows negative signs, that is, decline or lower predicted happiness in terms of Social Amenities in the host community. Meaning, Shiroro community has lower or decline predicted probability of happiness in terms of Social Amenities.

The fourth objective is to ascertain whether Shiroro Hydro Electricity Dam is able to enhance happiness status of host community as measured by Social Amenities. This was based on research question 'How has the installed 'Shiroro Hydro Electricity Dam influence the happiness of the host community in terms of Social Amenities. Findings of the study revealed negative results in three independent variables as

against two with positive results – not happy. This outcome fulfilled the objective, which also answered the mentioned research question.

The statement of null hypothesis of Social Amenities is 'Shiroro Hydro Electricity Dam does not impact positively on happiness of host community as measured by Social Amenities. The evidence from the results of Social Amenities suggests that Shiroro Hydro Electricity Dam community has lowered predicted probability of happiness of the host community. Therefore, the study accepts the null hypothesis that the installed Shiroro Hydro Electricity Dam does not affect positively on happiness of the host community.

5.3 Policy Recommendation

Infrastructural project like dam is a coin of head and tail. There is no project like dam, no matter how positive its impacts may be, there must be its attached pains to the host community. Shiroro Hydro Electricity Dam has brought to the community unhappiness due largely to distortions of their socio economic values. Major predicaments that bother the community due largely to the dam are lose of farmland that metamorphosed to migration of farmers in search of upland farming and farmland flooding experiences. In the spirit of 'take and give", and for the fact that the community is an agrarian community, the study therefore, recommends the following:

1. Government should put up structure of flood forecast in place for early warning signals to minimise flood damage in the community. The responsibility of the structure should also include compensation system for support of flood victims and cushioning flood shock effect to the community.
2. To avoid further migration due to farmland lost and to change local perception in favour of available resources, farm-education or training scheme of the rural

community be introduced to encourage irrigation and fish farming since there is access to large water body throughout the year. To be successful, the program should embrace:

a. Provision of necessary financial support for farmer's (to encourage them implement) new farming method, introduce modern methods and seedling of shot time gestation and other farm input to facilitate dry season farming as cushion to flood effect in the community and as alternative farming provision.
b. Making provision (financial support) and encourage modern fishing in both raining seasons and building artificial or earthen ponds along the riverbanks during the dry seasons for the host community's fish farming.

3. There should be Rural Infrastructure Trust Fund (RITFund) that would be entrusted with responsibility of providing rural infrastructure or Social Amenities to Shiroro Hydro Electricity Dam host community. The RITFund revenue generation should be from a percentage of proceed from Shiroro Dam unit of Power Holding Company of Nigeria as a matter of policy. RITFund as an institution should be a custodian of generated revenue and entrust with the responsibility of channelling all host community infrastructure contracts.

It is always better to shift resources to the people then allowing people chase resources. Availability of these resources to the community will go along way at solving the problems of host community's migration of families, alleviate problem of inter-village/family land conflicts, and further improve household per capita income. Furthermore, it will cushion the effect to dam cause negative externalities of flood (-0.165), urban influence (-0.223), environmental change (-0.030), water borne

diseases (-0.448), rural electricity supply (-0.100), rural water supply (-0.164) and rural health care facility (-0.732) thus, enhance host community's happiness.

5.4 Conclusion

The findings of the research indicate that Shiroro Hydro Electricity dam host community is not happy. The results of three variables out of four are pointers to this conclusion. The variables HHY indicates improved income in the host community because of the dam. Although, improved income or riches is expected to bring happiness to a people, it is also logical to have improved riches without a follow up happiness. This might be because of the circumstances that surround the improvement such as associated pains of loss of farmland, deprivation of right to fatherland, deprivation of decision in matters that directly concern them, loss of cultures among others. These externalities are responsible for the unhappiness of the host community and are worthy counter of attention for improving income-associated happiness.

Although, Usman and Ifabiyi (2012) which is the major study on Shiroro dam cover Shiroro community and beyond to Kwara State, the findings of the study is similar with the findings of this study. They found that the project does more harm than good to the socio economic values of the host community and single out road infrastructure as a prominent benefit of the community. In their words "60% of the respondents could not see any positive contribution the project has made on their livelihoods (rather then) … improved road network". This study also found that the community is not happy. However, road infrastructure variable predicted probability of interaction effect is positive.

It is also apparent that, at the end of this study a further step is achieved in the study of Dams in Nigeria. To our knowledge, most of the studies on Dams in Nigeria

center their methods of analysis on socio economic values around the immediate gouges and suburb of the rivers. However, this study employed Propensity Score Matching method where two locations form the focal points of the study – treatment and control groups. The treatment group being the catchment areas of the Shiroro Hydro Electricity Dam while the control group being another gouge (Gurara River) that has similar characteristics with treatment group i.e. counterfactual group. The control group forms the reference point of the analysis.

Secondly, introducing happiness studies in Nigeria is a value addition to the academia. Happiness is generally not common in the developing countries and Nigeria in particular. Introducing happiness studies is like opening a new academic chapter in Nigeria. In addition, the wisdom behind it is, since some specific infrastructures have become subjects of grievance that generates violence in Nigeria, happiness studies should be able to expose the importance of happiness to economic development and as coolant to violence phenomena.

The study's policy implication is that the two recommendations of the study if strictly implemented would serve as poverty alleviation policy to the immediate host community. The host community will not only have improved income but happier which means more productivity. This is not all, but government taking queue from this by applying it to other sensitive infrastructures that has been generating hits in the economy will go along way at resolving grievances for happier atmosphere. In other words, solving poverty problems, increase income of the communities involved in cases like this will go along way at reducing violence and crime at macro level in Nigeria.

5.5 Contribution of the study

There two academic contributions of this study to the existing body of knowledge. In the first place, to our knowledge, no study has employ Propensity Score Matching method where two points forms the focal points in respect with data collection – treatment group and control group. The treatment group being the catchment area of the dam while the control group which is another gorge or river that has similar characteristics i.e. counterfactual group. PSM is said to have advantage of not necessarily requiring a baseline or panel survey, but of course, it satisfies the conditional independence assumption by matching the groups based on the multidimensional vector X^2. Secondly, although observations are dropped to achieve the common support, PSM increases the likelihood of sensible comparisons across the groups, potentially lowering bias in the program impact due to fewer impositions of constraints on the functional treatment model (Becker & Ichino, 2002; Khandker, *et al.*, 2010).

Secondly, in developing countries and Nigeria in particular, studies on happiness are not common. " Most of the original studies of happiness, by both economists and psychologists, focused on OECD countries, and in particular the United States and Europe, all of which were countries that had reached a certain level of economic prosperity" (Graham, 2009). Since some infrastructures has become subjects of grievance that generated violence in Nigeria, this study introduced happiness studies viz a viz infrastructure (Dam) to ascertain the level of happiness in a Nigeria's rural fraction and therefore, serve as value addition to the academia.

5.6 Limitation of the study

This study has a few shortcomings that hampered precision in data collection and computation. The first problem is difficulty at retrieving information about the

income of the rural dweller. The respondent tended to be stringent at revealing information about their annual income. Therefore, the study resorted to use household consumption expenditure as a proxy for household income.

Secondly, ethically, consumption and savings make up income. However, the respondents are also not willing to reveal information about their savings. The responses are that, they do not have any savings to others. This might not be unconnected with security reasons or might portray the picture of large-scale poverty in the locality. Therefore, the study is silent about savings in the determining household per capita income.

Thirdly, the dam had been installed since 1990 therefore; accurate information about after dam effect is supposed to cover over 20 years. This is very difficult to come by because of the long period, age of respondent involved and calibre of the respondents. That is to say, some of the respondents were very young at the earlier ages of the dam and majority of the respondent are non literate, thus, will not be articulate enough about information of long past years. Therefore, to solve this problem and forge-ahead, the study used information of recent years of 2013 and 2014 to represent after dam experience.

5.7 Suggestion for future research

Since this research on happiness concerns sub-sector of a rural community and for the fact that happiness study is not yet embraced in Nigeria, there is the need for applicability of happiness studies to socio-economic issues at macro level. The reason may not be farfetched. Violence is a common phenomenon in Nigeria and in the words of Pearlstein (2012) "Unhappy people are more likely to find themselves in unproductive or even destructive conflict than happy people". Therefore,

application of happiness study to socio-economic national issues is a good area for future studies. These areas could include electricity or energy sector most especially that it is currently undergoing privatization, petroleum sector, culture, spirituality *inter alia.* These are sensitive and violence prone sectors hence good areas of future studies to check or reduce violence.

REFERENCES

Adenikinju, A. F. (2005). *Analysis of the cost of infrastructure failures in a developing economy: The case of the electricity sector in Nigeria* (Vol. 148): African Economic Research Consortium.

Adetola, A., Goulding, J., & Liyanage, C. (2010). A Critical Appraisal of Road Transport Infrastructure Management in Nigeria. *Public Private Partnerships*, 77 - 88..

Adomi, E. E., Ayo, B. T., & Nakpodia, E. (2007). A better response rate for questionnaires: Attitudes of librarians in Nigerian University Libraries. *phylosophy and Practce*, 1 - 7.

Agénor, P.-R. (2010). A theory of infrastructure-led development. *Journal of Economic Dynamics and Control, 34*(5), 932-950.

Ahmed, M. H., Teferra, A. T., Yuya, B. A., & Melese, K. A. (2014). Impact of Soil Conservation on Farm Efficiency of Maize Growers in Arsi Negelle, Central Rift Valley of Ethiopia. *International Journal of Economics and Empirical Research (IJEER), 2*(2), 36-43.

Ahuvia, A. C. (2002). Individualism/collectivism and cultures of happiness: A theoretical conjecture on the relationship between consumption, culture and

subjective well-being at the national level. *Journal of Happiness Studies, 3*(1), 23-36.

Ai, C., & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics letters, 80*(1), 123-129.

Akinwale, A. A. (2010). The menace of inadequate infrastructure in Nigeria. *African Journal on Science, Technology, Innovation and Development, 2*(3), 208-229.

Aleseyed, M., Rephann, T., & Isserman, A. (2003). The Local Economic Effects of Large Dam Reserviors: U.S Experience 1975 - 95. *Revised version published in Review of Urban and Regional Development Studies., 10*(2), 91 - 108.

Anderson, D. R., Sweeney, D. J., & Williams, T. A. (2011). *Statistics for Business and Economics*. Mason, USA: South-Western, Cengage Learning.

Anielski, M. (2007). *The economics of happiness: Building genuine wealth*. Gabriola Island, Canada: New Society Publishers.

Anwana, E. (2010). Impact of Oil Exploitation on Sustainable Development and Green Economy in Nigeria: The Niger Delta Case.

Argyle, M. (2001). *The psychology of happiness*. East Sussex: Routledge.

Askarov, M. (2012). The Significance of Being Downstream: Uzbek Concerns Over the Rogun Dam. *Research in Social Problems and Public Policy, 20*, 65-74.

Ayilla, M. (1990). IBB Commissions Shiroro Dam, *New Nigerian Newspaper*, p. 1 and 3.

Ayogu, M. D. (2000). *The political economy of infrastructure investments in Nigeria.* Paper presented at the Annual Bank Conference on Development Economics Washington, DC.

Babatunde, O., Afees, S. A., & Olasunkanmi, O. I. (2012). Infrastructure and Economic Growth in Nigeria: A multivariate Approach. *Research Journal of Business Management and Accounting 1*(3), 30-39.

Barrow, R. (2012). *Happiness* (Vol. 131). New York: Routledge.

Becerril, J., & Abdulai, A. (2010). The impact of improved maize varieties on poverty in Mexico: a propensity score-matching approach. *World Development*, *38*(7), 1024-1035.

Beck, M. W., Claassen, A. H., & Hundt, P. J. (2012). Environmental and Livelihood Impacts of Dams: Common Lessons across Development Gradients that Challenge Sustainability. *International Journal of River Basin Management, 10*(1), 73-92.

Becker, S. O., & Ichino, A. (2002). Estimation of average treatment effects based on propensity scores. *The stata journal*, *2*(4), 358-377.

Bekhet, A. K., Zauszniewski, J. A., & Nakhla, W. E. (2008). Happiness: Theoretical and Empirical Considerations. *Nursing Forum, 43*(01), 12-23.

Bentham, J. (1781). *An Introduction to the Principles of Morals and Legislation, reprint: Kitchener* : Batoche Books.

Biswas-Diener, R. (2008). Material wealth and subjective well-being. In M. Eid & R. J. Larsen (Series Eds.), *The science of subjective well-being* (pp. 307-322).

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of public Economics, 88*(7), 1359-1386.

Boniwell, I. (2008). *Positive psychology in a nutshell: A balanced introduction to the science of optimal functioning*: Personal Well-Being Centre.

Boswell, T., & Dixon, W. J. (1993). Marx's theory of rebellion: A cross-national analysis of class exploitation, economic development, and violent revolt. *American sociological review*, 681-702.

Brown, S., Taylor, K., & Wheatley Price, S. (2005). Debt and distress: Evaluating the psychological cost of credit. *Journal of economic psychology, 26*(5), 642-663.

Bruni, L. (2006). Civil Happiness: Economics and Human Flourishing in Historical Perspective: New York: Routledge.

Bruni, L. (2007). The 'Technology of Happiness' and the Tradition of Economic Science L. Bruni & P. L. Porta (Eds.), *Handbook on the Economics of Happiness*

Bruni, L., & Stanca, L. (2006). Income aspirations, television and happiness: Evidence from the world values survey. *Kyklos, 59*(2), 209-225.

Bryceson, D. F., Bradbury, A., & Bradbury, T. (2008). Roads to poverty reduction? Exploring rural roads' impact on mobility in Africa and Asia. *Development policy review, 26*(4), 459-482.

Burnett, S. (2011). *The Happiness Agenda: A Modern Obsession*: Palgrave Macmillan.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys, 22*(1), 31-72.

Carolyn, H., Maffioli, A., & Vazquez, G. (2010). Impact Evaluation Guidelines: A premier for applying Propensity Score Maching (pp. 1 - 56): Inter-America Development Bank.

CBN. (2000). *The Changing Structure of Nigerian Economy and the Implcation for Development*. Lagos: Real Communication Ltd.

Chandra, A., & Thompson, E. (2000). Does public infrastructure affect economic activity?: Evidence from the rural interstate highway system. *Regional Science and Urban Economics, 30*(4), 457-490.

Chirwa, T. G. (2010). Program evaluation of agricultural input subsidies in Malawi using treatment effects: Methods and practicability based on propensity scores *Millennium Challenge Account - Malawi*: Munich Personal RePEc Archive (MPRA).

Choy, Y. K. (2004). Sustainable Development and the Social and Cultural Impact of a Dam-Induced Development Strategy-the Bakun Experience. *Pacific Affairs*, 50-68.

Christopher J. Boyce1, Wood, A. M., Banks, J., Clark, A. E., & Brown, G. D. A. (2013). Money, Well-Being, and Loss Aversion: Does an Income Loss Have a Greater Effect on Well-Being Than an Equivalent Income Gain? *Psychological Science 24*(12), 2557–2562.

Cluver, L., Boyes, M., Orkin, M., Pantelic, M., Molwena, T., & Sherr, L. (2013). Child-focused state cash transfers and adolescent risk of HIV infection in South Africa: a propensity-score-matched case-control study. *The lancet global health, 1*(6), e362-e370.

Collier, P., & Hoeffler, A. (2004). Greed and grievance in civil war. *Oxford economic papers, 56*(4), 563-595.

Costley, C., Friend, L., Meese, E., Ebbers, C., & Wang, L. J. (2011). Happiness, Consumption and Being. *Research in Consumer Behavior, 11*, 209-240.

Coulmas, F. (2010). The Quest for Happiness in Japan. *関西学院大学先端社会研究所紀要= Annual review of the institute for advanced social research*(2), 1-25.

Curini, L., Jou, W., & Memoli, V. (2014). How moderates and extremists find happiness: Ideological orientation, citizen–government proximity, and life satisfaction. *International Political Science Review, 35*(2), 129-152.

Datta, G., & Meerman, J. (1980). Household Income or Household Income Per Capita in Welfare Comparisons. *Review of Income and Wealth, 26*(4), 401-418.

De Vries, M. F. K. (2009). *Sex, Money, Happiness, and Death: The Quest for Authenticity*. Hampshire: Palgrave Macmillan.

Di Tella, R., & MacCulloch, R. (2008). Gross national happiness as an answer to the Easterlin Paradox? *Journal of Development Economics, 86*(1), 22-42.

Diener-Ed, & Martin, S. (2009). Beyond Money: Toward an Economy of Well-being. In E. Diener (Ed.), *The Science of Well-Being* (pp. 201-265). New York: Springer.

Diener, E. (2000). Subjective Well-being: The Science of Happiness and a Proposal for a National Index. *American psychologist, 55*(1), 34.

Diener, E., & Biswas-Diener, R. (2002). Will money increase subjective well-being? *Social indicators research, 57*(2), 119-169.

Diener, E., & Biswas-Diener, R. (2005). Psychological empowerment and subjective well-being. *Measuring empowerment: Cross-disciplinary perspectives*, 125-140.

Diener, E., & Seligman, M. E. P. (2009). The Science of Well-being Social Indicator Reseach Series 37, E. Diener (Ed.) *Beyond Money: Toward an Economy of Well-Being* (pp. 201-265).

Dipietro, W. R., & Anoruo, E. (2006). GDP per capita and its challengers as measures of happiness. *International Journal of Social Economics, 33*(10), 698-709.

Dolan, P., Peasgood, T., & White, M. (2008). Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of economic psychology, 29*(1), 94-122.

Dotson, T. (2012). Technology, choice and the good life: Questioning technological liberalism. *Technology in Society, 34*(4), 326-336.

Drakopoulos, S., & Karayiannis, A. (2007). Human Needs Hierarchy and Happiness: Evidence from the Late Pre-Classical and Classical Economics. In B. Luigino & P. P. Luigi (Eds.), *Handbook on the Economics of Happiness* (pp. 53-67). Cheltenham, UK:: Edward Elgar Publishing.

Duflo, E., & Pande, R. (2005). Dams: National Bureau of Economic Research.

Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization, 27*(1), 35-47.

Easterlin, R. A. (2005). Building a Better Theory of Wellbeing L. B. a. P. L. Porta (Ed.) *Economics and Happiness: Framing the Analysis*

Easterlin, R. A. (2006). Life cycle happiness and its sources: Intersections of psychology, economics, and demography. *Journal of economic psychology, 27*(4), 463-482.

Ebrahimnejad, S., Mousavi, S. M., & Seyrafianpour, H. (2010). Risk identification and assessment for build–operate–transfer projects: A fuzzy multi attribute decision making model. *Expert Systems with Applications, 37*(1), 575-586.

Estache, A. (2008). Infrastructure and development: A survey of recent and upcoming issues. *Rethinking infrastructure for development, 2*, 47.

Etiosa, U. (2006). Dams are Unrenewable: A Discussion Paper. Community Research and Development Centre, Nigeria.

Ezeazu, E. (1998). 15 Years is Enough: Shiroro Communities Fight Back. *Community: The Quqrterly Publication of Community Action for Popular Participation, 03,* 16-18.

Faiz, A., Faiz, A., Wang, W., & Bennett, C. (2012). Sustainable Rural Roads for Livelihoods and Livability. *Procedia-Social and Behavioral Sciences, 53*, 1-8.

Floyd, D. (2011). Do traditional measures of economic performance really satisfy the needs of citizens for a better society? *International Journal of Social Economics, 38*(3), 218-223.

Foster, V., & Pushak, N. (2011). Nigeria's infrastructure: a continental perspective *Policy Research Working Paper Series*: World Bank.

Fourie, J. (2006). Economic infrastructure: a review of definitions, theory and empirics. *South African Journal of Economics, 74*(3), 530-556.

Frank, R. H. (2005). Does Absolute Income Matter? l. Brune & P. L. Porta (Eds.), *Economics and Happiness: Framing the Analysis*

Frankfort-Nachmias, C., & Nachmias, D. (2007). *Research methods in the social sciences*: Worth Publishers.

Frey, B. (2008) Happiness: A revolution in Economics. *Munich lectures in Economics*. London: The MIT Press.

Frey, B., & Stutzer, A. (2000). Maximising happiness? *German Economic Review, 1*(2), 145-167.

Frey, B., & Stutzer, A. (2002a). The economics of happiness. *World Economics, 3*(1), 1-17.

Frey, B., & Stutzer, A. (2002b). *Happiness and economics: How the economy and institutions affect human well-being*. New Jersey: Princeton University Press.

Frey, B., & Stutzer, A. (2005a). *Economics and Happiness: Framing the Analysis: Framing the Analysis*: Oxford University Press.

Frey, B., & Stutzer, A. (2005b). *Testing Theories of Happiness*. New York: Oxford University Press.

Frey, B., & Stutzer, A. (2008). The thirst for happiness. *Journal of International Business Ethics Vol.1 No.1 2008, 01*(02), 07 - 17.

Frey, B. S. (2011). Peace, war and happiness: Bruder Klaus as wellbeing facilitator. *International Journal of Wellbeing, 1*(2).

Frey, B. S., & Stutzer, A. (2007). The Thirst for Happiness. *International Journal of Business Ethic, 01*(01), 07-17.

Frischmann, B. M. (2005). An economic theory of infrastructure and commons management. *bepress Legal Series*, 609.

Fu, B.-J., Wu, B.-F., Lü, Y.-H., Xu, Z.-H., Cao, J.-H., Niu, D., . . . Zhou, Y.-M. (2010). Three Gorges Project: Efforts and challenges for the environment. *Progress in Physical Geography*.

Gaillard, R. (2010). Nigeria: capacity Bulding for PPP Infrastructure. In M. M. M Hassan, E Negash (Ed.), *Project Appraisal Report*: African Development Fund.

Gajigo, O., & Lukoma, A. (2011). Infrastructure and Agricultural Productivity in Africa. *Market Brief, 23 November, 2011*. Retrieved from www.adb.org website:

Gavin, J. H., & Mason, R. O. (2004). The value of happiness in the workplace. *Organizational Dynamics, 33*(4), 379-392.

GPP. (2012). Global Poverty Info Bank. *Conflict and poverty*. Retrieved from http://www.globalpovertyproject.com/pages/contact_us

Graham, C. (2009). *Happiness around the world: The paradox of happy peasants and miserable millionaires*: Oxford University Press.

Greene, W. (2010). Testing hypotheses about interaction terms in nonlinear models. *Economics Letters, 107*(2), 291-296.

Guardiola, J., González-Gómez, F., García-Rubio, M., & Lendechy-Grajales, Á. (2013). Does Higher Income Equal Higher Levels of Happiness in Every Society? The Case of the Mayan People. *International Journal of Social Welfare, 22*(1), 35-44.

Hafsaas-Tsakos, H. (2011). Ethical implications of salvage archaeology and dam building: The clash between archaeologists and local people in Dar al-Manasir, Sudan. *Journal of Social Archaeology, 11*(1), 49-76.

Haybron, D. M. (2001). Happiness and Pleasure. *Philosophy and Phenomenological Research, LXII*,(03), 501 - 528.

Haybron, D. M. (2005). On Being Happy or Unhappy. *Philosophy and Phenomenological Research, 71*(2), 287-317.

Haybron, D. M. (2008a). Philosophy and Science of Well being. In M. Eid & R. J. Larsen (Eds.), *The Science of Subjective Well Being* (pp. 17 - 43). New York: The Guilford Press.

Haybron, D. M. (2008b). *The Pursuit of Unhappiness:The Elusive Psychology of Well-Being*. New York: Oxford University Press Inc.

Headey, B. (2007). The set-point theory of well-being needs replacing: on the brink of a scientific revolution? : Discussion papers//German Institute for Economic Research.

Hefferon, K., & Boniwell, I. (2011). *Positive Psychology: Theory, Research and Applications* (First ed.). England: Open University Press.

Heinrich, C., Maffioli, A., & Vazquez, G. (2010). A primer for applying propensity-score matching: Inter-American Development Bank.

Helliwell, J., Layard, R., & Sachs, J. (2013). World happiness report.

Helliwell, J. F. (2003). How's life? Combining individual and national variables to explain subjective well-being. *Economic Modelling, 20*(2), 331-360.

Helliwell, J. F. (2006). Well-Being, Social Capital and Public Policy: What's New? *The Economic Journal, 116*(510), C34-C45.

Helliwell, J. F., & Huang, H. (2006). How's Your Government?: International Evidence Linking Good Government and Well-being: Cambridge Univ Press.

Hurst, M., Dittmar, H., Bond, R., & Kasser, T. (2013). The relationship between materialistic values and environmental attitudes and behaviors: A meta-analysis. *Journal of Environmental Psychology, 36*, 257-269.

Iacono, M., & Levinson, D. (2012). Rural Highway Expansion and Economic Development: Impacts on Private Earnings and Employment.

Iganiga, B., & Unemhilin, D. (2011). The Impact of Federal Government Agricultural Expenditure on Agricultural Output in Nigeria.

Inoni, O. (2009). Effect of road infrastructure on agricultural output and income of rural households in Delta State, Nigeria. *Agricultura Tropica et Subtropica, 42* - 32.

Iwayemi, A. (2008). *Nigeria's Dual Energy Problems: Policy Issues and Challenges.* Paper presented at the Proceedings of 31st International Conference of International Association for Energy Economics.

Kacapyr, E. (2008). Cross-country determinants of satisfaction with life. *International Journal of Social Economics*, *35*(6), 400-416.

Kaun, D. E. (2005). Income and happiness: earning and spending as sources of discontent. *The Journal of Socio-Economics, 34*(2), 161-177.

Kavetsos, G., & Koutroumpis, P. (2011). Technological affluence and subjective well-being. *Journal of economic psychology, 32*(5), 742-753.

Kesebir, P., & Diener, E. (2009). In pursuit of happiness: Empirical answers to philosophical questions *The Science of Well-Being* (pp. 59-74): Springer.

Kessides, C. (1993). *The contributions of infrastructure to economic development: A review of experience and policy implications* (Vol. 213): World Bank Publications.

Khan, M. T., Islam, M., Chattha, T. H., & Hayat, R. (2011). Impacts of Mini Dams on Socioeconomic Development of Farmers of Rainfed Region. *Journal of Agriculture and Social Sciences, 7 - 18*.

Khandker, S. R., Koolwal, G. B., & Samad, H. A. (2010). Handbook on Impact Evaluation : Quantitative Methods and Practices

Kimball, M., & Willis, R. (2006). Utility and happiness. *University of Michigan*.

Kotrlik, J. W. K. J. W., & Higgins, C. C. H. C. C. (2001). Organizational research: Determining appropriate sample size in survey research appropriate sample size in survey research. *Information technology, learning, and performance journal, 19*(1), 43.

Kumudu, G., William, A., & Lakshmanan, T. (2008). Highway-induced development: evidence from Sri Lanka. *World Development, 36*(11), 2371-2389.

MacKerron, G. (2012). Happiness economics from 35 000 feet. *Journal of Economic Surveys, 26*(4), 705-735.

MacKerron, G., & Mourato, S. (2013a). Happiness is Greater in Natural Environments. *Global Environmental Change, 23* (5), 992-1000.

MacKerron, G., & Mourato, S. (2013b). Happiness is greater in natural environments. *Global Environmental Change, 23*(5), 992-1000.

Mahadea, D., & Rawat, T. (2008). Economic growth, income and happiness: An exploratory study. *South African Journal of Economics, 76*(2), 276-290.

Mahanta, C. (2010). India's North East and Hydropower Development Future Security Challenges. *South Asian Survey, 17*(1), 131-146.

Marcellus, I. O. (2009). Development planning in nigeria: reflections on the national economic empowerment and development strategy (NEEDS) 2003-2007. *J. Soc Sci, 20*(3), 197-210.

Martin, M. W. (2012). *Happiness and the good life*: Oxford University Press.

Masood, A., Ellahi, N., & Batool, Z. (2012). International Journal of Basic and Applied cience.

McCabe, S., & Johnson, S. (2013). The Happiness Factor in Tourism: Subjective Well Being and Social Tourism. *Annals of Tourism Research, 41*, 42-65.

McMahon, D. M. (2008). The Pursuit of Happiness in History. In M. Eid & R. J. Larsen (Eds.), *The Science of Subjective Well-being* (pp. 80-93). New York: Guilford Press.

Melgar, N. (2012). Interaction effects in probit models, reinterpreting the impact of education on attitudes towards immigrants and free-trade. *Journal of Reviews on Global Economics, 1*, 82-88.

Mohit, M. A. (2013). Quality of Life in Natural and Built Environment–An Introductory Analysis. *Procedia-Social and Behavioral Sciences, 101*, 33-43.

Morgan, S., & Winship, C. (2007). *Counterfactuals and Causal Inference: Methods and Principles for Social Research*. Cambridge: Cambridge University Press.

Mudzengi, B. K., Ejide, B., Tamuno, S. O., Iroh, W. O., Muchenje, F., Moruff, M., . . . Salam, A. (2012). An Assessment of the Socio-Economic Impacts of the Construction of Siya Dam in the Mazungunye Area: Bikita Distrct of Zimbabwe. *Journal of Sustainable Development in Africa, 14*(4), 1-17.

Mullen, J. (2007). Productivity growth and the returns from public investment in R&D in Australian broadacre agriculture. *Australian Journal of Agricultural and Resource Economics, 51*(4), 359-384.

Nelson, J. P. (2004). Meta-analysis of airport noise and hedonic property values. *Journal of Transport Economics and Policy (JTEP), 38*(1), 1-27.

Ness, D. (2007). Sustainable infrastructure: Doing more with less by applying eco-efficiency principles. *Sustainable Infrastructure in Asia*, 87.

Nettle, D. (2005). *Happiness: The science behind your smile*. New Yorks: Oxford University Press.

NewsWatch. (2011). Crisis Waiting For Opportunity'

Nordenfelt, L. (1996). *Quality of life, Health and Happiness*. Hants: Avebury - Ashgate Publishing Limited.

Norton, E. C., Wang, H., & Ai, C. (2004). Computing interaction effects and standard errors in logit and probit models. *Stata Journal, 4*, 154-167.

NPC. (2010). *Population Distribution by Sex, States, LGAs, and Senatorial Districts*. Abuja: Federal Republic of Nigeria.

NSG, N. S. G. (2011). Niger State Vision 3:2020. In M. K. Yahaya (Ed.), (pp. 1 - 344): Niger State Government.

Nussbaum, M. (2005). Mill between Aristotle and Bentham L. Bruni & P. L. Porta (Eds.), *Economics and Happiness: Framing The Analysis*

O'Brien, C. (2008). Sustainable happiness: How happiness studies can contribute to a more sustainable future. *Canadian Psychology/Psychologie canadienne, 49*(4), 289.

O'Brien, C. (2010). Sustainability, happiness and education. *Journal of Sustainability Education, 1*.

Oguzor, N. S. (2011). A spatial analysis of infrastructures and social services in rural Nigeria: Implications for public policy.

Ogwude, I. (2011). Trasport Infratructure and Mobility in Nigeria. *Journal of International Development, 9*(1), 456 - 467.

Oishi, S., Graham, J., Kesebir, S., & Galinha, I. C. (2013). Concepts of happiness across time and cultures. *Personality and Social Psychology Bulletin, 39*(5), 559-577.

Olaseni, M., & Alade, W. (2012). Vision 20: 2020 and the Challenges of Infrastructural Development in Nigeria. *Journal of Sustainable Development, 5*(2), p63.

Olukanni, D. O., & Salami, A. W. (2012). Assessment of Impact of Hydropower Dams Reservoir Outflow on the Downstream River Flood Regime–Nigeria's Experience. *Hydopower-Practice and Application*, 61-82.

Oyefusi, A. (2007). Oil-dependence and Civil conflict in Nigeria.

Oyefusi, A. (2008). Oil and the probability of rebel participation among youths in the Niger Delta of Nigeria. *Journal of Peace Research, 45*(4), 539-555.

Pacek, A. C. (2009). Politics and Happiness: An Empirical Ledger. In A. K. Dutt & B. Radcliff (Eds.), *Happiness, Economics and Politics: Towards A Multi-disciplinary Approach* (pp. 231-255). Cheltenham: Edward Elgar

Paki, F., & Ebienfa, K. (2011). Militant Oil Agitations in Nigeria's Niger Delta and the Economy. *International Journal of Humanities and Social Science, 1*(5), 140-145.

Pasinetti, L. (2005a). Paradoxes of happiness in economics. *Economics & Happiness: Framing the Analysis, Oxford University Press, Oxford*, 336-343.

Pasinetti, L. (2005b). Paradoxes of happiness in economics L. Bruni & P. L. Porta (Eds.), *Economics and Happiness: Framing the analysis*

Pearlstein, A. (2012). Pursuit of Happiness and Resolution of Conflict: An Agenda for the Future of ADR. *Pepperdine Dispute Resolution Law Journal*, *12*(215), 215-351.

Peiro, A. (2006). Happiness, satisfaction and socio-economic conditions: Some international evidence. *The Journal of Socio-Economics, 35*(2), 348-365.

Poff, N. L., & Hart, D. D. (2002). How Dams Vary and Why It Matters for the Emerging Science of Dam Removal: An ecological classification of dams. *BioScience*, *52*(8), 659-668.

Porta, P. L., & Scazzieri, R. (2007). 5 Public happiness and civil society. *Handbook on the Economics of Happiness*, 95.

Rankin, W. J. (2009). Infrastructure and the international governance of economic development, 1950–1965. *InternatIonalIzatIon of Infrastructures*, 61.

Read, D. (2004). Utility theory from jeremy bentham to daniel kahneman.

Rehdanz, K., & Maddison, D. (2005). Climate and happiness. *Ecological Economics, 52*(1), 111-125.

Rephann, T., Dalton, M., Stair, A., & Isserman, A. (1997). Casino gambling as an economic development strategy. *Tourism Economics, 3*(2), 161-183.

Robertson, I., & Cooper, C. (2011). *Well-Being, Productivity and Happness at work*. New York: Palgrave Macmillan.

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual review of psychology, 52*(1), 141-166.

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of personality and social psychology, 57*(6), 1069.

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of personality and social psychology, 69*(4), 719.

Sekaran, U., & Roger, B. (2010). *Research methods for business: A skill building approach*: John Wiley & Sons.

Sen, A. (1993). *Capability and well-being*: na.

Sengupta, R., Coondoo, D., & Rout, B. (2007). Impact of a Highway on the Socio-economic Well-being of Rural Households Living in Proximity. *Contemporary Issues and Ideas in Social Sciences, 3*(3).

Serrano-Domingo, G., & Requena-Silvente, F. (2013). Re-examining the migration–trade link using province data: An application of the generalized propensity score. *Economic Modelling, 32*, 247-261.

Shehu, A., & Sidique, S. F. (2014). A propensity score matching analysis of the impact of participation in non-farm enterprise activities on household wellbeing in rural Nigeria. *UMK Procedia, 1*, 26-32.

Sheldon, K. M., & Lyubomirsky, S. (2007). Is it possible to become happier?(And if so, how?). *Social and Personality Psychology Compass, 1*(1), 129-145.

Sizer, L. (2010). Good and Good For You: An Affect Theory of Happiness1. *Philosophy and Phenomenological Research, 80*(1), 133-163.

Sophie, N. (2007). Addressing the Social Impacts of Large Hydropower Dams. *Journal of International Policy Solutions, 7*, 11-17.

Start, D. (2001). The Rise and Fall of the Rural Non-farm Economy: Poverty Impacts and Policy Options. *Development policy review, 19*(4), 491-505.

Stryker, D., Camera, A., Pokrel, P., & Raisman, M. (2008). Nigeria: Economic Perfomance Assessment: United State Agency for International Development (USAID).

Stuart, E. A., Lee, B. K., & Leacy, F. P. (2013). Prognostic score–based balance measures can be a useful diagnostic for propensity score methods in comparative effectiveness research. *Journal of clinical epidemiology, 66*(8), S84-S90. e81.

Stutzer, A., & Frey, B. S. (2006). Does marriage make people happy, or do happy people get married? *The Journal of Socio-Economics* (35), 326–347.

Tan, Y., Hugo, G., & Potter, L. (2005). Rural women, displacement and the Three Gorges Project. *Development and Change, 36*(4), 711-734.

Tavits, M. (2007). Principle vs. pragmatism: policy shifts and political competition. *American Journal of Political Science, 51*(1), 151-165.

Tay, L., Morrison, M., & Diener, E. (2014). Living Among the Affluent Boon or Bane? *Psychological science*, 0956797614525786.

Tenaglia, S. (2007). Testing theories on happiness: A questionnaire: Working paper, University of Tor Vergata–Roma.

Tian, G., & Yang, L. (2005). A Formal Economic Theory for Happiness Studies: A Solution to the Happiness-Income Puzzle: Mimeo, Texas A&M University.

Tilt, B., Braun, Y., & He, D. (2009). Social impacts of large dam projects: A comparison of international case studies and implications for best practice. *Journal of environmental management, 90*, S249-S257.

Torrisi, G. (2009). Infrastructures and economic performance: a critical comparison across four approaches.

Tumbare, M. J. (2008). Managing Lake Kariba sustainably: threats and challenges. *Management of Environmental Quality: An International Journal, 19*(6), 731-739.

Tyson, S. (2006). *Essentials of Human Resource Management* (Fifth ed.). New York: Routledge.

UNICEF. (2001). Children's and Women's Rights in Nigeria: A Wake-up Call– Situation Assessment and Analysis 2001. *National Planning Commission and UNICEF, Abuja*.

Ura, K., Alkire, S., Zangmo, T., & Wangdi, K. (2012). *A Short Guide to Gross National Happiness Index*. Thimphu: The Centre for Bhutan Studies.

Usman, A., & Ifabiyi, I. (2012). Socio-Economic Analysis of the Operational Impacts of Shiroro Hydropower Generation in the Lowland Areas of Middle River Niger. *International Journal of Academic Research in Business and Social Sciences 2*(4), 57 -76.

Veenhoven, R. (1991). Is Happiness Relative? *Social Indicators Research, 24*(1), 1-34.

Veenhoven, R. (1994). Is happiness a trait? *Social indicators research, 32*(2), 101-160.

Veenhoven, R. (2000). Well-being in the welfare state: Level not higher, distribution not more equitable. *Journal of Comparative Policy Analysis: Research and Practice, 2*(1), 91-125.

Veenhoven, R. (2009). How do we assess how happy we are? Tenets, implications and tenability of three theories. *Happiness, economics and politics*, 45-69.

Venetoklis, T. (2004). *An Evaluation of Wage Subsidy Programs to SMEs Utilising Propensity Score Matching*: Government Institute for Economic Research.

WDR. (1994). World Development Report: Infrastructure for Development A. Rowley (Ed.) *World Development Indicators* Retrieved from http://wdronline.worldbank.org/worldbank/a/c.html/world_development_report_1994/abstract/WB.0-1952-0992-3.abstract.sec1

Webber, M. (2011). The Political Economy of the Three Gorges Project. *Geographical Research*.

Weinhold, D. (2012). The happiness-reducing costs of noise pollution. *Journal of regional science, 20*(10), 1-12.

Welsch, H. (2008). The social costs of civil conflict: evidence from surveys of happiness. *Kyklos, 61*(2), 320-340.

Wilmsen, B., Webber, M., & Duan, Y. (2011). Involuntary Rural Resettlement Resources, Strategies, and Outcomes at the Three Gorges Dam, China. *The Journal of Environment & Development, 20*(4), 355-380.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*: MIT press.

Wren-Lewis, S. (2010). Towards a complete account of psychological happiness. *Praxis, 2*(2), 58-81.

Yahaya, M. K. (2002). Development and challenges of Bakolori irrigation project in Sokoto State, Nigeria. *Nordic Journal of African Studies, 11*(3), 411-430.

Zaid, Y. A., & Popoola, S. (2010). Quality of Life among rural Nigerian women: The role of information.

Zarma, I. H. (2006). *Hadro Power Resources in Nigeria*. Paper presented at the Second Hydro Power for Today Conference, International Centre on Small Hydro Power (IC-SHP) Hangzhou China.

Zauszniewski, J., & Nakhla, W. (2008). Happiness: Theoretical and Empirical Considerations. *Nursing Forum, 43*(01).

Zelenski, J. M., & Nisbet, E. K. (2014). Happiness and Feeling Connected The Distinct Role of Nature Relatedness. *Environment and Behavior, 46*(1), 3-23.

Ziri, R. (1996). 15 years is Enough; Shiroro Communities Fight back. *Community: Quaterly Publication Of Community Action for Perticipation 03,* 16 - 18.

Zurick, D. (2006). Gross National Happiness and Evironmental Status in Bhutan. *Geographical Review, 96,* 657-681.