INFRASTRUCTURE POLICY REFORMS AND RURAL POVERTY REDUCTION IN GHANA

The Case of the Keta Sea Defence Project

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A minithesis submitted in partial fulfilment of the requirements for the degree of Master of Arts in Public Administration in the School of Government, University of the Western Cape

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DECLARATION

I declare that *Infrastructure Policy Reforms and Rural Poverty Reduction in Ghana: the Case of the Keta Sea Defence Project* is of my own work, that it has not been submitted for any degree or examination in any other university, and that all sources I have used or quoted have been indicated and acknowledged by complete references.

Ewald Quaye Garr May 2010

Signed: 

DEDICATION

To my father, and my (late) mother.

To all lecturers who have inspired me to this level.

To all people in rural areas looking forward to better public policies to help make their lives better.

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KEYWORDS

Public Policy

Poverty

Rural Communities

Infrastructure

Targeting

Implementation

Integrated development

Financing Infrastructure

Participation

Impact Assessment

ACRONYMS

DFID	-	Department for International Development
EWB	-	Engineers without Borders
FDI	-	Foreign Direct Investment
Ghc	-	Cedis (Ghana's Currency, March and April 2010 average exchange rate of Ghc 1.4 to a US dollar was used in the study)
GLDD	-	Great Lakes Dredge and Dock Company
GLSS	-	Ghana Living Standard Survey
GoG	-	Government of Ghana
GPRS	-	Ghana Poverty Reduction Strategy
GSS	-	Ghana Statistical Service
IFAD	-	International Fund for Agricultural Development
KSDP	-	Keta Sea Defence Project
MDG	-	Millennium Development Goal
MFEP	-	Ministry of Finance and Economic Planning (Ghana)
OECD	-	Organisation for Economic Cooperation and Development
PCI	-	Per Capita Income
Sida	-	Swedish International Co-operation Agency
UN	-	United Nations
UNCHS	-	United Nations Centre for Human Settlements
WHO	-	World Health Organisation

ABSTRACT

Infrastructure Policy Reforms and Rural Poverty Reduction in Ghana: the Case of the Keta Sea Defence Project.

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Over the years Ghana has adopted many policy reforms with the aim of reducing poverty. Though official reports show a reduction in poverty, poverty remains mainly a rural phenomenon. An essential instrument identified as crucial for rural poverty reduction is infrastructure. However, infrastructure is lacking in many rural areas. Though the government has acknowledged the contribution of infrastructure to poverty reduction and continues to increase annual expenditure on infrastructure provision, the government is worried about the failure of many infrastructure projects to reduce poverty.

This minithesis seeks to understand why infrastructure projects fail to contribute effectively to poverty (rural) reduction. The thesis assumes that though infrastructure provision can impact positively on rural poverty reduction, the same infrastructure provision has worsened or put people in worse conditions of poverty. Therefore it is not automatic that infrastructure provision would reduce rural poverty as often held. The thesis goes on to postulate that a positive relationship between infrastructure and rural poverty reduction is best achieved within a broad or generic policy which provides the framework for providing such infrastructure.

The thesis assesses these assertions empirically by first, testing the relationships between infrastructure and rural poverty reduction. Here a large scale infrastructure project in Ghana known as the Keta sea defence project serves as the case study. Secondly the thesis assesses Ghana's infrastructure provision policy environment and its implications on rural poverty reduction in the affected communities of the Keta sea defence project.

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CHAPTER 1

Introduction

"Eliminating Poverty is not beyond man provided we will fix what needs to be fixed" Author

1.1. Infrastructure Provision and Rural Poverty Reduction in Ghana

Ghana is a developing country in sub-Sahara Africa with a 2009 per capita income (PCI) of US$670 (World Bank 2009).[1] Over the years Ghana has taken various reforms aimed at poverty reduction. Though some measure of poverty reduction has been achieved, poverty remains mainly a rural phenomenon (GoG, 2007:25; UN, 2005a:5; GSS, 2006: entire report). With about 62% of the population living in rural communities of which over 50% are poor (Obeng-Odoom, 2007:3), it is important the country's poverty reduction strategies pay attention to rural areas.

Infrastructure facilities like transport, electricity, water, irrigation, etc, have been identified as a major vehicle for poverty reduction (Fan, 2004:1; OECD, 2006:1; DFID, 2002:6-13). In rural areas where about 75% of the poor live, there are very limited or no basic infrastructure facilities (IFAD, 2008:1). Consequently, production and living costs are high, and there is limited access to social services. There is less opportunity for development, and poverty is perpetuated in a form of a vicious cycle (Gunatilaka, 1999:1). It would follow then that if poverty is to be reduced there is the need to provide the basic infrastructure facilities for rural communities. Similarly, many scholars have argued that poverty reduction in Ghana (and sub-Sahara Africa) would depend on providing efficient infrastructure facilities (Ariyo and Jerome, 2004:3; Fan, 2004:1).

Despite the optimism about the significant contribution of infrastructure to poverty reduction, this has not always been the case. Though Ghana continually increases its spending on infrastructure provision, infrastructure provision in the country has been characterized by failures (Ministry of Finance and Economic Planning - MFEP 2009a:2-3). Engineers without borders (EWB) noted that infrastructure provision in Ghana is not guided by strategic frameworks but one driven by personal and political interest thereby resulting in "poor prioritization of infrastructure projects throughout rural Ghana".[2] Kalitsi (1970: 224 – 225) also observed in a study of the resettlement project of Ghana's Akosombo Hydro-electric power dam, *"a resettlement programme which was largely expected to be of lasting benefit to the affected*

[1] Internet source: <http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf> Accessed on 22/01/2010
[2] Internet source: http://www.ewb.ca/en/whatwedo/overseas/projects/infrastructure_ghana.html Accessed on 04/4/2010

people presented now, only a cost in human suffering in spite of considerable public investment that was made.". The Government of Ghana has acknowledged the significant impact of infrastructure on poverty reduction but it is concerned about the failure of many infrastructure projects due to policy and implementation lapses (MFEP, 2009a:3). For Mutahaba, et al. (1993:44-48) poverty reduction or development should not only be about infrastructure provision but the framework that guides its provision, as many projects in Africa that have failed because of inadequacies in policy management.

Infrastructure provision in Ghana is done through sectoral policies: transportation policy, water policy, national electrification scheme, environmental policy, etc. These are complemented with national legislations like the national constitution, National Development Framework, Ghana Poverty Reduction Strategy (GPRS) I and II, etc. Aside from the sectoral policies Ghana has no generic or broad policy for infrastructure provision.

To understand the situation of infrastructure provision in Ghana, the thesis assesses the relationship between infrastructure and poverty reduction, and examine the adequacy of Ghana's infrastructure provision policy environment. To analyse these issues under study empirically, the Keta sea defence project (KSDP) located on the south eastern coast of Ghana will form the case of the study. The KSDP is a large-scale infrastructure project (costing US$ 1 billion) initiated by the government of Ghana as a development project to save the rural communities of Keta from sea erosion and flooding, and to reduce poverty in these rural communities.

1.2. Problem Statement

> *[Infrastructure] Benefits have often been less than anticipated, especially because of inadequate attention to governance and institutional frameworks. 'White elephant' infrastructure projects are far from unknown. And high levels of personal and political corruption, facilitated by weak systems, have hindered a demand-led approach, distorted public investment choices, diverted benefits from the poor and encouraged neglect of maintenance. DFID, 2002:14.*

This position was re-echoed when the government of Ghana noted that infrastructure provision in Ghana has not contributed much to poverty reduction as expected (MFEP, 2009a:3-4).

Despite the evidence that infrastructure reduces rural poverty this has not always been the case. Ghana's medium term annual infrastructure gap is estimated at US$ 2.4 billion (MFEP, 2009a:3),

and though annually Ghana increases its budgetary spending on infrastructure provision, Ghana is dotted with many uncompleted, abandoned, and failed infrastructure projects.

Also some infrastructure projects instead of reducing poverty or improving public welfare have inflicted harsh conditions of poverty and human suffering on the affected people. For example, in one of his works on the resettlement programme of the Akosombo Hydro-electric Power Dam Kalitsi (1970:224-225) concluded *"… the resettlement programme which was largely expected to be of lasting benefit to the affected people presented now, only a cost in human suffering in spite of considerable public investment that was made."* The question then is why do these projects fail, and how can infrastructure projects be designed to reduce rural poverty and promote growth? This question comes at the time just when the government of Ghana has admitted that there are problems with infrastructure provision in Ghana and has called for new ideas to aid the provision of infrastructure. These problems range from funding infrastructure projects, the distribution of infrastructure, access to infrastructure, quality of existing infrastructure, management and maintenance of infrastructure (Ministry Of Finance and Economic Planning, 2009:2-3). In the face of poverty and human suffering, the huge cost of infrastructure provision and the challenges of infrastructure provision, it is important to critically analyse the relationship between infrastructure provision and poverty reduction and to find out if the policy environment in Ghana supports effective infrastructure development. To do this the thesis empirically evaluates the impact of a large scale integrated development infrastructure project (US$ 1 billion) known as the Keta Sea defence project (KSDP) which aimed at reducing poverty in the rural communities of Keta. The thesis would then proceed to examine Ghana's infrastructure provision policy environment using the assessment results of the KSDP. This would form the basis for discussions on reforms in infrastructure provision. The need for this study is not in doubt as at the moment Ghana seeks new ideas to harness effectively the significant potentials of infrastructure into poverty reduction and development.

1.3. Research Objectives

Following from the problem statement a series of specific objectives have been outlined to guide the direction of the study and to shape the concepts, description, interpretation and analysis of the case. The main objective of the study is to gain a better understanding of the relationship between infrastructure and rural poverty reduction, and the implications on policy and implemented project outcomes in Ghana.

The sub-objectives include:

1. Examine the role of infrastructure in rural poverty reduction
2. Explore the nature of policies that govern infrastructure provision in Ghana
3. Analyse the challenges and opportunities inherent in the KSDP
4. Evaluate the impact of the KSDP on the affected people
5. Propose recommendations

1.4. Research Questions

To address the research objectives above the following specific questions were asked:

1. What is the role of infrastructure in rural poverty reduction
2. What is the nature of Ghana's policies on infrastructure provision and how did this affect the KSDP?
3. What are the challenges and opportunities inherent in the KSDP?
4. What is the impact of the KSDP on the affected people?
5. What recommendations can be made to improve infrastructure provision and to ensure that it effectively contributes to rural poverty reduction?

1.5. Rationale and Significance of the Study

Poverty remains a serious challenge in Ghana and the state continuous to make efforts to reduce poverty. Infrastructure which could help in poverty reduction appears to be having provision problems. Like many countries that have managed to overcome such developmental challenges, investigating the relationship between infrastructure provision and poverty reduction and the policy implications in Ghana would be a key step to helping address Ghana's problem of infrastructure provision, poverty, and underdevelopment. Given the perfect timing, especially, when the Government of Ghana has called for new ideas to harness the significant contribution of infrastructure to poverty reduction and development, the thesis provides suggestions based on facts which can be relied upon to influence policy development and infrastructure provision. Also being the first of such policy and impact assessments of the KSDP, the thesis makes recommendations aimed at improving the welfare effects of the project on the poor.

Generally the study contributes to development policy research and the ongoing debate on infrastructure, poverty reduction, and rural development.

1.6. Definition of Key Concepts

Extrapolating from the cogent observation of Voltaire to define concepts before analysing such concepts (Cohen, 1987:13-31), this section defines the salient concepts contained in the paper within the context in which they were used.

Public policy: this generally refer to "mechanisms employed to realize societal goals and to allocate resources" (Baker et al., 1975:12-15) and specifically it refers to "a relatively detailed statement of government objectives in a sector and a general statement of the methods to be used in achieving those objectives" (De Coning and Van Baalen, 2006:216).

Poverty: refers to people living under conditions characterized by low income or unsustainable sources of livelihood, homelessness or inadequate shelter, lack or limited access to good drinking water and sanitation, lack of access to health care, lack of access to education and information, insecurity and vulnerability as a result of risk to natural disasters or protection against attacks, exclusion from political participation, and lack of opportunities.

Rural communities: refer to communities often sparsely populated, characterized by high levels of poverty, limited or no access to social services (health centres, schools, water), low income groups, informal jobs, mainly subsistence production (agriculture, fishing, hunting, and other traditional handicrafts), low productive capacities, often no industries, bad transport systems, ineffective market systems, low level of literacy, and often vulnerable to natural disasters.

Infrastructure: refers to "physical facilities [roads, airports, utility supply systems, communication systems, water and waste disposal systems etc], and the services [water, sanitation, transport, energy, communication and information, education, health care, shelter, relief and protection] flowing through those facilities" (Masika and Baden, 1997:2). The list of infrastructure facilities can be categorised into economic and social. Economic Infrastructure refers to those structures which form the capital stock of a country that facilitate economic production. These include, roads, bridges, railway systems, airports, ports and harbours, houses, irrigation systems, electricity dams and power generation plants, technology and communication facilities, market and trade facilities, water supply treatment and supply plants, sewage and drainage facilities, waste management plants, tourism facilities, storage and post harvest facilities. Social Infrastructure refers to those facilities that promote the social wellbeing of

people within a state. These include education and health facilities, flood control and sea defence structures.

Targeting: this is the act of identifying and selecting poor (affected people or beneficiaries) and the specific areas of impact to match their needs and to maximise gains.

Implementation: is the transformation of policies into desirable outcomes.

Integrated development: the processes through which the interconnected activities of various sectors are coordinated synergistically to bring about sustainable poverty reduction and growth.

Financing infrastructure: refers to how funds and investments are attracted or arranged to support infrastructure provision.

Participation: refers to the involvement of affected people in decision making, planning, implementation, and evaluation of outcomes.

Impact Assessment: refers to an evaluation of the effect of a project on the affected people based on predefined objectives.

1.7. Delimitation of the Study

The study focuses on the relationship between infrastructure and rural poverty reduction, and the implications for policy and implemented outcomes. The entire gamut or dimensions of policy, poverty reduction, and infrastructure are beyond the scope of the thesis. The thesis is limited to the contextual understanding of poverty reduction, the contributions of infrastructure to poverty reduction, the flaws and problems of infrastructure provision, the concept of public policy, and the complexities in the implementation process. The thesis is set in the Ghanaian policy environment and the KSDP serves as the case study. However, because poverty, infrastructure, and policy have similar concerns that cut across most developing (some developed) countries the study draws lessons from some universal and successful policy processes and management models across the globe. The impact of infrastructure on poverty reduction is evaluated from the micro (households) perspective. Theories and conceptual models are applied to elucidate the relationship between infrastructure and rural poverty, and policy and outcomes. Methodological triangulation is used to improve the accuracy of the research results.

1.8. Ethical Statement

The thesis ensured the confidentiality, privacy, and integrity of participants. The purpose of the study was explained to respondents and officials involved, and they were encouraged to decide freely if they wanted to respond to questions on the topic understudy, and they were at liberty to excuse themselves if at any point they feel threatened or uncomfortable with the line of questioning. The questionnaires were anonymous so that it could not be traced to particular respondents.

1.9. Organisation of the Study

The minithesis is structured into six chapters. Beyond this introductory chapter (1) the remainder of the thesis is as follows:

Chapter 2 – Literature Review and Theoretical Framework: The chapter reviews the salient literature on the phenomenon understudy, presents the major debates on the research problem and explores theories and models to explain the relationship between infrastructure and rural poverty reduction, and their policy implications.

Chapter 3 – Methodological Design of the thesis: in this chapter, the thesis explains the methodology employed by the study to test empirically the relationship between infrastructure and rural poverty reduction, and to analyse the policy implications. The data type needed, the generation of data to measure the variables, sampling method, and the possible limitations of the study, are explained.

Chapter 4 – Presentation of Research Findings: Here the thesis presents a description of the case study and then follows it with the empirical findings of the study. These include the results of the impact assessment of the KSDP on rural poverty reduction and the findings on Ghana's infrastructure policy environment and the implications on implemented project outcomes.

Chapter 5 – Reforms in Infrastructure Provision in Ghana: The chapter proposes a model for policy reforms in infrastructure provision in Ghana. It outlines the steps and the essential elements to be considered in arriving at a coherent infrastructure policy.

Chapter 6 – Conclusion and Recommendations: The thesis concludes by summarizing the findings, the limitations, and the general impact of the study on poverty reduction and development. Basing on the findings recommendations are made.

CHAPTER 2

Literature Review and Theoretical Framework

"Use the literature, don't let it use you" Becker, 1986:149

In order to take note of what has been accomplished in the field of infrastructure, poverty reduction, and development policies, the thesis reviewed various literatures, views, and concepts in this area of scholarship. Ghana has limited literature with respect to the topic therefore additional literature from other countries that provided useful insights to the topic were considered. Becker (1986:149) warns that while reviewing literature we should be cautious of its potential to influence and transform our understanding. In this chapter the thesis uses the literature to examine the relationship between infrastructure, policies, and rural poverty. Policies lay the foundation for infrastructure and poverty reduction. However for a better appreciation of the issues under study the review first discusses the concept of poverty and the relationship between infrastructure and rural poverty reduction. The thesis then proceeds to discuss the concept of public policy, and the relationship between policy and implementation within the context of infrastructure provision and rural poverty reduction in Ghana.

2.1. Infrastructure and Poverty Reduction

2.1.1. Poverty in Ghana

As indicated earlier, Ghana is a low income country in sub-Sahara Africa with a 2008 per capita income (PCI) of US$670 (World Bank, 2009). Since the 1980s, the country has embarked on many development strategies; Structural Adjustment Programmes, Economic recovery programmes, Vision 2020, and now the Ghana Poverty Reduction Strategies I and II. The 2006 Ghana Living Standard Survey (GLSS) indicates a decline in poverty (population living on less than US$ 2 per day) from 51.7% in 1991/92 to 28.5% in 2005/2006. The extreme poverty (population living on less than US$ 1 per day) declined from 36.5% in 1991/92 to 18.2% in 2005/2006 (GoG 2007:25). Though the GLSS reports that poverty has reduced over the past 18 years, poverty remains largely a rural phenomenon in Ghana (Send-Foundation, 2006:12; UN, 2005a:5; Aryee and Asante, 2003:4). According to the GSS 2000 reports for 1999 urban poverty stood at 19% and rural poverty at 50%. Additionally, the majority of Ghanaians about 60% live in rural areas (Obeng-Odoom, 2007:3). These presuppose that if Ghana is to reduce poverty there is the need to look at the rural areas where the poor lives.

However, the poverty results generated from the World Bank led 'income approach' has been questioned and contested. Thompson (2003:2) describes it as unscientific and unrepresentative of poverty in Ghana.[3] Though the income approach shows that poverty has reduced studies indicate that sectors like health and education are still lagging (Abdulai: 2009:21). As a result, the Parliamentary Select Committee on Poverty Reduction of Ghana's Parliament has called for a standard measurement of poverty in Ghana to support effective development projection (IDEG and Canadian Parliamentary Centre 2005:11). This brings us to the multidimensional perspective of poverty. Thus, aside the use of income as an indicator of poverty, poverty in Ghana is considered a multidimensional phenomenon (Nkum and Ghartey, 2000; Batse et al., 1999; see Ashong and Smith, 2001:6). Poverty is assessed with the level of income or source of livelihood, access to food and material things, access to education, health care, water, sanitation, vulnerability and participation or social inclusion.

Income: The 2006 Ghana living standards survey (GLSS 5) conducted by the Ghana Statistical Service shows that the three main sources of income in Ghana include agriculture (35%), wage employment (29%), and self employment (25%) (GSS 2008: viii). Ghana's average household income is US$ 1,327, and an average PCI of US$ 433. The 2006 average PCI for urban areas is about US$ 562 and about US$ 332 for the rural areas. Clearly incomes levels are lower in the rural areas of Ghana than in urban areas (GSS 2008: viii, 107 – 108).[4]

Price: Income and price determines the consumption pattern of households. The average annual household expenditure of Ghana is US$ 2,085. Average annual household expenditure is about 1.6 times higher in urban areas (US$ 2662) than rural areas (US$ 1,645) though household size in rural areas is larger than urban areas (GSS 2008:vii, 94-96).

Other Dimensions of Poverty:

Health care, the Ghana living standards survey or GLSS (GSS 2008:19) notes that whiles about 63% of people in urban areas consult a doctor when they are sick, only about 30% in rural communities do same.[5] The survey also indicated enrolments in the national health insurance was higher in the urban areas than rural areas (GSS, 2008:29-30). *Education*, the GLSS reports

[3] Thompson (see also Abdulai: 2009:21) argues that the World Bank and the Government of Ghana arrived at the 39% based on 'the perception of data users' and not from a scientific calculation of economic growth.
[4] The average exchange rate used is Ghc 0.92 to a US dollar – the prevailing rate in June 2006 as indicated in the GSS 2008: viii.
[5] Also while less than 1.5% of children under 5 years in urban areas have not been immunized, about 4.3% (2.5 to 6%) of children under 5 years have not been immunized in rural areas (GSS 2008:27).

that while 84% of adults in urban areas have been to school the same can be said of only 58.7% of people in rural areas (GSS, 2008: iv, 12). *Water*, the GLSS shows that while 73% of people in urban areas have access to pipe-borne water, the same can be said of only 14% of people in rural areas (GSS, 20018: v, 68). *Electricity*, whiles 79% of people in urban areas have access to electricity only 27% of people in rural areas have electricity (GSS, 2008: v, 69). *Sanitation*, using flush-toilet as an indicator of sanitation while 22% of urban people have flush-toilets only 1% of rural dwellers have a flush-toilet (GSS, 2008:71). *Shelter*, this is measured through the type of building material. While 76% of houses in urban areas are built from cement or sandcrate blocks, 73% of houses in rural areas are built from mud which is not durable (GSS, 2008:64). The presentation so far shows that poverty is indeed a rural phenomenon in Ghana.

Infrastructure has recently blossomed into the international development arena as a purposeful vehicle for poverty reduction (OECD, 2006:3), and has been identified as key for rural poverty reduction in Ghana (NDPC, 2005:2). However, for Kalitsi et al who have conducted studies on infrastructure projects in Ghana (2008:2-3) and Masika and Baden who have also conducted a study on infrastructure poverty reduction (1997: 3), though there is ample evidence that infrastructure impacts positively on economic growth, the same cannot be said about the impact on poverty reduction. These two positions set the tone for the discussion on the relationship between infrastructure and poverty reduction.

2.1.2. Infrastructure, Growth and Poverty Reduction

Infrastructure forms part of the capital stock (investment) of an economy that stimulates growth and many theories have argued that economic growth contributes to poverty reduction (DFID, 2002:4). The growth theories advance a link between infrastructure and growth: infrastructure as capital is a factor of production that goes into the aggregate production function, where growth is the effect of productivity (Straub, 2008:7). The Standard Production Function explains that the output of an economy (or firm) depends on the amount of input, which includes infrastructure capital. Therefore an increase in infrastructure capital stock would increase the productivity of other factors leading to growth (Straub, 2008:16). Combining the "growth theory" and the "trickle down model", the latter assumes that increase in growth would result in benefits through employment opportunities, higher incomes, more goods and services at affordable prices to the populace and eventually reduce poverty (Jaililan and Wess, 2004:2). However, the trickle down approach may not necessarily be effective for poverty reduction as it does not target the poor;

instead it could lead to such benefits accruing to the elites and the well-to-do in society to the disadvantage of the poor. Economic Geography models also postulate that the combination of geographical targeting, functional and sectoral mix of infrastructure have significant effects on growth (Straub, 2008:9). Straub (2008:18-20) found in a review of 140 cases on the link between Infrastructure and growth between 1989 and 2007, the use of macro-econometric methods which includes production function, cross country regressions, cost function estimations, and growth accounting methods; and micro economic methods using data from households and firms. Straub (Ibid) concludes that 63% of cases recorded a "positive significant relationship" between infrastructure and growth, 31% cases found "no significant effect," and 6% found a "negative significant relationship."

The specific interest of the paper is the rural poor, and therefore the review proceeds with a micro-economic approach looking at the effect of infrastructure on households' income, prices of goods and services for households and other dimensions of poverty such as access to health care, education, drinking water, electricity, shelter, sanitation, vulnerability, and environmental sustainability.

The effect of infrastructure on Income

The income of people is an indicator of their purchasing power, and one of the indicators of poverty. People with high incomes are able to afford consumer goods and services that improve their wellbeing, and people with low income can't afford basic goods and services which can make them poor. Infrastructure investments like roads, irrigation, and electricity can lead to high incomes for farmers and traders through increase in productivity and access to markets. Similarly, roads and electricity can lead to the creation of non-farm jobs that leads to high incomes for rural people (Straub, 2008:7).

The construction of infrastructure employs large numbers of workers which translates into income for the hither-to unemployed (DFID, 2002:12; Fox and Porco, 2001: 112; Sida, 1996, see Masika and Baden, 1997: 3). This is especially the case when labour-intensive methods are used. It is estimated that in Ghana if 30% of infrastructure investments were labour-intensive about 50,000 direct jobs and 75,000 indirect jobs would be created (Islam and Majeres, 2001; see DFID, 2002:12). Mashiri et al (2005:860) also cite the case of a road construction project in a poor community 'Amadiba' in the Republic of South Africa through what they termed

"Community based labour intensive construction" which saw the employment of 1700 men and women and this reduced the rate of unemployment from 75% to 38%. The study revealed further how the hither-to poor and unemployed people were able to build decent houses, pay school fees, and buy farm inputs to expand their sources of income to cater for their families. However, labour productivity as a result of improved infrastructure such as transport, electricity, and technology can also result in job losses as they replace human labour activities for example farm hands and porters, and consequently provide little or no income for the affected labour.

The effect of infrastructure on prices of goods and services

The prices of goods and services affects poverty as lower prices allow poor households to afford more of what they need, thereby improving their wellbeing and reducing poverty. On the other hand higher prices reduce the quantity and quality of goods and services that the poor can afford and this result in deprivations, malnourishment, sickness, low level of education, etc.

Rural areas with bad roads or transport networks pay higher prices for transport, price of drinking water and other goods or services are high in rural areas (Kilkenny, 1995:1). The provision of infrastructure can reduce or increase prices for the beneficiaries. Infrastructure affects prices through labour and output productivity, economies of scale, and cost adjustment. Infrastructure services such as, transport, electricity and communication reduces the time spent commuting, makes transactions effective and efficient, and enhances productive capacities. Individuals and firms take advantage of the improved capacities to increase production at lower cost which often leads to lower prices (Straub, 2008:8). However, it should be noted that a fall in supply price particularly for goods and services with high price elasticities may lead to substantial increase in demand which can limit the price effect (as prices may rise).

The effect of infrastructure on other dimensions of poverty

Infrastructure creates access to services like education, and health care, which hither-to the beneficiaries did not have access to, thereby increasing school enrolment, and promoting good health (World Bank, 2007:60). *Health care*, a WHO study indicates that 40% to 60% of rural dwellers in developing countries live more than 8km far from health centres. This has serious consequences for the health of the rural poor; death from minor illnesses and high rate of infant and maternal mortality cases (Ibid; Porter, 2007:5).In Saboba village in Ghana the nearest heath centre is about 50km away. As a result when the people are ill they have no access to medicine

or health care.[6] *Education*, Porter (2007:2-3) also cite cases where children in the central region of Ghana had to walk a distance of 4-5km to get to school. The children are punished when they get to school late, they also face serious academic problems as they get to school tired and they have no light at home to study. This result in high rates of school drop-outs and high levels of illiteracy: most teenage girls get pregnant or they are forced into marriage - the vicious cycles of poverty continuous.

Water and sanitation, Sida (1996: see Masika and Baden, 1997:3) also describes clean water and sanitation as indicators of well-being. Globally 10 million people (this includes the Ghanaian rural poor) die annually from water and sanitation related diseases such as diarrhoea, cholera, dysentery, typhoid, hepatitis, and tapeworms (UN, 2005b:3-8). Providing water and sanitation facilities could prevent these deaths. *Shelter*, providing shelter or resettling poor people protects them from the vagaries of the weather and other sicknesses associated with bad shelter. However, Kalitsi (1984:224-225) Diaw and Schmidt-Kallert (1990:197) cite examples of resettlement projects in Ghana which left the affected people more impoverished.

The rule of thumb for these dimensions of poverty is that their absence or inadequacy leads to deprivation and vulnerability in terms of skills and job opportunities, diseases, risks, exclusion, and short-life expectancy which characterize poverty (Sen, 1999:87-90).

2.1.3. Contribution of the different types of infrastructure to poverty reduction

Participatory poverty assessments indicate that the rural poor attach significant level of importance to infrastructure (Ariyo and Jerome 2004: 8; DFID, 2002: 8). In the words of a young woman in Little Bay (Jamaica) "if we get road, we get everything else: community centre, employment, post office, water, and telephone" (Narayan and Patesch, 2002; see DFID, 2002:9).

Transport Infrastructure: Roads, railways, and other appropriate means of transport can break the barrier of isolation and remoteness that perpetuate rural poverty, by opening-up rural communities and linking them up to other towns. An appropriate transport infrastructure could reduce the cost of production, increase trade, create market and increase demand for rural produce, attract investment, facilitate more non-farm job opportunities, increase income of rural poor, increase access to health care and education, and as well provide safety nets for the poor.

[6] Internet source: <http://chapters.ewb.ca/pages/chapter-african-partnerships/african-programs-sector-profiles/rural-infrastructure-in-ghana/EWB-Rural-Infrastructure-Print.pdf> [4/4/2010]

According to the World Bank's Operations Evaluation Department's report (1999:3) on a road project in Ghana, when village beneficiaries were asked about the impact of the road project on their lives, they reported that the arrival of more vehicles has reduced the cost of transport. They could transport more produce to the market and they could sell at better prices. The beneficiaries also reported that could get people across to the hospital quickly in case of any emergency.

Electricity infrastructure: Electricity is an important resource that facilitates the creation of non-farm employment opportunities like dress making shops, hair salons, repair shops, and food processing industries (Dinkelman, 2008:2). Electricity is an incentive to attract FDIs to rural areas. In Ghana electricity is a 'pull factor' or incentive for the deployment of personnel to rural areas. Consequently areas without electricity find it difficult to attract personnel: the likes of Agricultural Officers, Medical Personnel, Teachers, are central for rural poverty reduction and development. Dinkelman (2008:9) reports a highly positive impact of rural electrification on employment creation in rural South Africa. Ali and Pernia (2003:9) refer to China where a 1% increase in investments in electricity results in 0.42% reduction in poverty. Songco (2002:4) also reports rural poverty reduction in India and Bangladesh as a result of rural electrification.

Irrigation is another form of infrastructure that contributes greatly to securing livelihood, increasing income, and eventually reducing rural poverty by providing reliable source of water to farmers to grow their crops as well as to feed their animals. Studies show that irrigated farm fields provide 40% of the world's total food production from only 17% of farm fields (FAO, 1999: 1). The prospect for rural areas where farming is the main source of livelihood is enormous. For example, in Vietnam, India, Thailand and Philippines, Bhattaria et al (2002:8) found that poverty was less in rural areas with irrigation than unirrigated areas; improved access to irrigation led to wealth creation and improvement in living standards in poor regions.[7] Agriculture in Ghana is largely a rural activity and it's mainly rain-fed. Though rain-fed Agriculture is not a reliable method (as Ghana usually experience about 6 months of rain per year), the Agriculture sector employs 65% of Ghanaians. The sector contributes to 40% of Ghana's GDP, and also contributes to 40% of Ghana's foreign currency. It follows that if Ghana can employ irrigated farming the gains would increase for the rural poor to escape poverty.[8]

[7] In Bihar in India, farm income in irrigated areas are 77% higher compared to unirrigated areas, as investment of 1$ made in irrigated area could yield over 4$ or more in employment value (Bhattaria et al., 2002:7)
[8] Internet source: http://www.jica.go.jp/english/publications/reports/study/capacity/200609/pdf/200609_04e.pdf [April 2, 2010]

Sea Defence and Flood Control, Flooding destroys farmlands and crops leaving farmers, households and communities in poverty. The debris or sediments deposited by the floods or sea possess health risk to communities, roads and properties are also destroyed. Sea defence mechanism or flood controls help avert these forms of poverty (Van Alphen et al., 2006:128).

2.1.4. Failures of infrastructure and their negative effects on poverty

The evidence that infrastructure reduces rural poverty are widespread. However, this has not always been the case. In their book on infrastructure and poverty reduction the DFID (2002:14) observed:

> *…Benefits have often been less than anticipated, especially because of inadequate attention to governance and institutional frameworks. 'White elephant' infrastructure projects are far from unknown. And high levels of personal and political corruption, facilitated by weak systems, have hindered a demand-led approach, distorted public investment choices, diverted benefits from the poor and encouraged neglect of maintenance.*

Similarly, Masika and Baden (1997:3) in their study on infrastructure and poverty point-out that *"while there is considerable evidence that infrastructure development is correlated with economic growth, there is less evidence to support a positive impact on poverty."* Infrastructure projects have plagued the poor with worst cases of poverty; the displacement of the poor, loss of livelihoods, destruction of utility services and human right abuses to the poor (DFID, 2002:6). Kofi Diaw and Einhard Schmidt-Kallert (1990:197) making reference to Kalitsi's study (1970:224-225) on the resettlement of people affected by the construction of Ghana's Akosombo hydro-electric dam noted ..."*the resettlement programme which was largely expected to be of lasting benefit to the affected people presented now, only a cost in human suffering in spite of considerable public investment that was made."* In one of his numerous studies on the effect of infrastructure projects on the poor in Ghana, Kalitsi (1970:224-225) noted that large scale infrastructure projects impact negatively on the affected people and there is the need for measures to reduce the hardships that new infrastructure brings onto affected people. Another example of the negative effects of infrastructure on the poor is the case of the people of Asukawkaw in Nigeria who were displaced, lost their livelihoods because of the construction of the Upper Volta hydroelectric dam in the 1960s (DFID, 2002:14). Quartey Jnr (1996:48) describes infrastructure provision in LDCs as one with a myriad of problems and losses. Devas (1991, see Masika and Baden, 1997:4) complains that most infrastructure projects do not benefit the poor as expected due to limited access and inappropriate forms of infrastructure. Also,

Masika and Baden (1997:2) notes that over the years infrastructure planning and design has mainly been the responsibility of Engineers, where aside technical specification little or no attention was given to the poverty reduction or economic potentials.

The on-going discussion demonstrates that some infrastructure projects contribute to poverty reduction and others do not reduce poverty or they worsen poverty in some cases.

2.1.5. Theoretical Analysis of the Impact of Infrastructure on Poverty Reduction

As the focus of the study is on the effects of infrastructure projects on poverty at the micro-level, Welfare theory is used to analyze the relationship between infrastructure projects and poverty. Based on Welfare theory, the theory of the Household serves as a baseline, and the Income method as a tool to explain project effects on poverty in terms of income and price changes. The Multidimensional view of poverty is used to analyse the relationship between infrastructure and the other aspects of poverty (access to; education, health, drinking water, electricity, sanitation, vulnerability, and environment). The detailed application of these theories is captured below.

2.1.5.1. Welfare theory

Welfare economic theory by heuristic extension originated from the Utilitarianism works of Jeremy Bentham (1748-1832) and James Mill (1773-1836). The theory holds that human welfare can be measured from the consumption of goods and services. Welfare economics is thus used to evaluate and to make policy decisions on the effect of specific projects on the welfare of affected people. As noted by Jenkins (1990:1, see Parsons 1996:46) if policy analysis refers to a "set of techniques with which to evaluate public policy options and select amongst them" then welfare economics theory (and utilitarianism) provide the 'analytical paradigm' for public policy analysis. Similarly, Mishan (1969:130) argues that theoretical welfare economics postulate among alternative economic situations in society which one makes people "better-off or worse-off." Public policy reforms are also based on welfare calculations as the aim is to promote public welfare (Parsons, 1996:45-46). Therefore for the impact assessment of the case under study welfare theory provided the framework for concluding that welfare in one economic situation was higher or lower than the other (Yew-Kwang, 1983:2). The main criticism of welfare economics is that it ignores issues of equity and fairness in its analysis (Parsons, 1996:46). As a note of caution the measurement of welfare is contentious (Just, et al., 1982:69) and the thesis did not delve into the controversy between cardinal or ordinal measure of utility. The two

measures of utility, the utility function and consumer surplus were combined to explain the relationship between infrastructure provision and poverty reduction. There is a longstanding controversy between utility function and consumer surplus as to which is the best measure of utility. However this was not the focus of the thesis as these were beyond the scope of the thesis. Of paramount importance is the fact that both measures explain the relationship between infrastructure and poverty reduction better when combined.

The income method explains project effects on beneficiaries in the form of increased productivity using producer surplus and cost savings using consumer surplus. It should be noted that the beneficiaries, Fishers, Farmers, and Traders were producers in one aspect and consumers in another, hence the calculation of project effects on their incomes from the point of producer surplus. These project effects are discussed below as *"the effect of infrastructure project on income - 2.1.5.1(a)"* and *"the effect of infrastructure project on prices - 2.1.5.1(b)1"*.

The household theory explains the welfare effect of the project on poverty reduction in the form of consumers' utilities. These welfare effects are discussed as *"income changes and poverty reduction – 2.1.5.1(a) 2"* and *"price changes and poverty reduction – 2.15.1(b) 2."*

Welfare theory starts from the premise that consumers behave as utility maximizing agents who alter their consumption behaviour in response to changes in the economic environment (Broadway and Bruce, 1984:31). The consumer or household (in this case) selects among alternatives the basket of goods that make him well-off: the utility maximizing consumer prefers more of each good to less (Pindyck and Rubinfeld, 2005:66). The utility of the individual household is important in the light of the fact that the welfare of the society is contingent upon the welfare of its individual households (Broadway and Bruce, 1984:31). Welfare theory argues that while the utility maximizing consumer (or household) has preferences that determine his/her (or its) utility and wants to get more of basket of goods that gives it higher utility or welfare, the household is faced with budget constraints determined by income and the prices of goods and services (Perloff, 2008:60). In order to meet its needs the household opts for the basket of goods that gives it the best utility under such budget constraints (Broadway and Bruce, 1984:31).

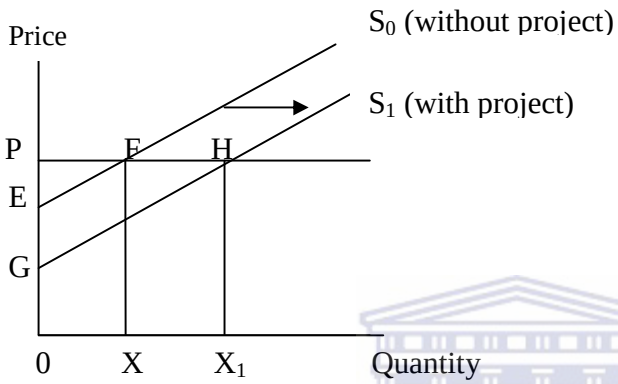
2.1.5.1 (a) Infrastructure Projects and Changes in Income

The effect of infrastructure projects on the income of affected communities is explained with the Income method using the concept of producer surplus.

2.1.5.1(a) 1. The effect of infrastructure projects on income

The income method assumes that before the intervention of the infrastructure project the productive capacity of producers was poor, as a result of high cost of production and low production output. In fig. 1 below, with the poor productive capacity producers were supplying X at a high cost of P denoted by S_0. The gross return was 0PFX, and the net gain was EPF.

Fig. 1. Infrastructure intervention and income changes



Source: Author

Following the project intervention the productive capacities of producers has improved (leading to output productivity, labour productivity, economics of scale and cost adjustment) such that they are able to supply more at the same price (X_1 compared to X_0 or they are able to supply the same quantity at a lower price, also with $S_1$the price of the amount X would be lower than P) this consequently result in increase in income.

In fig. 1 above, the improvement in productive capacity is denoted by a shift in the supply curve from S_0 to S_1, the producer is able supply S_1 of X_1 at the price of P. The gross return increases (from 0PFX) to $0PHX_1$, and the net gains also increases (from EPF) to GPH. Here the change that is attributable to the project is the difference between the case without the project and the case with the project thus: gross return +XFHX1, and net gain +GEFH.

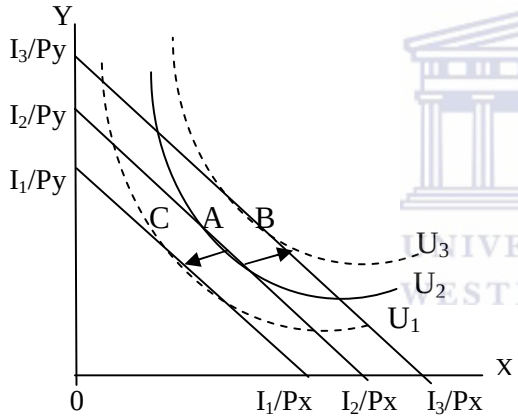
The concept of income method and producer surplus applies to the KSDP. Without the intervention farmers were producing at comparatively high costs because the sea and lagoon were flooding their farmlands resulting in bad harvest and losses. In addition, as the road network was bad the farmers, fishers, and traders were incurring high costs transporting their produce to the market. With a supply of S_0 and a price of P gross returns amounted to 0PFX and

the producer surplus was EPF. With the infrastructure intervention costs of production decreased or productivity increased and as farmers, fishers, and traders are able to increase their output (S_1) which is leading to increased gross returns of ($0PHX_1$) and producer surplus (GPH>EPF).

2.1.5.1 (a) 2. Income Changes and Poverty Reduction

The income effect of infrastructure projects in the beneficiary communities is explained from their utility or satisfaction that is derived from the consumption of a preferred basket of goods limited by their income. The household theory assumes that increase in the household's income would lead to a higher demand for their preferred goods basket as their consumption capacity increases, and this would increase their welfare measured in terms of utility. This is illustrated in fig. 2 below.

Fig. 2. Income changes and Welfare Effects



Source: Glahe and Lee, 1981, p.112

Taking the base scenario where the household income is I_2 and prices Px and Py the budget line is A and the utility level is U2. An increase in the household's income from I_2 to I_3 when prices for both goods remain the same the budget line shifts outward to B, the X and Y intercepts (best combination of X and Y) also increase to I_3/Px and I_3/Py, and the utility level of the household increases to U_3. On the other hand if the household's income decreases from I_2 to I_1, the budget line falls to C, the X and the Y also decrease to I_1/Px and I_1/Py, and the household's utility falls from U_2 to U_1. Therefore an increase in household income when all other things are equal leads to improved welfare for the household.

Similarly, for the project communities in the case of the KSDP an increase in their income would affect their welfare. Normally, the utility or satisfaction that is derived from the consumption of

their preferred goods basket is limited by their income. However, with the increase in income, and the prices of goods remaining constant, the consumers in the beneficiary communities would have an outward shift in their budget line allowing them to consume more. This would result in an increase in the project communities' demand for their preferred goods basket, and their utility which is a measure of their welfare will increase as showed in fig. 2 above.

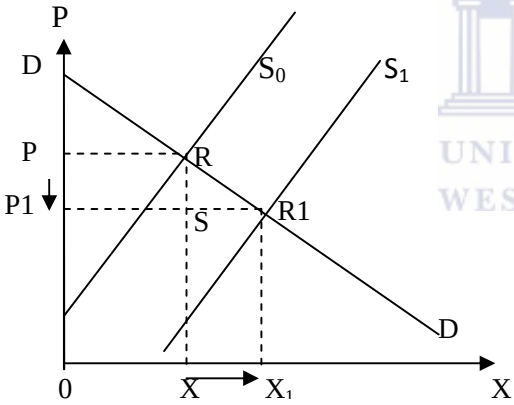
2.1.5.1(b) Infrastructure Projects and Price Changes

The effect of infrastructure projects on the prices of goods and services is explained with the concept of Consumer Surplus.

2.1.5.1(b) 1. The effect of infrastructure project on prices

A project that leads to reduction in the cost of goods and services can be said to benefit the affected people. This benefit also known as "cost-saving" is explained from the concept of Consumer surplus. This is explained in Fig. 3 below.

Fig. 3, Infrastructure and price changes: Consumer Surplus



Source: Modified by Author (see Mishan, E., 1982, p.25-27)

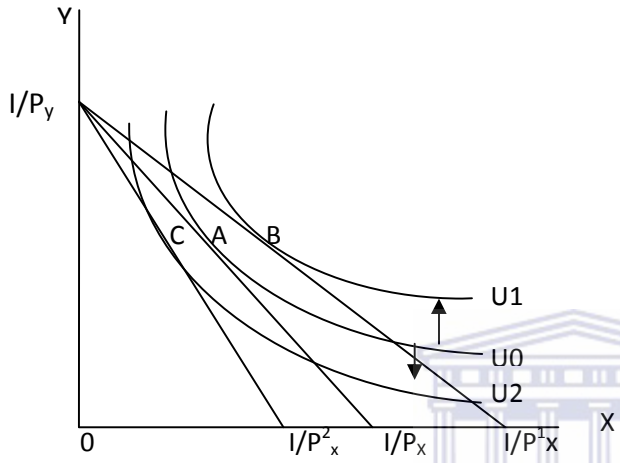
Without the project Consumer Surplus was PDR. With the project Consumer Surplus has increased to P_1DR_1, the reduction in cost or price leads to high demand or increase use of the facility from 0X to OX_1. The rectangle P_1PRS represents cost saved and the minimum benefit from the project. Triangle SRR_1 represents consumer surplus that will accrue from additional use of the infrastructure. PP_1R_1R can be accepted as the maximum price that the affect people would give to have the price reduced from 0P to $0P_1$.

Applying the income method and consumer surplus to the communities of the KSDP, the cost-savings benefits are as follows; the new road can lead to reduction in transport cost and further result in increased output productivity, labour productivity, economies of scale, and cost

adjustment, these would then result in lower prices of goods and services for the consumers. Similarly, the prices of farm produce, and fish would also decrease. Lets' proceed to look at how this could increase welfare (reduce poverty).

2.1.5.1(b) 2. Price Changes and Poverty Reduction

Fig. 4, Prices changes and welfare effects



Source: Modified by Author (see Glahe and Lee, 1981: 113)

In the base scenario, with prices Px and Py and income I, the budget line is A and the household's utility level is U_0. A decrease in price of the good X from Px to P^1x where income remains the same at I, the household's budget line shifts to B (shifts to the right), while the quantity of Y the household can afford remains the same because of the unchanged price; and its utility increases from U0 to U1. On the other hand, an increase in the price of good X from Px to P^2x, the household's budget line shifts to C (shifts to the left), while the quantity of good Y the household can afford remains the same, and the household's utility falls from U0 to U2. Vice-versa when the price of good Y changes. This theory informs that all other things being equal when the prices of goods and services are high the community experience lower welfare and with low prices the community experience higher welfare.

Similarly, as lower prices of goods and services allow for higher utility; consumers in the project communities are able to increase their demand for their preferred goods basket as their income would allow them to consume more, and this would result in a higher utility and an increased in

welfare. On the other hand, an increase in prices of goods and services whiles income remains constant would lead to a reduction in their utility or welfare as illustrated in Fig. 4 above.

2.1.5.2. Multidimensional Approach to Poverty Reduction

The multidimensional perspective of poverty reduction emerged as a critique to the often used uni-dimensional income approach to poverty widely propagated by the World Bank (2001; see Makoka and Kaplan, 2005:6). The income approach distinguishes between extreme poverty and poverty. 'Extreme poverty' refers to people who live on less than US $1 a day, and 'poverty' refers to people who live on less than US $2 a day. Though simpler to measure and widely accepted, the income approach does not directly explain the entire gamut and facets of poverty. Poverty is and continues to express itself in multiple dimensions of deprivation beyond income. A major contributor to the debate on the measurement of poverty is Amartya Sen. His work on capabilities in *"Development as Freedom"* espoused that the wellbeing of a person should not be reduced to income alone (Sen, 1999:87-90). Poverty should focus on the deprivations that inhibit the human wellbeing or the capabilities that make it possible for people to live the 'functional' life that they wish for themselves (Ibid).

The Multi-dimensions of poverty include; economic opportunities, water, sanitation facilities, access to health, education, shelter, security, participation in society, and access to information. The multidimensional perspective of poverty encapsulates the concept of deprivation and capabilities. Aside from income, the environment where one lives if it is prone to sea erosion or flooding can hinder the person's self-actualization or wellbeing just like the case under study. Similarly, access to health care, access to education, access to security or protection by the state, equal opportunities, etc, these are the deprivations that undermine human development in rural areas. The income and the capability approaches should not be seen as opposing concepts, instead, income is one of the deprivations and this can be reached through the capability perspective. Higher quality education and training can lead to high income and wages, good health guarantees more working hours to earn income, security and equal opportunities to all male, female, the handicapped, etc improves their capacities (Sen, 1999: 90). The measurement of deprivation seem to be the critique of the capabilities perspective, however, Sen indicates that there is no specific definition of indicators or a one size fit all set of indicators but the

deprivations fall within the multidimensional definition and the specific indicators of poverty may vary for different cases (Alkire, 2007:1).

There is a growing concurrence among academicians and policy makers on the capabilities and deprivation (the multidimensional) approach to poverty reduction and rural development (Makoka and Kaplan, 2005:5; Grusky and Kanbur, 2006:1; Alkire, 2007:1). Bassand (1986; Brugger 1986:39; cited in Nemes, 2005:2) noted that development should be one of qualitative and structural factors based on social, political, ecological, cultural and issues of sustainability and "not just quantitative and monetary measure." Engineers without Borders (EWB) an international NGO also writes "Human development is not about the rise and fall of national incomes. Rather, it is about the people, desire and struggle to expand their freedoms and lead lives they value".[9] Acknowledging the multidimensional nature of poverty the Copenhagen Declaration of 1995's defines absolute poverty as "a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information" (Makoka and Kaplan, 2005:6).

Having discussed the subject of poverty and infrastructure, the thesis proceeds to discuss the issues of policy and implemented project outcomes within the context of infrastructure provision and rural poverty reduction.

2.2. Public Policy

The state or the government as conceptualised by Thomas Hobbes (1651) in his works on the "leviathan" and "social contact" has the responsibility to provide for the welfare of her citizens. Explaining the role of the state or government further Thomas Jefferson (student of John Locke and David Hume) emphasized that the state and its institutions are "human constructs" designed for the welfare of society, i.e., "Governments are instituted by men…to secure the right of life, liberty, and pursuit of happiness" (Garr, 2010:4; Sachs, 2005: 348).[10] The constitution of Ghana (Republic of Ghana,1992, Act. 1; see Garr, 2010:14) mandates the state to provide for the welfare of all citizens, and the resources of the country are to be used for this sole purpose … *"the sovereignty of Ghana resides in the people of Ghana in whose name and for whose welfare the powers of government are to be exercised …"* Public Policies are tools or guiding

[9] Internet Source: http://www.ewb.ca/en/whoweare/humandevelopment.html [4/4/2010]
[10] Where the state fails to provide for the welfare of the citizens it should be changed.

frameworks employed by the state to meet the needs of citizens. Baker et al. (1975:12-15) defines public policy as "a mechanism employed to realise societal goals and to allocate resources." Nolan (2002:91) defines policy as "a broad statement of principles to guide action. It sets forth an overall goal or direction, describes in general terms what should be done [to attain the goals]". Similarly, Van Baalen and De Coning (2006: 216) describes policy as "a relatively detailed statement of government objectives in a sector and a general statement of methods to be used in achieving those objectives."

In the last two decades the policy management experience has made great in-roads in the south.[11] Mutahaba et al. (1993:45) however note that the implementation of policies have not been without failures, as projects are often associated with delays, over-run their costs, deliver "half-baked" outcomes or outright failures in some cases. Mutahaba et al., (ibid) chronicled many reasons that underpin the failure of projects and attributed them to difficulties in policy management in Africa; mainly these are political, social, economical, organizational, and institutional in nature. This is discussed further in the following paragraphs.

2.2.1. Infrastructure Policies

It was not until the late 1980s when public policy studies took interest in infrastructure provision, after infrastructure re-emerged into the international development arena as a purposeful vehicle for poverty reduction (OECD, 2006:3). According to Ariyo and Jerome these developments in infrastructure have brought about changes in the design, implementation, finance, ownership, management, and control of infrastructure services (2004: 4).

Fox and Porch (2001:106) note that infrastructure may be key to development but to accomplish that, it should be part of a "well structured program" [policy]. Similarly, DFID (2002:14) observes that for most infrastructure projects *"…benefits have often been less than anticipated, especially because of inadequate attention to governance and institutional frameworks…"* These observations raise issues of policy concern - suggesting that for infrastructure to contribute effectively to poverty reduction it should follow a well laid-out policy framework that outlines the objectives, resources, and procedures to be followed. By extension, the failures in infrastructure provision are as a result of the absence of adequate guiding frameworks.

[11] Through the work of many scholars including Brock and McGee (2004), Court and Young (2003), Brynard, Cloete and De Coning(1994, 2006), Dunn (1994), Grindle and Thomas (1980), Holmes and Scoones (2000), Leach et al. (2005), Mutahaba et al. (1993), Thomas and Grindle (1990) Walt (1984) Walt and Gibson (1994) Williams (2000, 2004), Wissink (1990), etc,.

2.2.2. Sectoral and Generic Infrastructure Policy

As indicated earlier, since the 1990s infrastructure provision has seen reforms in terms of design, implementation, financing, ownership, management, control, and a shift from hardware to outcome based infrastructure. However, in the absence of a generic or broad infrastructure policy in an environment where policy development is still at its infant stages one wonders how such revolutionary changes can be harmonised and made manifest effectively in the various sectors. The use of sector wide approaches (SWAP) may not effectively reduce poverty, as sectors that are likely to gain would support specific SWAPs, and sectors that do not gain directly may not support SWAPs (Maxwell, 2003:13; Foster et al., 2001:10). For cross-sectoral issues like poverty and rural development, cross-sectoral (broad) policy frameworks and regulations are the key determinants of outcomes. Marsden and Bristow (2000:456) also observes that *"there is little specific knowledge of the degree to which sectoral policies could potentially be more integrated as to better match the holistic nature of rural areas"*. Sectoral policies are characterised by inconsistencies and multiplicity of interpretations which frustrate cross sectoral projects. Generic policies are better placed to harmonize the development aspirations of the various sectors to meet national aspirations. Reforms in infrastructure provision have not been effective in Ghana (Ministry of Finance and Economic Planning - MFEP, 2009a:2-3; 2009b:1). The Government of Ghana (GoG) still provides all infrastructures with very little private sector involvement. In one of the several sensitization programmes on Public Private Partnership, the Minister of Finance and Economic Planning (MFEP, 2009b:1) said *"the Government believes that the private sector can and must play a bigger role in our infrastructure service delivery…"* In reality not much has been done in terms of policy changes to reflect, initiate or guide such a process – so the statement remains a wish.

Infrastructure facilities are not just physical structures or services in themselves but they serve as mediums or conduit pipes for translating sectoral plans or policies into the respective actualized sectoral objectives. Therefore it is no news to see social, economic, or environmental plans being implemented through infrastructure. An infrastructure policy is often generic, cross-sectoral and an integrated framework. It may be argued that a generic infrastructure policy may not be able to capture the diverse needs of the various sectors (Fox and Porco, 2001:120, 127). However it should be noted that most infrastructure services have at their base similar characteristics and concerns: high initial fixed cost and low marginal cost of supply, high sunk costs, public goods,

and also involves externalities. As a result of these characteristics most infrastructures are subject to similar, funding arrangements, implementation strategy, and they may also fail or succeed for comparable reasons. Definitely a generic infrastructure cannot make provision for everything but the key frameworks can be provided and the other details put in complementary policies. Moreover, such generic frameworks do not subsume the very specific details of the various sectors: most sectors have specialized policy strategies and the generic frameworks plays a broader role of providing the direction for linking the various specific sectors to the national aspirations. It is not a one-size-fit-all policy. With the current sectoral policy approach to infrastructure provision in Ghana significant poverty reduction and growth opportunities remain untapped.[12]

2.2.3. Rural Infrastructure and Policy

The objective of Ghana's development policies is to reduce poverty, and the fact as illustrated earlier shows that poverty in Ghana is a rural phenomenon (NDPC: 2005:2-3; UN, 2005a:5; Aryee and Asante, 2003:4). Following the ongoing review on the relationship between infrastructure and rural poverty reduction, that the former can influence the latter, it would follow that Ghana's policy environment on infrastructure provision incorporates elements that are essential to addressing rural poverty. Such rural poverty reduction strategies should seek to improve the welfare and the productive capacities of rural people based on the specific characteristics of rural areas: high level of poverty, low income groups, few or no industries, mainly subsistence production, bad transport network, ineffective market systems, low level of productive capacities, idleness, low level of literacy, often forest or water resources and their associated development potentials, prone to natural disasters, etc (OECD, 2006:27).

Critical policy concerns of rural infrastructure

Targeting: accessibility and distribution of benefits to the poor is vital for rural infrastructure to reduce poverty. This requires the development of criteria to identify the poor: income and expenditure data may be used (Gunatilaka, 1999:3). Rural infrastructure is more of a public good (most often non-rival and non-excludable) and this makes targeting the poor difficult. The need to target the poor is to avoid the situation where few well-to-do in the rural community monopolize or make maximum use of the facility to the disadvantage of the very poor. (Deva,

[12] A generic (infrastructure) policy makes for effective use and management of resources and development interventions for the attainment of national goals (poverty reduction and development), obtain more by reducing the duplication of activities.

1991, see Masika, and Baden, 1997:4). Thus, similar to Michel Foucault's dictum of "*dispositif*" the well-to-do in the communities who have the capacities to take advantage of rural infrastructure and exploit the poor (1977:194-228).[13] For example, private water vendors (sell subsidised rural water at prices higher than normal rates) and private transport and water providers capitalize on their resources and subsequently their monopoly to charge exorbitant fares.[14] Effective targeting should be employed to create opportunities that ensure maximum gain for the poor. Also, because of the low level of income in rural areas policy should consider regulations and subsidies to protect the welfare of the rural poor.

Targeting areas of impact: For such rural infrastructure projects to reduce poverty it is imperative to target channels such as Agriculture development, Fishery development, Tourism promotion, local craft promotion, improvement in health care, improvement in access to education, etc so as to impact significantly on the people's welfare and production capacities. Geographical targeting (OECD, 2006:27), targeting specific areas of comparative advantage, removing obstacles to development and integrated development planning are key.

Integrated development planning: A DFID study (2002:11) noted that when infrastructure projects are complemented by other sectoral interventions it has a greater impact on poverty reduction. It is important that infrastructure provision in rural areas is linked to social services and the productive sectors so as to create forward and backward linkages among the production sector. Single-sector infrastructure makes it difficult to realise any meaningful impact on poverty reduction (OECD, 2006:28). A participant in a participatory poverty assessment in South Africa noted … "Government departments work in isolation, for example, the Department of Works would construct a road where there is nothing else, while Education establishes a school where there is no road" (DFID, 2002:11). Such integrated infrastructure projects do not only benefit the poor but, also reduces the cost that the various sectors would incur (cost and risk sharing schemes, pool of expertise, etc) in developing the various sectors individually.

Low Cost and Affordability: Infrastructure projects aimed at rural poverty reduction should consider the low income group of the people. This can be done through price mechanisms that

[13] The French Philosophers - Michel Foucault use of the word "dispositive" refers to the resource, institutions or structures which enables people to enhance or maintain their power within a group.

[14] Similarly, this has been the case with irrigation projects where households with large farmlands benefit most (Gunatilaka, 1999:4), but in a counter argument a World Bank study noted that where large-scale farmers benefit from rural infrastructure in the form of improved productivity they employ more of the poor at high wages and that reduces poverty (World Bank, 1990; see Gunatilaka, 1999:4). Gunatilaka questions, why invest in rural poverty when it will not benefit the poor directly?

protect the poor, such as block tariffs, the use of appropriate rural technologies, or the development of state programs that takes up part of the cost as a means of attracting investments and residents to the rural areas (Masika, and Baden, 1997:4). The rule of thumb is that, in all efforts to provide affordable services to the rural poor the sustainability or maintenance cost of the project should never be compromised.

Employment creation and skills training: In view of the fact that, in rural areas most people are underemployed, deliberate efforts should be made when designing infrastructure projects to create jobs for the people. As indicated earlier the construction of infrastructure projects employs large numbers of workers which translates into income for the hither-to unemployed (Fox and Porco, 2001: 112; Sida, 1996, see Masika and Baden, 1997: 3). This is especially the case when labour-intensive methods are used. Also such labour-intensive methods equip the hither-to unskilled and unemployed rural poor with employable construction skills and experience to take-up jobs to provide for their households. It is estimated that in Ghana if 30% of infrastructure investments were labour-intensive about 50,000 direct jobs and 75,000 indirect jobs would be created (Islam and Majeres, 2001, see DFID, 2002:12). In seeking to create more job opportunities, it should be ensured that the jobs are decent, and accidents, exploitation and human right abuse are reduced by enforcing labour, health, and safety standards (OECD, 2006:29; DFID 2002:12). Often infrastructure contracts are awarded to large and also foreign companies. To further the objective of rural poverty reduction it is important for such principal contractors as a matter of policy to award smaller service contracts to rural community groups, local contractors or service providers (OECD, 2006:29). Additionally, to create more job opportunities for the community members and nationals it is important as a matter of policy for about 60% or more of casual labourers to be employed from the rural communities and about 30% within the country. This would curtail the situation where foreign contractors bring in casual labours from their native countries which reduce job and income earning opportunities for the rural poor (for example, Chinese and other foreign construction companies implementing projects in Ghana bring in casual labour from their home countries to take up positions).[15]

Environmental: The environment is crucial in the daily lives of rural people and their destruction makes the poor worst-off. Thus it is important rural infrastructure integrate environmental concerns that help to improve the wellbeing of the rural poor (Jones and Carswell, 2004: 63).

[15] Internet source: http://news.myjoyonline.com/business/201005/45939.asp [May 10, 2010]

Participation of affected communities: Participation of the affected people is vital for the project to target the poor or respond appropriately to their needs. This also helps to empower the rural poor to take responsibility for their own development and the maintenance of the infrastructure. Local government planning structures should be strengthened to effectively collate local plans and get the local people involved in such projects (Williams, 2005:63, OECD, 2006:27).

Financing: Financing of such infrastructure should follow from a broad infrastructure policy. Decisive efforts should be made to explore all reliable forms of funding (state, community, private sector, and donor support) that can serve the welfare of the public. Taking note of financial constraints on the part of the state, the government should encourage private investment in infrastructure. Infrastructure investments in rural areas are unattractive to the private sector because of the difficulty in recouping investment, an alternative could be cost sharing and tax incentives. Under cost sharing and tax incentives the state takes responsibility for funding the basic infrastructure (with high sunk cost) such as road, electricity, and water. Private investors are then encouraged with tax incentives to invest in other sectors like irrigation and farming, markets and industries, etc. The communities can also invest jointly in the likes of standing pipes and buses. Multilateral and bilateral donors in Ghana have shown interest in supporting rural infrastructure provision. The government should improve transparency and local accounting systems so as to encourage more donor investments in rural infrastructure (OECD 2006:33).

Management and Maintenance of rural infrastructure: Rural infrastructures often face problems of management and maintenance. Some studies (Gunatilaka, 1999:5) have indicated that politicians and people working in the public sector have an incentive not to maintain infrastructure because they get politically recognized by commissioning new projects. New projects also make it easy to take bribes or divert public resources to private benefits (ibid). It is important for (infrastructure) policy to set-out how rural infrastructures are to be managed. Aside the often used state management structure, the affected communities can be involved. This also creates jobs and increases the community's ownership and sustainable use of the resource.

Following the justification for a broad infrastructure policy and identification of essential inputs that should help reduce rural poverty, it may seem enough, but, Bardach (1977:3) observes:

> *It is hard enough to design public policy and programmes that look good on paper. It is harder still to formulate them in words and slogans that resonate pleasingly in the ears of political leaders and the constituencies to which they are responsive. And it is excruciatingly hard to implement them in a way that pleases anyone at all, including the supposed beneficiaries or clients.*

2.2.4. Complexities in Infrastructure Policy Implementation - converting policies into outcomes

The implementation process or the translation of policy into desirable outcome is often complex and more variable than expected. Bardach (1977:5) writes "*even the most robust policy – one that is well designed to survive the implementation process – will tend to go awry. The classic symptoms of underperformance, delays, and escalating costs are bound to appear*."

It was not until 1960-1970s following the failure of many policies after the second world war that the implementation process got attention as an important exercise in the policy making process in terms of analysis and research. It was thought that once policies pass the cost-benefit analysis they would automatically translate into desirable outcomes. Martha Derthick's *New Towns in Town: Why a Federal Program Failed* (1972) and Pressman and Wildavsky's *Implementation* (1973) are said to be the pioneers on discussions in the implementation process (Parsons, 1996: 463). Pressman and Wildavsky (1973, xv) define implementation as "a process of interaction between the setting of goals and actions geared to achieve them". For Van Meter and Van Horn (1974:447-448) policy implementation refers to "those actions by public or private individuals (or groups) that are directed at the achievement of objectives set forth in prior policy decisions". As Brynard and De Coning (2006:180) put it, "successful implementation is the final acid test for a policy to be success." Similarly, Jenkins (1978:203) observes that implementation is "how change occurs" in the policy process. Thus, the implementation process is a crucial stage between policy and successful outcomes, it determines whether a brilliant policy would materials or fail. Hargove (1975, see Parson, 1996:462) calls it the 'missing link' in the policy process. There are many issues that go on or into implementation of policies that are often not considered in the policy process, the actors, substructures, and interests. There are three main models of implementation; the Top-down, the Bottom-up, and hybrid approaches.

2.2.4 (a) Top-down and Bottom-up Approaches to Policy Implementation and Development

The on-going discussion has touched on the role of various actors. The policy implementation process encompasses different actors and various interests, including the policy makers at the centre, and the middle level officials or the beneficiaries of the project (Mazimanian and Sabatier, 1981, see Brynard and De Coning, 2006:189). At the crux of some failures in policy implementation is the disagreement or neglect of some actors and their interests or the

exaggeration of the role of other actors. Some scholars (Pressman and Wildavsky, 1973; Van Meter and Van Horn, 1975; Hood, 1976; Gunn, 1978; Nakamura and Smallwood, 1980; Mazimanian and Sabatier, 1983; see Fischer et al, 2007:89) have argued for centrally defined and hierarchical implementation (carried out like a chain of commands from the top through the administrative machinery according to specificity) known as the "top-down" approach. In contrast to the "top-down" position is the "bottom-up" position championed by Lipsky(1971) Elmore (1978;1980), Hjern and Hull (1982) (see, Parsons 1996:463; Fischer et al, 2007:89) who argue that the people at the grass root level are well-informed about the situations they face and they are in the best position to implementation rural developments. The theories of top-down and bottom-up were initially treated as opposing sides (Fischer et al, 2007:95).

A parallel position to the bottom-up approach known as the endogenous concept in rural development led by Bassand, Brugger, Bryden, Friedman, Stuckey, Lowe, and Ray (1986) criticized the practice where rural development plans were remote controlled or isolated from the intended beneficiaries, wondering how "socio-economic problems can be solved by standard measures regardless of location and culture" (see Nemes, 2005:2). For Shortall and Shucksmith (1998:75) the importance of the endogenous approach lies in the fact that development is not about increase in goods and services but also empowerment and the ability of the local people to manage their resources, and this should be done through policy changes. Similarly Picchi (1994; see Nemes, 2006:3) pointed to the fact that "political institutional arrangements" can help establish a strong endogenous environment for development. Ray (1997:347) argues that the endogenous approach "sets development activity within a territorial rather than sectoral framework." However, the danger in Ray's argument including some of the bottom-uppers (endogenous approach) is simply an over emphasis of the participation of local people to the detriment of pragmatic and relevant policy and implementation processes. Most often programmes are confirmed from the centralized national offices which have a good idea about the resources available at a particular time and the broad spectrum of competing needs, and we can't pretend as if the central does not exist. It is important to provide realistic analysis of these issues, otherwise rural infrastructure would continue to remain a "breathtaking" framework but a failure in practice. As rightly pointed-out by Brugger (1986:50) "'too endogenous,' self-reliant development which ignores external effects and global economic processes" can be very devastating. There are also concerns about endogenous rural development projects that end-up

enriching powerful groups or actors leaving the rural poor in squalor and servitude (Lowe et al., 1998, Ward and Nicholas, 1998, see Nemes, 2006:4). Pessimistically, Slee (1994:191) argues that not much has changed about the endogenous (bottom-up) and exogenous (top-down) approaches, the objective remain unchanged and it is in the interest of those at the top to promote local participation to protect their own interest.

Like the dictum of Heraclitus (535BC 475BC) "change is the only constant," Wildavsky concedes that "implementation is an evolutionary process … constantly reshaped and redefined"(see Fischer et al., 2007:90). Most proponents of both the 'top-down' and 'bottom-up' approaches have relaxed from their extreme positions to say a hybrid which is a combination of the 'top-down' and 'bottom-up' approaches is preferable (Majone and Wildvasky, 1978; Lewis and Flynn, 1978; Barret and Fudge, 1981; Hjern 1982; Elmore, 1985; Sabatier, 1986; Goggin et al.,1990; see Fischer et al, 2007:91). Hanf (1982:171) writes that "it is not a question of choosing 'top' or 'bottom' as though these were mutually exclusive alternatives".

2.2.4 (b). Converging themes in the Implementation Process

Gradually academicians and policy makers are beginning to concur on the complexities inherent in the policy implementation process which is influenced by multiple actors and operates at multiple levels. Across countries, development fields and theories some common elements have emerged in implementation. These common elements; Policy *Content*, Institutional *Context*, *Commitment* of implementers, *Capacity* of implementers, and *Clients and Coalitions*; can be described as a set of interrelated variables (Brynard and De Coning, 2006:182).

The issue of *content* answers the question, what is the problem at hand and how does the policy intend to solve it. In this regard the benefit derived from rural infrastructure policy is redistributive such that resources are reallocated to the rural poor who are often marginalized, by way of integrating them socially and economically into the state; regulatory such that rules are made to control or protect some sections of the society (e.g. the poor); or distributive such that it brings about improvements in welfare for the larger population (Lowi, 1964; see Brynard and De Coning, 2006:196-197). These are critical questions that need to be answered to inform the objective of the policy, how it would be achieved and who would make it happen (Pressman and Wildvasky, 1973; see Brynard and De Coning, 2006:197).

The *context* refers to the institutional processes that the infrastructure policy must go through; these are often influenced by the social, economic, political, and legislative environment. It is important to know if the context supports the content as for example an infrastructure project that seeks to increase productivity in crop farming would be difficult in a rural fishing community where farm lands are limited and people have very little knowledge about farming – this often happens when most people equate rural poverty reduction to increase in farming activities. A policy may have the best of intentions but the contextual processes can render it a fiasco.

The necessity of *Commitment* is expressed in the words of Warwick (1982:135)

> *Governments may have the most logical policy imaginable, the policy may pass the cost-benefit analysis with flying colours, and it may have a bureaucratic structure that would do honour to Max Weber, but if those responsible for carrying it out are unwilling or unable to do so, little will happen.*

If an infrastructure policy is to reduce rural poverty the commitment of the politicians at the national and regional levels, technocrats in the various ministries and agencies, the "street-level bureaucrats" and the beneficiaries cannot be ignored. They would have to work conscientiously on their roles.

Capacity is important because no infrastructure policy will reduce poverty if the implementers do not have the capacity to execute the project. Capacity can be grouped into tangible and intangible capacities. The tangible capacities include human, financial, and material resources. The intangible capacities or what others call soft skills include leadership, commitment, boldness, political willingness, etc. The capacity being discussed should not be mistaken for what Brynard and De Coning (2006:199) call the "minimum conditions" that are required for the normal daily routine functions. Programme or project implementation demand extra capacities, for example, the *"eunoia"*[16] or political will to take decisions without first "counting the votes on the election day" or the *"eunoia" and* boldness to vote huge sums of money for intervention projects that seek the wellbeing of rural citizens like the KSDP even in the faces of limited resources. The lack of political will to provide the necessary capacities is at the crux of the failure of most projects (Garr, 2008:100).

Clients and Coalitions, development policies affect different groups of stakeholders, including those who stand to benefit and those who may have to give-up something for the policy or project to take-off. The actions of both groups have the tendency to affect the policy positively or

[16] Used by Aristotle to mean seeking good for others for the sake of the others [http://plato.stanford.edu/entries/aristotle-ethics/ , Friendship] January 27, 2010

negatively. The ability to identify clients and coalitions, whose interests are affected, harness the positive actions, negotiate or convince and co-opt the negative influences to see the good in the policy and to support it, is vital. According to Rein and Rabinowitz (1978:314) a division among the interest groups is capable of upsetting the implementation process.

Communication can be added as a sixth variable as it is the medium of implementing projects. Good channels of communicating project goals among the project team are essential. Similarly communication serves as a channel for preventing and resolving conflicts within the implementation environment. Lately most projects have bulletins to inform the stakeholders as to what is going on and to alleviate fear of doubts that may culminate into tensions which can have explosive consequences on the implementation process (GLDD, 2000:1).

Coordination can also be added to the converging variables as most scholars would agree that without the coordination of plans, the various actors, resources, and project components implementation will fail.

2.2.4 (c) Management styles in the Implementation Processes

In view of the fact that infrastructure provision involves huge sunk costs, effective financial management tools like Medium Term Expenditure Frameworks (MTEF) are very useful as they ensure that projects are implemented on schedule and also they shield projects from political manipulation (De Coning and Van Baalen, 2006:242). Particularly in countries where 'who does what and who gets what' depends on client-patron relationships and political cronyism, some governments abrogate infrastructure contracts based on such relations (Gunatilaka, 1999:3-4). Infrastructure financing and management has also moved beyond sole government sponsorship to privatization, public private partnerships (PPPs), public private community partnerships (PPCPs), Build Operate Transfer (BOT), etc, and has so far generated so much interest from private investors, communities, and state (MFEP, 2009:1-6; UNECA, 2000:4; DFID, 2002:20-25). The rule of thumb here is coherence in development policy planning implementation and management, as that is the key to transforming "breathtaking" policy concepts like rural infrastructure to the "promise land" of rural poverty reduction and development. It is apparent from the discussions so far that some project management elements are indispensable in the implementation of rural infrastructure. These essential elements for the achievement of project goals also known as project management body of knowledge (PMBOK) include project integration, scope management, time management, cost management, quality management,

human resource management, communication management, risk management, and procurement management (Burke, 1999:6-7; Turner, 1993: 8-14).

2.2.5 Theorizing the relationship between public policies (infrastructure policy) and outcomes (rural poverty reduction)

2.2.5 (a) Developments in Implementation Theory

Generally there are three generations of implementation, the first generation also known as the classical perspective assumes a top-down approach to implementation. It assumes that policy implementation is an automatic cog such that once rules and policies are made by the higher hierarchy of authority it will necessarily be implemented to the letter by the men at the bottom of the authority structure. It was rationalized on a hierarchical and centrally defined system of government which by heuristic extension characterized the monarchical and aristocratic systems of government that existed in the periods preceding the 20th century. Setbacks and failures in implementation outcomes within the 1950s -70s brought about the need to reconsider the assumptions of the first generation and to accept the fact the implementation process is much more complex and dynamic. For example as noted by Levine (1972:9) policy is "implemented by program operators who may or may not be in sympathy with the plans, may or may not have even understood them, but in any case will certainly be governed by their own motives and imperatives, both personal and programmatic". Though the second generation has enriched the body of knowledge on implementation by critiquing the first model and raising probing questions in addition to the many cases studies collected to demonstrate the complexity in the implementation process, a causal or predictable relationship is still lacking. It is difficult to specify if there is any generally acceptable theory in policy implementation: a causal relationship between an independent variable and implementation outcomes, or predict the frequency of any pattern of relationship between any independent variable and implementation outcome, or any 'multivariate analysis of implementation performance' (Goggin, 1986: 328-329). The difficulty of a predictable causal relationship between an independent variable and implementation outcomes have led many scholars to forego statistical methods for case studies analysis (ibid). The absence of, and the quest for a predictable theory in implementation studies gave rise to the third generation of policy implementation (Bardach, 1977:5; Brynard and De Coning, 2006: 184-186; Pressman and Wildavsky, 1977:3).

As part of the third generation seeking a predictable causal relationship, the thesis applied two models developed from case studies to attempt to construct a relationship between policy and implementation outcome, the impact chain model and the game model. Using the triangular approach, the models were complemented with other public policy theories, including Warwick's implementation transaction model, Actor centred institutionalism, and Rationale public choice theory.[17] It is worthy of note that it is when such models from case studies are applied to the extent that patterns of consistency and predictability emerge in their analysis that we can announce the discovery of a theory.

2.2.6 (b) The Impact Chain Model

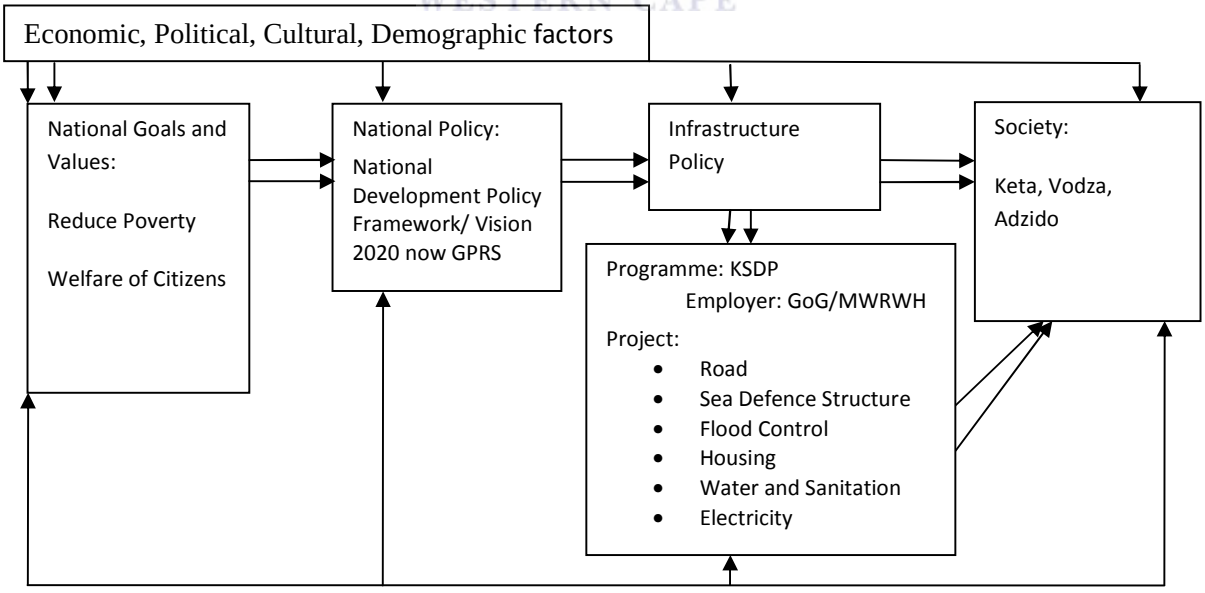
Parallel to the description of policy as providing the guiding framework and environment within which state interventions are undertaken Austin proposed the 'Policy Impact Chain Model' (1990:77). The model describes the process through which polices are made and implemented to satisfy the needs of society. The policy impact chain model argues that national interests and aspirations are drawn from the concerns of society which are influenced by the economic, social, political, demographic and environmental conditions of the society. The concerns of society are converted by government into national policies and strategies, the policies are then implemented (transformed) into outcomes that seek to meet the interest of society through special-purpose vehicles known as programmes and projects. The national policies help address concerns within certain sectors, group or area of a country, and as rightly noted by Kent and McAllister (1985, see De Coning and Van Baalen (2006:216) it provides the framework for which programmes and projects are designed. An important acknowledgement in the "policy chain model" is that the affected people or society participate in the policy planning, implementation and evaluation of the project, thereby incorporating both elements of the top-down or first generation and the bottom-up or second generation of implementation. The relationships of all actors are directed by rules in the policy, the rules are not assumed to be automatic but they are evolutionary changing with time and thereby demanding dialogue between the various actors at the various stages of the policy process. Policy in the impact chain model is seen as an evolving process and does not end just after it is conceived, and its implementation as noted by Majone and Wildavsky (1984:16) "…will always be evolutionary; it will inevitably reformulate as well as carry-out policy"

[17] As will be explained in details in the subsequent paragraphs, Warwick's implementation transaction model and Actor-centred institutionalism emphasize the importance of policy and institutions in achieving policy and project objectives. Rationale public choice theory also emphasize on the importance of the interest of the political interest.

Similarly, Warwick's implementation transaction model (1982:181) assumes that it is important for policies to set up the 'parameters and direction for action'. The consideration of the programme's environment is important for the project outcome and the role of clients or the affected people is critical to the success or failure of the policy outcome. The Actor-centred institutionalism (ACI) theory of public policy also emphasizes the role of institutions and structures in shaping the society (Howlett and Ramesh, 2003:29; March and Olsen, 1984:738). For the ACI theory, rules, institutions and structures constrain and direct what and how the state attends to the needs of the people. The state or politicians do not just act but they operate, plan and implement projects based on rules and policies that set-out how things are to be done. [18] The conclusion reached here is that broad policies (rules and institutions) are important for the state to meet the welfare needs of the society. The emphasis on policy, structures or institutions does not refer to the classical view of policy implementation but as evident in the discussion a combination of elements from the first, second, and third generations of policy implementation.

Applying the impact chain model to the KSDP, poverty is a major problem in Ghana. Poverty is the result of economic, social, environmental, cultural, and the demographic factors. The relationship between the KSDP and the impact chain model is illustrated in fig. 5 below.

Fig. 5, Impact Chain Analysis: Relationship between policy and implemented project outcome



Source: Austin 1990:77 (modified)

[18] One variant of the ACI theory, Transaction Cost Analysis (TCA) also provides a model for identifying problems and the range of solutions that can be administered (Howlett and Ramesh. 2003:30).

Ghana's desire to reduce poverty (public welfare) shapes the national goals and values. Ghana's value and goal to reduce poverty is expressed in the National Development Policy Framework – NDPF (NDPC and IIED, 2000:1) now GPRS. Following the affected peoples' complain about the destructive effects of sea erosion and flooding on their lives, the Government of Ghana (GoG) responded by initiating the Keta sea defence project - KSDP (which becomes the instrument for reducing poverty). Before initiating the KSDP the model assumes Ghana has an infrastructure policy crafted in line with the National development policy framework or GPRS to guide the project.[19] The employer of the project, the GoG, is represented by the Ministry of Water Resources Works and Housing (MWRWH). Under the programme (KSDP) there are a number of integrated projects intended to reduce poverty in the affected communities – road, sea defence structure, flood control, housing, electricity, water and sanitation. The society or the affected communities here are Keta, Vodza, and Adzido. Like Pressman and Wildavsky's analysis of policy implementation "If *X* is done at time t_1, the *Y* will result at time t_2" (1973:xiii), the Impact Model proceeds that once the policy is well planned, and the necessary resources are put in place including consultation with the stakeholders and actors the expected outcome should be achieved. In this case, the KSDP is expected to achieve its objective of poverty reduction.

2.2.6 (c) The Game Model

Departing from the policy impact model are Bardach's (1977) and Warwick's (1982) game models. Bardach's game model in his book, *the Implementation Game (1977:56)*, asserts that implementation is a game of "bargaining, persuasion, and manoeuvring …" The Actors 'play to win as much control as possible, and endeavour to play the system' to achieve their personal interest (Parson, 1996:470). Thus, the Government's initiation of the project can be seen as using the project to control the beneficiary communities, and so it applies more commitment to ensure that the project succeeds. Another government taking over from the previous government which has little or insignificant votes in the affected communities may decide to divert resources to where its sympathizers are or delay the release of project funds to demonstrate its authority as a way of blackmailing people in the affected communities to join its fold. The Game model believes that politics goes beyond decision making to affect implementation. Politics cannot be ignored in the implementation process. This approach sees implementation as "another form of politics …" (Parsons, 1996:471).

[19] This is an assumption; Ghana provides infrastructure through sectoral policies and not a generic policy.

Similarly, Warwick in his model (1982, see Brynard and De Coning, 2006:193) argues that, policies do not matter and that policy implementation is a matter of power play; who gets what is based on what the government's expects to get in return. In the words of Warwick (ibid) the game theory "plays down plans and policies and plays up the power of bargaining and exchange". Warwick's model suggests that, whatever policies or plans that might be the basis for the KSDP, it is subject to government's manipulation. The government decides the fate of the project based on what it stands s to gain. It stands then to reason that, the political interest of the government in the affected project communities can influence the project outcome, what Warwick may describe as a "swing from total rationality to virtual irrationality in implementation" (ibid). Thus, as to whether a project will succeed or fail does not necessarily depend on the having a policy but on the private interest of the government. The public policy making perspective of the rational public choice alludes to the position of the game theories. The rational public choice theory developed from the 'principles of neo-classical economics to political behaviour' argues that political actors engage in rent-seeking behaviours. The action of the political actor (the voter or the politician) is informed by self-interest (Van Winden, 1988; see Howlett and Ramesh, 2003:22). The relationship between the state and public welfare is like a 'business cycle', satisfying private interest instead of national interest. In most developing countries where political office which is supposed to be a position of dedicated self-less service has ironically turned into a 'glorified aristocratic' position, the politician who wants fame, money, and power makes 'sweet' promises to the voter so that the voter is convinced to vote him into office. When in power the politician or the government also tries to fulfil its campaign promises to its voters or party people through all means. Politicians may not necessary follow a policy process which is often cumbersome, but may decide at his/her behest when and how to implement projects. Such projects are likely to be initiated or implemented in election seasons. In such situations not all sections of the population or poor people would benefit but mostly only cronies, also such projects may be abrogated when a new government comes into power as often laid down rules are not followed.

2.3. Hypothesis

Following from the above discussions and analysis into the relationship between infrastructure and rural poverty reduction, and policy and implemented outcomes, the following hypotheses have been postulated:

1. There is a positive relationship between the Keta sea defence project and rural poverty reduction.
2. The more an infrastructure project is guided by an infrastructure policy the more likely it is to succeed in reducing rural poverty.

2.4. Summary

Chapter two has reviewed the literature on infrastructure, rural poverty and public policy. Theories and models were explored to explain the possible relationships between infrastructure and poverty reduction, policy and implemented project outcomes, which culminated into the hypothesis of the thesis. The thesis now proceeds to chapter three to explain the methodology for collecting data, and empirical testing the relationship between the variables under discussion.

CHAPTER 3

Research Design and Methodology of the Study

"Every discourse, even a poetic or oracular sentence, carries with it a system of rules for producing analogous things and thus an outline of methodology" - Jacques Derrida

The chapter outlines the methodology employed to test empirically the assumed relationships between infrastructure, rural poverty reduction, policy, and implemented outcome (with the aim to respond to the objectives of the thesis). The operationalisation of hypotheses, data collection methods, sampling method, data needs, and the methods of data analysis are explained.

The methodology is organized in series; the first section of the chapter provides the methodology to test empirically the impact of an infrastructure project (KSDP) on poverty reduction in the affected rural communities. This section involves quantitative analysis mixed with some qualitative analysis. The quantitative analysis became necessary because the section involved the quantification of data, measurement of quantities and amounts, and the use of statistical tests to explain relationships. The second section examines the implications of the impact assessment results on Ghana's infrastructure provision policy environment – this part is mainly qualitative. The qualitative method here became necessary because the thesis sought to gather in-depth contextual information on infrastructure provision, policy, implementation, and rural poverty reduction in Ghana.

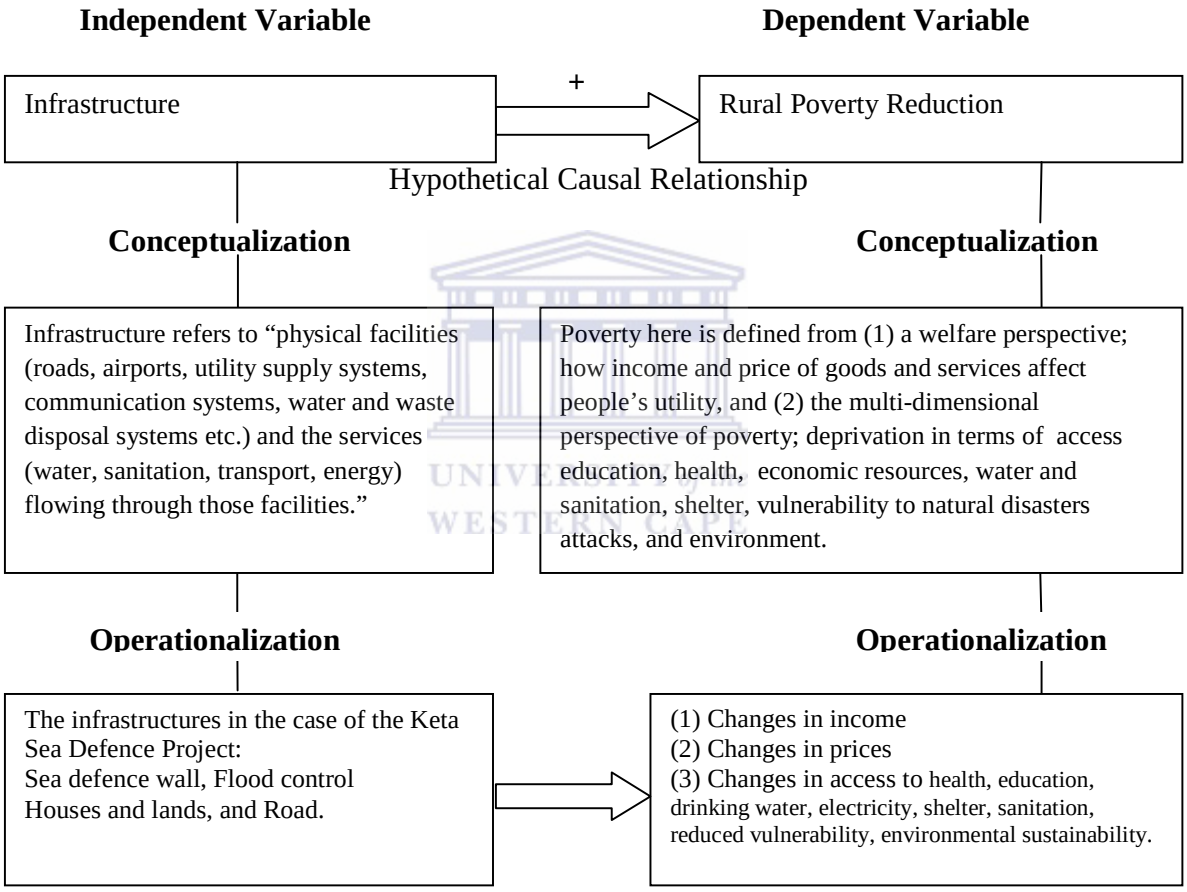
The use of methodological triangulation or cross-examination combines the strengths of the qualitative and quantitative method thereby enhancing the degree of credibility of the research results (Altrichter et al., 2006:117, see also Denzin: 2006). As noted by Webb et al. (1966:3), "once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly reduced".

3.1 Impact Assessment of the KSDP on Rural Poverty Reduction

3.1.1. Operationalisation of Hypothesis

The operationalisation of the hypothesis is presented in the form of a diagram below, where abstract variables like Infrastructure and Rural Poverty are conceptualized or defined, and from there they are operationalised into observable or measurable indicators.

Fig.6, Conceptualisation and operationalisation of the impact of infrastructure on poverty reduction.



Source: Author

3.1.2. Methods of Assessment – "With and Without" Analysis

3.1.2.1. Essence of the "With and Without"method

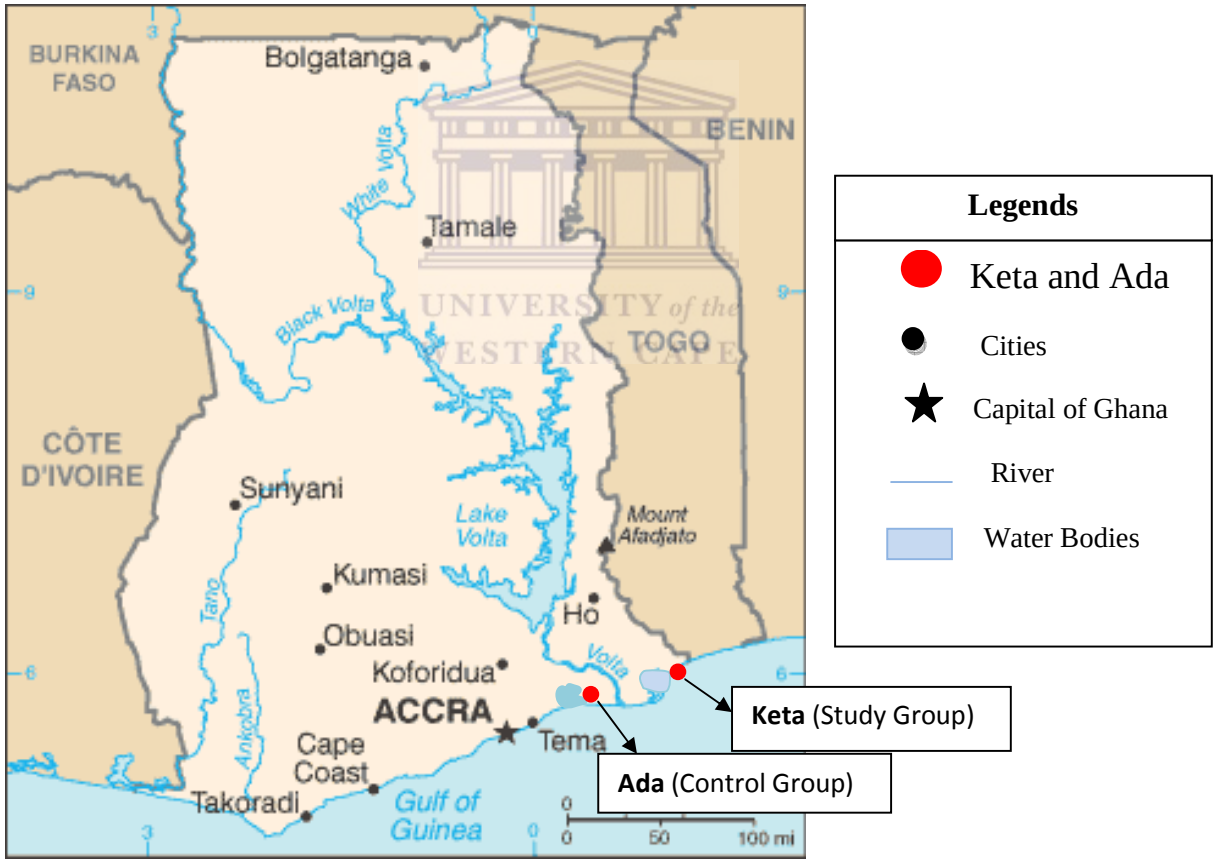
Due to the unavailability of accurate baseline data on poverty levels in the various communities coupled with the challenges of attribution bias, the "with and without" method was used to measure changes in poverty (compared to the alternative "before and after" method the "with and

without" method reduces attribution bias). The "with and without" method compares the study group to a control group without the infrastructure project: the difference between the two cases forms the basis for inferring the impact of the project. The control group thus, serves as the baseline data for the analysis of the study group. For the control group to provide a good basis for inferring project changes, the control group should be comparable to the study group in terms of characteristics relevant to the study the only exception should be that the control group has no infrastructure project.

3.1.2.2. Selection of sites

The study (project) and the control groups Keta and Ada respectively are located in Fig 7 below.

Fig. 7 Map of Ghana locating the study and control groups.



Source: modified by Author

The thesis tried to minimize bias by selecting a control group that had comparable characteristics (the basic defining features of towns and communities) in terms of socio-economic activities, environmental conditions, demography, and history, vegetation and climate. Very essential was

the fact that the two groups were facing the same problems of sea erosion and severe poverty before the infrastructure project commenced in the study group (with the aim to stop the destructive activities of the sea and to reduce poverty in the rural communities). These characteristics are contained in table 1, below.

Table 1, Characteristics of the Study Group and the Control Group

Characteristics	Study Group	Control Group
Affected Communities	Keta: Adzido, Vodza, Keta	Ada: Elavanyo, Lolonyakope, Totope
Community type	Rural	Rural
Location	South Eastern Coastal Plains	South Eastern Coastal Plains
Environment	Lagoon, Sea	Lagoon, Sea
Vegetation	Coastal Savannah, Mangrove trees	Coastal Savannah, Mangrove trees
Climate (Rainfall, Temperature)[20]	800ml, 30 degrees Celsius	750ml, 30 degree Celsius
Economic Activities	Fishing, Farming, Salt mining, Trading, Fish processing, Tourism Potentials, etc.	Fishing, Farming, Salt mining, Trading, Fish processing, Tourism Potentials, etc.
Problems before year 2000	Sea Erosion; flooding; loss of lands, infrastructure, properties, and livelihoods: Poverty.	Sea Erosion; flooding; loss of land, infrastructure, properties, and livelihoods; Poverty.
Number of households[21]	1250	1100
Intervention	Keta Sea Defence Project	No Intervention

Source: Author

Table 1 above indicates that among the characteristics used as the basic defining features of towns and communities the study group and the control group were comparable. This made the two groups suitable to conduct the "with and without" analysis.

To ensure that the data collected were accurate and adequately reflected the realities in the communities, 6 communities 3 from each group were selected. The communities as indicated in the table above included, Adzido, Vodza, and Keta for the study group, and Elavanyo, Lolonyakope, Totope for the control group.

[20] www. ghanadistricts.com, Keta district, Dangme West district [20/04/2010]

[21] Estimated number of households was collected from elders and senior members of the communities and further verified against district records. Data on the population of the communities was not available from the responsible administrate offices.

3.1.3 Data Needs and Data Collection Methods

The variables derived from the operationalisation above were measured through various data sources. Primary data were collected through questionnaires and observation, and secondary data was cited from Keta district reports and KSDP documents. These are detailed in table 2, below.

Table 2, Variables, indicators, units of measurements, and data sources

Variables	Indicators	Measurement	Source of Data
Infrastructure (Independent Variable)	1. Road 2.Housing community 3. Flood control 4. Sea defence wall	Description of indicators	Project Documents, Observation
Rural Poverty Reduction (Dependent Variable)	1. Income	Income levels	Questionnaire
	2. Price	Prices of goods and services	Questionnaire, Observation
	3. Access to:		
	A. Health Care	Health care accessibility	Questionnaire
	B. Education	Education levels	Questionnaire
	C. Drinking water	Source of drinking water	Questionnaire
	D. Electricity	Source of lighting	Questionnaire
	E. Shelter	Type of building Material	Questionnaire
	F. Sanitation	Type of toilet facility	Questionnaire
	G. Vulnerability	Risk of erosion, flooding	Questionnaire
	H. Environment	Protection of environment	Reports, Observation

Source: Author

3.1.3.1. Data Needs

The levels of income of households in the study and control groups were used to measure income differences between the two groups. The monthly household incomes in the study and control groups were collected via questionnaires.

Prices of goods and services were used to measure differences in the prices between the study and control groups. The prices were collected from the respondents in the study and the control groups and cross-checked to ensure the prices were accurate and uniform for each group.

Accessibility to health care in terms of constrains accessing health and enrolments in health insurance were used to measure differences in access to health care; these measures explained why people may have access to health care or be denied access to health care. A questionnaire was used to collect responses on accessibility to health care.

The level of education of children in the two groups was used to measure differences in access to education; the level of education of the children tells if children in a particular group have a better or limited access to education. The respondents chose from various levels of education provided in the questionnaire.

Respondents' source of drinking water was used to test if there were differences in access to drinking water between the two groups. The questionnaire provided different sources of drinking water: indoor pipe-borne water (highest ranked) means better access to drinking water, and open water bodies (least ranked) means poor access to drinking water.

The source of lighting was used to measure differences in access to electricity in the study and the control groups. The respondents chose from various sources of lighting (ranked as electricity (1), generator (2), Kerosene Lantern or candles (3)) provided in a questionnaire.

The type of building material of respondents' shelter was used to measure differences in access to quality shelter in the two groups. Here the size of the structure was not as important as the building materials. Building materials tell the durability of the structure to provide shelter, also it is used nationally. Among a list of materials cement was ranked as the best, and thatch/clay was ranked as the least desirable. A questionnaire was used to collect this information.

The type of toilet facility that a household uses was used to measure differences in sanitation between the study and the control groups. This measure was important because for most coastal communities in Ghana sanitation is a huge challenge as the people in the absence of adequate toilet facilities resort to the use of the sea shore as the place to ease themselves. The health risks include typhoid, cholera, etc. The information was collated with a questionnaire.

The risk of being exposed to sea erosion and flooding was used to measure differences in vulnerability between the study and the control groups. Before to the project the two groups were facing sea erosion and flooding – contributing factor to poverty in the two groups. Therefore in

the light of a project intervention it was important to measure people's vulnerability to sea erosion and flooding. This was accordingly measured with a questionnaire.

The respondents' perception of the sustainability of the environment, project documents and the researcher's observation formed the basis for measuring the differences in environmental sustainability between the study and control groups. Prior to the project in the year 2000, communities in both the study and the control groups were experiencing rapid erosion of their coastal lines, and the sea and lagoons were flowing into each other. This has catastrophic consequences on the coastal ecology, the resultant salinity in the lagoon affected aquatic life in the lagoon leading to the destruction of fishing stock in the lagoon, and equally the salinity was destroying farm fields close by the lagoon. The communities between the sea and the lagoon were being submerged. Therefore it was important to see if the project had contributed to the protection of the environment.

3.1.3.2. Sampling and Data Gathering

The unit of analysis is the household. Non-probability sampling methods such as the Accidental and Quota were applied to data collection. Accidental sampling method is where the research selects members or cases of the target group who are willing to participate in the study. Quota sampling also refers to selecting a sample that represents the different groups within the target population. Probability sampling where all cases in the population have equal chances of been selected requires more time and resources which the thesis was constrained with. Also the affected people were very sensitive to the project as it has high political undertones, and there was a high tendency that some people may not be willing to participate and in these regards a probability sampling was not going to be effective. Therefore the non-probability sampling method which selected people who were willing to participate provided the needed data for the study. It also measured-up-to the budget of the study. The possible bias with this method could be that it was not very representative as it could have led to the selection of people who wanted to voice-out their feeling in support or against the project. A sample size of 120 households was chosen, 60units from the project group and the remaining 60units from the control group.

A questionnaire containing both closed and open ended questions was used to obtain the needed data from the respondents. Field workers (graduates from the communities with research experience) were trained by the researcher to administer the household questionnaires. The

questionnaire was structured and based on the data needs above.[22] The questionnaire had questions on Income and Economic Resources, Price information, Health, Education, Drinking water, Sanitation, Shelter, vulnerability, and Environmental sustainability. Local languages (Ewe and Adagbi) were used as a medium of communication where there were literacy challenges to help the respondents respond appropriately. Some observations were made; based on the question or data at hand and timely events relevant to the data were recorded.

3.1.4. Selection of Respondents

The thesis was interested in the affected peoples' perspective of the project effect and not that of the Government or "so-called" experts. Therefore the survey selected traders, fishers, farmers, and formal sector workers as respondents based on the fact that they were the main actors in the two groups directly affected by the project who could at best articulate the affected peoples' perspective. As indicated earlier, a sample size of 120 households were chosen, these is shown in table 3 below.

Table 3, Sampling and break-down of target groups

Groups	**Household of Respondents** (120): Traders - 30 , Farmers -30, Fishers -30, Formal sector employees -30
Study Group	Keta (20), Vodza (20), Adzido (20)
Control Group	Elavanyo (20), Totope (20), Pute (20)

Source: Author

3.1.5. Data Analysis and Interpretation

The thesis used SPSS (statistical package for the social sciences) to analyse the data.

Statistical Tests: Three main types of statistical tests were used in the analysis, the Chi-square test, Cramer's v correlation coefficient, and the Mann-whitney test. *The Chi-square test* was used to measure the significance of the relationships between the variables; nominal variables and ordinal variables. When the Chi-square test value is greater than the critical value or the p-values is less than the alpha level of significance of 0.05 it is established that there is a significant relationship between the two variables. *The Cramer's v coefficient* was used to test the strength

[22] Please see the Questionnaire in annex 1

or relationships between the variables, it also indicates the significance of relationship between the variables; it is used for nominal variables only. The strength of the relationship ranges from 0.0 to 1.0, the higher or closer the value is to 1.0 the stronger the statistical relationship which means the independent variable explains the dependent variable and that the result was not by chance. The lower or closer the value is to 0.0 the weaker the relationship. *The Mann-Whitney U test* also known as Wilcoxon test was applied here because the income and expenditure data were non-parametric and in place of T'test it was used to compare the means of the study and control groups.[23] The Mann-Whitney U test measures if there is any evidence to suggest significant difference between the study group and the group: this is done by measuring if the mean ranks of the groups differ significantly.[24] A significant relationship is declared if the p-values is less than the alpha level of significance 0.05, alternatively when the Z score (+ or -) is greater than 1.96 standard critical value at the alpha significance level of 0.05 (Gravetter et al,. 2009:673).

Confirming or Rejecting Hypothesis: To test the hypothesis whether there is a relationship between the KSDP and rural poverty reduction, the incomes levels, and the prices of goods and services in the study and control group were compared. The effect of the other dimensions of poverty, health care, education, drinking water, electricity, sanitation, shelter, vulnerability and security, and environmental sustainability in both communities were compared. As indicated earlier in the chapter, using the "with and without" method, where the study group scores higher or there is a positive significant difference in the case of the study group it is defined as a positive relationship between the KSDP and rural poverty. On the other hand, where there are no significant differences between the two groups it is concluded that there is no relationship between KSDP and rural poverty reduction.

[23] The author acknowledges that the Mann-Whitney U Test is conventionally applied to random samples, however it can be applied to non-probability samples when it fulfills the other assumptions for the test and provides statistically logical and accurate explanation for the relationship understudy.
[24] http://oak.ucc.nau.edu/rh232/courses/EPS625/Handouts/Nonparametric/The%20Mann-Whitney%20U%20Test.pdf

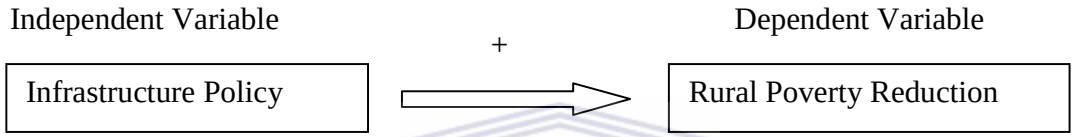
3.2 Implications of Project Results on Ghana's Infrastructure Policy Environment

This section focuses on examining the adequacy of Ghana's infrastructure provision policy environment by considering the implications of the assessment results on the infrastructure policy environment. The findings of the impact assessment provide the basis for policy analysis. Additional data was drawn from primary and secondary sources.

3.2.1. Operationalisation of Hypothesis and Concepts

Hypothesis: *"The more an infrastructure project is guided by an infrastructure policy the more likely it is to succeed in reducing rural poverty"*

Fig.8 Operationalisation of relationship between infrastructure policy and rural poverty reduction



The hypothesis suggests a positive relationship between infrastructure policy and rural poverty reduction. It should be noted here that the dependent variable 'rural poverty reduction' refers to the poverty impact assessment results of the KSDP (3.1 above). The independent variable 'infrastructure policy' is represented by indicators that will be derived in the next paragraph. To understand the relationship between Ghana's infrastructure policy environment and rural poverty reduction, the indicators of 'infrastructure policy' were compared with the indicators (poverty impact assessment results) of rural poverty reduction. The implications were then analysed.

For the operationalisation of infrastructure policy, there is no "fine" script as to what an infrastructure policy should contain. Such criteria are contextual and depend on the objectives and goal s of the state. In the literature and conceptual review some elements came-up as crucial for effective infrastructure provision. Aside from the fact that most of these have been successfully applied in other countries, they are very contextual as they align with the constitutional provisions and national development policies of Ghana (they meet the content and context discussed under the 'five' protocols of implementation). These indicators are presented below as criteria for assessing the infrastructure provision policy environment of Ghana.

3.2.2. Assessment criteria for Ghana's Infrastructure Provision Policy Environment

The indicators derived for the infrastructure policy were compared with the case of the KSDP.

Table 4. Criteria for assessing the KSDP and Ghana's infrastructure provision policy environment

Criteria	***Data Source***
Policy Framework/ level	Project documents, interviews
Policy Content	Project documents
Broad Policy Framework	
Address problems that characterize infrastructure failure	Sectoral policies
Provide regulatory measures for private sector involvement	Sectoral policies
Financing	Project document, sectoral policies
Provide for equitable distribution of benefits	Project documents
Provide continuous monitoring and evaluation of the performance of infrastructure	Interview/Project officials
Promote sustainability/ management and maintenance	Interview/ Project officials
Provide for environmental protection	Project documents
Provision for externalities	Interview /Project officials
Stakeholders • Government • Ministries, Department, State Agencies • State owned enterprises and public utility companies • Local Government • Private Investors, Financial Institutions, Contractors • Relevant Multi-lateral and bilateral donors • Affected communities/institutions	Interview/ Project officials, Project Documents
Rural Infrastructure	
Targeting the poor	Project documents
Accessibility, low cost and affordability	Questionnaire, Observation, project documents
Integrated development project	Project documents
Impact on social wellbeing	Questionnaire, Project documents
Impact on productivity and growth	Questionnaire, Project documents
Job creation	Questionnaires, Project documents
Participation of affected rural communities	Interviews/Project officials

Conditions for confirming hypothesis

If the policy assessment finds that Ghana's infrastructure policy environment is adequate and the project impact assessment shows that poverty has reduced then the hypothesis is confirmed.

If the policy assessment finds that Ghana's infrastructure policy environment is inadequate and the project impact assessment shows that poverty has reduced mildly then the hypothesis is confirmed.

If the policy assessment finds that Ghana's infrastructure policy environment is lacking and the project impact assessment shows that poverty has not reduced then the hypothesis is confirmed.

Conditions for rejecting hypothesis

If the policy assessment finds that Ghana's infrastructure policy environment is adequate, but, the project impact assessment shows that poverty has not reduced then the hypothesis is rejected.

If the policy assessment finds that Ghana's infrastructure policy environment is lacking, but, the project impact assessment shows that poverty has reduced then the hypothesis is rejected.

Data Source and Methods of Data Collection

As indicated in the criteria above the data needs for the policy assessment were drawn from primary and secondary data – a methodological triangulation of primary and secondary data.

The secondary data source include; the legislations, policy frameworks, and project documents.

In addition to the primary data collected through questionnaires for the impact assessment of the KSDP on the beneficiary rural communities, key interviews were also conducted to add substance to the secondary data. The participants of the key interviews include; the Keta district development planning manager – his view was important in the light of the fact that he is very influential in planning the development programmes and projects of the district; the Member of Parliament for Keta constituency – as the member of parliament who saw the initiation of the project he was very influential and he should be well informed on the policy processes that were involved in the implementation of the project; and the chief engineer of Ghana's ministry of Water Resources Works and Housing (the employer of the project) – being the engineer of the employer of the project he should be informed on the policy and implementation details of the project. These sources provided the useful information needed to answer the research questions and to meet the research objectives.

3.3 Methodological Challenges

There was very limited literature on infrastructure provision in Ghana. Additionally there was limited documented data on the KSDP and this made it difficult to access the project.

The absence of adequate baseline data on poverty was a shortcoming for evaluating poverty over time. However, such an analysis over time would in any case face the problem of attribution In view of the fact that the problem of attribution bias is inevitable, indeed external factors such as climate change, other projects, technology boom or political affiliation could affect development and poverty reduction in the different communities such that observed changes cannot be attributed to the project alone. The alternative “before and after” approach is only possible in a static environment and the appropriate approach to limit these short comings was the application of the “with and without”. Additionally, many questions related to the project were asked for each indicator to justify that the project is largely responsible.

Change in poverty dimensions such as health care, education, environmental sustainability, etc are not instantaneous such that they could be assessed and judgement passed within a short period, instead it takes time, about 10 years and above. Therefore the 5 years assessment period of the study was not enough to assess accurately the accumulated project impact.

Some respondents were not comfortable stating their monthly income. There was the risk of some respondents understating or overstating their income. Also it was difficult for people in the informal sector to calculate their monthly income. However, in such cases the respondents were given formulas which helped them in estimating their monthly income.

However, some of these risks were inevitable, and at best the researcher put in place measures to reduce any adverse effect that such risks might have on the credibility of the findings.

3.4 Summary

The chapter 3, outlined the methodology used in empirically testing arguments raised by the thesis. The hypothesis and concepts were operationalised. The data needed and the rationale behind the selection of those data were stated. Methods of data collection, measurement of hypothesis, and the challenges were all explained. The thesis now proceeds to chapter 4 to present and analysis the findings of the study.

CHAPTER 4

Presentation and Discussion of Findings

"Nothing has such power to broaden the mind as the ability to investigate systematically and truly all that comes under thy observation in life." Marcus Aurelius, Meditations ch. II

Proceeding from chapter 3 where the research methodology was outlined, the chapter 4 presents and discusses the research findings. The chapter is divided into two main sections, a description of the case study, and presentation of the findings and discussion of the main trends.

4.1. The Case of the Keta Sea Defence Project

This section describes the case study - KSDP, so as to inform the study on the context of project. The history of the KSDP spans about a hundred years and that is covered variously in this chapter. The thesis proceeds by locating the study area.

4.1.1. Location of the Study Area

The KSDP lies between the communities of Keta and Hlorve located within latitude 5.55N and longitude 0.59E on the south eastern coast of Ghana, about 160km east of the capital Accra.

Fig 9, Map Ghana showing the case study area

Source: Boateng, 2009:2

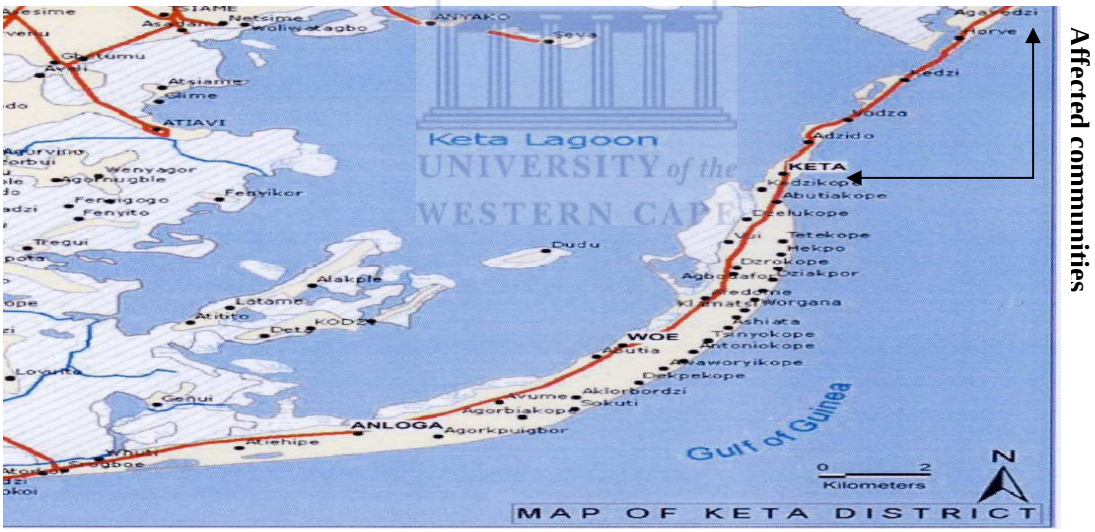
4.1.2 The people of Keta and the affected communities

Keta and the other affected communities fall within the administration of Keta district located in the Volta region of Ghana. The population of the entire Keta district is about 133,661(2000).[25]The affected communities belong to the Anlo tribe of Ghana, and they speak the Ewe language. The livelihoods of the people include fishing, fish processing, farming, and trading. The vegetation is characterized by coastal savannah, and mangrove trees. About 30% of the 1086km^2 surface area of the district is covered by inland water bodies, one of which is the Keta lagoon, the largest lagoon in Ghana stretching to the eastern end of the Volta estuary. [26] As indicated earlier (in the challenges of the study in the methodology chapter) adequate data was not available on poverty levels in the affected communities.

4.1.3 Sea erosion, flooding, and the Keta Sea Defence Project

The affected communities lie between the sea and the Keta lagoon as shown in fig. 10 below.

Fig. 10, Map of Keta District showing affected communities of the KSDP -top right



Source: Kraan, 2009, p. 68

The name 'Keta' in the Anlo Ewe language means 'top of the sand'. History has it that when the great fore fathers of the Anlos were migrating through the southern coast they came across this long stretch of land filled with sand and they said this is the 'keta' ('top of the sand') and since then it has been Keta. The people of Keta have been occupying this long stretch of land between the sea and the lagoon for over 300 years. The problem of sea erosion in Keta started about 103

[25] www. ghanadistricts.com/Keta district [20/04/2010]
[26] Ibid

years ago precisely 1907 when the first sea erosion occurred, then in 1924, 1949, 1986, 1996, and 1997.[27] Since the start of the sea erosion various attempts have been made by different actors at different periods including the colonial masters the British in the then Gold Coast to prevent the sea from eroding or submerging the land (Kraan, 2009:272). See table 5 below.

Table 5, Plans and proposals aimed at stopping sea erosion at Keta in the 20th century

Year	Event/Report/Who	Proposed Activity	Estimated cost
1923	Director of Public Works, arranged by the Commissioner of the Eastern Province	Erect groynes along part of the seashore at Keta	
1929	A.T. Coode; contracted by the British colonial government	Permanent sea defence works	£1,000,000
1938	Anlo State Council	Build a restraining wall along the shore at Keta	£70
1951	New African Gov - Officer in charge Keta District Public Works Department	Anti-erosion work at Keta and temporary groynes	£8,000
1956	Sr. William Halcrow and Partners ordered by the Minister of Works and Housing	Report: Halcrow lagoon land and reclamation project	
1963	Aryee – Officer in charge Keta District Public Works Department	Cut a canal at Kedzi	
1978	Volta Regional Commissioner, Commissioner for Works and Housing contracted Messrs Marine Salvage	Stone works	C450,000
1985	Blueprint for coastal protection with Togo, Benin, Nigeria - PNDC		
1986	Study Coastal Erosion – Prof. Mawuse Dake – PNDC		
1987	Report of Cooperativa Muratori and Cementisti – PNDC	Integrated plan for sea defence, lagoon flood control, and economic development	US$44,148,000 (Donors) US$488,000 (Gov) C634,420,000 (Gov)
1996 - 1999	Great Lakes Dredges and Dock Company (GLDD) – NDC Gov	Keta Basin Integrated Development Project: Sea defence walls (groynes and offshore breakwaters), Lagoon flood control, Land Reclamation, Resettlement communities, 8.3km Asphalt link road	US$84,000,000 (Gov loan – EXIM Bank) US$916,000,000 (Gov)

Source Akyeampong 2001 (modified by Author), also see Kraan, 2009:271

[27]Some factors that are reported to have triggered the sea erosions are discussed in the subsequent paragraphs.

According to Kraan (2009:272) after the first erosion in 1907, the colonial administration did not put in place measures to prevent further erosion as they expected the merchants who were doing brisk business along the Keta coast and the people of Keta to take action to protect their town and businesses. In citing Akyeampong (2001:116) Kraan wrote "the merchants and people of Keta believed that the colonial government was obliged to do something as part of their political over-rule" (2009:272). In the first initiative in 1923 the colonial government built a sea defence wall to prevent sea erosion but this did not stop the destructive effect of the sea as it all got destroyed. This informed the colonial administration that the effect of the sea erosion was more complicated than initially thought and that there was need for detailed study to find a solution to the sea erosion. London based engineers Coode, Wilson, Mitchell and Vaughan-Lee did the evaluation and prepared a report that could best be described as British neglect of the people of Keta and surrounding communities to their fate:

> In all the circumstances such as we have endeavoured to describe, we conclude that the expenditure which would be requisite on a system of groynes or other preventive work could not only be justified by the prospects of success but, moreover, that the value of the buildings and property to be served does not warrant the very large outlay which would have been incurred.(Gold Coast, Despatches Relating to Coast Erosion in the Neighbourhood of Keta (Accra, 1929), A.T. Coode to the Under Secretary of State for the Colonies,15 Aug. 1929. In: Akyeampong, 2001:117; see Kraan 2009:272)

After 1965, the situation was aggravated as the Keta lagoon also started flooding the communities between Keta and Hlorvie (Boateng, 2009:4). Studies demonstrate that the construction of the Akosombo hydro-electric dam in 1964 reduced the flow of fluvial sediments that built the plain on which Keta lies. The fluvial sediments that form the land started depleting from its annual accumulation of 71 million m^3 to 7 million m^3 per year, and this catalysed the effect of sea erosion and flooding in the communities between Keta and Hlorve (Boateng, 2009:4). Between 1895 and 1965 the shoreline has been retreating at a rate of 4km per year, and after the construction of the Akosombo dam [28]thus between 1964 and 2000 the erosion of shoreline increased to 8m per year (Ly 1980, see Boateng, 2009:5).[29]

Kraan (2009:272) reports that by the first half of the 1980s two-thirds of Keta had already been submerged by the sea. The first bold attempt to stop the sea from submerging Keta and

[28]The Akosombo hydro electric dam was built on the Volta lake of Ghana – the largest artificial lake in the world [wikipedia.org]

[29] "Dams and other impoundments prevent sediments from reaching down-stream water courses. Deficiency in nutrients and sediment reaching deltas results in coastal erosion and reduction in natural productivity of aquatic life forms. For example, the normal nutrient and sediment supply circle for the Lower Volta Basin downstream of Akosombo was distrupted by the construction of the dam and has resulted in increased sea erosion in the Keta and Ada-Foah[29] areas of the coast line." (Republic of Ghana, 1999:9, see Kraan, 2009:271)

surrounding communities started in 1986 when the PNDC (Provisional National Defence Council)[30] brought in experts from Italy to access the problem of coastal erosion in Ghana and to propose solutions. The Italian firm Cooperativa Muratori and Cementisti identified twenty-two "active spots of erosion along the coastline" responsible for the sea erosion in Keta. In 1987, the Italian firm presented to the government of Ghana an integrative plan for sea defence, Lagoon flood control, and economic development (ibid). The magnitude of the proposed project was beyond the District Assembly and so became the responsibility of the central Government, for which the implementing agency became the Ministry of Work and Housing.

4.1.4. KSDP and Rural Poverty Reduction

By the 1996 about half of the affected communities have been submerged, with the sea and the lagoon running into each other. Some communities were almost cut off from main land towns. The submersion of communities, buildings and the destruction of the infrastructure available, and the negative effects on farming, fishing and other forms of livelihood led to increased poverty in the communities. As part of the Government of Ghana's intervention a US$ 1 billion KSDP was vigorously pursued from 1996 and completed in 2004. The project awarded to Great Lakes Dredges and Dock (GLDD) was designed as an integrated development project to stop sea erosion and flooding, and to reduce the high level of poverty in the affected rural communities.

As part of the goal of the KSDP to reduce poverty the project components were designed and expected to impact on poverty reduction and economic productivity as follows (GLDD, 2002:1):

The construction of a sea defence wall, the sea defence wall was expected to prevent sea erosion and the destruction of public infrastructure and private assets. As part of the sea defence wall safe landing sites were to be created where fishers can launch their canoes and drag their nets. This was to promote the shore-based drag-net fishing industry and to increase income levels.

Lagoon flood control, this was to reduce flooding. The flood control mechanism was expected to reduce the losses of farmers and increase their production. The level of water in the lagoon and the sea is controlled such that when the level of water in the Keta lagoon rises it is channelled into other water bodies so that it does not flood the farmlands as it used to before the project.

Reclamation of land, this involved the reclamation of 300acres of land from the sea. The reclaimed land was to be developed into well-planned resettlement communities with schools,

[30] The PNDC came to power through military revolution, transformed into a political party - National Democratic Congress and won the 1992 elections to form a civilian government. The NDC started the project before losing power to NPP in the year 2000.

lighting, water and sanitation, and public infrastructure. The reclaimed land can be used for agriculture purposes to increase food production and income, location of businesses, fish processing industries, etc to create employment opportunities for the rural people.

Construction of resettlement communities for the affected people, Communities with about 800 housing units were to be built for the affected households. The houses were to include 4-bedrooms to 1-bedroom units to compensate affected people who have lost large or small houses.

Construction of 8.3 km Asphalt link road from Keta through the affected communities to Hlorve, the road was expected to serve as a major corridor for economic activities linking many poor communities and creating large market network for farmers, fishers, and traders. Also it should serve as major transit route to neighbouring Togo, Benin and Nigeria thereby increasing trade and other economic opportunities in these communities. The road and the protected beaches were expected to provide the needed boost for tourism to blossom coupled with the presence of historical monuments, landmarks, island, and birds of different species.

Establishment of ancillary enterprises, fishing harbour, cold stores, tourism services, and salt mining projects were also expected to be added to create jobs, increase revenue collection and to reduce significantly rural poverty.

4.1.5. The Policy and Legislative Background of the KSDP

The KSDP was supported by many sectoral policy frameworks, chiefly among these was the integrated coastal zone management and sustainable development projects under the national policies on the protection, management, and development of the marine and coastal environment (Amlalo, 2009: 9). The other policies included the National Environmental Policy, National Wetland Policy, Fisheries Act 2002, Act 625; Fisheries Law, 1991 (PNDC 256); Fisheries (Amended) Regulations, 1977 and 1984, Agriculture Policy, Tourism Development Policy, Land Management Policy, Minerals Policy, Wildlife Conservation Policy, Energy Policy, and the National Disaster Management policy, Local Government Act 6420 of 1993, and the Mineral and Mining Law, 1986 - PNDC 153 (Amlalo, 2009:3-4). Though the Ministry of Environment Science and technology coordinated these policies, the Ministry of Works and Housing implemented the project (MWH). The project might have originated as an environmental and disaster management programme or one of an economic development. However, beyond that the project was essentially an infrastructural one, hence its implementation by the MWH.

4.2. Impact Assessment of the KSDP

This section presents an impact assessment of the KSDP on rural poverty reduction. This is done by looking at the implemented project components, and evaluating their impact of the affected rural communities.

4.2.1. Implemented Project Components and their Expected Impacts

As indicated in the earlier chapters the KSDP consist of five integrated components; a sea defence wall, flood control, land reclamation, asphalt link road, and resettlement communities.

Sea Defence Wall

A sea defence wall has been constructed (GLDD, 2001:1). This structure is made-up of rock-lined groynes and offshore breakwaters built to stop the sea from eroding the land (U.S. Army Engineer and Coastal Engineering Research Centre (1984: 287-292).[31] This has provided a safe enclave where the fishers can launch their canoes and drug their nets, and also a safe beach environment to promote tourism. The expected increase in job opportunities and income through high fish catches and the promotion of tourism is evaluated later in the section. The century old problem of sea erosion that almost destroyed the rural communities has been halted. The destruction of private and public assets by the sea erosion has been averted. The people should be able to make long term plans without the fear of sea erosion, and live a humane and dignified life. Below in pictures 1,2 and 3 are fishers working and women trading in the safe enclave.

Pictures 1,2, and 3, Fishers at work and women buying fish for the market

Source: Kraan, 2009:15, 135

However, the beneficiary communities still complain of fall in the fish catch, and this is because in recent years foreign pair-trawlers have been fishing illegally in the shallow waters of Ghana with dangerous equipments and chemicals which are depleting the fish stock in the shallow

[31] Groynes and offshore breakwater are structures built to receive the erosive waves of the sea thereby reducing the effect of the sea on the coast and refilling the coast with sand and pushing the sea back.

waters for the Ghanaian fishers (Joyonline News, 2008).[32] Though this is beyond the immediate scope of the project, if the sectoral policy environment was effective the sectors involved in planning the KSDP could have solved this problem. Such illegal fishing and environmentally damaging activities are within the control of the National Environmental Policy, Fisheries Regulation, Wildlife Conservation Policy, and Local Government (Amlalo 1999:3-4). These institutions could support each other to stop the problem, but they have failed to act.

Flood Control

A flood control has been constructed. The flood control releases water in and out of the Keta lagoon. Thus, in the raining season when the water levels are high water is released-out of the lagoon through the flood control gate into the sea to prevent flooding of the farm fields and communities (GLDD, 2000:3). The expected increase in income levels through high productivity is evaluated later in the section.

Land Reclamation

The project has reclaimed about 240 hectares of land.[33] The reclaimed land is needed for the development of the affected communities. The land has been planned to facilitate the project's aim of poverty reduction. For example the land has been demarcated into sites for, the resettlement of communities (houses, schools, water, hospital), the construction of a link road, and an industrial enclave for the development of industries and other commercial activities (industries, hotel, etc). The expected effects are evaluated later in the chapter.

Asphalt Link Road

An 8.3km asphalt link road has been constructed from Keta through the affected rural communities to meet the south eastern border towns. The problem prior to the project where the affected communities were disconnected from main land towns has been solved. The use of rickety overloaded multipurpose vehicles which were dangerous and also at high economic costs has been halted. The 8.3km asphalt link road has now made the affected communities middle or nodal towns between market centres and the eastern border towns (destinations for brisk retail business). The road now serves as the shortest international route for neighboring African countries (Togo, Benin, Nigeria, etc) entering Ghana through the eastern coastal border. These were expected to increase supply of consumer goods and reduce prices of goods and services.

[32] http://news.myjoyonline.com/news/200812/24052.asp [12/04/2010]
[33] Project document from the Keta district development planning office

The road was also expected to improve access to health care, and education as the people now have access to safe and convenient means of transport. These expectations are evaluated later in the section.

Resettlement Communities

Resettlement communities have been constructed for the people of Adzido, Kedzi, Vodza, etc, The communities were planned and designed to provide modern infrastructure facilities such as housing units, electricity, water, telephone, sanitation facilities, and school: the plan for such services is indeed commendable. It was expected that the provision of these infrastructures would contribute significantly to reductions in the multi-dimensions of deprivation that perpetuate poverty in the affected communities.[34] However, the housing project was not completed. Over three years since the completion of the project only about 400 one-bedroom housing units have been constructed out of over 800 four-bedroom, three-bedroom, two-bedroom and one-bedroom housing units. This is a major set-back of the project. The affected people complained bitterly about the fact that some people have got houses and others have not got their share of the houses, moreover there was no equity in the distribution of houses as people who had 4-5 bedrooms pulled-down had to settle with their large families in 1-bedroom house units. One of the affected people narrated, *"My house that was demolished had 3 bedrooms, a living room, and a large kitchen, and that was okay for my family made-up of two wives and 6 children now look at where they have put me. They have deceived us."*

At the start of the project there was no resistance but an endorsement of the project, but later, delays in the housing component antagonised the affected communities. The delay is attributed to the government's refusal to release funds for the project. The affected people held civil demonstration to vent their grievances against the government. The project was executed under the tenure of two different (opposing) governments. The NDC Government started the project and the NPP Government came to continue the project. In the year 2000 election which brought the NPP into government, for the Keta electoral constituency the NDC recorded 94.2% of votes and the NPP had 2.9% of votes. Obviously, the affected communities are strong-holds of the NDC and losing grounds for the new government – NPP (Electoral Commission of Ghana, 2000).[35] Extrapolating from Warwick's Game model the new government deliberately refused to

[34] The beneficiaries expressed the satisfaction that they are now safe from sea erosion and flooding, and though some aspect of the project did not meet their expectation, at least they have not been submerged.

[35] http://www.ec.gov.gh/userfiles/2000%20PRESIDENTIAL%20ELECTION%20RESULTS(2).pdf [15/4/2010]

release funds for the project because the beneficiaries are not its sympathizers (1982, see Brynard and De Coning, 2006:193). Beyond the policy and project implications the political details are beyond the scope of the thesis. More about how the project was financed will be discussed later in the chapter to throw more light on the policy implications.

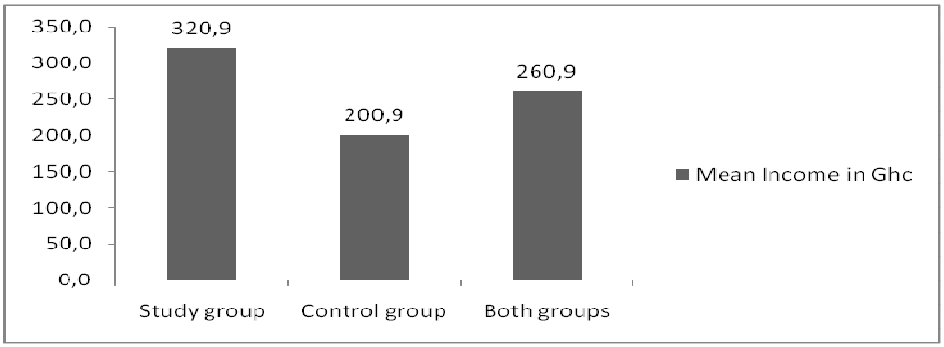
4.2.2. The Impact of the KSDP on the various dimensions Poverty

In this section, the thesis presents the findings of the impact of the KSDP on the various dimensions of poverty by way of comparing the cases in the study group to the control group.

4.2.2(a) The Impact of the KSDP on Household Income

The income of a household is considered as an indicator of the household's wellbeing. Ceteris paribus a higher household income would allow the household to consume more goods and services that increases its wellbeing or utility, and on the other hand a household with lower income may not be able to meet its welfare needs.[36] This relationship between income and wellbeing is fully explained in the theoretical part of the thesis. As explained in the methodology, a questionnaire was used to collect household incomes of respondents in the study and control groups.[37] The thesis proceeds to compare the mean monthly household incomes in the study and control groups to find-out if the KSDP has affected income levels (thus, if there is any difference in income levels between the study and control groups). If the study group has higher income, then the KSDP has led to improved levels of income for the affected people.

Fig 11. Mean monthly household income in the study and control groups



Source: Author

[36] Also, the importance of income as an indicator of wellbeing is evident in the use of incomes, wages, and PCIs as a measure of poverty; the World Bank distinguishes between extreme poverty(less than US $1 a day), and poverty (less than US $2 a day)
[37] Please refer to question 12 in the questionnaire attached in the annex.

The mean monthly household incomes in fig. 11 show that income level in the study group (320.9) is larger than income level in the control group (200.9). This puts the PCI for the study group at Ghc 641.8, and Ghc 401.8 for the control group.[38] Taking the average exchange rate of Ghc1.4 to US$1 as at March 2010, the PCI for the study group US$458 and US$287 for the control group are lower than the national PCI of US$670 (World Bank 2008).

To evaluate statistically if income levels are significantly different between the study and control groups the Mann Whitney U test was used to find the mean rank for both groups.[39] The choice of the Mann-Whitney U test replaces the often used 't test' here because the income data for the study group as explained earlier is not normally distributed – non parametric (positively skewed), see the data analysis section of the methodology (chap.3)for detailed explanation.

Table 6, Mann-Whitney U test for difference in households' monthly income between study and control groups

	What is the monthly income of your household?
Z	-4,219
Asymp. Sig. (2-tailed)	,000

Given a Z score = -4.22 > 1.96 (critical value), p-value = 0.00 < 0.05 = α, there is sufficient evidence to conclude that income levels are significantly higher in the study group than the control group. Also, the mean income rank for the study group 71.5 > 45.5 for the control group.
Further, the affected people were asked whether the KSDP had increased their income.[40]
A large 68.3% of respondents reported that their incomes have increased, and 31.7% reported that their incomes have not increased. The empirical result supports the theoretically anticipated result that a set of interventions such as the sea defence wall, lagoon flood control, and road helped to improve productivity or lower cost, thereby leading to increased production and higher consumer surplus translated into income of producers.

For the farmers, all 100% indicated that the project has increased their income. The flood control has reduced the flooding of their farms thereby increasing productivity without substantial

[38] The PCI is calculated by multiplying the mean monthly household income of each group by 12 and dividing the outcome by 6 which is the average number of people in each household for both the study and the control groups.
[39] Mann-Whitney U test (Wilcoxon test) is a non parametric test normally used for random samples, but it can be applied to non-probability samples when the data is not normally distributed, and the variables are ordinal, the independent variables have two levels; and explains the relationship understudy: http://academic.udayton.edu/GregElvers/psy216/SPSS/ordinaldata.htm
[40] This question is contained in question 19 of the questionnaire attached in the annex.

increase in cost, also, they have a good road that facilitate the transportation of their produce to market, loses in terms of high transport cost and perishing of their produce have reduced; this increase in output without substantial increase in cost or even cost reductions explains the increase in their income. The findings here are similar to the findings of Tahmina Begum who assessed the impact of flood control embankment in Bangladesh and found that the project has increased beneficiaries' income (Begum Tahmina, 1993:53).

Among the fishers 40% reported marginal increases in income. This is attributed to the safe landing sites created by the sea defence wall: where the fishers are able to work for long hours to increase their output without incurring additional costs. In addition, the fishers now have an Asphalt road through the community to market centres where they are able to sell-out their fish without difficulty or extra cost. The 60% of fishers who reported no improvement in their income levels attributed it to low fish catch. Aside from the 'safe enclave' nothing has been done to improve fishing.

For the traders, 70% reported marginal increases in income. In Keta and its surrounding towns, markets are held daily and rotated among the towns. For example, if the market day for Keta is Monday, that of Denu is Tuesday, Akatsi is Wednesday, and Agbozume is Thursday, and then Keta on Friday and it continues in that order, and so every day is a market day in one town or the other. With the good road network traders are able to trade in many market centres and also for long hours as it is easy to access transport and they are able to convey their wares without extra costs. This incentive to increase output or high volumes of production traded without substantial additional cost explains the increase in income for the people in the project community. This result confirms Fan's observation that provision of roads in rural Africa contributes to rural poverty reduction (2004:3). The 30% of traders who reported no increase in income were Fish-mongers who attributed it to low fish catch.

Again as a confirmation of the welfare theory contained in chapter 2, it was derived that, ceteris paribus an increase in household income leads to increase in utility as the household budget gets bigger and allows the household to demand more of their preferred goods basket which reflects in increased expenditure.

Table 7, Monthly expenditure of households in the study and control groups

	Study Group	Control Group	Both Groups
Means	Ghc 267.59 (US$191)	Ghc 188.79 (US$135)	Ghc 228.19 (US$162)

Source: Author

The mean monthly household expenditure in table 7, shows that expenditure levels are higher in the study group (Ghc 267.59 or US$191) than expenditure in the control group (Ghc 188.79 or US$135). Similarly, the Mann-Whitney Test for households' expenditure indicate a Z score of -3.64 > 1.96 (critical value), p-value of 0.00 < 0.05 = α, there is sufficient evidence to conclude that the monthly expenditures of households in the study group is significantly higher than that of households in the control group. Thus, utility levels have increased in the affected project communities. The results support the theory put forward in chapter 2.

Construction work at the project site did not create much employment opportunities for the affected communities. Surprisingly, the US$1billion infrastructure project could only create about 380 jobs (GLDD, 2003:3). Moreover most of the casual employees came from other towns and regions as only 13% of households reported that a relative had a job. In this case incomes that would have improved the wellbeing of poor households were limited.

From the analysis it can be concluded that the Keta sea defence project has led to an increase income and has contributed to poverty reduction however the gains can be better than the results so far as project opportunities have not been harnessed, and income levels are still low (a PCI of US$458 as against a national PCI of US$670). There are many short-comings that need to be addressed – These are subsequently discussed, and addressed in the recommendations.

4.2.2(b) The Impact of the KSDP on Prices

The prices of goods and services affect poverty by determining the budget line or how much a household can consume with a given income. Lower prices would allow the household to consume more, and higher prices at the same income reduce the quantity and quality of goods that the household can afford. This relationship between price and poverty reduction is explained in the welfare theory in chapter 2. This section sought to find-out if the KSDP has affected the prices of goods and services by comparing prices in the study group to prices in the control

group (thus, if there is any difference in prices between the study and control groups). If the prices of goods and services are lower in the study group, then the KSDP has led to lower prices.

Table 8, Prices of Goods and Services

Goods and Services	Prices in Study Group(Ghc)	Prices in Control Group(Ghc)
1. Bowl of Maize	2.00 (US$ 1.43)	2.00 (US$ 1.43)
2. Bowl of Rice	4.50 (US$ 3.21)	5.00 (US$ 3.57)
3. Bowl of Beans	4.00 (US$ 2.56)	4.50 (US$ 3.21)
4. Bowl of Gari	1.7 (US$ 1.21)	2.00 (US$ 1.43)
5. Bottle of Cooking oil	2.00 (US$ 1.43)	2.20 (US$ 1.57)
6. Bowl of Sugar	4.50 (US$ 3.21)	5.00 (US$ 3.57)
7. Smallest loaf of Bread	0.10 (US$ 0.07)	0.20 (US$ 0.14)
8. Tin of Milk	0.85 (US$ 0.61)	0.90 (US$ 0.64)
9. Exercise Book	0.25 (US$ 0.18)	0.30 (US$ 0.21)
10. Transport from the community to the nearest town or village within a distance of less than 2km	0.40 (US$ 0.29)	0.80 (US$ 0.57)

Source: Author

Table 8, above shows the prices of 10 goods and service that form part of the basic goods basket in Ghana (GSS, 2008:100).[41] The prices were collected from the respondents in both groups and further cross-checked from the vendors (markets) in the two groups. These prices are determined by market forces of demand and supply. With the exception of good no. 1 (Maize) prices are lower in the study group than the control group.

The price of Maize (Good no. 1.) is the same in the study and control groups because in the control group and its surrounding communities maize is the main cereal crop and as a result of the abundance of the commodity in the communities the prices are down. In the study group maize production is on a small scale but because the community is now closer and accessible to major market centres[42] where goods are brought from all parts of the country, the commodity is abundant on the market the prices are down similar to the price (Ghc 2.00 or US$1.43) in the control group.

[41] Basic goods basket were taken from Ghana's average household expenditure.
[42] The study groups are close to large market centres Akatsi, Anloga, Denu, Dabala, Keta, etc where goods are brought from many parts of Ghana. Every day is a market day at one centre, as the days revolves among the centres.

The 100% difference in the cost of transport can be attributed to the asphalt road that runs through the project communities to major towns, consequently it is easy to access transport and prices are lower. The control group communities on the other hand have dusty rough roads where a limited number of transport vehicles operate and as a result prices are high.

Picture 4, Asphalt road to study communities. Picture 5, Bad road to control communities

Source: Author

Similarly, the prices of the other goods are lower in the study group compared to the control group because almost all the goods are produced outside the two groups and they have to be transported to the communities and markets, where the study group has an advantage over the control group in terms of good transport network and accessibility to market centres.

As a testament of the impact of the KSDP on the prices of goods and services the affected people in the study group were asked if the project had resulted in comparably lower prices: 67.3% of respondents said "yes" and 32.7% said they have not seen reduction in prices.[43]

The findings on reduction in prices supports the theory proposed in chapter 2. The cost-saving effects on increased output and labour productivity, economies of scale, and cost adjustment, reflects the lower prices of goods and services for the consumers as evident in table 8 above.

It can be concluded that the KSDP has led to a decrease in prices.

4.2.2 (c) The Impact of KSDP on other dimensions of Poverty

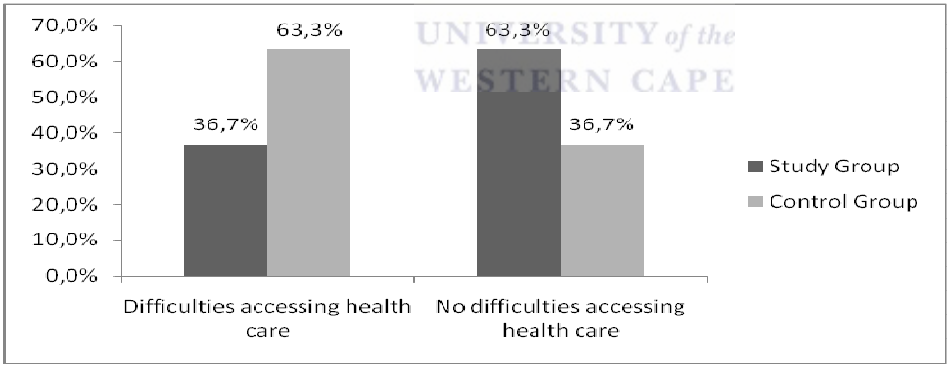
The other dimensions of poverty include, access to health care, education, drinking water, electricity, good sanitation, vulnerability and security, and environmental protection. Here the interest was to assess if there is a difference between the study and control group in terms of better access and opportunities with regards to the other dimensions of poverty which can be attributed to the KSDP.

[43] See question number 34 in the questionnaire attached in the appendix

Access to Health Care

Health care is a core determinant of poverty or wellbeing. A healthy person has the capacity to work and earn income, attain education or skills, participate in social and political developments, etc; conversely, an unhealthy person is deprived of these capabilities and he is poor. The importance of good health to poverty is further expressed in MDG goal 4 (Reduce child mortality), goal 5 (Improve maternal health), and goal 6 (Combat HIV/AIDS, malaria and other diseases). In Ghana according to 2002 health reports, malaria accounts for 11% of all reported death cases; respiratory infections account for 8%, prenatal conditions account for 8%, etc (WHO - Ghana Mortality Fact Sheet, 2006.)[44] Indeed health care is a fundament of poverty reduction. In view of the fact that infrastructure projects can improve peoples' access to health care, this section will find-out if the KSDP improved the affected people's access to health care (thus, if there is any difference in access to health between the study and control groups). If the study group has better access to health care, then the KSDP has improved access to health care. As indicated in the data needs in the methodology respondents were asked whether they had good access to health care or there were constrains that denied them access to health care.

Fig. 12, Access to health care in the study and control groups



Source: Author

In fig. 12 above, [45] while greater majority (63.3%) of respondents in the study group reported they have no difficulties accessing health care, only a minority (36.7%) of respondents in the control group said they have no difficulties accessing health care. Similarly, while only 36.7% of people in the study group reported they have difficulties (mainly financial) accessing the health care, a large 63.3% of respondents in the control group reported they have difficulties (mainly financial and transport) accessing health care.

[44] Internet source: <http://www.who.int/whosis/mort/profiles/mort_afro_gha_ghana.pdf> [Accessed on 27 December 2009]
[45] Question number 36 in the questionnaire attached in the appendix

Table 9, Significance and correlation tests between groups and access to health care[46]

	Value	Approx. Sig.
Nominal by Nominal Cramer's V	,267	,000
N of Valid Cases	120	

Source: Author

Given a Cramer's v test value of 0.27, probability of 0.00 at a significance level of 0.05% (p< .000), it can be concluded that there is a significant relationship between the groups and access to health care. The relationship is a weak positive one (0.27). People in the study group have better access to health care than people in the control group. Further, when the affected people in the study group were asked "Has the sea defence project improved your household's access to health service,"[47] all respondents thus 100 % indicated "Yes." It can therefore be concluded that the KSDP has improve the affected peoples' access to health care.

The reasons for the differences in access to health care in the study and control groups are explained in people's enrolment or membership in health insurance, and access to transport.

Health insurance enrolment

As explained earlier health care is an indicator of poverty and payment for health care is a primary indicator of access to health care. In many developing countries out of pocket payment for health care has been responsible for high mortality rates and acute poverty for many households (Garr, 2009a:1). As part of Ghana's development policies a national health insurance scheme largely subsidized by government was established to provide health care to all people resident in Ghana (Republic of Ghana, 1992: Act 650 of 2003). Children below 18 years and the very poor or unemployed adults with no reliable source of income or support (core poor) have free access. Adults with support or income were required to pay annual premiums ranging from Ghc7.20 (US$5.1) to Ghc48.00 (US$34.3) depending on their income. In view of the fact that health care is very expensive it would be expected that many poor people would join the scheme, but this is not so in the control group. While most people (78.3%) in the study group are enrolled in a health insurance scheme which assures them of quality health care at very little or no extra

[46] The Cramer's v correlation coefficient is a nominal test for correlation for 2X2 tables or more. It is used here to test the strength of the relationship between the groups and access to health care because both variables are nominal. It should be noted that since Cramer' v indicates significance of relationship between the variables there is no need to repeat a significant test with a Chi-square test. See http://www.statisticssolutions.com/nominal-association

[47] Question number 40 in the questionnaire attached in the appendix.

cost, only 41.7% of respondents in the control group are enrolled in a health insurance scheme.[48] The high health insurance enrolment in the study group is attributed to the ease of assessing transport due to the link road in the communities, and the comparatively higher levels of incomes in the study group as explained earlier.

Transport constrains to health care

To verify further whether transport infrastructure had contributed to improved access to health care, the respondents were asked "How accessible is the hospital from where you live"[49]

While (100%) all respondents in the study group reported that it was "easy to find transport to hospital" only 11.7% of respondents in the control group said same, and a large 88.3% of respondents in the control group said it was "difficult to find transport to hospital" This result has serious repercussions on access to health care in the control group.

These findings from enrolment in health insurance and transport constrains indicate that the KSDP has increased access to health care.

Access to Education

Education provides people with the capacity and skills to work and earn income for food, health care, shelter, and also to take decisions for themselves. People with limited or no education may be limited in these capacities and are likely to be poor. Similarly, UNESCO proclaims "education and training are essential in addressing rural poverty."[50] The MDG 2 also emphasizes the attainment of universal primary education. It is in acknowledgement of these facts that the government of Ghana has a free compulsory basic education policy for all children of school-going age to attain at least basic education. To encourage children to stay in school Ghana has a school feeding programme to ensure that children in most deprived community schools are fed free, and in addition the government has started providing free uniforms for children in rural schools. These efforts explain the importance of education to development and poverty reduction. In view of fact that infrastructure can contribute positively or negatively to education (World Bank - IEG, 2007:60), this section found out if the KSDP has contributed to improve access to education (thus, if there is any difference in access to education between the study and control groups). If the study group has better access to education, then the KSDP has improved access to education. As explained in the data needs in the methodology (chapter 3), the level of

[48] Generated from question number 37 in the questionnaire attached in the appendix
[49] Question number 38 in questionnaire attached in the appendix.
[50] UNESCO Education Page http://www.unesco.org/en/esd/themes/rural-development/

education of the children in the various households is used because for the study group if there is any relationship between the KSDP and education it would impact on the children's level of education, vis a vis the reviews of the effect of infrastructure on children's education in the literature review (Porter, 2007:2-3).[51]

Table 10, Levels of Education of Children in the Study and Control group communities

	Tertiary	Senior High School	Junior High School	Primary School	Kindergarten
Study Group	22.4%	22.4%	29.3%	24.1%	1.7%
Control Group	7.8%	13.7%	23.5%	52.9%	2.0%

Source: Author

In table 10 above, data collected on children's current level of education indicates that whiles 22.4% of children in the study group are in tertiary institutions the same can be said of only 7.8% of children in the control group.[52] At the senior secondary school level whiles there are 22.4% children from the study group, there are only 13.7% from the control group. In the lower levels of education such as the junior secondary school, the study group records 29.3% and the control group 23.5%; at the primary school there are 24.1% of children from the study group and 52.9% from the control group.

Table 11, Chi-Square significance test of relationship between the groups and the levels of education[53]

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11,145[a]	4	,025
N of Valid Cases	109		

At a significance level of 0.05 and a p-value of 0.025, a chi-square value of 11.14 and a critical value of 9.49, there is a significant relationship between the two groups and access to education. The study group has a better access to education than the control group. Thus the KSDP has improved access to education for the affected communities.

As explained earlier, access to basic education (Primary and Junior secondary school levels) is free or highly subsidized in Ghana. Also basic schools are provided in almost all communities as part of the Government's Free Compulsory Basic Education policy (FCUBE) which seeks to

[51] As explained in the literature review where the road to school is far or unsafe, children drop-out of school and are unable to attain higher levels education and vice versa.
[52] Children here refers to people of school going age who do not earn income but are under parental sponsorship
[53] The Chi-square measures the significance of relation between both nominal and ordinal data, and the groups and levels of education here are nominal and ordinal respectively.

achieve universal primary education. Public senior secondary schools and tertiary institutions though subsidized places more financial responsibility on parents (Republican Constitution of Ghana, 1992, Chapter 6 Section 38 Sub-Section 2). Both the study and control groups have basic schools in their communities, however, both groups are far from the nearest senior secondary school and they incur transport costs. Whiles the cost of transport to the nearest high school in the control group is Ghc 0.80(US$0.57) that of the study group is 50% lower Ghc 0.40(US$0.29). Additionally, while it is difficult to access transport in the control group, it is easy to access transport in the study group. These factors contribute to explain why many children of school going age in the study group are able to attain higher education than children in the control group. The findings are synonymous with studies conducted by the World Bank which shows that improvement in rural infrastructure increases school attendance (World Bank - IEG, 2007:60).

In conclusion the KSDP has improved the affected people's access to education.

Access to Drinking Water

Safe drinking water is vital for human survival and it is considered as an indicator of wellbeing (Sida, 1996, see Masika and Baden, 1997:3). Aside serving as an inevitable drink, water is used for preparing food, personal hygiene, cleaning, etc. The UN reports that annually millions of children die from water-borne diseases; however these deaths can be prevented just by providing safe drinking water to rural communities (2005:3,7).

Picture 6, Communities without safe drinking water

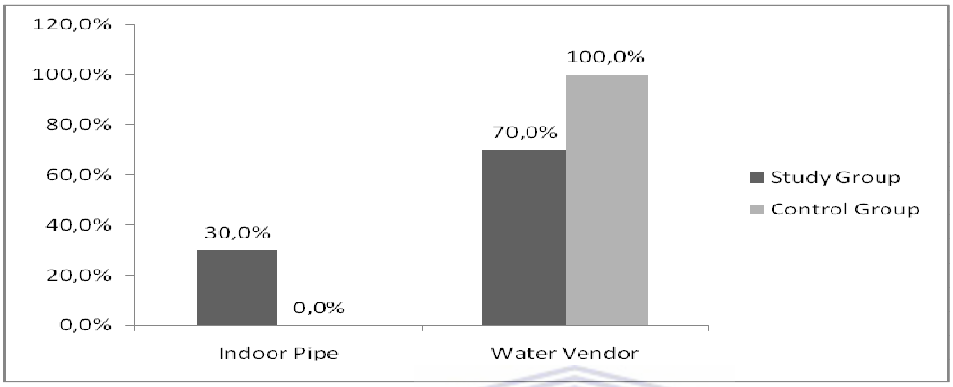
Picture 7, Communities with safe pipe-borne drinking

Sources: UN Water for life (2005), cover page

As part of the resettlement component of the KSDP the affected communities were to be provided with safe drinking water.In this section the thesis sought to find-out if the KSDP has

improved the affected rural communities' access to safe drinking water by comparing access to drinking water in the study group to the control group (thus, if there is any difference in access to safe drinking between the study and control groups). If the study group has better access to safe drinking water, then the KSDP has improved access to safe drinking water.

Fig. 13, Source of drinking water in the study and control groups



Source: Author

In fig. 13 above is the respondents' source of drinking water. While 30% of households in the study group have indoor pipes, no household (0%) in the control has indoor pipe. All households (100%) in the control group buy their water from water vendors. The remaining 70% of households in the study group also buy their water from vendors. These indicate that the households in the study group have better access to safe drinking water.

Table 12, Cramer's v test of significance and strength of relationship between the groups and access to drinking water.[54]

		Value	Approx. Sig.
Nominal by Nominal	Cramer's V	,420	,000
N of Valid Cases		120	

Given, Cramer's v test value of 0.42, alpha significance level ($\alpha = 0.05$), p-value of 0.00, there is a difference in access to drinking water between the groups. The strength of the relationship is a moderate positive one (0.42). Though the study communities have improved access to safe drinking water, but the improvement rate could have been greater. Though all residents with completed houses have indoor pipe fittings, it is only 30% that have water connected to their homes. The majority of respondents (70%) complain about the unwillingness of the project authorities and the water authorities to provide them with water. Even the 30% who have water

[54] The Cramer's v is used here to test the strength of association between nominal variable.

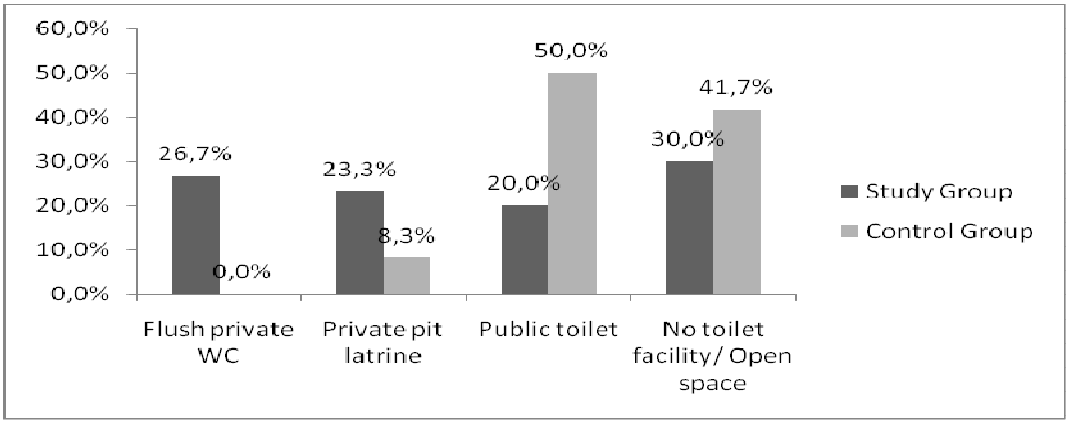
connected complain about connection and services charges. This is a problem of affordability and accessibility which has not been addressed between by the project authorities.

The 70% of people in the project communities particularly women and girls would still have to spend some of their time fetching water thereby distracting them from other productive activities, attending school, and taking care of the nutritious needs of the homes. This is unfortunate especially when it is evident that based on the project objectives it is very possible to supply water to as many homes as possible. Further, as the cost of buying water daily from vendors is much more expensive than direct monthly charges, failure to supply water to people willing to pay for water services may defeat the objective of poverty reduction. Poverty can drive some of the rural poor to drink unsafe water and this could have serious health consequences for the affected people as observed by the UN water for life program (2005a:3, 7).

Sanitation

The UN "Water for life" programme reports that poor sanitation breed fatal diseases like diarrhoea, cholera, dysentery, typhoid and hepatitis which are killing millions of people (2005a:8). Most coastal communities in Ghana have poor sanitation and one contributing factor is the absence of toilet facilities. As part of the resettlement communities it is expected that toilet facilities would be provided. Here the thesis evaluated if the KSDP has contributed to improved sanitation conditions by comparing the study group to the control group (thus, if there is any difference in sanitation conditions between the study and control groups). If the study group has better sanitation conditions, then the KSDP has contributed to improved sanitation conditions.

Fig. 14, Toilet facilities in the study and the control groups



Source: Author

In fig. 14 above, while 26.7% of respondents in the study group have private flush toilets (WC) which is ranked as the highest among toilet facilities, none that is 0% of respondents in the control group has a flush private toilet. On the second ranked toilet facility, private pit latrine; 23.3% of households in the study group and 8.3% of households in the control group have it. Coming to the third ranked toilet facility, public toilet; 20% of respondents in study group use it, while a large 50.0% of respondents (half of all respondents) in the control group use public toilet. On the least ranked toilet facility, open space/no toilet facility; a large 30% of respondents in the study group said they are no toilet facilities and a more lager 41.7% of respondents in the control group said there are no toilet facilities and they resort to unauthorized open places.

Table 13, Chi-square test of the relationship between the study and control groups, and sanitation.[55]

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29,803	4	,000
N of Valid Cases	120		

Given a Chi-square value of 29.8 and a critical value of 9.49, significance level of 0.05 and a p-value of 0.00, and a degree of freedom of 4; it is conclusive that there is a significant difference in sanitation conditions in the study and control groups. The study group has better sanitation conditions than the control group.

Though there is some improvement in sanitation facilities, there is still more to be done as 73.3% of households do not have WCs due them and about 30% resort to open spaces. The critical question for policy and implementation interest is: the project aimed at providing toilet facilities to the affected households or communities and also to stop the people from resorting to open spaces, so what prevented the project from achieving this noble objective? The problem as explained earlier has to do with the refusal of the new government to release funds for the completion of the resettlement project, and also disagreements between the project planners and the affected communities.

Though some improvements have been made the failure of the project to provide toilet facilities to the greater majority of households in the communities means that the study group is still exposed to the risk of diseases related to bad sanitation , cholera, dysentery, etc mentioned above which have negative implications on poverty reduction.

[55] A chi-square is used to test the significance (and not the strength) of relations because the variables are nominal and ordinal, in which case Cramer'v or contingency coefficient cannot be used.

Access to Electricity

The availability of electricity spurs the creation of non-farms jobs and livelihoods for many. Electricity attracts FDIs and personnel to rural communities. These create an enabling environment for rural poverty reduction. As part of the resettlement the affected communities were to be provided with electricity, therefore, the thesis sought to find-out if the communities have been provided with electricity and if it has improved their standard of living.

Electrical installations have been made in the completed houses and the national grid runs through the communities which indicate an immediate intension to provide the communities with electricity.[56] In reality the affected communities have been living in darkness for over three years. This epitomizes failure in the project implementation process on the part of the project authorities and the various sectors involved. The absence of electricity in the communities means fewer, shops, salons, repair shops and other small scale businesses that may create jobs and income opportunities for the rural people. The hope of having cold store facilities to preserve their fish so as to sell it at good market prices has eluded them. This is a disincentive to the attraction of FDIs which could also create jobs and development opportunities for the rural poor. Though the KSDP has demonstrated its intension to provide electricity to the communities it has failed to provide them access to electricity.

Access to Shelter

In his works on infrastructure and resettlement in Ghana, Kalitsi has often lamented how large scale infrastructure projects deprive people of adequate shelter and increase poverty in affected communities (1970:224-225). The kind of shelter that people inhabit affects their health and their level of vulnerability to disasters. The thesis evaluated the resettlement communities of the KSDP, to find-out if the KSDP has made any contribution to improved shelter for the project communities.

As stated earlier the housing component of the project has been abandoned, only about 400 houses have been built out of the about 800 expected houses. Secondly, the 400 completed houses are only 1-bedroom house units. Large households who had their big houses pulled-down and were promised 3 and 4 bedrooms house units have been forced to accept 1 bedroom house

[56]A policy and implementation study looking at access to electricity, despite the electrical installations may focus on what prevented the different actors completing the job that was almost done and conclude that they have failed. An economic impact assessment of infrastructure on the other hand by virtue of the electrical installations may conclude that electricity is in the community and then proceed to make assumptions on the expected benefits.

units. Thirdly, the households that are yet to receive their houses live in structures built from inferior materials like thatch and rusty iron sheets which can crumble and fall in times of strong waves and heavy rains. Also because the people in the communities use naked flame lightings houses that are built of wood or thatch can combust into inferno and this may lead to more deprivation for the people involved. Such inferior building materials also come with health risks. The affected people acknowledge that they have been rescued from sea erosion and flooding but they have lost their houses. The comments of some respondents are as follows:

"The project just ended abruptly they did not inform us as to when they will provide us with our house"[57]

"I had 3 bedrooms, kitchen and a large compound but here I am caged into a 1-bedroom house with my wife and children, how?"[58]

"I am very disappointed with what is going on, we had a big family house, they pulled it down and gave us 1-bedroom house for one large extended family. There was no equity in the distribution of houses, some people who did not have houses now have houses and people who had houses do not have houses, how do you expect us to be happy when these things are happening"[59]

This finding confirms Kalitsi's view that often large infrastructure projects in Ghana leave the affected people worse off (1970:224-225). As explained earlier the inability to complete the housing project is attributed to political manipulation which confirms the game theory. With respect to shelter the KSDP has failed to make meaningful contribution to poverty reduction.

Levels of Security and Vulnerability

The UN Water for life programme noted that between 1991 and 2001, over 665,000 people died in water related disasters such as floods and sea erosions and properties worth millions of US$ were destroyed (2005b:12). In the case under study, large tracts of land and properties have been submerged in the sea leading to poverty in the affected areas. Therefore vulnerability to flooding and sea erosion is a constant threat that affects people's choices and way of life and often pushes them into poverty, hence the need to look at people's vulnerability to flooding and sea erosion.

[57] Respondent Number 2
[58] Respondent number 13
[59] Respondent Number 23

The thesis verified if the project has reduced vulnerability in the project communities by comparing the study group to the control group. People's perception on their vulnerability to flooding and sea erosion, observation, and project document formed the basis for the assessment.

Table 14, Vulnerability to sea erosion and flooding in the study and control groups

	Vulnerable to sea erosion and flooding	Not Vulnerable to sea erosion and flooding
Study Group	6.7%	93.3%
Control Group	96.7%	3.3%

In table 14 above, whiles an insignificant 6.7% of people in the study group reported that they are vulnerable to flooding and sea erosion, a significant 96.7% of respondents in the control group reported they were vulnerable to flooding and sea erosion. Conversely, while a significant 93.3% of people in the study group indicated that they were not vulnerable to flooding and sea erosion, only an insignificant 3.3% of people in the control group said they were not vulnerable to flooding and sea erosion.

Table 15, Cramer's v correlation coefficient test for significance and strength of relationship between the groups and vulnerability.[60]

		Value	Approx. Sig.
Nominal by Nominal	Cramer's V	,901	,000
N of Valid Cases		120	

Given a Cramer's V value of 0.90, a p-value of 0.00 and a significance level of 5%, it is conclusive that between the study group and the control group there is a significant difference in the level of vulnerability. The level of vulnerability in the study group is lower than that in the control group. The Cramer's v test shows that the relationship between the variables is a very strong and positive (0.9). The KSDP has reduced vulnerability in the project communities.

The construction of the sea defence wall which involves rock-lined groynes and offshore breakwaters (Pope and Joan,1984: 287 see also The Coastal Society,1985)[61] protects the coast and the inhabitants from the perennial sea erosion which has in the past submerged more than half of the communities (GLDD, 2000:3). The lagoon flood control mechanism lowers the level of water in the lagoon when the level rises to prevent flooding (Ibid). These have eased the

[60] The Cramer's v is used here to test the strength of association between nominal variables.
[61] Off-shore breakwater is a structure built as part of coastal defence to protect the coast from sea erosion whiles collecting sand to refill the coast.

flooding in the communities and the destruction of farm fields. As explained earlier, sea erosion and flooding displace people and affect their socio-economic activities. In conclusion the KSDP has led to reduction in the level of vulnerability.

Environmental Sustainability

There is no doubt about the importance of the environment to poverty reduction, as this has already been explained in the literature review. A "World watch" report noted that "instead of giving hope for the future" infrastructure projects have "ruined the ecosystem." (Imhof and Lanza, 2010:8). Here the thesis verified if the KSDP has impacted positively on environmental sustainability by comparing the situation in the study group to that in the control group. As explained in the methodology earlier, the assessment of the impact on environmental sustainability is based on project reports and observation.

Again the construction of the groynes and off-shore breakwater has reinforced the coastal shoreline and prevented sea erosion. Without the intervention the stretch of land between Keta and Kedzi was less than 50m in some places and the danger of the sea breaking into the lagoon and affecting the salinity of the lagoon resulting in tragic consequences for aquatic life, agriculture, fishing, etc has been averted. Similarly, the construction of flood control and the dredging of the lagoon have reduced the threat of the Volta River swelling in the raining season and flooding the lagoon and posing serious danger to the fragile fresh water environment which holds different fish species and the many different species of birds (GLDD, 2000:1). The control group is however facing these problems, sea erosion and its associated humanitarian problems, and the sea breaking into the lagoon and endangering aquatic life. The paper therefore concludes that the KSDP has protected the natural ecology.

The conclusion drawn from the impact assessment above is that the KSDP has made some important contributions to poverty reduction but it has failed to significantly reduce rural poverty.

The hypothesis that, there is a positive relationship between the Keta sea defence project and rural poverty reduction is confirmed.

4.3 Implications of Project Results on Ghana's Infrastructure Policy Environment

This section focuses on the findings of the impact assessment and its impact on the policy environment of Ghana.

4.3.1. Policy Reference of the KSDP

Policy Framework and policy level: Ghana has no generic or broad policy framework for infrastructure provision. Instead sectoral policies are used. The KSDP was supported by many policy frameworks, key among these is the integrated coastal zone management and sustainable development project under Ghana's national policies on marine and coastal environment (Amlalo, 1999: 9). The other policies include the National Environmental Policy, Agriculture Policy, Tourism Development Policy, Land Management Policy, Minerals Policy, Wildlife Conservation Policy, Energy Policy, and the National Disaster Management policy (Amlalo, 1999:3). The Ministry of Environment Science and Technology coordinated the activities of these sectors. However, the Ministry of Works and Housing implemented the project. Similar to Mutahaba et al.'s account of project failure in African countries, the cooperation between the various sectors and departments ended at the planning phase (1993:52). There was very little coherence in the implementation process as to which sector or level of government was to act when it came to transforming the project opportunities into services. The role of various actors, central government, sectors, local government, or the beneficiaries was vague and as noted by Mazimanian and Sabatier (1981, see Brynard and De Coning, 2006:189) such projects have implementation problems. Sectoral network approaches may turn-out to be less effective when there is no umbrella or coordinating policy: as sectors that stand to benefit directly would support specific projects and sectors that may not benefit directly may not support the project (Maxwell, 2003:13; Foster et al., 2001:10). Since the project is mainly an infrastructural one, a generic infrastructure policy is better placed to harmonize the interest of the various sectors into an infrastructure one. Therefore one realizes from the impact assessment that beyond the development of the physical infrastructure not much has been achieved in terms of pulling the synergies of the various sectors into services to reduce poverty.

Policy content: The orientation of the KSDP is redistributive as it sought to redistribute resources to the poor by committing resources to the rural poor (Ostrom, 1999:48). Stating in a project document that the project would reduce poverty is not enough to ensure that such redistributive objectives are met. A generic infrastructure policy is better placed to provide broad guidelines on

how redistributive (distributive or regulatory) policies are to be carried-out. As noted by Lowi (1964), Van Meter and Van Horn (1975) the success and effectiveness of implementation differs for the various types of policy contents (see Parsons 1996: 480-481).

4.3.2. Broad Policy Concerns

Private Sector Participation: The importance of private sector participation in infrastructure provision cannot be underestimated. The government of Ghana has consistently called for private sector participation in infrastructure provision in view of the fact that it reduces the burden on the state and creates new forms of organization for promoting development (MFEP, 2009b:1). In the words of the Minister of Finance and Economic Planning (MFEP, 2009b:1) *"the Government believes that the private sector can and must play a bigger role in our infrastructure service delivery…"*.But very little has been seen of private sector participation in infrastructure provision because not much has been done in terms of policy changes to reflect, initiate or guide such a process. For example the private sector involvement in the KSDP was minimal. The private sector participation was limited to the transport sector, the project consultant and contractors. However more private interests in the form full privatization, Public Private Partnerships (PPPs), Public Private Community Partnerships (PPCPs) could have been encouraged to develop the business and tourism potentials of the project since the government was taking the cost of the sectors oriented towards public goods. The conclusion here follows that Ghana's sectoral approach to infrastructure provision is inadequate.

Financing: How a project is financed determine the level of success. As explained in the impact assessment, the project was funded in two ways, the first part which consisted of the construction of the sea defence wall, lagoon flood control, reclamation of land, and the construction of 8.3km link road was pre-financed with a loan from the EXIM Bank of USA. The second part of the KSDP which involves the construction of the resettlement communities was to be funded by the government and it was not pre-financed. The pre-financed components of the project have been completed and they account for the successes of the project. The impact assessment reported that the component that was not pre-financed accounts for the failures of the project as it remains uncompleted. The latter also allowed for political manipulation of the project causing dissatisfaction and apathy in the project communities. Because infrastructure provision involves huge sunk costs as a matter of policy projects should be adequately financed before implementation. If there was a generic policy which legislated that all infrastructure projects

should be pre-financed or use Medium Term Expenditure Frameworks (MTEF), the problems of the project would have been averted and the project would have had greater impact on poverty reduction. Ghana's sectoral approach to infrastructure provision is inadequate in this respect.

Continuous monitoring and evaluation of infrastructure performance: Four years after the project, no socio-economic impact assessment has been conducted to assess the performance of the infrastructure on poverty reduction in order to do adjustments where necessary. Monitoring and evaluation is part of the project management cycle and should go with the project. Even if for any reason this was not specified in the project document, a generic or broad infrastructure policy would have given more impetus to continuous monitoring and evaluation and to incorporate feedback into the project. This helps to ensure that the project was on track to achieve its objectives. However, this is lacking in the case of the KSDP, an attestation of the inadequacy of Ghana's sectoral policy for infrastructure provision.

Environmental protection: The project document indicated key environmental concerns that needed to be addressed such as protecting and enhancing the 'life-supporting' capacities of the sea, lagoon, soil and the ecosystem and mitigating adverse effect of sea erosion, flooding and the destruction of shoreline. Following the support of the national environment policy and other legislations on marine and coastal development, and the lead role of the ministry of environment in the project the environmental concerns have been addressed.

Externalities: Often negative infrastructure externalities which affect beneficiary communities are not factored into the project cost. The KSDP made provision to control negative externalities like road accident by introducing speed-limits. However, other negative externalities like air pollution, and noise to the residents located close to the road have not been provided for. Regulations can be put in place to integrate this into the cost of the project. Such regulations on externalities are core components of generic infrastructure policies.

4.3.3 Rural Infrastructure Policy Concerns

Targeting and equitable distribution of project benefits: To deliver project benefits to the poor people who need it most it is important that projects effectively target the poor. Additionally, channels of impact through which the poor are to benefit need to be developed to pass-on the benefits. The project documents identified the entire affected communities as the target area. The channels of impact were identified as fishing, farming, trade, and tourism. Identifying the areas of impact is a first step that is to be followed by services within those sectors to improve the

wellbeing of the people and also to pursue equitable distribution of project benefits. However, the KSDP did not move beyond the first step. This is because the sectoral policy environment failed to galvanise the various sectors to transform the areas of impact into services.

Accessibility, cost and affordability: as discussed earlier most rural infrastructure projects fail because they are not accessible to the poor who are the intended beneficiaries or they fail to incorporate the low income conditions of the poor. With respect to the KSDP no specific measures were taken to ensure that the infrastructural services were accessible to the rural poor. The project did not consider for example how much the community could pay for water or electricity, the price that they could be charged without the service providers running loses or whether the government was cross-subsidizing the services. As indicated by the impact assessment greater majority of the people do not have electricity or water even though it is due them. Limited access to social services can hinder the poverty reduction and growth opportunities. Ghana's sectoral infrastructure provision environment is incapable of dealing with issues of accessibility and affordability across the sectors, when indeed accessibility and affordability provisions are key components of generic infrastructure policies.

Integrated development project: Similar to the above, as explicitly explained in the chapter 2, when infrastructure projects are complemented by other sectoral interventions it has greater impact on poverty reduction. The KSDP is one of integrated development and this is commendable. However beyond the installation of hardware or physical infrastructure nothing has been done to harness the development potentials of the various sectors into employment and income opportunities so as to increase the project's impact on poverty reduction. The huge tourism potentials – islands, boat trips, bird view sites, beaches, forts/ancient structures and many historical sites - remain untapped, salt mining and the fishing industry also remains undeveloped. There appeared to be inconsistencies and multiplicity of interpretations at the central government, sectoral, and local government levels as to the services and industries that were to be developed. The many sectors involved in the planning of the project vanished when it came to implementation. Consequently nothing materialized beyond the physical infrastructure. The case here aligns with Cord's observation "rural infrastructures are often under-resourced and implemented in an unsustainable fashion, resulting in chronic underprovision" (2001:82).The sectoral approach was unable to coordinate the various sectors to deliver the integrated development objectives of the project. An overarching policy is lacking here.

Impact on social wellbeing: The impact assessment result shows that the project through the road has improved access to health care, education, open-up the communities, increase security and mobility of the affected people. Improvement in access to water and sanitation facilities is marginal and affected people still risk water-borne and sanitation related diseases because the resettlement component of the project has been abandoned.

Impact on productivity and growth: Often people in rural areas have low productive capacities and to sustainably reduce poverty it is important to develop their productive capacities. The project document stated that the project would improve the productive capacities of fishers, farmers, and traders. As explained in the impact assessment, the physical infrastructure has improved the productive capacities of farmers, fishers, and traders. However more needs to be done in the fishing industry to increase its impact on poverty reduction. The gains here are attributed to the physical infrastructure. There is the need to harness the opportunities presented by the physical infrastructure into services.

Job creation: As indicated in the impact assessment no conscientious effort was made to ensure that the project employed as much local people as possible. Neither was the use of labour intensive methods encouraged to create job opportunities for the poor in view of the revelation that in Ghana if 30% of infrastructure investments were labour-intensive about 50,000 direct jobs and 75,000 indirect jobs would be created (DFID, 2002:12; Sida, 1996, see Masika, and Baden, 1997: 3). Consequently for a project worth about US$1billion only about 380 Ghanaians were employed. Most of the people employed came from other towns and regions. The project did not offer the affected people enough job opportunities. This raises policy concern. As part of an aggressive generic infrastructure policy that seeks to empower and improve the wellbeing of people particularly rural areas where people are unemployed, provisions can be made to ensure that for example for all infrastructure projects at least 60% of casual job positions go the affected communities and about 30% to citizens from other parts of the country or labour intensive method should constitute a minimum of 30% of construction works. This is seriously lacking.

Participation of the affected rural communities: This is vital if the project is to appropriately target the poor or respond to the needs of the people. This is also important to empower the rural poor and to inculcate a sense of ownership and responsibility for their own development and also for the maintenance of their infrastructure. Officials in charge of the project at the district and national levels explained that the affected people were involved in the planning and development

of the project. The affected people also indicated that they had good will towards the project until the new Government failed to release funds for the completion of portions of the project. As an expression of their dissatisfaction they held demonstrations to make their grievances known to the project authorities. The affected people feel bitter and letdown by the project which was to improve their wellbeing but has not lived-up to their expectation. This confirms Rein and Rabinowitz's view that division among the actors is capable of upsetting the implementation process and outcome (1978:314). The KSDP was one of a top-down approach with little participation of the affected communities (Garr, 2009b:7). In this case the sectoral policies did not make adequate provision for the participation of affected people and the resolution of conflicts that may arise. Participation is an essential feature of generic infrastructure policies.

Management and maintenance (sustainability): Rural infrastructures often face management and maintenance problems. Most projects fail because most project budgets plans do not cover what should happen with maintenance after the hardware is completed, and in no time such projects are destroyed because of lack of maintenance. The KSDP is supervised by the Keta District Assembly, as and when there is the need for any maintenance the Assembly calls on the appropriate authorities involved. However, the management and the maintenance of the KSDP may face challenges as there is no appropriate management authority. Also, some components of the project are not completed, and there are disagreements between the affected communities and other stakeholders (Government and the local government authorities).

In view of the assessment and discussion above the thesis concludes that Ghana's infrastructure policy environment is inadequate, and following the findings of the impact assessment that poverty has reduced mildly, the hypothesis that, "the more an infrastructure project is guided by an infrastructure policy the more likely it is to succeed in reducing rural poverty" is confirmed.

4.4 Summary

Chapter 4, presented and discussed the findings of the study. The KSDP was described, emphasis was also put on rural poverty reduction and the policy and legislative background of the project. The components of the project and their impact on poverty reduction were analysed. The implications of the project's results on Ghana's infrastructure policy environment were subsequently discussed. Reforms in infrastructure provision in Ghana are proposed in chapter 5.

CHAPTER 5

Reforms in Infrastructure Provision in Ghana

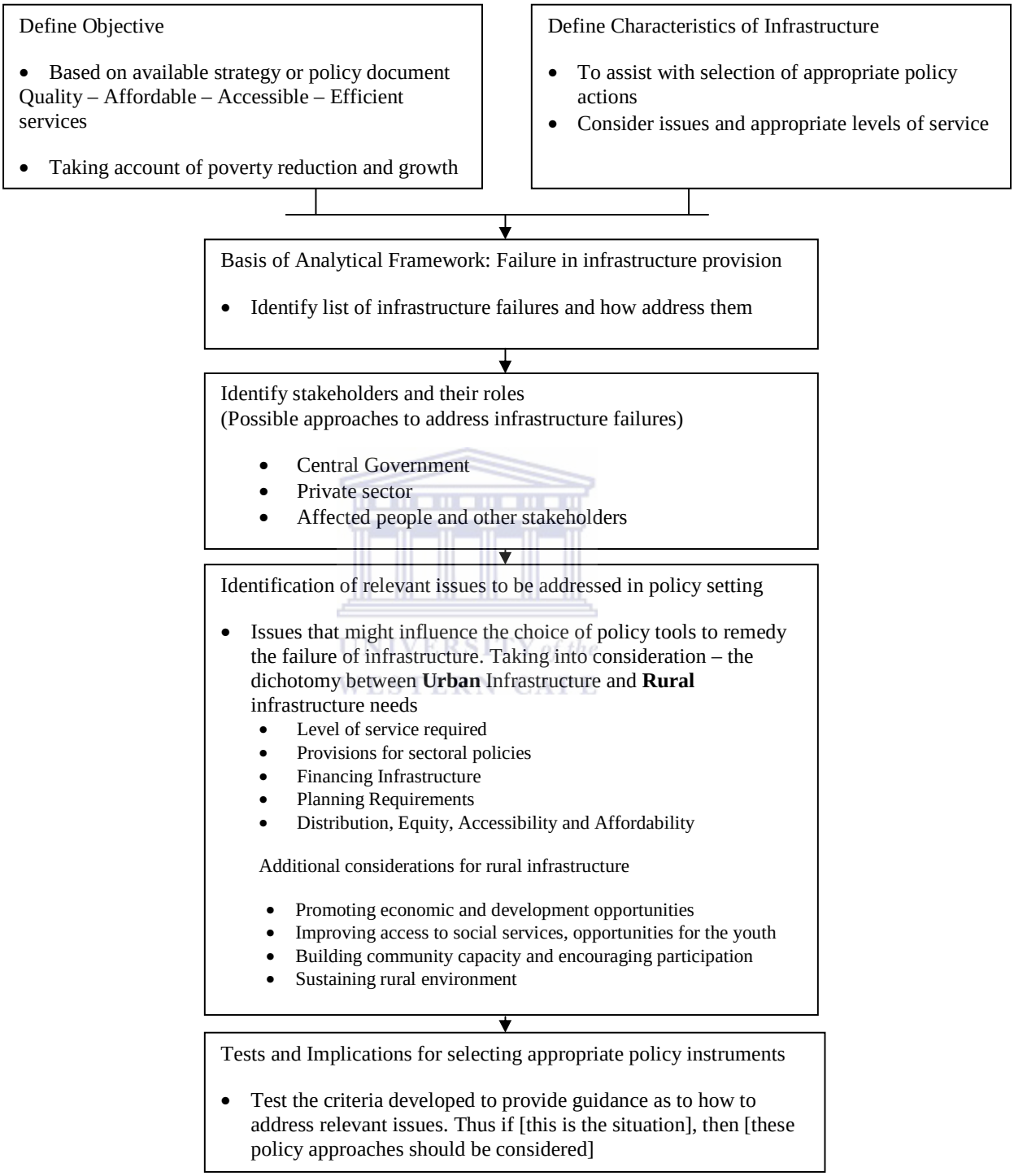
"The costs of policy reforms and adjustments are less than the intended benefits which may eventually materialise" Author

As indicated by the analysis so far Ghana does not have a broad infrastructure policy and this largely account for the failures in most of her infrastructure provision. One of the problems is the level of inconsistencies, duplications, and the multiplicity of interpretations in Ghana's sectoral, central and local government policies (Ferazzi, 2006:8). One way to harmonize and distinguish between the relationships between the various actors, their various levels of involvement and implementation is through a comprehensive infrastructure policy. Definitely a broad infrastructure policy cannot make provision for everything but the key frameworks can be provided and the other details put in complementary policies. In addition to the specific facts of Ghana, evidence from most OECD countries has demonstrated the enormous contribution of such broad infrastructure policies to efficient infrastructure provision and consequently for the improved wellbeing of their citizens (NZMED, 2005; Mclnemey, Nadarajah and Perkins, 2007).[62]

The thesis proposes a broad infrastructure policy for infrastructure provision in Ghana. The purpose of this broad infrastructure policy is to provide a coherent body of laws governing infrastructure provision in Ghana. The thesis proceeds to discuss the model for reforming infrastructure provision in Ghana by highlighting the essential elements of a generic infrastructure policy for Ghana. Developing a full infrastructure policy is beyond the scope of the thesis; the discussion therefore summarized the salient steps and elements of the reform.

[62] Internet source:http://www.treasury.gov.au/documents/1221/HTML/docshell.asp?URL=02_NRA.asp [03/04/2010]

Fig. 15. A model for reform in infrastructure provision in Ghana



Source: Ministry of Economic Development, New Zealand - NZMED 2005[63] (Modified)

[63] http://www.med.govt.nz/templates/MultipageDocumentPage____9194.aspx [03/04/2010]

1(a) Objective

The objectives of the infrastructure policy reform should take into account Ghana's development aspirations to reduce poverty and also to promote growth (GPRS 1 and II). The policy should seek to ensure that households and enterprises have access to quality, reliable, and affordable infrastructure services that is sustainable in the short-term and in the long-term. The policy should seek the following:

- Serve as a coherent framework for providing infrastructure: specify how infrastructure needs are to be met under what conditions and by whom.
- Correct the efficiencies responsible for failure in infrastructure provision
- Make for equity in the distribution and access to resources
- Be cross-sectoral (harmonize the sectoral policies) and an integrated framework, and very flexible to accommodate changing sectoral needs (never a one-size-fit-all).
- Ensure that benefits to be derived from infrastructure provision are greater than the cost.
- Consider the demography, geographical location, the environment (NZMED, 2005)[64]

1(b) Characteristics of infrastructure

To understand the dynamics of infrastructure and how they can facilitate the development aspirations of the state and the appropriate policy instruments to employ it is important to identify the characteristics of infrastructure.

A striking feature that sets most infrastructure sectors apart from other sectors is that its central operating networks are natural monopolies. These central networks include "Water supply networks, high voltage electricity transmission wires, fixed telephone lines, gas pipe networks, roads and railway networks…" (Mclnemey, Nadarajah and Perkins, 2007).[65] Aside from the state providing these infrastructures, private companies can also provide these services however they should operate under public regulations that ensure that they deliver quality and affordable services. Also they should allow their competitors access (fair) to the central networks.

Most infrastructure sectors involve high initial fixed and sunk cost, and low marginal costs of supply. Such infrastructure can be provided by the state and where the private sector is allowed to provide it should be under regulation. The private sector should be encouraged to invest in infrastructure that do not involve huge sunk costs however under competitive public regulations.

[64] Internet sources: http://www.med.govt.nz/templates/MultipageDocumentPage____9192.aspx 03/04/2010
[65] Internet source:http://www.treasury.gov.au/documents/1221/HTML/docshell.asp?URL=02_NRA.asp03/04/2010

Most infrastructure have the traits of public goods, thus, they are not excludable or exhaustible. In this case it is often difficult to recoup cost invested into their supply. The state can provide these infrastructures, or provide incentives for the private sector to provide these infrastructures but under public regulation. For infrastructure sectors where the excludability of consumption is high and also exhaustibility or rivalry in consumption is high such that cost can be recouped the private investor should be encouraged to invest, however under competitive public regulations.

Most infrastructure facilities involve externalities that are not factored into service charges. This can be corrected through regulations or monetary tools (taxes, fees or subsidies). Positive externalities are gains beyond the immediate benefits of project such as rise in the value of land. Negative externalities on the other hand refer to other negative effects that the project may bring about such as pollution or accidents.

2. Identifying and addressing problems that characterize infrastructure failure

A list of failed infrastructure projects at the different levels should be compiled. The main reasons for the failures should be identified and for each factor that contributes to infrastructure failure the following questions should be answered: What is the problem? What causes it? Who and what can be done to solve the problem?

For example the case study identified the following problems with infrastructure provision:

(a) Inefficient regulatory frameworks constrain the provision of efficient infrastructure and this will involve identifying the regulatory failures and bottlenecks in infrastructure provision, for example missing policies, inconsistencies and multiplicity of interpretations, the absence of a harmonizing infrastructure policy or the use of uncooperative sectoral policies. These may necessitate the introduction of new policies and regulatory frameworks to fill the gaps.

(b) Financing problems: The financing problems should be listed, for each problem it should be investigated to find-out how and why such funding problems persist, and the appropriate policy tools identified to correct funding problems that characterize infrastructure provision.

(c)Political manipulation: Projects distracted by political manipulation should be identified. Then proceed to examine how political manipulations come about and the remedial regulatory frameworks which can put in place to prevent or reduce the effects on infrastructure projects. This may include strengthening ineffective regulatory frameworks.

(d) Poor targeting and limited access to infrastructure services: This should involve identifying targeting problems, problems of equity in resource distribution and also the problems that constrain people's access to infrastructure services, and finding solutions to them.

(5) Negative externalities: Externalities should be incorporated into infrastructure service charges to take care of any negative externality. This would involve identifying the externalities that affect infrastructure provision and the necessary regulatory frameworks to incorporate.

The following could assist in addressing the challenges of infrastructure provision:
(i) Continuous monitoring and evaluation of infrastructure performance: This is key to efficient, effective, reliable and accessible infrastructure provision but often it is not done. The task here is to identify monitoring and evaluation constrains and to make the necessary policy input to provide frameworks for continuous monitoring and evaluation of infrastructure performance.
(ii) Management and maintenance: This is a contributing factor to the failure of infrastructure facilities. It would require the identification of factors that affect the management and maintenance of infrastructure, and the necessary policy input made to ensure efficient management and prompt attention to the maintenance of infrastructure facilities.
(iii) Participation: This would involve identifying the various levels of infrastructure provision and the various stakeholders at each level, and why they may be excluded and the necessary policy input made to ensure the participation of stakeholders in infrastructure provision.

3. Identify key stakeholders and their roles
Government: Government as the custodian of public welfare has the responsibility to make regulations for the provision of infrastructure to meet the needs of the people: create attractive infrastructure market, and enforce public interest competition rules or standards. The government can also be involved in the provision. The level of involvement should be determined by the characteristics of the infrastructure involved.

Local Government: The level at which the local government is involved in infrastructure provision should be legislated.

Private sector (Investors, Banks, and Contractors): The role of the private sector should be clearly stated. The sector is capable of providing infrastructure to help the state meet the needs of citizens. The level of involvement should be decided by the type of the infrastructure involved.

Affected Communities and other stakeholders: the policy should legislate on how people affected by infrastructure can be involved in the project, their rights and privileges, anticipated conflicts and how to resolve such conflicts.

The choice of approach should be based on transparent and robust cost-benefit analysis and should be responsive to prevailing conditions. The involvement of these stakeholders should depend on the level, scale, and interest of the infrastructure.

4. Issues that needs to be addressed in policy setting

The difference between Urban and Rural infrastructure should be considered.

- The various levels of infrastructure provision should be defined.
- The policy should consider harmonizing the various sectoral policies in terms of infrastructure needs.
- The policy should consider private sector participation in infrastructure provision through promoting competition and regulating private sector participation, etc.
- Planning Requirements for infrastructure provision
- Distribution, Equity, Accessibility and Affordability

For rural infrastructure, the policy should make additional provisions for the following:

- Maximise economic and development opportunities
- Improve access to social services and create opportunities for the youth
- Empower and build the capacity of rural people and also promote their participation.
- Sustain rural environment

5. Tests and implications of the policy instruments developed

The various criteria developed should be tested.

The approach summarily outlined above is empirically grounded and can be relied-upon by Ghana to develop a coherent infrastructure policy capable of aiding the national aspiration of poverty reduction and growth.

Summary

This chapter discussed and proposed reforms in infrastructure provision in Ghana. The thesis now proceeds to conclude and to make recommendations in chapter 6.

CHAPTER 6

Conclusion and Recommendation

"The defining and distinguishing feature of the Homo sapiens is its ability to make sense of the world, i.e. to use its intellect to understand and change both itself and the world of which it is an integral part"
J.J. Williams, 2000:395

6.1. Conclusion

Rural poverty reduction is at the core of Ghana's development goals and a lot is being done to achieve this goal. In recent years infrastructure has re-emerged as an essential vehicle for poverty reduction and the Government of Ghana (GoG) has indicated the conviction to use infrastructure to reduce poverty. However the GoG complains of failures in infrastructure provision and the inability to translate the potentials of infrastructure into poverty reduction (Ministry of Finance and Economic Planning - MFEP 2009a:2-4). To understand this phenomenon the thesis analysed the relationship between infrastructure and rural poverty reduction, and the implications of policy on implemented project outcomes. The thesis used the case of an infrastructure project (KSDP) to illustrate the dynamics of infrastructure and its influence on rural poverty. The thesis examined the role of infrastructure in rural poverty reduction using the welfare theory (complemented by multidimensional approach to poverty) and found that there is a positive relationship between infrastructure and rural poverty reduction but impact depends on the policy environment. The thesis explored the infrastructure provision environment of Ghana and concluded that Ghana provides infrastructure through sectoral policies. Employing the Austin policy chain model, game model, and other complimentary theories, the thesis indentified some of the challenges and policy inadequacies associated with failures in infrastructure provision in Ghana. Responding to Ghana's call for new ideas to improve the impact of infrastructure provision on public welfare, the thesis is now in a better position to make recommendations (based on facts, local knowledge, global trends, and rational thinking which can be relied upon to provide efficient, reliable, accessible and affordable infrastructure). The choice of the KSDP is very important in that it is not one of total failure or 100% success but it showcases two sides of infrastructure provision. The traditional engineer perspective would judge the project as a good one because some purely technical components of the project have been well executed. The other side which has to do with social-economic welfare and has broader national development and policy implications may consider the project as insufficient and incomplete. This balance is

needed to demonstrate both the good practices in infrastructure provision and the failures in infrastructure provision. The KSDP, thus, provided good empirical perspectives for the study.

Main findings

An observation which encapsulates the main findings is that which was made by Kessides (1993:2). The impact of infrastructure on poverty reduction and growth is not the minimal impacts of the physical presence of infrastructure but also the services that are generated by such facilities to reduce poverty (includes promoting economic growth).

The first finding follows that infrastructure provision in Ghana is done through sectoral policies.

Successes

The sea defence, flood control, and the road as physical infrastructure have contributed positively to rural poverty reduction:

- Access to health care and education has improved as a result of the road connecting the affected communities to many other towns with health centres and schools respectively.
- Income levels have increased marginally for some people as a result of the road which has improved access to markets, and the flood control which has reduced the flooding of farms.
- Prices of goods and services are comparatively lower and this is good for poverty reduction.
- The environment (coastal and lagoon ecology) is protected and the sense of security has increased as the problem of sea erosion and flooding which threatened to submerge the affected communities has been halted.
- The affected communities now offer good prospects for poverty reduction and growth (salt fishing, tourism, and other industries) compared to before where they were almost submerged.

The decision to make the project an integrated development project instead of a sea defence project is in tandem with Ghana's development aspiration to reduce poverty (GPRS 1 and II).

Employing a pre-finance instrument for the core - structural works was very efficient and this ensured that those components were completed on schedule. The pre-financing also ensured that the project had some level of protection from political manipulation.

The contract between the Government of Ghana and Great Lakes Dredge and Docks Company (GLDD) of the USA was well executed on the basis that the project components were all

completed on schedule. The project took cognizance of essential elements of project management also known as project management body of knowledge (Turner, 1993:8-14; Burke, 1999:6-7). The scope of project was specified, cost was pre-financed, time schedule was made drawn and followed, activity schedules were used to organize the project, components were integrated, the GLDD had a news 'brief' (*GLDD info*) which communicated the objectives and progress of work, and also the key staff and their roles were specified.

One may be convinced by the list above that some gains have been made compared to many other infrastructure projects in Ghana. Absolutely, this project is reputed as a pride for Ghana (politically, historically, and environmentally), one of the largest infrastructure projects in west-Africa, and a show of good relations between Ghana and the US. However, when they are clear indications that the gains of the project are limited, and that gains are being hindered by institutional, policy and implementation challenges which underpin the failure of most infrastructure projects, it is in the interest of the public and the state to identify and to correct those failures. The role of public institutions is to ensure that public investments provide efficient, reliable, accessible and affordable services and not 'half-baked' services.

Failures

(1) Poverty Reduction: Beyond the infrastructure hardware the project failed to harness the development potentials and opportunities created. The fishing industry, tourism industry, or salt industry could have been targeted to add value to the project and the communities.

- The project failed to create jobs for the affected people as expected.
- Income levels are still low in the affected communities.
- Property rights to parts of the land are in dispute and this is a disincentive to the development of the reclaimed land.
- Resettlement component of the project is incomplete and has been abandoned.
- The project has failed to provide shelter for over 400 families.
- The affected people do not have electricity and majority do not have water.

(2) Financing: The choice of financing approach for the resettlement component of the project was very inappropriate. Adequate budgetary provision was not made for the project.

(3) Political Manipulation: Manipulation of the project by the government (new government) disrupted the full implementation of the project. This has hindered poverty reduction.
(4) Private sector involvement: Private sector involvement in the project was very limited because the sectoral policy environment did not make much room for the private sector.
(5) Participation of beneficiaries: This was weak and not existent where it mattered most.
(5) Targeting and Accessibility: This did not impact on poverty reduction because the sectoral policy environment did not make provisions for effective targeting of the poor.
(6) Integrated development project: The effectiveness of the integrated development approach to the project was very minimal. Beyond the minimal impact of the completed physical infrastructure, very minimal or nothing has been achieved in the form of coordinated effort to develop services that can improve the standard of living of the people or create income earning opportunities for the people and this is a major problem with infrastructure provision in Ghana.

The reasons accounting for the problems with the project will not be complete without mentioning the implementation process. The implementation process was hampered by the absence of a broad infrastructure policy. This was needed to coordinate the activities of the various sectors, and also to serve as an instrument to promote poverty reduction, growth and development. Ghana's sectoral approach to infrastructure provision is inadequate and lacking in many aspects (outlined above) and this is a major contributing factor to infrastructure failure.

The hypotheses

The first hypothesis that "there is a positive relationship between the KSDP and rural poverty reduction" is confirmed.
The second hypothesis that "the more an infrastructure project is guided by an infrastructure policy the more likely it is to succeed in reducing rural poverty" is also confirmed.

6.2. Recommendations

"Our opinion in these circumstances count for nothing until we act upon them" Monbiot, 2004:24

Having shown the inadequacies in Ghana's infrastructure provision environment the first recommendation is a call for reform to help develop a coherent infrastructure policy: the approach for this has been explained in the previous chapter. The subsequent recommendations focus on important elements that should be incorporated in rural infrastructure development. Before that the thesis makes specific recommendations for the KSDP.

6.2.1. Specific Recommendations for the KSDP

Local Management Body: A key problem of the KSDP is the multiplicity of interests but the absence of a direct responsible decision making authority. There is the need to constitute a management authority (e.g. Keta Development Authority) to develop the potentials of the KSDP. The authority should be headed by an executive director and constituted by the local government (Keta District Assembly), affected communities, private sector, and strategic central government interest. They should be tasked to re-look at the development plan of the project and to device means to complete the uncompleted portions of the project. Additionally the authority should resolve disputes relating to property rights and attract investors into the project.

Completion of Resettlement Communities: The Government of Ghana should seek funding to complete the remaining 400 houses, and also provide water and electricity to the affected people. An Alternative means of funding the resettlement communities could be to advance proposals to the UN disaster fund, Habitat International, and other Donor countries and organizations that are into the provision of shelter. Additionally, the Government can internally launch a campaign calling on companies particularly those in the building industries to support the housing project in cash, materials, or expertise. Ghanaians are benevolent and would provide the support.

Promoting tourism: The management authority should engage the affected communities to consider tourism promotion. Thus, while the affected people hold the property rights to the land the private sector should be attracted to develop the islands suitable for leisure boat trips, bird viewing sites, and the beaches into attractive sites, through PPCPs, PPPs, etc. These activities would help mobilize resources, create jobs, revenue, and other opportunities for the local people.

Developing the fishing industry

The location of the communities between the lagoon (inland fishing) and the sea (marine fishing) is very strategic for the development of a fishing industry.

The unlawful activities of pair-trawlers who are depleting fish stock in the shallow waters (with all kinds of banned substance and methods) thereby denying Ghanaian fishers of good catch should be halted. This requires the intervention of the ministry of fisheries and the Ghana Navy to arrest and prosecute such criminals. This would enable the local fishers to make good catch and thus improve their household's wellbeing.

Investment and training for fishers in the use of modern fishing equipments. Most of the poor fishers along the coast use traditional fishing methods which have become unproductive in recent years. Government spends so much on subsiding pre-mix fuel for fishers, however because the fishers use traditional fishing methods they spend all the fuel and their time searching for fish which they hardly find. It is important the government through the Ministry of Agriculture and Fisheries invest and train fishers in the use of modern fish detecting equipments which would help fishers locate where fishes are and to increase their yields.

If this proves to be successful the next step should be the establishment of cold stores through PPP, PPCP, etc, and later a fishing habour as initially planned. The affected people have already indicated their support for such projects.

Salt mining: The salt mining potentials of the project can be harnessed to create jobs opportunities for the people and revenue for communities. The project can be initiated through PPCP or PPP.

Policy Recommendation for Rural Infrastructure Development

Financing Rural Infrastructure: In view of the fact that infrastructure provision involves huge financial and sunk costs, policy should make it mandatory for infrastructure provision to be pre-financed. Financial tools like Medium Term Expenditure Frameworks should be used. Taking note of financial constraints on the part of the state, the private sector and communities should be allowed to finance and manage some infrastructure facilities. While the state takes responsibility for rural infrastructure that are pressing but unattractive to private interest because of difficulty in recouping investment costs. Additionally, multilateral and bilateral donors' support should be sought. Over the years Ghana has received infrastructure support from dozens of multilateral and bilateral countries who often require reliable and accurate public accounting systems. The government should do well to improve the public accounting systems so as to encourage donor investments in infrastructure. These can be well managed within a generic infrastructure policy.

Creating Employment opportunities: As a matter of policy infrastructure projects should be made to recruit at least 60% of casual labour from the project communities and a total of about 95% from the project country. Secondly as a matter of policy rural infrastructure provision where possible should be at least 30% labour intensive and efforts should be made to use resources in the affected communities. These would create jobs and income for the rural poor.

Targeting, Accessibility, Affordability, and Sustainability: Effective targeting methods should be employed to ensure that development projects benefit the poor. Rural infrastructure should be sustainable to help reduce poverty. It should be possible to operate and maintain at minimal cost. To achieve these there is the need to remove barriers that may prevent the poor from accessing services, prices should take into consideration the incomes of the affected people. Cross-subsidies and cost recovery plans can be used to improve accessibility and sustainability. Other options include taxation (from the rich and other industries), and donor support which for Ghana has been very commendable in rural water and some road projects.

Participation: As a matter of policy all infrastructure projects should provide for the effective participation of affected people through the entire project cycle. Channels of communication and methods of conflict resolution should be outlined. This would not only make for the success of projects but also for sustainability as the people would consider the project as their own and try to protect or maintain it as much as they can.

Political manipulation: this has great influence on project outcomes. Regulations such as contractual immunity and political prohibitions and also pre-financing tools can used to reduce political manipulation of projects. However it should be carefully done so that it does not counteract against transparency and the fight against corruption.

The thesis recommends for further research, private sector participation in infrastructure provision and how that can support rural poverty reduction and growth.

Like many developing countries Ghana's policy environment is still at its infant stages. Some sectors do not have comprehensive policies and some policies do not adequately reflect national aspirations (Ferazzi, 2006:8). These are impacting negatively on national development.

What the thesis has done as a matter of relevance to national development is to identify one of these key areas, situate the opportunities and challenges and to make recommendations for improvement: specifically infrastructure provision and how it impacts on Ghana's core goal of poverty reduction.

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APPENDIX 1

Questionnaire for households in the project and control communities

Infrastructure Policy Reforms and Rural Poverty Reduction in Ghana: the case of the Keta Sea Defence Project.

This questionnaire seeks to gather data necessary to analyse the case above. Your opinion will be very useful in achieving this task. You can be assured that any information you provide will be confidential.

Questionnaire No. _____

Group: Study Group _____ (1) Control Group ____ (2)

Community:

□Adzido (1) □ Vodza (2) □ Keta (3) □ Totope (4) □ Elavanyo (5) □ Lolonyakope (6)

A. Basic Demographic Information

1. Gender? □Male (1) □ Female (2)
2. What is your age? _____
3. What is your marital status? □Married(1) □Single(2) □Widow(3) □Divorced(4)
4. How many are you in your household? _____

   Questions 5 to 7 are to be answered by respondents from the project area

5. Would you say the Keta Sea Defence Project has reduced poverty in your community?

   □Yes (1) □No (2)
6. Would you say the Keta Sea Defence Project has helped to improve your personal standard of living? □Yes (1) □No (2)
7. If you answered "yes" to question 6, can you list how the KSDP improved your situation?_____

   _____

B. Income and Economic Resources

The questions here seek responses that tell us about the effect of infrastructure on income change

8. What is your occupation? _____
9. How would you classify your occupation?
   □Secured (1) □Temporary (2) □Casual (3) □No job (4)
10. What is the main source of income for your household? _____
11. How many people earn wages or salaries in your household? _____
12. (a) What is the monthly income of your household in cedis? _____
    (b) What is the income group of your household?

    □> 1000 cedis (1) □>600 to 1000 cedis (2)

    □>300 to 600 (3) □>100 to 300 cedis (4) □ 1 to 100 cedis (5)
13. How would you rate your household income?
    □ Very high (1) □ High (2) □ Low (3) □ Very low (4)
14. What is your monthly household Expenditure in cedis? _____
    (b) What is the expenditure group of your household? □> 1000 cedis (1) □>600 to 1000 cedis (2) □>300 to 600 cedis (3) □>100 to 300 cedis (4) □< 100 cedis (5)
15. Which of the following Household Properties do you own?
    Furniture: □Yes (1) □No (2)
    Refrigerator: □Yes (1) □No (2)
    TV: □Yes (1) □No (2)
    Radio: □Yes (1) No (2)
16. Which of the following Properties do you own?
    Auto: □Yes (1) □No (2)
    House or Land: □Yes (1) □No (2)
    Canoe: □Yes (1) □No (2)
    Bicycle: □Yes (1) □No (2)

Questions 17 to 20 are to be answered by people in the project area

17. Was any member of your household employed in the Sea Defence Project?

□Yes (1) □No (2)

18. (a) If you answered "yes" to question 17, how many people in your household were employed in the Sea Defence Project? □>10(1) □6 to 10(2) □3 to 5(3) □ 1 to (4) □None (5)

    (b) What is your opinion with the job opportunities offered by the project?

    _____

19. To be answered by Farmers, Fishers, and Traders:

    .1.a. Farmer: Has the Flood control increased your production output?

    □Yes (1) □No (2)

    .1.b. Has the Flood control increased your income? □Yes (1) □No (2)

    .2.a. Fisher: Has the Sea defence wall increased your volume of fish catch?

    □ Yes (1) □No (2)

    .2.b. Has the Sea defence wall increased your income? □Yes (1) □No (2)

    .3. Trader: Has the project (new road) increased your earnings? □Yes (1) □No (2)

20. Can you list some positive economic benefits of the KSDP if any?

    _____

    _____

21. Can you list some negative economic impacts of the KSDP if any?

    _____

    _____

C. Price Information

Responses to these questions seek to find-out about the effect of infrastructure on price changes by looking at information about a typical Ghanaian consumption basket.

22. How much does a bowl of Maize cost in cedis? _____
23. How much does a bowl of Rice cost in cedis? _____
24. How much does a bottle of local cooking oil cost in cedis? _____

25. How much does a bowl of sugar cost in cedis? _____
26. What is the cost of an Exercise Book in cedis? _____
27. What is the cost of the smallest loaf of Bread in cedis? _____
28. How much does a bowl of Gari cost in cedis? _____
29. How much does a bowl of Beans cost in cedis? _____
30. How much does a tin of Milk cost in cedis? _____
31. (a) What is the cost of transport from your village to another village within a distance of less than 2km in cedis? _____

    (b) How many trips do you make outside your village in a month? _____

32. How much do you spend on the following goods and services per month in cedis,
    A. Food _____
    B. Housing (1) Own/ relative's house _____ (2) Rented house _____
    C. Transport _____
    D. Education _____
    E. Fuel and Electricity _____
    F. Drugs and Medical Services _____

Questions 33 to 35 are to be answered by people in the project community.

33. Has the project (new road) reduced your transport costs or cost of production?
    □Yes (1) □No (2)

34. Has the project (new road) resulted in reductions in the prices of goods and services?□Yes(1) □No(2)

    If you answered "yes" to the question above, what are some of those goods and services?

    _____

35. What is your general impression about the road, with regards to benefit to your community? _____

D. Other Dimensions of Poverty

These responses seek to establish empirical relationship between infrastructure and access to social services other indicators of poverty.

Health

36. (a) Do you experience any constrains visiting the hospital? □Yes (1) □No (2)
    (b) If you answered "yes" to the question above, what are those constrains?
    _____

37. Do you have health insurance? □Yes (1) □No (2)
38. How accessible is the Hospital from where you live? □Easy to find transport (1) □Difficult to find transport to Hospital (2) □No means of transport (3)
39. If you have children, are they immunized? □Yes (1) □No (2)
40. To be answered by people in the project area: Has the Sea defence project improved your household's access to health service? □Yes (1) □No (2)

Education

41. What is your level of Education? □Post-graduate level (1) □Tertiary (2) □Senior Secondary level (3) □ Junior Secondary level (4) □ Primary level (5) □ No formal education (6)
42. (a) How many children of school going age are in your household? _____
    (b) Are all the children of school going-age in your household in school?

    □Yes (1) □No (2)

    (c) What is the present level of education of the children in your household? □Post-graduate level (1) □Tertiary (2) □Senior Secondary level (3) □ Junior Secondary level (4) □ Primary level (5)

43. (a) How many children of school going-age in your household are in school?
    _____
    (b) How many children of school going-age in your household are *NOT* in school?
    _____

    (c) If you answered "No" to Question 42 (b) above, any reason for this?
    _____

44. (a) What is the distance from your home to the nearest basic school? □ < 1km (1) □ 1km to 3 km (2) □>3km to 5km (3) □>5 km or more (4)

    (b) What is the distance from your home to the nearest high school? □ < 1km (1) □ 1km to 3 km (2) □>3km to 5km (3) □>5 km or more (4)

    (c) What is the cost of transport from your community to the nearest high school? □< / = GHC 0.50 (1) □> GHC 0.50 to GHC 1.00 (2) > GHC 1.00 to GHC 2.00 (3)

45. To be answered by people in the project group.
    Has the new road improved your household's access to education?

    □Yes (1) □No (2)

    If yes, how _____

Access to Drinking Water

46. Which is your source of drinking water □Indoor pipe(1) Public standing pipe(2) □Water vendor/ Tanker truck service (3) □Well(4) □River/Stream/Lake/Pond/Spring(5) □others(6) _____
47. If you answered (2), (3), (4), or (5) to the question above, what is the distance to the source of water? □ Within 100m (1) □ >100 – 500m (2) □ >500-1000m(4) □> I 000m (5)

Sanitation

48. What type of toilet facility do you have? □Flush indoor toilet (1) □Compound-house flush toilet (2) □Private Pit Latrine (3) □ Public toilet (4)□No toilet facility(5)
49. How do you manage refuse? _____

Shelter

50. What type of shelter or house do you inhabit? □ Storey building (1) □Bungalow (2) □Semi-detached house (3) □ Chamber and hall (4) □single room (5)

51. What Materials is your shelter made of;

    A. Wall Materials: □Cement (1) □Wood (2) □Corrugated Iron (3) □Mud/ Thatch (4) □others (5) _____

    B. Floor: □Cement(1) □Wood (2) □Mud(3) □ No floor (4)

    C. Roofing Materials: □Cement (1) □Asbestos or Aluminum sheets (2) □Thatch (3) □others (4) _____

Access to Electricity, Lighting and Energy for domestic use

52. What form of lighting do you use? □Electricity (1) □Generator (2) □Kerosene and Lanterns (3) □ Candles (4) □ others (5) _____
53. What type of Energy do you use in Cooking? □Electricity (1) □Gas (2) □Charcoal (3) □Cooking Fuel or firewood (4) □others (5) _____

Security and Vulnerability

54. Do you have public phones booths in your community? □Yes (1) □No (2)
55. Are you vulnerable to flooding or sea erosion? □Yes (1) □No (2)
56. Are you vulnerable to armed robbery or other forms of attack? □Yes (1) □No (2)
57. What type of roads do you have? □Coated Road (1) □Paved or graveled road (2) □Rough or Bad road (3) □ Foot Paths (4) □None (5)
58. What are the states of the means of transport in your area with regards to safety? □Safe (1) □Rather Safe (2) □Rather Unsafe (3) □Unsafe (4)

    Questions 59 to 60 are to answered by people in the project area

59. In the course of the KSDP were the rights of any member of your household abused as a result of loss of livelihood or loss of property without due compensation?

    □Yes (1) □No (2)

    Others (specify): _____

60. Did the construction of the KSDP posses any risk to your household by way of:

    Health Risk? □Yes (1) □No (2)

Crimes or robbery? □Yes (1) □No (2)

Others: _____

Environment

61. Is the survival of the coastal eco-system in your community threatened by natural and human activities? □Yes (1) □No (2)
    If yes, how _____

Thank you for responding to the questionnaire.

APPENDIX 2

Interview Questions for key project officials

Office: Chief Engineer, Ministry of Water Resources Works and Housing (Ghana)

1. Has Ghana got an infrastructure policy that governs infrastructure provision?
2. In the case of the KSDP did it follow any particular policy?
3. How was the planning process for the KSDP carried-out?
4. Who participated in the planning process?
5. In your opinion is the KSDP completed?
6. The housing project is not completed; about 60% of the affected people do not have houses any reason for this?
7. What type of funding was used for the resettlement component of the KSDP?
8. Were externalities factored into the project cost?
9. What are the results of monitoring and evaluation that you have so far conducted on the project?
10. What happened to the other economic developments projects such as harbour, cold storage facilities, bird viewing sites, salt mining industry, etc.
11. Were the affected people involved in the project and what is the extent of their involvement?

Office: Keta District Development Planning Manager

1. Has Ghana got an infrastructure policy that governs infrastructure provision?
2. In the case of the KSDP did it follow any particular policy or how did it come about?
3. In your opinion is the KSDP completed?
4. The housing project is not completed; about 60% of the affected people do not have houses any reason for this?
5. What type of funding was used for the resettlement component of the KSDP?
6. What happened to the other economic developments projects such as harbour, cold storage facilities, bird viewing sites, salt mining industry, etc?

7. Is the private sector involved in the development of the economic opportunities (tourism services, cold stores, fish processing, salt mining) created by the project?
8. Were externalities factored into the project cost?
9. Were the affected people involved in the project and what was the extent of their involvement?
10. Have there been any problems between the affected people and the project authorities?
11. Have you conducted any assessment on the impact of the project on poverty reduction and what are your findings?
12. In your view has the KSDP reduced poverty among the affected people? If yes, how?
13. What provisions have been made for the management and maintenance of the KSDP?
14. What was/is the role of the Keta District Assembly in the planning, implementation, and monitoring and evaluation of the KSDP?
15. Is the KSDP an important feature in your development plans?
    If yes, how important is it?

Office: Member of Parliament for Keta constituency

1. In the case of the KSDP did it follow any particular policy?
2. In your opinion is the KSDP completed?
3. Does the project outcome represent the NDC's plans and expectation for the project or what is your party's view on the project as it stands now?
4. The housing project is not completed; about 60% of the affected people do not have houses any reason for this?
5. What type of funding was used for the resettlement component of the KSDP?
6. What happened to the other economic developments projects such as harbour, cold storage facilities, bird viewing sites, salt mining industry, etc?
7. Were the affected people involved in the project and what is the extent of their involvement?