THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

By

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Declaration

I here by declare that, this submission is my own work towards the MSc in Development Planning and Management and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of any university, except where due acknowledgement has been made in the text.

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Abstract

The role of rural transport in ensuring rural development cannot be overemphasized. Improved access to transport services, thereby increasing mobility can clearly help in reducing all aspects of poverty. Improved Rural transport therefore can be regarded as the panacea to development.

Governments all over the world in their quest to reducing poverty have adopted the Millennium Development Goals which are concrete measures for judging performance through a set of inter-related commitments, goals and targets on development, governance, peace, security and human rights. These Goals set the framework towards poverty reduction, and reflect the national development strategies of these countries.

With the inclusion of both maternal and child mortality reduction as the Fourth and Fifth Millennium Development Goals (MDGs) has stirred increased attention to the multi-sectoral nature of these challenges. The transport sector has a critical role to play in achieving these Millennium Development Goals.

According to ISSER (2007), the world is on track to halve extreme poverty by 2015; however, prospects are more uncertain for the goals of reducing child and maternal mortality. In Ghana, there is evidence that the gains made in the late 1990s and early 2000s have rapidly been eroded, with infant deaths in the first month accounting for most of this decline. Neonatal mortality rates increased from 30 per 1000 live births in 1998 to 43 per 1000 lives births in 2003. Gaps in antenatal care, unsupervised deliveries and inadequate postnatal care account for the high levels of maternal deaths. The current estimate of maternal mortality ratio in Ghana is about 503 deaths per100,000 live births and it is quite likely that the MDG of achieving about 250 deaths per 100,000 lives may not be realized by 2015.

The transport sector has the potential to improving access to health care, thereby increasing access to antenatal care, supervised deliveries and postnatal care. It is in the

light of the above that, this study sought to establish the relationship between rural transport and achieving a reduction in both child and maternal mortality. The cross sectional design was adapted for the study. Relevant secondary data (literature) was reviewed and primary data was gathered by the use of questionnaire. A total of 160 household questionnaire targeted at mothers were administered. Additionally, questionnaire for the institutions like the District Health Directorate, District Assembly, and seven Health facilities. Further more Questionnaire targeted at Traditional Birth Attendants and Transport Operators were also administered.

The findings of the survey indicated that, transport infrastructure, with regards to roads in the District are generally poor; the surfaces of these roads are bad to the extent that, some of them become immotorable in the rainy season. This situation resulted in the low volume of vehicles that plied the roads in the rural areas of the district. It was further discovered that, riding bicycle and walking were the most dominant modes of transport. Motorized transport that is readily available is the motor bike of which few elites of the society own.

Additionally, it was revealed that, access to health facilities was a problem; this is resulting from the fact that, transport infrastructure and services provided in the District are inadequate and in a poor state. Access to health facility is also compromised by the distance to these health facilities as shown by the accessibility map. Pregnant women and lactating mothers therefore find it difficult to move from their homes to the health facilities. Also, outreach services by health personnel are hampered by the deplorable situation of rural transport in the District. This situation does not arguer well for improvement in maternal and child mortality.

An improvement in the provision of rural transport will contribute to improving accessibility to health facilities by pregnant women and lactating mothers. This therefore will serve as an impetus to achieving a reduction in maternal and child mortality in the Gushegu District.

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List of Abbreviations

ACSD	Accelerated Child Survival Development
ANC	Antenatal Care
AIDS	Acquired Immune Deficiency Syndrome
AMTSL	Active Management of the Third Stage of Labor
CEDAW	Convention on All forms of Discrimination against Women
CHPS	Community Health Planning Services
DANIDA	Danish International Development Agency
DFID	Department for International Development
DMHIS	District Mutual Health Insurance Scheme
FANC	Focused Antenatal Care
GDHD	Gushegu District Health Directorate
G-JAS	Ghana Joint Assisted Strategy
GLSS	Ghana Living Standards Survey
GNI	Gross National Index
GPRS I	Ghana Poverty Reduction Strategy
GPRS II	Growth and Poverty Reduction Strategy
GPRTU	Ghana Private Road Transport Union
GSS	Ghana Statistical Service
HIRD	High Impact Rapid Delivery
HIV	Human Immune Virus
IFRT	International Forum for Rural Transport
ILO	International Labour Organization
IMR	Infant Mortality Rate
KVIP	Kumasi Ventilated Improved Pit
MCH	Maternal and Child Health
MDGs	Millennium Development Goals
MMR	Maternal Mortality Rate
NDPC	National Development Planning Commission
NHIS	National Health Insurance Scheme

NR	Northern Region
ODA	Official Development Assistance
ODI	Overseas Development Institute
PROTOA	Progressive Transport Owners Association
RBM	Roll Back Malaria
RCH	Reproductive Child Health
RTI	Rural Transport Infrastructure
TBA	Traditional Birth Attendant
TTBA	Trained Traditional Birth Attendant
UN	United Nations
UNCED	

Dedication

This work is dedicated to my beloved parents; Mr. and Mrs. Ekekpi.

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CHAPTER ONE
GENERAL INTRODUCTION

1.1 Background of the Study

Rural transport is an area receiving increasingly more attention from development specialists. Over the last decade, the World Bank, ILO and other organizations concerned with rural development and poverty alleviation, have initiated programmes and projects to understand better, the role that rural transport plays in the local economy and to demonstrate the importance of rural transport (Donnges, 2001). The Overseas Development Institute in 2000 indicated that, transport is integral to attaining a livelihood and emphasized that, transport problems and needs of the poor are essentially about access. Additionally, Fouracre (2001) has stated that, the transport sector is associated largely with improvement in physical capital; therefore, access to transport and other services such as schools, clinics and markets is integral and contributory to the development of capital assets. However, transport improvement itself does not alleviate poverty nor provide a long-term guarantee for employment but provides opportunity to access economic, social and educational facilities without which such opportunity is not possible (Parikesit and Magribi, 2005).

Despite the recognition of the role of transport to development and the livelihoods of poor people, rural transport networks in most developing countries are underdeveloped and of poor quality (Lebo and Schelling, 2001). It is estimated that about 900 million rural dwellers in developing countries do not have reliable all season access to main road networks, and about 300 million do not have motorized access at all (Lebo and Schelling, 2001). This situation has resulted in poor rural people having limited access to basic social services, safe water, all-year roads, electricity and telephone services.

In September 2000, all countries including Ghana agreed to work towards the reduction of income-poverty and improvement of people's health, education and environmental conditions (Willoughby, 2004). Since then, most governments of developing countries have been giving serious attention to how these Millennium Development Goals (MDGs)

should be interpreted, adapted and applied to the realities of the situations they face. Many have mounted new or expanded initiatives to try to accelerate progress in the fields highlighted by the goals (Willoughby, 2004). The inclusion of both maternal and child mortality reduction as the Fourth and Fifth Millennium Development Goals (MDGs) has stimulated increased attention to multi-sectoral nature of these challenges. The transport sector has a critical role to play in achieving these MDGs (Babinarb and Roberts, 2006). It is therefore imperative to understand the role of transport in improving poor people's health.

In Ghana, the issue of maternal and child mortality has been of great concern. International organizations such as United Nations Children's Fund (UNICEF) and World Health Organization (WHO) have been complementing government efforts to implement relevant programmes and interventions to reduce maternal and child mortality in the country, but it still remains high as of 2005. This assertion is emphasized by WHO in 2005 when they indicated that, infant and under-five mortality remains high, with a rate of 112 per 1000 in 2004. Malaria accounts for 22percent mortality in children; only 9percent of children and 8percent of pregnant women use insecticide-treated nets (WHO, 2005). Access to sanitation remains low and diarrhoea is a common cause of morbidity and mortality in children under five years (WHO, 2005).

The Gushegu District is one of the districts in the Northern Region of Ghana, where access to health facilities is very poor, due to insufficient health facilities and poor transport. This was also indicated by the Ghana Statistical Service in 2005 when it indicated that, Gushegu District is the most disadvantaged with respect to location of clinics, with 44.2percent of localities beyond 25km. The people therefore seek alternative means of health care which results in complications and sometimes death. This study consequently seeks to examine the role of rural transport in achieving reduction in maternal and child mortality in Gushegu District.

1.2 Problem Statement

The NDPC (2006) annual progress report on GPRS I indicates that, access to health services is still limited in the country. This is attributed to a number of factors including socio-cultural, geographical, financial barriers and service delivery constraints. These barriers have resulted in poor utilization of health facilities in both urban and rural areas, particularly among the poor and vulnerable groups of the population. This situation adds to worsening the situation of health problems in the country, among which maternal and child mortality is a major part.

Progress towards the reduction of maternal and child mortality rates have been very slow with the reduction of under-five mortality making the least progress. The rate reduced from 119 per 1000 births in 1993 to 111 per 1000 in 2003. Available data from the MOH revealed that, the national institutional MMR increased from an average of 1.86 per 1000 live births in 2004 to 2.05 in 2005, with wide regional variations. (NDPC, 2006). This therefore implies that, it is very unlikely the MDG of improving maternal health by reducing maternal mortality rate by three quarters and the target of reducing under-five mortality by two-thirds by 2015 may not be achieved.

Additionally, the Pathfinder International (2005) has indicated that, maternal mortality in Ghana remains very high, and has actually increased from 240 deaths per 100,000 live births in 1993 to 540 deaths per 100,000 live births in 2006, with some community studies having found mortality rates as high as 800 deaths per 100,000 live births.

Acknowledging the above situation, G-JAS (2007) has indicated that, the current estimates show that neonatal mortality stagnated between 1998 and 2003. Nonetheless, progress in reducing infant and under-five mortality levels was stalled during GPRS I, with child malnutrition remaining a significant problem and accounting for up to 60 percent of the cases of child mortality. They further indicated that, infant mortality (IMR) and maternal mortality (MMR) are inextricably linked. National estimated maternal mortality stands at 214 deaths per 100,000 live births, although the adjusted figure

published by the UN is 540 deaths per 100,000. In either case, Ghana is off track in achieving the MDGs on both MMR and IMR counts. Of particular concern is that, these trends have coincided with a period of increased health sector financing (G-JAS, 2007).

This assertion is emphasized by USAID in 2008, when they indicated that, despite significant donor resources to the health sector, there has been little improvement in health outcomes in Ghana over the past 10 years. While there was a decline in under five (5) Mortality Rate in earlier years, from 1998 to 2003, the under five (5) Mortality Rate increased from 108 to 111 per 1,000, due to an increase in the neonatal mortality rate and a slight increase in the post-neonatal mortality rate. Similarly, the Maternal Mortality Rate (560 per 100,000 live births) has not declined in the past decade.

These health problems are commonly bigger in rural areas, where nearly 60percent of the countries population is living. The regions with the lowest level of health care provision and hence the greatest problems in public health are Upper West, Upper East, Northern and Central, of which the Central Region is in the southern part of the country (Grimbergen and Thonnissen, 2007).

In the northern region, the ability of the poor to access health facilities that are located at considerable distances is influenced by the road infrastructure and the transportation system (ibid). This is a contributory factor to the deplorable health situation in the region. However, with the low density of the region (25.9/sq.m), coupled with the scattered nature of localities, makes the siting of health facilities difficult. This nevertheless does not justify the current distribution of hospital facilities in the region (Grimbergen and Thonnissen, 2007).

The Gushegu District is faced with a number of challenges in the health sector among them is the inadequacy of health infrastructure, accommodation facilities for health staff, and the low number of health staff (GDHD, 2008). The incidence of maternal and child mortality according to GDHD (2008) is considered to be high with under five mortality

being 201 per 1000 live births as indicated by Ghana Statistical Service (2005). Additional, there are some communities in the district, numbering seventy two (72) which are regarded as hard to reach by health personnel. Access to health care is very difficult and impossible in the raining season in these areas (GDHD, 2008). Hence, this has resulted in the very low utilization and patronage of available health facilities and health services especially supervised delivery by skilled attendants (GDHD, 2008). The people generally exhibit poor health seeking behaviour and many people patronize the services of quack doctors, herbalists and will only report to the health facilities as a last resort (GDHD, 2008).

The district generally has a poor road network and condition with only the central and western part of the district being linked by feeder roads. The surface of these roads become difficult to ply especially in the rainy season because they develop pot holes and sometimes are even washed away (GDHD, 2008). This situation has contributed to poor access to health facilities. The resultant effect of this is the inability of the local people especially women to have access to health services. In addition, transfer of patients between levels of health care facilities and for delivery of medicines, vaccines and other essential equipment are major problems affecting health delivery in the area. Consequently, Heyen-Perschon (2005) has indicated that, transport has been identified as an essential resource and vital tool for the delivery of health services. The purpose of this study will be to establish the role of rural transport in reducing maternal and child mortality in the study area.

1.3 Specific Research Questions

Based on the research problem discussed in the previous section, the study seeks to find answers to the following questions.

i. What is the nature of rural transport in the study area its effect on maternal and child mortality?
ii. What factors contribute to accessibility of health facilities in the study area and its effects on maternal and child mortality?

iii. What is the nature of out reach services in the District and how does transport facilitate the service? and

iv. What policy measures can help in the reduction of maternal and child mortality in the study area?

1.4 Study Objectives

The General Objective of the study is to examine the relationship between rural transport, child and maternal mortality and to propose measures for improvement.

Specifically, the study seeks to:

1. To examine the nature of rural transport and its effect on maternal and child mortality in the study area;
2. To identify and examine the nature of accessibility to health facilities and its effect on maternal and child mortality in study area;
3. To assess the nature of out reach services by health personnel and how transport facilitate the services; and
4. To make recommendations based on the findings for policy and research.

1.5 Scope of the Study

The study geographically covers the Gushegu District in the Northern region of Ghana. This is because the researcher is familiar with the District. Also the District is privileged to have a modern Hospital which was recently constructed. This facility is expected to help improve the health situation in the District. The hospital is also complemented by four (4) Community Health Planning Centers and two (2) Health Centers. However, transport infrastructure and services in the District is deplorable. This area will therefore serve as a good case in assessing the role transport play in the access to health facilities.

In terms of content, the study will rely on data from rural transport activities such as mode of transport, travel time, travel cost, waiting time, distance to health facility and nature of roads in the District. Information from the District Assembly and the District

Health Management Team with regards to accessibility of health centers, nature of their outreach services with emphases on key indicators as mode of transport number of personnel involved and cost per out reach service.

1.6 Justification of the Study

The significant contribution of transport and mobility to development and the livelihoods of poor people is widely recognized. However, the development sector is yet to fully acknowledge and understand the role of transport in improving poor people's health. In the context of the need to step up development activity to meet the Millennium Development Goals, a better understanding of the relationship between mobility and health becomes a priority (IFRT, 2006). The outcome of this study will therefore bring to bear the relationship between rural transport and health care delivery in rural areas especially with regards to maternal and child mortality.

Results of the study will also inform government and other bilateral donors committed to the cause of the Millennium Development Goals to realize that transport is an essential component to achieving the MDGs. Hence, investing in rural transport will be of great benefit to the rural poor.

1.7 Limitations

The major limitation faced in the field was the unavailability of adequate means of transport, coupled with the sparsely distribution of communities in the district. This resulted in difficulty in movements to communities especially those that were far from the health facilities to gather data. Also, language barrier made the interview process longer. This was due to the need for translation of every question to the understanding of the interviewees.

In addition, some health personnel of the various institutions were contracted to collect data from communities that were far from the facility since they had motor bikes and also new the area better.

1.8 Organization of the study

The report of this study contains six chapters. Chapter One basically gives introduction to the whole study. It contains the problem statement, the objectives of the study and an outline of how the study was conducted. It also contains the justification of the study as well as the scope and limitations of the study.

Chapter Two contains reviews of literature on the concepts and other issues that are regarded as relevant to guide the study. It includes a discussion on the Millennium Development Goals (MDGs), rural transport and maternal and child mortality and how policies are directed to its reduction.

Chapter Three is a presentation of the methodology used to carry out the study. It presents information on the research design, sample determination and size, and the process by which data was be collected and analyzed.

Chapter Four gives a presentation of the profile of the study area, highlighting issues regarding rural transport, maternal and child mortality. Chapter Five is a presentation of results and discussions of the data collected. The final chapter outlines the summary of the findings, recommendations and conclusions drawn from the study.

1.9 Chapter Summary

Having provided a presentation of the introduction of the study, the problem statement, research questions, objectives and how the study is organized. The next chapter is a presentation of discussions on relevant literature and discussions on the study. This is to help relate the problem with available literature as well as establish useful lessons for addressing the phenomenon.

CHAPTER TWO
MILLENNIUM DEVELOPMENT GOALS, RURAL TRANPORT AND MATERNAL AND CHILD MORTALITY

2.1 Introduction

Regarding the research problem, and the study objectives discussed in the previous chapter, it is important to further review relevant related issues. Therefore, this chapter presents a review of literature and discussions on the concepts, issues that are considered as pertinent to the study. It contains a discussion on the Millennium Development Goals (MDGs), rural transport and maternal and child mortality and the policies aimed at reducing the phenomenon.

2.2 The Millennium Development Goals

It is almost a truism that the problems facing humanity are closely intertwined, and that each tends to complicate the solution of one or the other (United Nations, 2001). Governments of several countries are dedicated to promoting and ensuring development towards the reduction of poverty and improving the living standards of its people. Despite their efforts, poverty has left more than one billion people living on less than a US$ 1 a day (Pochun, 1999). It has also made another two billion people a little better off and it must be noted that most of the poor people are in developing countries (ibid). Quilligan (2005) has indicated that, Africa is the only region that is actually poorer than it was 30 years ago where 43 of the 53 nations still suffer from chronic hunger and low-income levels. Sub-Saharan Africa is indicated to have been left behind world development, the circumstance which has left Africans to live in extreme poverty, with one-third of Africans living in hunger and about one-sixth of children dying before age five (Economic Commission for Africa, 2005).

In Ghana however, the situation seems to be getting better over the past two (2) decades. According to the Ghana Living Standard Survey, 51.7percent of the population were

living below the national poverty line in 1991. By 1998/99, this figure had fallen to 39.5 and by 2005/06, it had again fallen to 28.5percent (GSS, 2006).

The resultant effect of poverty is the inability of people to meet their basic needs such as access to education, health, food, and shelter which are necessary for survival. However, the realization of the effects of poverty contributed to the coming into being of the Millennium Development Goals which are a comprehensive attempt to reduce poverty and improve lives, unprecedented in its strategic nature and scale (Clarke, 2008).

The ODI (2008) has indicated that, the Millennium Development Goals (MDGs) represent the most determined efforts in history to galvanize international actions around a common set of development targets, and that, their success will have immense consequence, not only for the worlds poor, but also for the credibility of collective action by the international community. These MDGs were derived from the Millennium Declaration which was adopted by all the 191 United Nation Member States at the Millennium Summit in September 2000 (Spinaci, 2004). Additionally, the MDGs are recognition that, 60 years after the end of World War II, the world remains far from the ideals of peace and prosperity inspired by the end of that global conflict. For Africa, the launching of the goals through a network of partnerships guided by the Millennium Declaration has served as a catalyst to spur long dormant programmes that, together, will bring the continent closer to its development aims (Economic Commission for Africa, 2005).

Spinaci (2004) also stated that, at the 2002 Monterrey Conference on Financing for Development, the rich and the poor countries adopted a compact in which developed countries reaffirmed their commitment to make concrete efforts towards the target of 0.7 per cent of GNI as Official Development Assistance (ODA) to poor countries. Individual countries therefore set themselves individual targets for increasing their ODA. This ranged from 0.17 per cent of GNI (United States by 2006) to 1 per cent of GNI (Norway and Luxemburg by 2005).

In addition, developed countries committed to opening their markets to trade, and support capacity building in developing countries. The poor countries on the other hand accepted the responsibilities of good governance, serious policy design, transparency and openness to real implementation. The MDGs are therefore a compact between North and South, defining the role and responsibility of developing and developed countries.

The MDGs according to UNICEF (2006) are set targets for quantifiable improvements in key areas of human development by 2015. All 191 United Nations Member States pledged that, by the year 2015, they will work to meet the following goals:

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, malaria and other related diseases;
7. Ensure environmental sustainability; and
8. Develop a global partnership for development.

Contained in the eight goals, 18 targets and 48 indicators of the MDGs are a number of previous declarations, as well as regional, national and international initiatives: such as the 1995 Copenhagen UN World Summit for Social Development, the 1995 Beijing Fourth UN Conference on Women, the 1994 Cairo UN International Conference on Population and Development, the 1979 Convention on All Forms of Discrimination Against Women (CEDAW), and the 1992 Rio UN Conference on Environment and Development (UNCED), among others (Economic Commission for Africa, 2005).

Progress in achieving the MDGs shows contrast with regards to the different countries. This has been emphasized by ODI (2008), which indicated that, performance on the MDGs is mixed, with some countries doing very well, others less so and a few doing

badly. It has been observed that, countries in Sub-Saharan Africa are lagging behind on all the goals whiles those in South Asia lad behind on those relating to human development.

Ghana is a signatory to the Millennium Declaration, nevertheless the realization of the MDG targets depends on government action now which has been encouraging. The NDPC (2005) did state in the GPRS I progress report that, conscious effort is being made by Ghana to achieve the Millennium Development Goals (MDGs). Consequently, the targets of the MDGs have been incorporated in the country's development framework with respect to poverty and hunger, education, health (especially child and maternal mortality), gender equality and women's empowerment, environmental sustainability and global partnership for development. The report indicated that, Ghana has the potential of meeting goals one (1), two (2), six (6), seven (7), and eight (8). This is due to the fact that government has provided suitable and supportive environment to implement policies that will promote the attainment of these goals. However, despite government efforts, it is seen as not enough to promote the meeting of goals three (3), four (4), and five (5). This therefore provided the basis of undertaking this study.

2.3 Transport and the Millennium Development Goals: The Nexus

According to Mbara (2002), Transport is a "system" comprising two major components, namely, the vehicle commonly referred to as the "carrying unit" and the path which in transport terms is commonly referred to as "the way". The latter component constitutes the transport infrastructure, thus, the transport system comprises of an infrastructure component and a service component.

Transport development that improves access and enhances the inclusion of the poor in the overall development process can be an entry point in poverty alleviation (UNESC, 2006). Access can be seen as a necessary requirement for the satisfaction of almost any need, especially physical and therefore provides a central integrating idea with which to grasp the complex interactions between economic and social needs. This therefore goes to

suggest that an improvement in transport infrastructure and services can provide people with access to a broad range of socio-economic opportunities and services as well as strengthen their capability to work and increase productivity, which are key to poverty reduction (ibid).

The Millennium Development Goals (MDGs) were accepted in 2000 by developing and developed countries as part of their commitment to creating a better, freer, and safer world. The MDGs identify key areas of human development, provide a framework for coordinated action, and set clear targets to measure progress (Munoz, 2008). However, as the 2015 deadline nears; many developing countries have already made extraordinary progress, improving the lives of millions of people. On the other hand, not all countries or all regions of the world are on track to meet the MDGs. The news is not all bad: for example, Malawi is making progress against child mortality and Ghana against hunger. But successes like these can become obscured by a tendency to see sub-Saharan Africa as a monolith rather than a region of 47 individual countries (Munoz, 2008).

Holm-Hadulla (2005) highlights the fact that, the MDGs can only be achieved through a coherent multi-sectoral approach ranging from improvement in education and health facilities to political and economic reforms of which the role of transport is prominent. Hence, sound transport infrastructure and services will be a necessary precondition for the realization of the goals. For example, ameliorating a region's health service provision or school system will only be beneficial for the target population if they are accessible, i.e. if means of transportation are available at affordable prices.

Despite the contributions of transport to development, it is hardly mentioned in the MDGs either as a cause of or as a potential solution to poverty (M'Cormark and Daniel, 2006). This assertion is emphasized by DFID (2002) which indicated that, the Millennium Development Goals and approaches to development policy (as addressed in the second White Paper) do not make significant reference to, or accord any due importance to the role of transport in the development process. Nevertheless, the

contribution of transport to the achievement of the Millennium Development Goals can not be overemphasized. The African Union and the United Nations Economic Commission for Africa (2005) have stated that, the significance of transport services to each of the MDGs means that effective pursuit of the latter requires priority attention to those transport services, which are relevant to each.

The overriding objective of all the MDGs is incorporated in the first: Eradication of extreme poverty and hunger. Economic growth is a precondition for development, however, growth itself is by no means a guarantee for poverty reduction, and its benefits are internalized by poor households if they are unable to participate in the increased economic and social opportunity associated with it. Holm-Hadulla (2005) has pointed out that, sound transport infrastructure is a crucial determinant of economic development, as improvement in transport infrastructure contributes to the economy in the form of a reduction in the cost of moving goods and services, and that the assembly of intermediate inputs for production, such as raw materials, labour and increasing profitability of firms, the overall output level and income in the economy.

According to the African Union (2005) and the United Nations Economic Commission for Africa (2005), Africa's extensive rural areas harbour the continent's greatest concentrations of hunger and poverty. But they also offer the greatest potential for near-term growth, through increased agricultural production and processing. Unlocking these potentials requires rural transport infrastructure and service adequately maintained to permit farmers to obtain inputs and advice at reasonable cost and to sell their outputs at remunerative prices. It is seldom, if ever, that roads alone can induce strong cumulative development but, in combination with initiatives and investments by private parties and public bodies, they can have dramatic effects, especially where transport investment has been seriously lacking as in much of rural Sub-Saharan Africa.

Ensuring basic quality of local transport infrastructure and services is important for achievement of primary school completion by all and of gender equality at all levels of education (MDGs 2 and 3). Easier, cheaper and safer physical movement is often a

significant element among measures to improve attendance at primary and secondary schools (African Union and the United Nations Economic Commission for Africa, 2005). Besides easing pupils and teachers access to the school, transport improvements can also contribute to reducing the amount of time that household members, including children, have to devote to collecting water, fuel and food, which is usually a principal reason for non-enrolment. Improvements of local roads and footpaths therefore tend to have particularly significant effects on school attendance in areas where little transport infrastructure had previously been built (African Union and the United Nations Economic Commission for Africa, 2005).

Similarly, Holm-Holla (2005) also indicated that, enrollment rates depend on various socio-economic factors, hence the quality of transport infrastructure and service can make an important contribution to enrollment rates since it reduces both financial cost and opportunity cost by lessening the average time needed to cover the distance to school. Also, transport improvement can lead to improved quality of education, since it will enhance the monitoring of teachers performance by supervisors as teacher absenteeism is a major drawback to quality education. However in developing countries, domestic transport for household needs such as gathering firewood or getting water is exclusively performed by women. Women in rural Africa transport three times as much as men; this takes 20-30percent of their time. Therefore reducing this physical burden will require improving access to farms, wood lots, water supply points and markets (Holm-Holla, 2005).

According to the African Union (2005) and the United Nations Economic Commission for Africa (2005), Sub-Saharan Africa faces particularly big challenges in bringing about the large reductions in child mortality and maternal mortality aimed at by MDGs 4 and 5. Transport has a significant role to play in getting the solutions effectively into the hands of the poor, through its part in ensuring reliable availability of supplies such as drugs, vaccines, bed-nets and spare parts for water systems, and of basic health services. Local transport infrastructure and services also affect the extent to which people can take advantage of such services, the scale and costs of the network the health authorities have

to maintain, and the degree to which patients can exercise choice and hence stimulate quality of service provision.

Transport plays an important role in raising the effectiveness of the health sector and improving access to health facilities (Holm-Holla, 2005). Further indication is given to the fact that, efficient transport infrastructure facilitates rapid response to emergencies and reduce the cost of regular visits to health facilities as well as delivery of medical services. Additionally, Holm-Holla (2005) has also indicated that, cultural constraints prevent pregnant women from consulting a gynecologist, but with improvement in the quality of transportation, it was found that they made those visits which helped frequently reduce maternal mortality which was associated with obstetric complications. Child mortality significantly decreases if basic supply with clean water and basic nutrition are assured. Hence, reducing the cost of delivering those goods will alleviate the scourge of child mortality even in a context where improvements in health facilities are not feasible (Holm-Holla, 2005).

The Millennium Development Goals are now the main focus of the world's development effort. These goals both contribute to economic development and are in themselves primary ends of that process: freedom from hunger, universal primary education, gender equality, reduced child mortality, improved maternal health, control of disease, environmental sustainability, and global development partnership (World Bank, 2008). It is the essential contribution of transport to achieving these ends that links transport to the outcomes targeted by the Millennium Development Goals. Therefore, transport is a necessary, though not sufficient contributor to economic development. But its contribution cannot be taken for granted (World Bank, 2008).

From the above discussions, it is clearly understood that transport is very central to the achievement of the Millennium Development Goals, since poverty remains a development issue of major concern in the region, with large sections of the population experiencing a basic access problem in both rural and urban areas (UNESC, 2006). This is because people will conveniently move from one location to another to enjoy some

service depending on how easily that service is accessible. Therefore, improving transport will ensure that people move around to enjoy services, since most of the services can not be provided in every community. Additionally, transport can provide and open up a variety of opportunities for people to benefit, in the sense that, it can provide jobs and further enhance people's chances to job opportunities in other areas, and also make it easier for people to move from one market to another to sell their goods. Transport can also cause the reduction of prices of goods making it affordable to all, and above all contribute to poverty reduction. Conclusively, transport if improved will be the panacea to achieving the Millennium Development Goals.

2.4 Concept and Meaning of Rural Transport

Several technical persons have come up with numerous meaning and definitions of rural transport. For Bryceson and Howe (1992), rural transport is the movement of persons and goods for any conceivable purpose (including collection of water or firewood), by any conceivable means including walking and head loading on various types of infrastructure including unproclaimed roads, tracks and footpaths. In a similar way, Donnges (2001) defines rural transport as the movement of people and goods in rural areas by any conceivable means, for any conceivable purpose along any conceivable route. The World Bank also gives emphasis to the above definitions by indicating that rural transport comprises the transport activities which take place at local government, community and household levels, and includes the rural transport services for passengers, freight by non-motorized and motorized means of transport and rural transport infrastructure, mainly rural roads, tracks, trails, paths and footbridges, and in some cases rural water and airways (World Bank, 2002).

From the above definitions, there is a clear indication that there is little distinction between what the various writers meant. Conclusively, rural transport deals with the movement of people and goods through any plausible means and route from one location to another and that this type of movement occurs in the rural setting.

According to Lebo and Schelling (2001), a new approach is emerging for rural transport interventions which require a more holistic understanding of the mobility and access needs of rural communities. The affected communities themselves are leading this demand-driven, participatory approach. In this context, rural transport consists of three elements:

- Transport services,
- Location and quality of facilities, and
- Transport infrastructure.

This approach acknowledges that intervention may be required in all three categories, not simply the latter. To effectively utilize and target available resources, country specific rural transport policies and strategies are required.

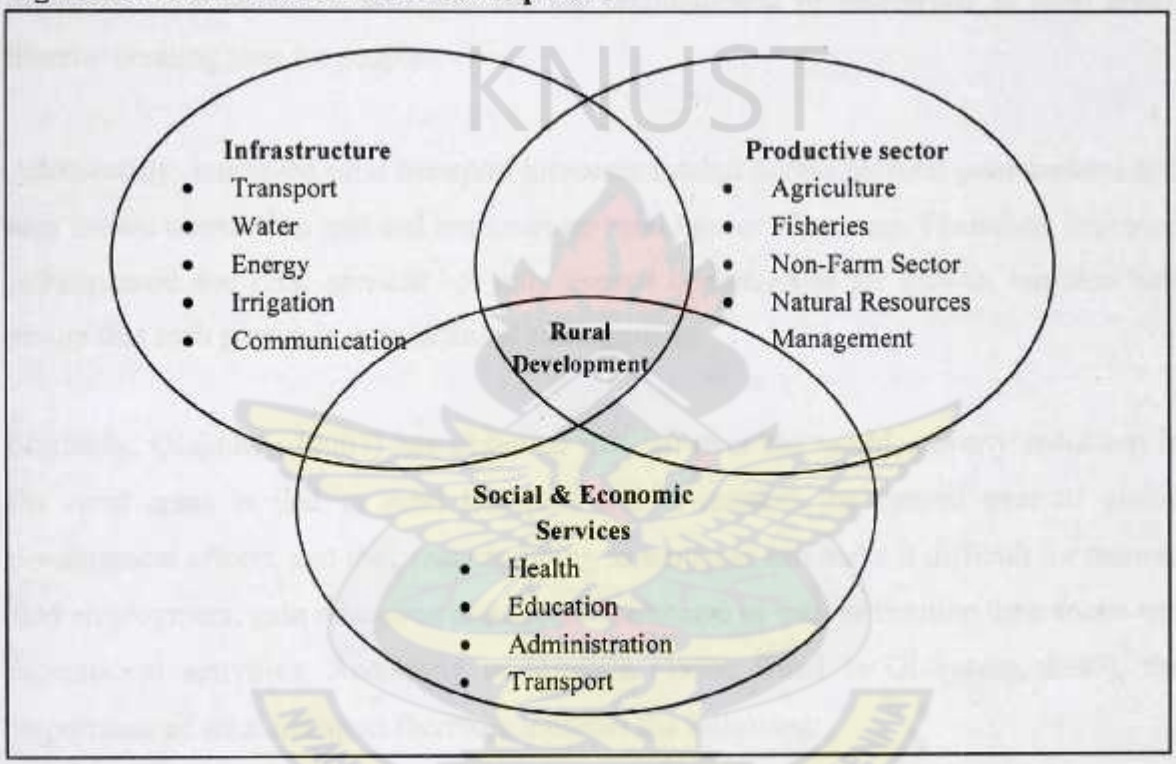
2.5 The Role of Rural Transport in Promoting Rural Development

Carney (1999) has indicated that, about 70percent of the world's poor live in rural areas and that rural people are not only isolated from economic opportunities, they also tend to have less access to social services such as health, sanitation and education. For example, it is estimated that around 1 billion rural households in developing countries lack access to safe water supplies (Carney, 1999). This situation does not auger well for rural development.

However, according to Adarkwa (2001), the development of a community is highly dependent on a reliable transport system for internal transportation (e.g. access to farms through good feeder roads and also movement of farm machinery like tractors, Lorries, etc) and for linking rural communities to market centers to sell their farm products and buy industrial goods. He further argued that, when the role played by transportation in development is considered, with emphasis on the fact that about 70percent of the world's poor are living in rural areas as indicated above and 65percent of Ghana's population is also living in rural communities, then the importance of rural transportation in transforming the rural economy can be appreciated.

Rural development according to Lebo and Schelling (2001) will occur as a result of the simultaneous development of adequate rural infrastructure, productive sectors, social and economic services, an appropriate macroeconomic framework, and good governance and local ownership, as these are required for rural poverty alleviation. Figure 2.1 clearly indicates the various elements of rural development, of which transport is very prominent.

Figure 2.1: Elements of Rural Development



Source: Lebo and Schelling, 2001

Effective transport, as a complementary input to nearly every aspect of rural activity is an essential element of rural poverty reduction and development. Fan (2004) stressed the fact that among all types of rural infrastructure, rural transport is probably the most crucial for the livelihoods of the rural poor. Therefore, the role of rural transport in promoting rural development can not be taken for granted.

Fan (2001) has indicated that, an inefficient transport system can act as a significant constraint on agriculture in rural areas, both by raising the costs and effectiveness of inputs in the production process and by delaying the sale of harvested crops and that, increases in agricultural output in some areas were accomplished by increasing the supply of intermediate means of transportation, which increased access and reduced costs of key inputs. Furthermore, rural enterprises are often located in the areas where there is good access to roads, electricity, and telecommunication facilities (Fan, 2001). Therefore, improved rural transport, will promote the establishment of enterprises in rural areas, thereby creating jobs for people.

Additionally, improved rural transport increases market access by rural poor farmers and also lowers transaction cost and improves on rural farmer's incomes. Therefore, improved infrastructure and rural services not only expand opportunities for growth, but also help ensure that such growth is more diffused and equitable.

Similarly, Olukotum (2007) has observed that, all over the world, poverty reduction in the rural areas is tied to rural transport and it remains the central goal of global development efforts, and that, inaccessibility to transport can make it difficult for them to find employment, gain education and access healthcare as well as limiting their social and recreational activities. According to Sumaila (1998; Cited in Olukotum, 2007), the importance of rural transport therefore includes the following:

i. Accelerate the delivery of farm inputs and the services of extension workers;
ii. Facilitate the evacuation and marketing of produce from agriculture, fishing and livestock;
iii. Ease of human movement within and outside the community, thereby reducing or eliminating repetitive movement and thereby increase in residual time for other activities;
iv. Enhance the effectiveness of public policy;
v. Reduce the level of wastage of agricultural products and thereby bring about a reduction in their prices;
vi. Mobilizing the vast natural and human resource potentials of the rural sector;

vii. Accelerate the delivery of basic needs to the rural majority;

viii. Helps the local populations regain their lost ability of self-reliance especially in the area of food production; and

ix. Facilitate the flow of information, diffusion of innovation and exchange of ideas which invariably lead to the introduction and adoption of new ideas and new techniques capable of catalyzing the mechanism for more effective operation and management of resources.

Indeed, the contribution of rural transport to development is a matter of fact. However, Lebo and Schelling (2001) have indicated that, the availability and affordability of rural transport services and intermediate means of transport are crucial to rural development, hence successful approaches to improving transport services must deal with issues related to low population density and transport demand in rural areas, should be cost effective and use flexible technology.

2.6 Rural Transport in Developing Countries

According to Donnges (2001), rural transport is a subject that is receiving increasingly more attention from development specialists. Essentially, the goal in providing and/or improving rural transport is poverty reduction. Inaccessibility and immobility due to isolation have left many rural inhabitants in utter desolation (Touton, 2003). Transport patterns between countries, within a country and between rural and urban areas differ considerably. This difference is resulting from the modes of transport that are available to rural and urban areas.

2.6.1 Modes of Rural Transport in Developing Countries

The majority of Rural Transport Infrastructure in developing countries carries traffic of less than 50 motorized four wheeled vehicles per day (VPD), but often, a substantial number of intermediate means of transport, such as bicycles and animal-drawn carts are carried (Lebo and Schelling, 2001).

Donnges (2001) has argued that, rural transport in developing countries has its own very distinct features. It is characterized by people moving themselves and their goods around in rural areas for a variety of subsistence, social and economic purposes. Some of this movement takes place in motorized vehicles along well maintained roads. Much of these movements which take place in and around the community are mainly on foot on rough roads. Also, intermediate modes of transport such as bicycles, motorcycles, tricycles or with small boats are used as well.

Within rural areas of developing countries, there is a wide range of access to, and use of, motorized transport services. The intensity of use is dependent on income, the availability of transport services (which is in turn dependent upon quality of road infrastructure and the density of demand) and on the level of tariffs and fares (Hine and Rutter, 2000).

2.6.2 Rural Transport Infrastructure

Rural Transport Infrastructure (RTI) as indicated by Lebo and Schelling (2001) is the rural road, track, and path network on which the rural population performs its transport activities, which includes, transport by non-motorized (walking, riding bicycle) and motorized vehicles, and haulage and transport of people by animals. It includes the intra and near village transport network, as well as the infrastructure that provides access to higher levels of the road network.

Additionally, Calvo (1998) has pointed out that, the concept of rural transport infrastructure (RTI) includes what are commonly referred to as rural roads, tertiary roads, low-volume roads, district roads, local government roads, council roads, feeder roads, access roads, and community roads. It also includes tracks, trails, paths, and footbridges.

Mbwana (1997) has however indicated that, transport infrastructure is a pre-requisite for any viable economic development of a country. Therefore, an efficient transport infrastructure is necessary for any country to compete effectively in today's economy. This applies to both developed as well developing countries. He further concluded that,

while most sub-Saharan African countries have the basic building blocks of a transport infrastructure; this infrastructure is far from efficient.

According to Touton (2003), transport is dependent on infrastructure and modes of transportation, and that rural transport, in particular, features several types of infrastructure and modes within any given region. From paved roads to gravel and earth roads to tracks and footpaths, these infrastructure promote motorized and non-motorized mobility alike.

Focusing on the composition of rural infrastructure, it can be deduced that, it is fundamental to the availability of transport services in an area. Hence, an improvement in rural transport infrastructure will be a determinant to transport services present and improvement in mobility, which will ultimately increase people's ability to gain access to goods and services.

2.6.3 Problems with Rural Transport

Despite the contribution of rural transport it is ironical that the sector has not been given the necessary attention it deserved to facilitate development in developing countries. This situation as indicated by the World Bank has resulted in roads in bad condition which are only seasonally passable and poorly maintained. In addition, many communities however are still without motorable access at all (World Bank, 2002).

The World Bank has further indicated that the main challenges to rural transport include the following;

i. **Lack of Rural Transport Policy and Strategy:** The development of national rural transport policy and strategy has often been fragmented and unsustainable. This is due to the lack of a coherent framework for the subsector;
ii. **Weak Management Capacity at Local Levels:** If rural roads are managed at central level, insufficient attention is given to local priorities but the responsible entity is often technically stronger than when roads are managed by local

government agencies. However, various options exist for enhancing the management capacity of local entities for rural transport infrastructure, including the use of consultants, contract management agencies and the creation of joint services committees;

iii. **Ownership and Responsibilities are Unclear:** An indication of the need to provide a coherent legal framework and clear assignments of management responsibilities for both the local government and the community rural transport infrastructure are absent. However, few countries have achieved this but many are working towards it having realized the importance of bringing all roads under regular maintenance;

iv. **Inadequate Financing:** Focus has been on allocation of donor's funds for capital works coupled with insufficient fiscal decentralization. There is a need to establish an adequate and steady source of financing for road maintenance and consolidate the planning and budgeting of capital and recurrent works. The new generation road funds provide opportunity for cost-sharing with rural road agencies;

v. **Inadequate Standards:** Rural roads are often over-designed, resulting in waste of scarce resources which leaves poorer communities unconnected or with unreliable access. Over-design can be a result of political pressure, attempts to overcome institutional and financial weaknesses, or the application of standard designs by road type instead of actual traffic;

vi. **Planning and Selection Processes have Withered Away:** Establishing participatory planning processes using physical and economic planning tools has been ignored;

vii. **Replacement of Force Account Execution:** Civil works, including maintenance, are increasingly performed by the private sector. The creation of local small scale labor-based contractors should be encouraged, mainly through proper contract management and packaging, and the provision of training; and

viii. **Promoting Private Provision of Rural Transport Services;** Adjustment of taxes and duties, and elimination of price fixing and licensing constraints are

strategic measures through which governments can promote better transport services. Improving transport services include stimulating the use of low-cost vehicles (bicycles and animal carts) by the urban and rural poor, particularly by facilitating access to credit.

The consideration of the above issues in planning for rural transport in developing countries is very essential. This is because it will ensure that appropriate rural infrastructure is provided, as well as continually maintained. This will serve as motivation for private transport service providers to participate in the provision of transport service in rural area, thereby contributing to their growth and development.

2.7 The Role of Rural Transport in Ghana

According to G-JAS (2007), transport is key to facilitating both improved productivity in agriculture and agro-industry (by linking rural production to processing centers and trading points) and development of Ghana's human resources (by ensuring rural communities' access to schools, clinics and water points). Road density in Ghana is 248 km per 1,000 sq km, compared to 368 in lower middle-income countries and 1,015 in high-income countries (ibid). The Government of Ghana has invested in the expansion of the network over the years but this expansion has not been accompanied by sufficient emphasis on network maintenance, with the result that only 35percent of roads are in good condition (G-JAS 2007).

In the rural areas, head loading and different forms of intermediate means of transport, especially bicycles, are the main modes of transport. This in fact plays an important role in freight transport (Pedersen, 2001). However, considering the fact that 65percent of Ghana's population is predominantly rural and their major economic activity is agriculture, the role of rural transport can not be overemphasized due to the following:

i. Rural transport affords rural farmers the opportunity to visit their farms on daily basis. It is quite unfortunate that during the raining season most of their roads are not accessible even on foot;

ii. Access to markets is an important component of rural life, therefore improved rural transport facilitates farmers and traders ability to be able to sell their produce and in turn buy industrial products for household use; and

iii. Due to the nature of how dispersed rural communities are, some basic services are located at central places. Rural transport therefore enables inhabitants to access these basic services such as education, water, and health facilities in other to utilize them.

Taking into account the critical role rural transport plays, it is therefore important that governments as part of their mandate improves rural transport in Ghana. Consideration should therefore be given areas where agricultural production is vibrant with high produce. Nevertheless, government should also ensure equitable distribution so that developments of rural transport are not skewed to only this areas where agricultural out put are high.

2.7.1 Transport in the health system and referral Network

Babinard and Roberts (2006) have indicated that, transport plays a critical role in the delivery of and access to health services, and in the overall effectiveness of the referral process. In effect, transport and road infrastructure acts as a key link between potential accessibility and actual utilization of health services. Transport is essential for the distribution of drugs, blood and other supplies necessary for care and proper operations of health facilities. Efficient transport systems and roads facilitate access by health workers to often sparsely populated rural areas as well as the necessary monitoring and supervision of health services and initiatives.

Transport and road infrastructure also have a major influence on a patient as well as a community's ability to access health care. When the ratio of health facilities to population is low or uneven, transport and roads can ensure a more adequate distribution of and access to care. In addition, the role of transport to reach facilities can be more complex as transport can provide a link to health care when the nearest health facility may not be the

most accessible or when the nearest one is not perceived as the most effective. Reversely, poor road infrastructure or lack of transportation can influence patients to seek health care from less trained providers as long as they are more accessible (Babinard and Roberts, 2006).

Additionally, transport services are complementary to maternal and child health services because they facilitate access to care during the critical peri-natal and neonatal periods. These services are particularly important in sparsely populated rural areas of most developing countries, where the ratio of health facilities tends to be low, as health facilities have large catchment populations widely dispersed over many hundreds of square miles (Babinard and Roberts, 2006).

Access to transport as well as greater proximity to health facilities has been linked to lower levels of maternal and child deaths, and identified as one of the several factors affecting attendance to antenatal care and hospital choice (Rose et al. 2001 cited in Babinard and Roberts, 2006). Likewise, peri-natal health status as measured by the frequency of low birth weights, neonatal death, stillbirth and early neonatal morbidity which is significantly improved with access to motorized transport (Ondimu, 2001; cited in Babinard and Roberts, 2006).

In many countries, however, women living in rural and remote areas have less easy access to health services than women living close to urban centers. Also, since not all health facilities provide maternal and child health services, distance and traveling time to access these services tend to be much greater.

In the referral system, transport facilitates access to both preventive and emergency care, which can be provided at the various care levels of the system either in the community or at a health care facility such as a health center or a district or national hospital. Transporting a patient from the location of an acute event or injury to a health facility or hospital is a critical element of pre-hospital care. Once at a facility, the triage process in

the pre-hospital subsystem determines which patients get transported to the facility with the adequate level of care. Recent attempts at measuring the costs of interventions necessary to strengthen health systems, such as the WHO-CHOICE database, and in particular, the costs of extending coverage of maternal and newborn care, show that, extending coverage for 75 countries would push current levels of expenditure from $US1 billion in 2006 to US$6.1 billion in 2015 (WHO, 2005; cited in Babinard and Roberts, 2006).

Also in Ghana, transport has been identified as an essential resource and vital tool of the delivery of health services (Heyen-Perschon, 2005). This has resulted in the formulation and implementation of a transport policy in the health sector. This transport policy indicates the number of transport facilities, especially with regards to vehicles that should be present in each health facility. The current situation in the selected pilot area of Northern Region proves that the model of minimum vehicle mix for the different health levels is not in place on the ground. This has contributed to the continual deterioration of the health situation especially in the rural areas.

2.8 State of Maternal and Child Mortality in Ghana

The Ghana Statistical Service in 2004 reported that, a relatively high percentage of women received antenatal care from a trained health professional, that is, a doctor, nurse, midwife or auxiliary midwife (21percent from a doctor and 71 percent from a nurse/midwife). Also, 1percent of mothers received antenatal care from a traditional birth attendant (TBA) and 6percent received no antenatal care. They further indicated that urban residents are also more likely to receive antenatal care from doctors (34percent) than rural residents (14percent) (GSS, 2004). The Ghana Statistical Service (2004) also acknowledged that, women's education is strongly associated with receipt of antenatal care from a health professional, hence as a woman's education increases, the likelihood that she will receive antenatal care from a health professional increases from 86percent among women with no education to 100percent among women with at least some secondary education. Additionally, about 54percent of women with secondary and higher

education see a doctor for antenatal care compared with 11percent of women with no education.

Heyen-Perschon (2005) has reported that, maternal mortality rate has stagnated at the high level of 220 per 100,000. With regards to Under-five mortality, the Ghana Statistical Service (2004) indicated that the figure is 111 deaths per 1,000 live births in the most recent five-year period. Nearly three in five of these deaths occur in the first year of life. Infant mortality is 64 deaths per 1,000 live births and child mortality is 50 deaths per 1,000 children age one year. Neonatal mortality is stated as 43 deaths per 1,000 live births in the most recent five-year period, while post neonatal mortality is 21 deaths per 1,000 live births. Neonatal deaths account for two-thirds of the deaths in infancy. Mortality levels in rural areas are considerably and consistently higher than in urban areas. For instance, under-five mortality in rural areas is 118 per 1,000 live births compared with 93 for urban areas (Ghana Statistical Service, 2004).

2.8.1 Causes of Maternal and Child Mortality in Ghana

The majority of maternal and child deaths continue to result from a combination of biological, medical, and social factors, which are often inextricably linked (Stekelenburg et al. 2004; Bhutta 2005; cited in Babinard and Roberts, 2006). Identifying the causes behind maternal deaths is therefore indicated as a first step in understanding how the transport sector can contribute to reducing the burden of maternal and child mortality in developing countries. Babinard and Roberts (2006) have reported that maternal deaths result from a wide range of both indirect and direct causes which have been discussed below:

i. *Direct maternal deaths* result from conditions or complications, or the management thereof, which are unique to pregnancy and occur during the antenatal, intra partum or postpartum period. Sixty to eighty percent of maternal deaths are due to five direct causes: hemorrhage, obstructed labor, eclampsia, sepsis, and unsafe abortion. These direct complications are unpredictable and tend

to occur within hours or days after delivery with between 11percent and 17percent of maternal deaths occurring during childbirth itself, and between 50percent and 71percent in the postpartum period (WHO 2005; cited in Babinard and Roberts, 2006); and

ii. *Indirect maternal deaths* result from a previous existing disease, or disease that developed during pregnancy and that was not due to direct obstetric causes but was aggravated by the physiologic effects of pregnancy. Maternal deaths due to indirect and likely preventable causes represent 20percent of the total number of deaths worldwide. These deaths are caused by diseases (pre-existing or concurrent), or by an existing medical condition or by compromised health due to poor nutrition and disease that is worsened by pregnancy or delivery. Typical diseases include malaria, anemia, hepatitis, cardiovascular diseases or HIV infection. Women whose health is already compromised are more likely to be vulnerable to pregnancy-related complications. Likewise, community-based or socio-cultural factors such as attitudes and practices toward pregnancy can influence maternal mortality (Stekelenburg et al. 2004; Okolocha et al. 1998; cited in Babinard and Roberts, 2006).

With regards to child mortality, Babinard and Roberts (2006) have indicated that, globally, the main direct causes of neonatal death are estimated to be preterm birth (28percent), severe infections (26percent), and asphyxia (23percent); neonatal tetanus, which is an easily preventable disease, accounts for a smaller proportion of deaths (7percent). In addition, there are many indirect causes of neonatal deaths, the most important of which is low birth weight (LBW), with between 40percent and 70percent of all neonatal deaths occurring among those weighing less than 2,500 gm at birth. Other indirect causes of peri-natal and neonatal deaths include poor status of maternal health and nutrition and untreated maternal infections. Maternal complications in labor also carry a high risk of neonatal death, especially among the poor. Finally, maternal and fetal malnutrition and failure to exclusively breast-feed also contribute prominently to the risk of death.

According to Oluwole (2004), maternal deaths occur as a result of complications that develop as a direct result of pregnancy, delivery or the post partum factors (direct causes), or as a result of worsening existing medical conditions (indirect causes). The main direct causes of maternal mortality in the African Region are sever bleeding during pregnancy, delivery and after delivery constituting 25percent, sepsis (15percent), pregnancy induced hypertension (12percent), unsafe abortion (13percent) and obstructed labour (8percent). Other direct causes include ectopic pregnancy which accounts for 7percent of the deaths. Additionally, 20percent of pregnancy related deaths are caused by indirect causes such as malaria, anaemia and HIV/AIDS. However, the re-emergence of tuberculosis in Africa poses a threat to mother and child.

In Ghana, the causes of maternal mortality as reported by Bawah (2008) are hypertension constituting 19percent; anaemia constituting 12percent; obstructed labour, 7percent; unsafe abortion, 11percent; infections, 10percent; bleeding during or after birth 17percent and other causes about 24percent. This representation of the situation in Ghana is not quite different from the African situation. UNICEF (2008) however stated that the most important causes of neonatal deaths include the following:

i. **Infections-** including neonatal tetanus acquired during the early post-natal period, a proportion of which will be associated with poor infection control measures, cord care and poor early feeding practices;
ii. **Asphyxia-** possibly secondary to birth problems or poor neonatal resuscitation;
iii. **Low birth weight (/Preterm)-** secondary to a variety of problems in the ante-natal period, which could include prematurity, maternal anemia, malaria and under-nutrition; and
iv. **Birth injuries-** due to problems during delivery.

2.8.2 Efforts in reducing maternal and child mortality in Ghana

According to the Ghana Statistical Service (2004), women have problems in accessing health care services, with 68percent of all women citing at least one of the specified

problems. The majority of women (55percent) said that difficulty in getting money for treatment was a big problem, while 33percent stated that they had problems with transport and distance to health facilities. This situation has caused them to seek alternative health care, which in the long run might be a threat to their health and may result in death.

The National Development Planning Commission (2006) has indicated that, the level of Maternal Mortality Rate (MMR) is a key indicator of access to and utilization of improved quality of maternal health services. Although there is lack of agreement on the level of maternal mortality rate in Ghana among stakeholders, there is general agreement that the rate is unacceptably high. Available data from the Ministry of Health revealed that, the national institutional maternal mortality rate increased from an average of 1.86 per 1000 live births in 2004 to 2.05 in 2005, with wide regional variations. To reduce the level of maternal mortality, the government continues to invest in maternal health programmes including increasing access to antenatal care during pregnancy and promoting institutional delivery.

To this effect, government initiated the National Health Insurance Scheme in 2001 aimed at removing the financial barrier to health services, and limiting out of pocket cash payment at the point of service delivery. The scheme makes provision for the poorest and most vulnerable people to be identified and exempted from making financial contributions to the system (NDPC, 2006).

The NDPC (2006) further indicated that as part of government policy to accelerate access to quality health services, the health sector has continue to deepen efforts and focus on the following three broad policy objectives:

i. Bridge equity gap in access to quality health and nutrition services: As part of this policy, government is focusing on redistributing health workers in favour of deprived areas, provide outreach services and clinics in deprived rural and peri-urban areas, improve Community-based Health Planning and Services (CHPS),

develop and implement high impact yielding strategies for under five (5) mortality and maternal mortality and malnutrition including scaling-up the successful Accelerated Child Survival and Development (ACSD) interventions, improve essential obstetric care to reduce maternal mortality and develop at least one fully functioning and well equipped hospital in each district;

ii. Ensure sustainable financing arrangements that protect the poor: Strategies under this objective include accelerating the implementation of the National Health Insurance Scheme including the exemption policy through guided introduction of District Mutual Health Insurance Schemes, and fixing low acceptable levels of payment for the poor. The exemption policy is expected to strengthened to enhance access of poor and vulnerable groups to healthcare by improving the eligibility criteria, procedures, public awareness and responsiveness of the health service facilities; and

iii. Enhance efficiency in service delivery: Strategies to strengthen efficiency in service delivery include expanding pre-service health training institution facilities to increase intakes of trainees, providing incentive schemes to support the retention and redistribution of trained health personnel, decentralize human resource management to the regional level, strengthening systems for accountability in health service delivery, collaborate with informal health service providers, expand community-based health service delivery and improve the quality of traditional health service delivery system.

Additionally, USAID (2008) has reported that, the Ghana Health Service, with support from UNICEF, DANIDA, and USAID, is implementing strategy to reduce maternal and child mortality in all 10 regions through high-impact rapid delivery (HIRD) interventions focused on mothers and children. This strategy is indicated as aiming to fill the service delivery gap in Government of Ghana programs at the community level to turn the corner on key maternal and child health (MCH) indicators, and to move Ghana closer to meeting the MDGs for maternal and child mortality by 2015. Priority areas of intervention include complementary approaches within communities and among health care workers serving

these communities to prevent malnutrition through promotion of complementary feeding and exclusive breastfeeding, and to treat cases of severe acute malnutrition, increase use of focused antenatal care (FANC), including preventive treatment for malaria, increase community awareness about the need for skilled attendance at birth, improve recognition and treatment of obstetric complications, scale up use of AMTSL and prevention of postpartum hemorrhage, improve newborn and neonatal care and treatment; improve hygiene; strengthen delivery of immunization services, including polio and effectively treat fever and diarrhoea in children under 5 (USAID, 2008).

The strategies highlighted are core issues to tackling the problem of maternal and child mortality in Ghana. Therefore if these programs are fully supported and implemented properly, Ghana will be able to reduce maternal and child mortality. It is however important to note that, efficient monitoring of the implementation process is very necessary to ensuring successful achievement of the aims of the program.

2.9 Conceptual Framework

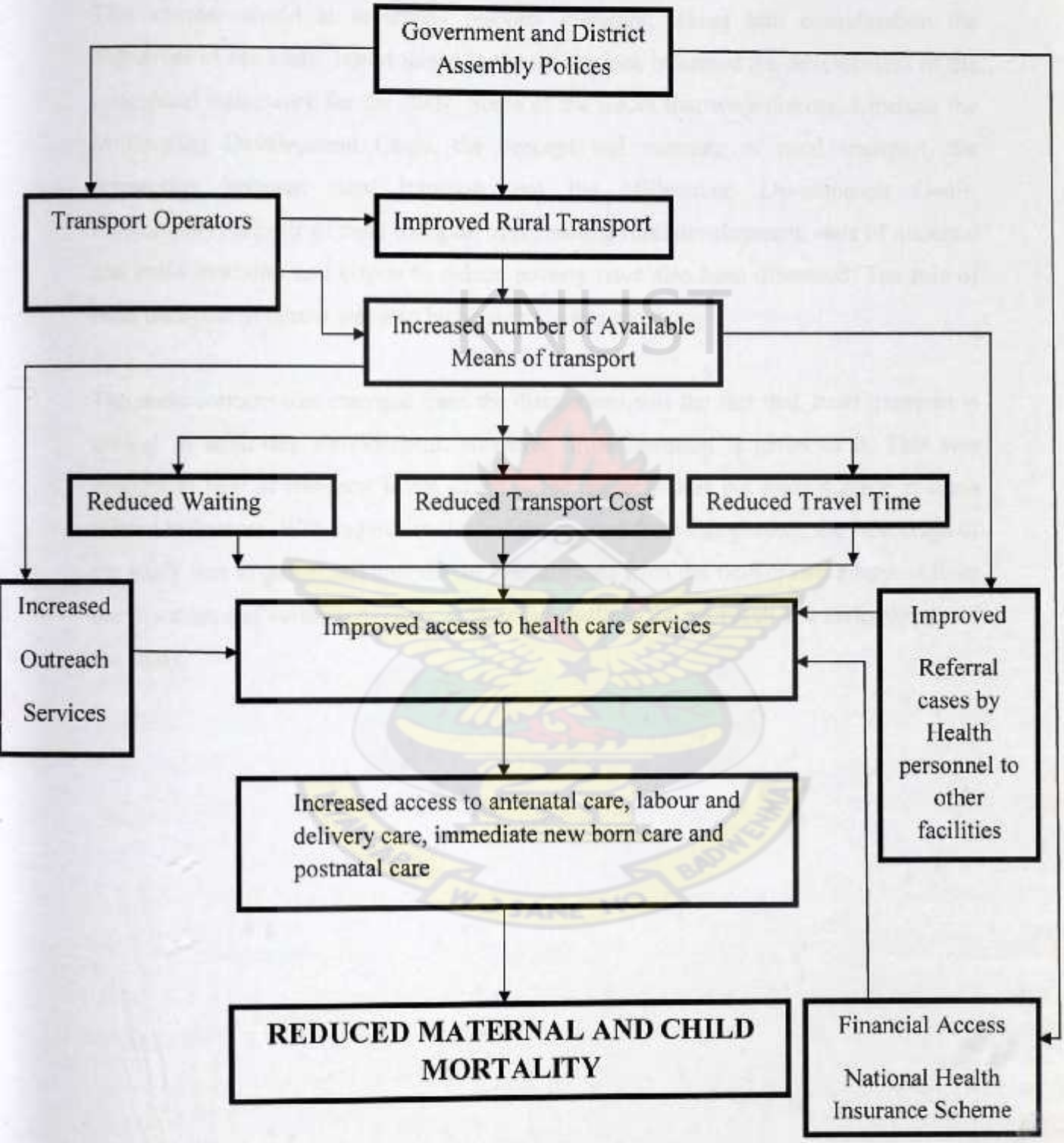
According to Barker (2007), improving maternal health remains the most elusive of the Millennium Development Goals. Every minute, at least one woman dies from pregnancy-related causes of which 99percent of these are in developing countries. The majority of these deaths occur in sub-Saharan Africa and South Asia, and are avoidable through using standard interventions and health care which all pregnant women and their newborns need.

The implementation of the National Health Insurance Scheme in the country has come to relief families of the financial burden by increasing access to health facilities. However, the burden of cost of transport to the health facilities still exists. There is no doubt therefore that, improving on the nature of rural transport will increase accessibility to health facilities by households and will contribute to the reduction in maternal and child mortality. Indeed, the role of rural transport is however important in achieving reduction of maternal and child mortality. There is the need for government to put in place policies

spelling out strategies to ensure development of rural transport infrastructure and services. These policies will also serve as bases for the private transport operators to give attention to the rural areas; thereby increasing the provision of services. This will ensure a reduction in travel time, waiting time and transport cost, hence increasing access to health facilities. Outreach services by health personnel will also be enhanced by the provision of adequate means of transport.

These factors when considered will enable members of households and pregnant women to have access to health care more frequently; it will also facilitate the referral of complicated cases to the appropriate health facilities for proper care and treatment, hence leading to a reduction in maternal and child mortality.

Figure 2.2: Conceptual framework



Source: Authors Construct, 2009.

2.10 Summary of the Chapter

This chapter aimed at reviewing relevant literature, taking into consideration the objectives of the study. Issues raised in the discussions informed the development of the conceptual framework for the study. Some of the issues that were discussed include the Millennium Development Goals, the concept and meaning of rural transport, the connection between rural transport and the Millennium Development Goals. Additionally, the role of rural transport in promoting rural development, state of maternal and child mortality and efforts to reduce poverty have also been discussed. The role of rural transport in Ghana was also highlighted in this chapter.

The main concern that emerged from the discussions was the fact that, rural transport is critical in achieving development. However, little attention is given to it. This was brought to bear as transport is not added to the major MDGs but finds it place in some related indicators. With regards to the insights gained from this chapter, the next stage of the study was to gather and analyze the relevant data from the field drawing lessons from the literature and various concepts. It therefore outlines the approach and methodology of the study.

CHAPTER THREE
STUDY APPROACH AND METHODOLOGY

3.1 Introduction

The preceding chapter provided information on relevant discussions on pertinent literature on the study. This chapter therefore provides information as to how the study was carried out. It presents information on the research design, sample size determination and the process by which data was collected and analyzed.

3.2 Research Design

The cross sectional research design was adopted in carrying out the study. According to Kumar (1999), cross sectional research design is said to be best suited to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issues by taking a cross section of the population. Grary (2007) also indicated that, the cross sectional design uses a snapshot approach where the data is collected at a point in time. The cross sectional design also aims at describing the pattern of relationship before some attempts is made at finding causal relationship. Therefore, since the study seeks to find the causal relationship between rural transport and maternal and child mortality, it is very appropriate to adopt this approach. Additionally, the study depended on both qualitative and quantitative data for analysis as the qualitative data gives more perceptive to the quantitative data collected.

3.3 Selection of Study Area

The choice of the study area is based it's familiarity with the research and on the fact that, the district is predominantly rural, with a high incidence of under five mortality rate. The District recorded under five mortality rate of 201 per 1000 live births as at 2000 and also has a total fertility rate of 5.5 GDHS (2003), exceeding the national figure of 4.4

3.4 Units of Analysis, and Study Variables

The unit of analysis is that unit about which information is collected and that provide the basis for analysis. The unit of analysis according to Kumekpor (2002) is the actual empirical units, objects, occurrences, which must be observed or measured in order to study a particular phenomenon. Therefore, the unit of analysis must be appropriate to the problem being investigated and focuses on the essentials of the objectives of the study.

For the purpose of this study, the units of analysis are pregnant women and lactating mothers within the households. Also individuals who are involved in the provision of transport services were considered in the study. Some Traditional Birth Attendants within the communities were also studied. Institutions taken into consideration are the various health facilities, District Health Directorate, and the District Assembly.

The study variables that were considered for the study are rural transport, demography of pregnant women and lactating mothers, accessibility, and outreach services. These variables were considered with reference to the study objectives and the research questions, the following variables represented in Table 3.1 are therefore deemed appropriate for the completion of the study.

Table 3.1 Study Variables and Data Source

Study Variables	Data Type	Source (s)
Demography of pregnant women and Lactating mothers	Age, level of education, religion, marital status and income levels	Households
Rural Transport	Transport infrastructure (Roads, bridges, tracks, footpaths waterways, terminal hubs etc) Modes of transport	Vehicle operators, transport associations, District Assembly (District Roads Engineer, Head of District Works Department)
Accessibility	**Geographical Access** -All weather motorable roads -Availability of transport -Distance of health facility from home -Travel time	District Assembly (District Roads Engineer, Head of District Works Department) District Health Directorate, Users of health facilities(Households)
	Physical Access -User friendly layout of the health facility -Effective direction to service points-using photos and local language where possible	
	Financial Access -Ability of users to pay for Services (Transport, drugs, diagnosis)	
Out reach services	Numbers of outreach services organized, number of personnel involved, transportation issues during outreach services, cost per outreach service.	District Health Directorate, And Heads of health facilities.

Source: Authors Construct, 2009.

3.5 Sampling Methods

The health facilities in the District were grouped into seven clusters. All these clusters were considered in the survey. This was to encourage the gathering of divergent views from respondents which can be representative enough.

The simple random technique was used to select communities. This technique was also used in selecting households. The simple random technique was used taking into consideration the list of communities and list of households in each community. This was to prevent bias and afford each community and household an equal chance of been selected.

The purposive sampling procedure was used in selecting individuals in the various institutions for interview. The purposive sampling technique was used because it is only some specific individuals (pregnant women and lactating mothers) who will be able to provide the information needed for the study. The health facilities in the district are very limited therefore all the facilities were considered in the study.

3.6 Sample Size Determination

In selecting the sample size of households for the study, the formula

$$n = \frac{N}{1+N(\alpha)^2}$$

Where; n= sample size, N= total population of the study area (Households), α is the error margin (8percent) was used.

From the above formula and considering the fact that the total number of households in the district is 12308. The number of households interviewed in the district was 154.29, approximately =154. However, for the sake of convenience, a total of 160 households were interviewed. The household questionnaire was distributed proportionally to the coverage areas of the health facilities was based on the number of communities each area covered. Table 3.2 shows the distribution of household questionnaire to the various health facilities.

Table 3.2: Distribution of Household Questionnaire

Sub District Health Facility	Number of Communities		Sampled Communities		Household Questionnaire
	Existing	Sampled	Communities Near Facility	Communities Far from Facility	
Gushegu	141 (40percent)	20	10	10	64
Katani	70 (20percent)	10	5	5	32
Kpatinga	35 (10percent)	5	3	2	16
Zinindo	5 (1percent)	2	1	1	2
Galwei	19 (5percent)	4	2	2	8
Nabuli	70 (20percent)	10	5	5	32
Damankon	12 (4percent)	5	2	3	6
Total	**352**	**56**	**28**	**28**	**160**

Source: Authors construct, 2009.

Additionally, institutions that are involved in ensuring good rural transport such as the District Assembly (District Works Department), Operators of transport services and those that are involved in health delivery such as the District Health Directorate, Traditional Birth Attendants (TBAs) were also interviewed.

3.7 Data Sources and Collections Instruments

The study relied on data gathered and collected from secondary and primary sources. Secondary data was gathered from relevant literature and statistical data on the subject matter. Data on maternal and child mortality, number of health center or clinics with reliable rural access and nature of roads was gathered from documentations and reports of the District Health Directorate and the District Assembly. Other secondary of data were gathered from journals, policy documents of the Ministry of Health, the Ministry of Transport, and from the internet.

Primary data was collected from the field by the use of self administered questionnaire, observations and informant interviews. The type of data that was collected includes accessibility to health service in terms of distance, cost of travel, and waiting time. Other primary data collected included unit cost per coverage of outreach service, emergency patients unable to reach health care in time, number of children born, place of preference of birth, antenatal and postnatal care visits among others.

3.8 Data Processing and Analysis

Data analysis involves the separation of data into its constituents in order to find out what it contains by examining individual parts. Quantitative data was processed using the Statistical Package for Social Sciences (SPSS). This is because its use facilitated easy manipulation and interpretation of data to achieve the study objectives. The chi-square test, and independent sample T-test was used to determine the significance of relevant transport related variables. Data was presented in graphical form using tables, graphs and charts.

CHAPTER FOUR
PROFILE OF THE STUDY DISTRICT

4.1 Introduction

Following the previous chapter which outlines the approach and methodology adopted for the study, this chapter presents secondary data with regards to the profile of the study area. It highlights some current situations of the study area such as education and water and sanitation among others.

4.2 Background Information

Gushegu is one of the twenty (20) administrative districts of the Northern Region (N/R) of Ghana. The district, together with Karaga was previously known as the Gushegu/ Karaga District established in 1988 which was curved out of the then Eastern Dagomba District Council. The district was further separated into the Gushegu and Karaga Districts in 2004.

4.3 Location and Size

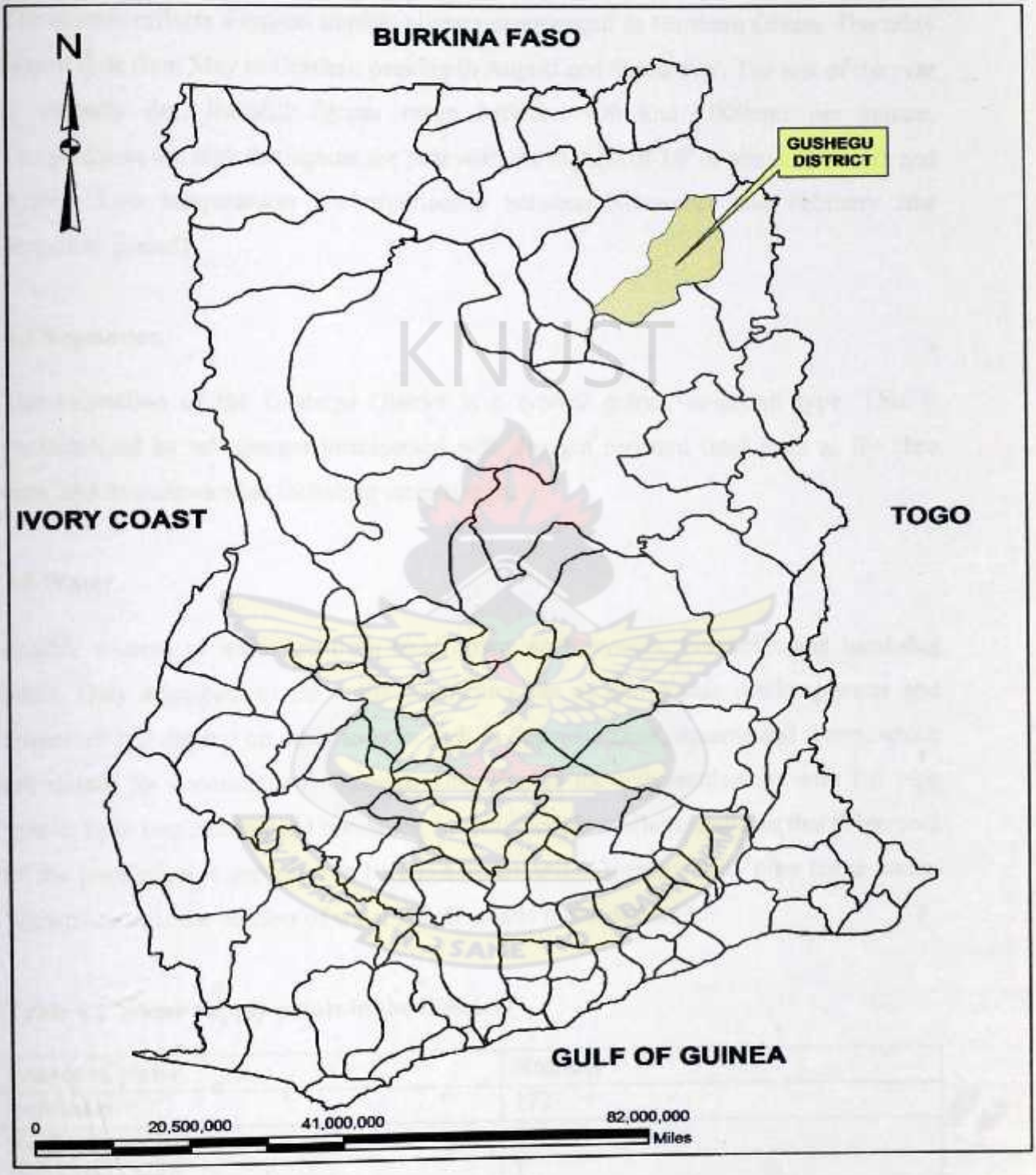
The district is located in the North Eastern part of the Northern Region between latitudes 9'.30' and 10'.30'degrees North and longitudes 0. 45' West. It shares boundaries with East Mamprusi and Bunkurugu/Yunyoo districts to the North, Yendi Municipal to the South, Saboba and Chereponi Districts to the East, Karaga and West Mamprusi districts to the West. The district is approximately 3,864 square kilometers and the district capital which is Gushegu is about 114-kilometers from Tamale, the Regional Capital.

4.4 Relief and Drainage

The relief of the District could be described as fairly undulating with heights ranging from about 140m at the valley bottoms to about 180m in the plateau surface. The land is strewn with numerous streams most of which are tributaries of major rivers in the Northern Region such as the Nasia, Daka, Nabogu and Oti rivers. The major river

identified is the Nasia, which flows between Namburugu and Bagli. Its tributaries include Duakulga and Kulbila which enters it from the south. The headwaters of the Daka River are found in the district. Tributaries of the Oti River include Nakua and Tanga to the east of Gbogu, Lorse and Kembi at Nawuhugu and Makpe at Katani. The Nasia only reduces in volume during the long dry season, whereas all the other streams dry up completely. In the rainy season however, all the streams increase in volume and flood the immediate surrounding land thereby cutting off most communities during the period. Most roads are also rendered unmotorable.

Map 4.1: Location of Gushegu District in the National Context



Source: Civil Engineering Department-Kumasi Polytechnic, 2009.

4.4 Climate

The climate reflects a typical tropical climate experienced in Northern Ghana. The rainy season lasts from May to October; peaking in August and September. The rest of the year is virtually dry. Rainfall figures range between 900 and 1000mm per annum. Temperatures are high throughout the year with the highest of 36° or above in March and April. Low temperatures are experienced between November and February (the harmattan period).

4.5 Vegetation

The vegetation of the Gushegu District is a typical guinea savannah type. This is characterized by tall grasses interspersed with drought resistant trees such as the shea nuts, and dawadawa trees including some shrubs.

4.6 Water

Potable sources of water are from small town water system, boreholes and hand-dug wells. Only 46percent of the entire population has access to safe drinking water and 54percent still depend on other sources such as dugouts, dams, streams and rivers, which are unsafe for consumption. Gushegu Township is the only settlement with the pipe system from two mechanized boreholes. In-fact, records available indicate that 9.1percent of the population is served with borehole water and 1.3percent with pipe borne water. Shown below is the number of water supply points in the district.

Table 4.1 Water supply points in the District

Source of water	Number
Boreholes	172
Hand dug wells	39
Treatment plant	1
Dam	42

Source: Gushegu District Assembly, 2008.

4.7 Sanitation

Poor environmental conditions are quite common in the district and these are associated with poor access to latrines and insufficient methods for both solid and liquid waste disposal. Further statistics shows that 10.9percent have VIP latrine while 10.2percent are served with KVIP and safe excreta 2percent (DA report 2004). Table 4.3 shows a break down of toilet facilities in the district.

Table 4.2 Sanitation Facilities in the District

Facility	Number
VIP	461
KVIP	40
Septic toilet (public)	4

Source: Gushegu District Assembly, 2008.

4.8 Education

Education has been identified as one of the major problems of the district. There is low level of education among the people in the district. Women and the girl child mostly affected. It is estimated that the gross primary enrollment rate is 3,359 for girls and boys is 8,743 while the primary school completion rate is 50.1percent for girls and 48.2percent for boys while JSS students qualifying or SSS is as low as 2percent for girls and 77percent for boys (GDA,2006). There are fifteen (15) early child development centers, 67 primary schools, six (6) JSS and one (1) SSS schools in the district. The teacher pupil ratio at the basic level is 1:48 and schools with standard structures are about 46percent in the District.

4.9 Summary

In summary the chapter specifically indicated the location and size of the District, relief and drainage, climate and also presented highlights on the situation of water, sanitation and education in the District. These issues together give a view on the District.

CHAPTER FIVE
PRESENTATION AND ANALYSIS OF DATA

5.1 Introduction

Following the discussion in the previous chapters, which outlined the theoretical bases and the framework for the study, this chapter presents results and discussions on the data collected from the field. Data collected from households were mainly targeted at pregnant women and lactating mothers. The data collected include marital status, age, educational level, occupation and religion which constitute some social and demographic characteristics. Other data collected took the form of issues regarding the household's health seeking behaviour, maternal and child care which took the form of attendance to antenatal care, postnatal care, practice of exclusive breast feeding and the immunization of children.

The chapter also presents information regarding accessibility to health facilities and it took into consideration, physical access and financial access with emphasis on the National Health Insurance Scheme. Physical access considered issues such as all weather motorable roads, available transport, distance of health facility from home, and travel time. Financial access also considered the issues such as ability to pay for transport and enrolment in the National Health Insurance Scheme. Additionally, data on outreach services by health personnel was also gathered. Information collected include number of outreach service per month, cost per outreach service, and means of transport for outreach service, number of personnel involved and challenges faced during outreach services.

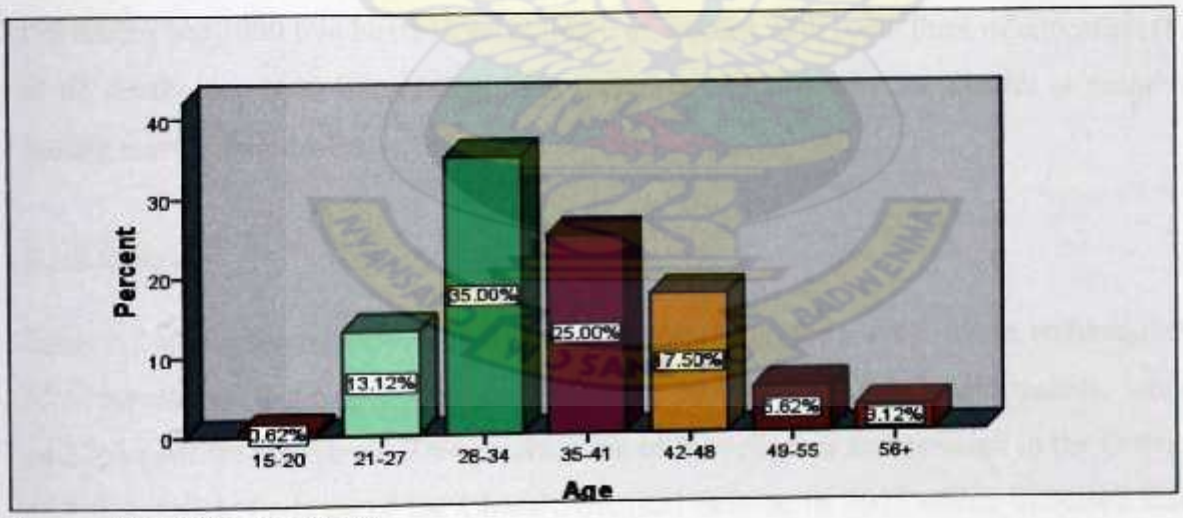
This chapter presents information gathered and discussions which served as an impetus for analysis, conclusion and recommendations.

5.2 Socio-demographic Characteristics of Respondents

5.2.1 Age and Marital Status

The study was mainly targeted at pregnant women and lactating mothers or women who have ever given birth. The survey revealed that, the ages of women interviewed ranged between 15 to 56+. However, majority (51.26percent) of women interviewed, were between the ages of 35 to 56+ years, with 48.12percent between the ages of 21 to 34 years. Just 0.62percent of respondents were aged between 15 to 20 years. Details are shown in Figure 5.1. The Ghana Health Service (2007) has indicated that, women below the age of 20 and above 35 years are prone to maternal death during pregnancy. This therefore indicates that, majority of respondents are prone to maternal deaths. Additionally, the survey showed that 97.50percent of women were married, whiles 2.50percent of them were widows. This showed a slightly varied background of respondents.

Figure 5.1: Age of Respondents



Source: Field Survey, 2009.

5.2.2 Educational Level of Respondents

With regards to educational background, the survey revealed that, 83.12percent of respondents had no formal education, 10.00percent had only primary education. It further

indicated that 3.13percent and 2.50percent had Junior High School and Senior High School Education respectively, with the remaining 1.25percent having had tertiary education (refer to Table 5.1).

Table 5.1: Educational of Level

Educational level of Respondents	Frequency	Percentage
No formal Education	133	83.12
Primary Education	16	10.00
JHS	5	3.13
SHS	4	2.50
Tertiary	2	1.25
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

The situation of the level of education is one of great concern, since UNICEF (2006) reported that, children of mothers with no education are more likely to die in their infancy (78 deaths per 1000 live births) than children of women with some form of education (52 to 65 deaths per 1000 live births). This therefore explains why the district is prone to having more infant deaths.

5.2.3 Religion

Table 5.2 shows the religious status of respondents. From the survey, it was realized that, 55.63percent of the respondents are Muslims, 30.00percent are Traditionalists, while 14.37percent are Christians. This presentation of the religious composition in the District portrays similar findings of the Ghana Statistical Service in 2005 which indicated that, 70.2percent of the population in the district are Muslim, 20.6percent are traditionalist, 6.0percent are Christians, and the remaining 3.2percent of the population had no affiliation with any other group.

From discussions with health personnel, it was revealed that, the religious background of people in the District has an influence on their health seeking behaviour. This was in reference to people with traditional religious background, as they tend to opt for traditional medicine to the orthodox medicine. However, they visit the hospital when complications occur, which in some cases results in death.

Table 5.2: Religious Status of Respondents

Religion	Frequency	Percentage
Muslim	89	55.63
Christian	23	14.37
Traditionalist	48	30.00
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

5.3 Economic Characteristics

According to GSS (2005) agriculture, hunting, and forestry are the main economic activities in the Northern Region. They indicated that, together, they account for the employment of 71.25percent of the economically active population, aged 15 years and older. They further stated that less than a tenth (7.0percent) of the economically active people in the region are unemployed.

Data from the Gushegu District Medium Term Development Plan (2006) indicated that, the District economy is dominated by activities in the four sectors namely, agriculture, manufacturing, commerce and service. However, the District is largely an agrarian economy which serves as the backbone of the District in terms of employment. It employs about 70percent of the total population in the District.

Results from the survey did not differ very much from the conclusions drawn by the Ghana Statistical Service. The results indicated that, 80percent of the respondents are engaged in agriculture, specifically crop farming. The respondents indicated that though

they help their husbands on their farms they also farm on small pieces of land given them by their husbands. The major crop cultivated by the respondents is groundnuts. The study further revealed that, about 7.50percent of women engage in farming and petty trading, 6.87percent engage solely in trading, while 3.1percent of the respondents were engaged in the formal sector which is mainly teaching, with the remaining 0.63percent of respondents, being engaged in artisan work which is dominated by sewing. This is shown in Table 5.3. Women in this area engage in commerce especially petty trading, shea butter and groundnut oil extraction but there is no established industry in the district.

Incomes of respondents are largely dependent on the type of jobs they engage in, for those in the formal sector (teaching) the average income per month for teachers who are in the formal sector range between GH¢ 180.00 and GH¢ 200.00. However, respondents whose main occupation are not in the formal sector range between GH¢ 40.00 and GH¢ 70.00. It is observed that, majority of respondents belong to the non-formal sector and their income as compared to the minimum wage of GH¢ 2.50, which amounts to GH¢ 75.00 per month is low.

In spite of the fact that, people are engaged in agricultural activities which is their main source of income, incidence of poverty is very high in the district. This can be attributed to the insufficient employment avenues and large family sizes. Additionally due to the declining soil fertility and decreasing agricultural outputs, has contributed to the incidence low incomes and poverty in the district.

This therefore is a source of worry as they may not be able to access health care if they are unable to pay their premiums of the National Health Insurance Scheme in the District. This will eventually have an effect on women as they will not be able accessing antenatal care, postnatal care and general health care.

Table 5.3: Occupation of Respondents

Occupation	Frequency	Percentage
Farming	128	80.00
Trading	11	6.87
Farming and light industry work(oil extraction)	3	1.88
Teaching	5	3.12
Artisan	1	0.63
Farming and Trading	12	7.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

5.4 Health Seeking Behaviour of Respondents

Health seeking behavior in terms of illness behaviour refers to those activities undertaken by individuals in response to symptom experienced (Jain et'al, 2006). Health seeking behaviour is influenced by a large number of factors, apart from knowledge and awareness. This behaviour among different populations particularly in the rural communities is a complex outcome as a result of many factors operating at individual, family and community levels. These factors include bio-social profile, past experiences with the health services, influences at the community level, availability of alternative health care providers including indigenous practitioners and their perceptions regarding efficiency and quality of the services. Hausmann-Muela et'al, (2003) also stated a range of other factors relevant for health-seeking behavior. These included unavailability of health facilities, lack of drugs, and the lack of money to pay for preventive or treatment costs.

The survey carried out sought to find out the number of times a member of the household fell sick and whether they sought medical care, where they went and the reasons they

sought medical care. Table 5.4 shows the incidence of illness in the household within the past one year. The survey revealed that, 70.62percent of respondents indicated that the frequency of illness in the household ranged between 1-5 times within the past one year, 15.00percent stated that the occurrence of illness ranged between 6-10, whiles 13.75percent said they had not registered illness in the household for the past one year.

Table 5.4: Incidence of illness in the Household within the past one year

No. of illness	Frequency	Percentage
Nil	22	13.75
1-5	113	70.62
6-10	24	15.00
11-15	1	0.63
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

The survey further revealed that all respondents indicated that they seek medical attention when any of their household member is sick, however, 74.37percent of them indicated that they visit the health facility only for medical attention, 7.50percent of them stated that they resort to self medication and sometimes visit the health facility, 5.63percent indicated that they resort to traditional medicine only, while 6.25percent specified that, they use traditional medicine and also visit the health facility. The survey also revealed that 0.63percent resorted to seeking medical attention from the herbalist; health facility and self medication, the implication of which could result in drug abuse and further complications resulting into death. The details are presented in Table 5.5.

Table 5.5: Place Medical Attention is sought

Place medical Care is Sought	Frequency	Percentage
Self medication	2	1.25
Visit herbalist	9	5.63
Visit to health facility	119	74.37
Both Visit herbalist and Visit to health facility	10	6.25
Both Self medication and Visit to health facility	12	7.50
Self medication Visit herbalist and Visit to health facility	1	0.63
No Response	7	4.37
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

From Table 5.6 it can be appreciated that, 70percent of the respondents indicated that, they sought medical attention from the health facility because they receive very good care. About 10.62percent of respondents indicated that, they sought medical care because they could easily access (short travel distance) it and also receive good care.

Table 5.6: Reasons Why Medical care is Sought

Reasons for Medical care sought	Frequency	Percentage
Affordability	6	3.75
Easy access (short distance traveled)	6	3.75
Proper/Good care provided	112	70.00
Both Affordability and Easy access	2	1.25
Both Affordability and Good care provided	7	4.38
Both Easy access and Good care provided	17	10.62
Affordability, Easy access and Good care provided	2	1.25
No Response	8	5.00
Total	**160**	**100.00**

Source: Field Survey. April, 2009

The above presentation of the behaviour of respondents with regards to seeking medical care is an indication that majority of them know and believe in the orthodox medicine than any other source of medical care. However, the study also pointed out that there are some section of the population who still resort to traditional medicine and self medication, and only go to the health facility when their situation deteriorate. This therefore implies that, herbalists also play a key role in health care delivery in the district and as such they should be recognized. The health seeking behavior gives a general perspective of how pregnant women and lactating mothers seek health care. It therefore shows that, pregnant women and lactating mothers go to the health facilities to seek medical attention when the need arises.

5.5 Current Situation of Rural Transport in the District

5.5.1 Transportation Infrastructure

The transport system of the Gushegu District is characterized by a network of trunk roads, feeder roads and footpaths which are categorized into engineered, partially engineered and non-engineered. The non engineered roads are the majority in the district, and are predominantly unpaved and ranges in conditions of poor, fair and good. An interview with the District Assembly revealed that, the roads are generally in poor state. Apart from a 3.5km bituminous surface feeder road within the Gushegu Township, all the other feeder roads within the districts are unsurfaced and are of earth or gravel. The feeder roads within the district are mainly connected to the major truck roads that link the Gushegu District to other Districts namely, Karaga, East Mamprusi and the Bunkpurugu/Yunyoo, Cherponi, Saboba and Yendi Municipality.

The District has three (3) main trunk roads, which link the regional capital Tamale, Yendi Municipal and East Mamprusi, these trunk roads are poorly and inconsistently maintained and are therefore in a deplorable state (refer to Pictures 1 and 2). These roads are poorly drained and as such are under the mercy of erosion creating gullies and potholes making it difficult for vehicles to ply. Most of the feeder roads are however well maintained and usually connects farming communities to the main truck roads that leads to the main

Gushegu market and other services facilities such as hospitals/health centres, and banks among others. Also found in the district are foot bridges which mainly are use to connect to some villages that are out of reach especially during the rainy season. The bridges enable farmers in those villages to be able to carry their farm produce to market center. It also enables them to have access to health care in the rainy season since health personnel can move to these communities and back, while community members can also visit the health facilities. These foot bridges were constructed with support from Danida under Transport Sector Program Support II.

Picture 1: Gushegu – Yendi Road

Picture 2: Gushegu – Borgu Road

It was also revealed that, the District Capital does not have an organized lorry station, hence vehicle operators use any open space found around the market area to park their vehicles for passengers to board. This does not auger well for the town as it makes it congested, especially on market days. The above description of rural transport infrastructure therefore confirms Touton (2003) description of rural transport infrastructure which is said to be in the form of paved roads to gravel and earth roads to tracks and footpaths. These infrastructure promote motorized and non-motorized mobility alike.

5.5.2 Transport Services

Transport modes available within the district comprise mainly motorized and non-motorized transport, with various carrying capacities. Head loading and walking, bicycle, donkey-cart, and push cart mainly used over short distances constitute non-motorized

modes while's motorbikes, passenger vehicles such as Urvan and 207 Benz bus and cargo vehicles (medium and heavy trucks) are the main motorized modes of transport in the District.

People in the District rely on these modes of transport to move from one location to another within the District. From the field survey, it was realized that, the most frequently used modes are bicycle and walking. Motorized transport services are mostly found to be active on market days in the big markets in the District. It is however, important to state that, it is only the metro mass transport service that operates from Tamale to the district daily, making two trips. Other buses also operate on the Gushegu - Yendi roads as well as the Gushegu - Tamale routes. These vehicles move once a day. According to the transport operators, the low volume of vehicles operating in the area is as result of the poor nature of the roads as it increases their maintenance cost, since they have to service their vehicles anytime they move on the roads. They further indicated that, they do not operate in the rural areas of the district because it is not part of their operational area, and also for the fact that roads leading to theses areas are narrow which can easily cause accidents.

The situation of limited transport service in the district has an effect on health delivery in the district. Emergency cases that occur in communities are rushed to the hospital on motorbikes if available or the use of bicycle. In some cases, buses are hired to carry pregnant women to the hospital. This leaves a great financial burden on families as transport operators in such cases, charge exorbitant fares. Pictures 3 and 4 show the most frequent modes of transport in the district.

Picture 3: Going for Antenatal care at Gushegu Hospital

Picture 4: Going back home after visiting the hospital

The above situation of rural transport in the District makes it very difficult for people to seek health care, as they will have to ride or walk long distances to get health care, thereby worsening their health situation.

5.6 The Role of Transport in Accessing Health Care

According to Health Link Worldwide (2000), lack of transport and cost of transport are important reasons why people do not use health care services, especially services requiring a referral. Problems with transport also affect the ability of staff to deliver health services.

In Ghana however, Heyen-perschen (2005) indicated that, 70percent of the poor population cited costs as one key reason for non-use of medical services. This includes cost for medicine, cost of treatment and cost of transport to and from the facility. In addition to this, physical location of health facilities does not meet household needs, in the sense that, distance is regarded as a major obstacle to the rural population. He further argued that, up to 70percent of the rural poor need more than 35 minutes to get to the next health facility, which is a reflection of only the portion of the rural population, consulting medical personnel. He also added that, the assumption, that access is a main

bottleneck of health care is proved by the fact that more than half of the rural population (55percent) do not consult medical personnel.

Heyen-perschen (2005) however reported that, the rural population relies on walking as the dominant mode of transport. Animal drawn modes of transport are playing no significant role in both rural and urban transport. Only a minor number of donkeys is used in agriculture and marketing in the northern part of the country. Horses only play a reserved role in traditional village ceremonies in rural Ghana. Bicycles are common in the country especially in the northern regions. The most common types are the Indian made Phoenix bikes and an increasing number of Japanese second hand bikes (with female frame design) as well as second hand mountain children bikes.

Nevertheless, the survey revealed that, 39.38percent of the respondents indicated that, they used bicycles as the main mode of transport to the health facility, 21.25percent reported that they visit the health facility by walking while 12.50percent used car with the remaining 6.25percent using motor-bikes. Other respondents however indicated that, they use a combination of the above modes of transport as can be seen in Table 5.7. These modes of transport are mainly used because they are readily available to them. This is because they do not have to wait for long hours for a car, which in some cases do not turn up. Additionally, these modes are not very efficient enough as it is not the most convenient way of carrying patience especially pregnant women to the health facilities. It therefore results in them developing complications.

Table 5.7: Modes of Transport used to Health Facilities

Modes of Transport	Frequency	Percentage
Walking	34	21.25
Bicycle	63	39.38
Motor Bike	10	6.25
Car/Lorry/Truck/Buses	20	12.50
Both Walking and Bicycle	14	8.75
Both Bicycle and Motor Bike	9	5.63
All Walking, Bicycle, and Motor Bike	3	1.87
Both Bicycle and Car	7	4.37
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

With regards to the time spent in getting to the health facility, the study revealed that, more than half (63.13percent) of the respondents indicated that they use more than 35 minutes in traveling to the health facility, 15.00percent use less than 20 minutes, 5.00percent use between 21 to 25 minutes, 11.25percent of respondents also indicated that they use between 26 to 30 minutes while 4.37percent said the time spent is between 31 to 35 minutes (refer to Table 5.8). The travel time is influenced by the condition of the roads and the available mode of transport as most of the vehicles that ply the roads in District are poorly maintained. It can also be inferred based on data from table 5.7 and 5.8 that majority of respondents used non motorized transport to the health facility. This has resulted in them using more travel time to the health facility.

Table 5.8: Time spent in getting to Health Facility

Travel time	Frequency	Percentage
<20minutes	24	15.00
21-25minutes	8	5.00
26-30minutes	18	11.25
31-35minutes	7	4.37
>35minutes	101	63.13
No Response	2	1.25
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Considering the fact that transport plays an important role in accessing health care, access to health facility is influenced by the duration spent in waiting for the means of transport. Data from the field survey revealed that 56.25percent spend more than 60 minutes waiting for a means of transport to enable them visit the health facility. In addition, about 32.50percent of respondents could not indicate the exact time used in waiting for a means of transport while just 1.25percent indicated that they did not waste anytime. These were respondents who mainly stayed in the District capital. Up to 6.25percent and 3.78percent indicated that they spent about 30 minutes and between 31 to 60 minutes respectively (refer to Table 5.9). The average waiting time in the district is 66.4 minutes. This implies that there are no reliable means of transport in the District.

Table 5.9: Waiting Time for Means of Transport

Waiting Time	Frequency	Percentage
No time Spent	2	1.25
0-30minutes	10	6.25
31-60minutes	6	3.75
>60minutes	90	56.25
No Response	52	32.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

The ability to access health facility is also dependent not only on the availability of means of transport but also the transport cost. Table 5.10 shows amount paid per trip to visit the health facility. It reveals that majority (45.63percent) of respondents pay between GH¢0.50 to GH¢1.00 for a trip to get to the health facility, 14.37percent pay fares greater than GH¢1.00 and 8.13percent pay less than GH¢0.50, with 29.37percent of respondents not responding. The survey also revealed that 57.50percent of respondents indicated that they could pay for fares charged whiles 10.60percent indicated that they could not, with 31.90percent not responding. This shows that the cost of transport is not a deterrent to them visiting the health center. Therefore pregnant women and lactating mothers can easily go to health facilities provided there are available means of transport. However due to the unreliable transport in the area, access to health care is still a problem.

Table 5.10: Amount per Trip

Transport Fares	Frequency	Percentage
No Money paid	4	2.50
<GH¢0.50	13	8.13
GH¢0.50-GH¢1.00	73	45.63
>GH¢1.00	23	14.37
No Response	47	29.37
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Availability of means of transport is aggravated by the infrequent nature of vehicles plying roads in the District. This serves as a contributory factor for the low accessibility to health facilities in the study area, since it tends to reduce the number of trips made by pregnant women. This is as a result of the poor transport infrastructure in the District. It was revealed by respondents (37.50percent) that, vehicles ply their communities on a weekly basis. About 32.50percent of respondents also indicated that, vehicles ply their roads on a daily basis. Details are presented in Table 5.11. The result of this situation is a reflection of how difficult it is to come by vehicles in the district. It was however

observed by respondents that, access to vehicles especially on market days was relatively easy and assured. These finding therefore authenticates the finding of Hine and Ruter (2003) that the availability of transport services is dependent on the quality of road infrastructure.

Table 5.11: Frequency of Vehicle Plying roads

Frequency of Vehicle Plying Roads	Frequency	Percentage
Every Hour	7	4.37
Everyday	52	32.50
Every 3 days	14	8.75
Weekly	60	37.50
Occasionally	6	3.75
No Response	21	13.13
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Access to health facility is also said to be compromised by the distance to the health facility. Information gathered showed that, 20.00percent of respondents travel less than 1km to access a health facility. This is mostly from respondents who lived in the same vicinity where the health facility is located. Also, about 30.00percent of respondents travel distances between 1km to 5km to access health facilities. The range of distance between 6km to 10km is traveled by 17.50percent of the respondents while 2.50percent travel distances between 26km to 30km (refer to Table 5.12).

Table 5.12: Distance to health facility

Distance to Health Facility	Frequency	Percentage
<1km	32	20.00
1-5km	48	30.00
6-10km	28	17.50
11-15km	22	13.75
16-20km	23	14.38
21-25km	3	1.87
26-30km	4	2.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Despite the fact that access to health facility is compromised by distance to the health facility, Table 5.13 shows that, 81.25percent of respondents see transport a major constraint to their ability to access health care. They further cited bad nature of roads, and inadequate means of transport as the other factors resulting in their delay in accessing health care. These factors together as well as result in tiredness due to the fact that they walk long distances to access health care. In spite of this, 17.50percent of respondents indicated that transport was not a constraint to their inability to seek health care.

Table 5.13: Transport as a major constraint

Response	Frequency	Percentage
Transport as a constraint	130	81.25
Transport not a constraint	28	17.50
No Response	2	1.25
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

5.7 Accessibility Analysis

According to Ouman and Herselman (2008), the state of local communities in rural areas can be categorized as inadequate, since the quality of medical care provided in rural areas has generally been perceived to be substandard to that of the urban settings. The reason being that, rural inhabitants are in general more likely than urban inhabitants to have lower educational achievement, experience high unemployment, and live in poverty. They further agued that, when it comes to access to health care, the rural population has been viewed as vulnerable with respect to access because of poorly developed and fragile health infrastructure, high prevalence rate for chronic illness and disability, socio economic hardships and physical barriers such as distance including lack of public transportation. Access to quality care is therefore important to eliminating health disparities among people in both urban and rural areas.

An accessibility analysis is carried out to give a pictorial view of how services or facilities are located in an area. This enables us to locate them in a best way to provide equitable growth by increasing the access of the population living in an area or settlement to functions that are located in central space. With regards to this study consideration is given to physical accessibility to health facilities in the Gushegu District.

5.7.1 Physical Accessibility

Physical accessibility is the amount of time and the distance with which people must cover one place (origin) to another (destination) to enjoy a facility and back. Measuring physical access of individuals and population to health facilities or other public services is crucial in planning the opening of new, evaluating programs impact and understanding changes in fertility and mortality (Rosero-Bixby, 1993). Besides displaying accessibility information on maps, it is essential to describe a situation to have a feeling of topological relationships and facilitate the use of information by decision makers.

Based on the fact that the main mode of transport in the District is by roads and footpaths, of which most of them (roads and footpaths) are difficult to move on in the rainy season.

This therefore serves as an impediment for accessing health care. Also distance and unavailable suitable means of transport to health facilities also contribute to the reduction in access to health care. The survey revealed that, the main means of transport used to the health facilities in the district is by the use of bicycle. However, walking is considerably done if the health facility is not far from homes.

An accessibility map to the health facilities in the District was prepared to give a vivid view to the nature of accessibility to health facilities in the District. In the preparation of the accessibility map, accessibility standards with respect to travel time to health facilities was adopted from a guide on District poverty profiling and mapping by Nkum and Associates. The guide indicates that that, for a client to be within high access of a higher health facility (Hospital) the maximum time travelled should be 30 minutes and for a lower level health facility say Health center, Community Health Planning Services (CHPS) and Clinics it is 20 minutes.

They further indicated that travelling along a second class road with a vehicle is at a maximum speed of 45km/hr. along a third class road is at a maximum speed of 20km/hr. Traveling by foot is 4km/hr on a footpath. The concept is based on time spent and distance covered in the course of travelling. Consideration is also given to the nature of the existing road network and medium of transport available. Based on the standards provided and the scale of the map, the maximum distances to be covered on each road are calculated as follows:

- **Travelling to the Hospital**

Travelling (by vehicle) along the 2nd class road at 45 km/hr, the maximum distance that one can travel to reach the hospital within 30 minutes is calculated as:

60 minutes = 45 km
30 minutes = 45x30/60 = **22.5 km**

This implies that all those within 22.5km away from the hospital along the 2nd class road can access the hospital within 30 minutes. Those beyond 22.5km on this class of road have low access to the hospital. Similarly, travelling along the 3rd class road at a rate of 20 km/hr the maximum distance that one can travel to reach the hospital within 30 minutes is calculated as:

60 minutes = 20 km

30 minutes = 20x30/60 = **10 km**

This implies that all those within 10.0km away from the hospital along the 3rd class road can access the hospital within 20 minutes. Those beyond 10.0km on this class of road have low access to the hospital.

For those travelling along by foot at 4km/hr, the maximum distance one can travel to reach the hospital in 30 minutes is calculated as:

60 minutes = 4 km

30 minutes = 4x30/60 = **2 km**

Converting the results of the above calculations from ground distances to map distances, using the scale of the map. Given a scale of 1:500,000 (1 cm to 5 km), the above results can be converted to map distances as follows:

22.5 km is equivalent to 22.5/5 = **4.5 cm**

10 0 km is equivalent to 10.0/5 = **2.0 cm**

2.0 km is equivalent to 2.0/5 = **0.4 cm**

- **Travelling to the lower health facilities (Health Center and CHPS zones)**

Travelling (by vehicle) along the 2nd class road at 45 km/hr, the maximum distance that one can travel to reach the hospital within 20 minutes is calculated as:

60 minutes = 45 km

20 minutes = 45x20/60 = **15.0 km**

This implies that all those within 15km away from the hospital along the 2nd class road can access the hospital within 20 minutes. Those beyond 15km on this class of road have low access to the hospital.

Also, travelling along the 3rd class road at a rate of 20 km/hr the maximum distance that one can travel to reach the hospital within 20 minutes is calculated as:

60 minutes = 20 km

20 minutes = 20x20/60 = **6.7km**

This implies that all those within 6.7km away from the hospital along the 2nd class road can access the hospital within 20 minutes. Those beyond 6.7km on this class of road have low access to the hospital.

Travelling along by foot at 4km/hr, the maximum distance one can travel to reach the hospital in 20 minutes is calculated as:

60 mins = 4 km

20 mins = 4x20/60 = **1.33km**

Converting the results of the above calculations from ground distances to map distances, using the scale of the map. Given a scale of 1:500,000 (1 cm to 5 km), the above results can be converted to map distances as follows:

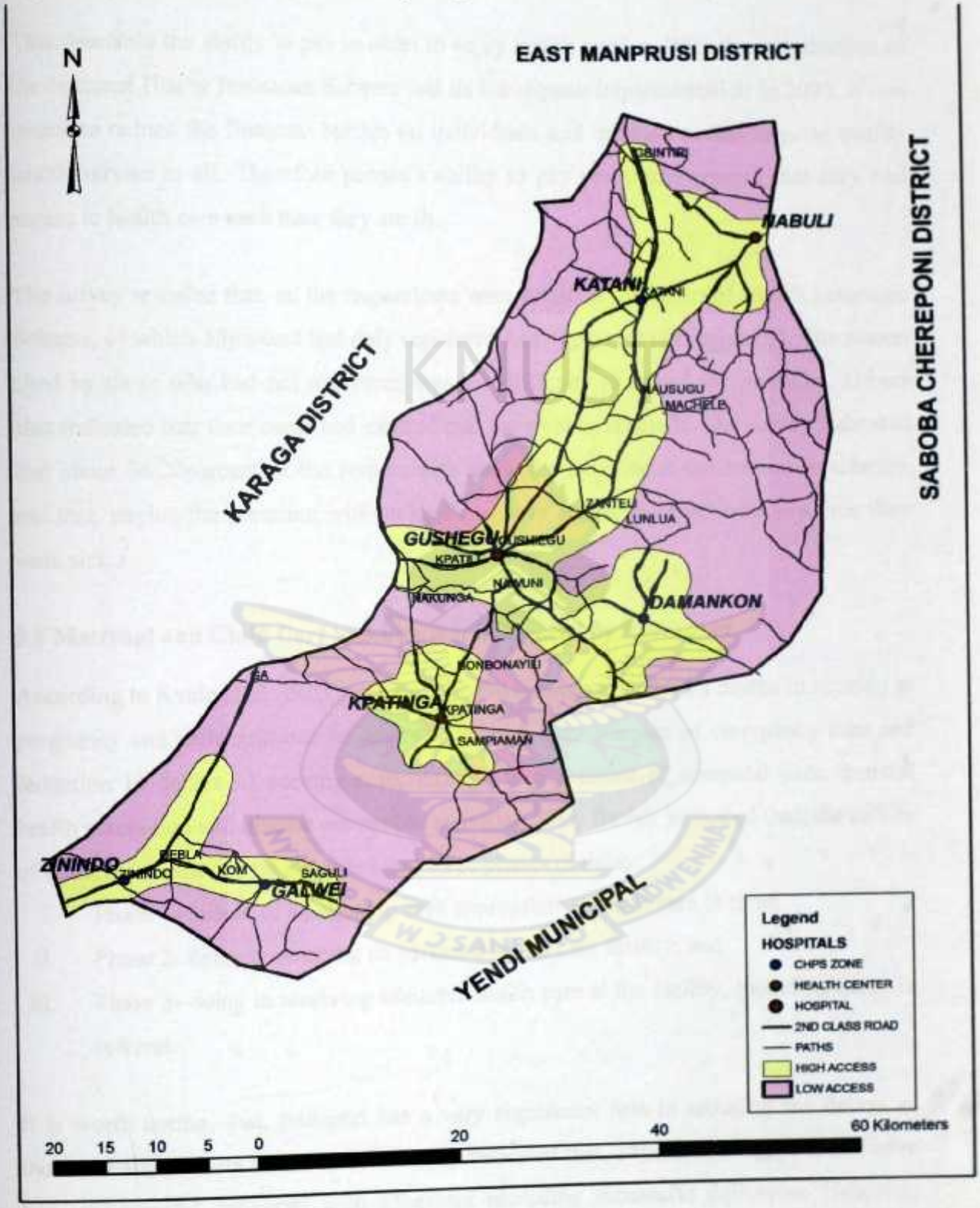
15 km is equivalent to 15/5 = **3.0 cm**

6.7 km is equivalent to 6.7/5 = **1.3 cm**

1.33 km is equivalent to 1.33/5 = **0.3 cm**

Map 5.1 shows an optimum accessibility to health facilities in the Gushegu District. This map was prepared based on the above calculations and using the thread measurement method since the roads are not straight.

Map 5.1: Health Facilities Accessibility Map



Source Authors Construct, 2009.

5.7.2 Financial Accessibility

This describes the ability to pay in order to enjoy health service. With the introduction of the National Health Insurance Scheme and its subsequent implementation in 2005, it was meant to reduce the financial burden on individuals and increase access to good quality health service to all. Therefore people's ability to pay premiums ensures that they had access to health care each time they are ill.

The survey revealed that, all the respondents were aware of the National Health Insurance Scheme, of which 55percent had duly registered and 45percent not registered. The reason cited by those who had not registered was the difficulty to afford the premium. Others also indicated that their cards had expired and were yet to renew it. The survey indicated that about 96.20percent of the respondents knew the benefits of the insurance scheme, and that, paying the premium will enable them have access to health care any time they were sick.

5.8 Maternal and Child Care and how it is influenced by Transport

According to Kvale et'al (2005), reduction in the number of maternal deaths in relation to pregnancy and childbirth can be achieved through improvement of emergency care and reduction in delays of seeking care, through improvement of antenatal care, general health promotion and disease prevention activities. They further indicated that, the causes of maternal deaths can be classified into three phases of delay:

i. Phase 1- failure of a patient to seek appropriate medical care in time;
ii. Phase 2- delay in reaching an adequate health care facility; and
iii. Phase 3- delay in receiving adequate health care at the facility, including delay in referral.

It is worth noting, that, transport has a very significant role in reducing the delays as indicated above. Data from the field survey indicated that, 34percent of respondents have had unsuccessful deliveries with 65percent recording successful deliveries. However, 25percent of those who recorded unsuccessful deliveries stated that, the number of times

it happened to them ranged between one (1) and 6 times. Details are presented in Table 5.14. Reasons for unsuccessful deliveries could be attributed to a number of factors. Majority of the respondents who had ever registered unsuccessful deliveries indicated it was as a result of still birth and breach labour. These situations will therefore require an efficient rural transport system to seek medical care at the health facilities before further complications could result. Poor nutrition of Children was also indicated a contributory factor to the death of children.

Table 5.14: Number of Unsuccessful Deliveries

No. of Unsuccessful deliveries	Frequency	Percentage
1-2	40	25.00
3-4	10	6.25
5-6	6	3.75
No Response	104	65.00
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

However, Table 5.15 reveals that, 49.37percent of respondents who had recorded successful deliveries adduced it to the fact that they frequently went for antenatal care and also belief that, God had granted them his mercies. In addition, about 9.37percent of them indicated that given birth at the health facility was the reason why they never recorded any unsuccessful deliveries.

Table 5.15: Reason for Successful Deliveries

Reason for Successful deliveries	Frequency	Percentage
Frequent ANC and God's Mercies	79	49.37
Giving birth at the Health facility	15	9.37
Trained TBA help me during delivery	4	2.50
Usually don't have complications during delivery	1	0.63
Herbal Medicine taken during pregnancy	4	2.50
No Response	57	35.63
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Antenatal care is a prerequisite to ensuring safe deliveries of pregnant women and avoiding maternal deaths. The survey revealed that, 94.40percent of respondents visited the health facility for antenatal care during pregnancy despite the challenges they faced. About 5.60percent indicated that they did not go for antenatal care. This was adduced to the fact that, health facilities were far, others did not have money to pay for hospital bills and the inadequate means of transport to facilitate their movement.

Table 5.16 shows that, more than half (52.50percent) of respondents mentioned inadequate transport as the major challenge they face when accessing antennal care. This situation is worse in the rainy season since some of the roads a completely unmotorable. Additionally, the only means of transport (bicycle) in the house might be taken to the farm. This leaves them no option than to walk, of which 18.75percent of respondents complain of tiredness, 17.50percent indicated that they did not face any problem since they did not stay far away from the health facility. This revelations goes to support the fact that, transports role in reducing maternal deaths is crucial.

Table 5.16: Challenges Respondents face going for Antenatal care

Challenges	Frequency	Percentage
No challenge faced health facility is near and available means of transport	28	17.50
Inadequate means of transport in the community	84	52.50
Tiredness as a result of walking	30	18.75
Money to pay for hospital bills	7	4.38
Long Waiting time during ANC and poor handling by nurses	7	4.37
No Response	4	2.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

The Government of Ghana in its efforts to reduce maternal mortality instituted the free care for women during pregnancy. This policy is meant to reduce the financial burden on families which will serve as encouragement to them to go for antenatal care and eventually reduce maternal mortality. It was revealed from the survey that, 80.6percent of respondents were aware of the policy. Out of the proportion of respondents, about 44.37percent of them indicated that they got the information from health personnel during antenatal care whiles 10.63percent heard the information from other colleagues as can be seen in Table 5.17.

Table 5.17: Place of Information

Place of Information	Frequency	Percentage
During ANC(from health personnel)	71	44.37
From other women	17	10.63
From radio announcement	26	16.25
Information service Vans	15	9.37
No Response	31	19.38
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Additionally, 80percent of respondents said that, the policy has encouraged them to go for antenatal care, with 74.37percent of them stating that it was because they will not pay for the antenatal care as it reduces the financial burden on them (refer to Table 5.18). It is therefore regarded as a good policy and should be continued as it has the potential to reducing maternal and child mortality.

Table 5.18: Reasons why Policy Encourages going for Antenatal Care

Response	Frequency	Percentage
I won't pay for Antenatal Care	119	74.37
Antenatal care concerns my health and unborn child, I will go at all cost	6	3.75
I won't pay for Antenatal care and because it concerns my health and unborn child, I will go at all cost	2	1.25
No Response	33	20.63
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

With regards to place of birth, the survey however revealed that 33.75percent of respondents indicated that they usually give birth at the health facility, 49.37percent at home, while 16.88percent give birth either at home or health facility (refer to Table 5.19). Distance to the health facility was an indication to the reason why they give birth at home, additionally there is no convenient means of transport to the health facility. They however, go to the health facility if complications occur during delivery.

Table 5.19: Place of Birth

Place of Birth	Frequency	Percentage
Health facility	54	33.75
At home	79	49.37
Both Health facility and At home	27	16.88
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Also, 30.00percent of respondents indicated that, they suffered some complications during child birth of which they were referred to higher level health facilities. However, the means of transport used to the health facility ranged from bicycle, motor bike and cars of which ambulance is included.

The study further revealed that, some of the respondents indicated that, their preferred place of birth was the health facility. This is because they were assured of been provided with proper care before and after birth. Table 5.20 shows that 59.37percent of respondents preferred to deliver at the health facilities whiles 40.63percent preferred to deliver at home since they had traditional birth attendants available in the community, and will only go to the health facility when they develop complications.

Table 5.20: Preferred Place of Birth

Place of Birth	Frequency	Percentage
At home	65	40.63
At the Health facility	95	59.37
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

With regard to child care the survey revealed that, 88.1percent of respondents practiced exclusive breast feeding, 9.4percent did not practice it (refer to table 5.21). The reasons adduced were that, it was their normal practice of feeding their children with water and breast milk at the same time. Others also indicated that, sometimes they go to fetch firewood and in doing so they give the baby water until they return from the farm, while some simply displayed ignorance of not knowing what exclusive breast feeding was.

Table 5.21: Practice of Exclusive Breast Feeding

Response	Frequency	Percentage
Exclusive Breast feeding Practiced	141	88.12
Exclusive Breast feeding not Practiced	15	9.38
No Response	4	2.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

The importance of practicing exclusive breast feeding for the first six months after a child's birth can not be overemphasized. However, other factors also contribute to ensuring that the newly born children are healthy and therefore reduce child mortality. According to UNICEF (2006), immunization plays a key role in achieving reduction of child mortality. This is because children are immunized against vaccine preventable diseases that are likely to cause their death before the age of five (5).

Table 5.22 reveals that 95.62percent of respondents immunized their children whiles 1.88percent did not. They indicated that, they usually bath their children herbs, but only immunize them during the national immunization programmes organized. This leaves their children prone to diseases that will affect their health and eventual death.

Table 5.22: Immunization of Children

Response	Frequency	Percentage
Children Immunized	153	95.62
Children not Immunized	3	1.88
No Response	4	2.50
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

It was further revealed that the means of transport to the health facilities for immunization was a problem. This eventually discouraged women from going to

immunize their children. Respondents indicated that, they usually immunize their children at the health facilities. They in some cases immunize them when the health personnel come on outreach service. Details of the means of transport used to the health facilities are indicated in Table 5.23. It revealed that 35.0percent of them usually walked, 37.5percent used bicycle. In some cases vehicles are used, this is often on market days.

Table 5.23: Means of Transport to Health Facility for Immunization

Means of Transport	Frequency	Percentage
Walking	56	35.00
Bicycle	60	37.50
Motor bike	3	1.88
Car/bus/truck	11	6.88
Both Walking and Bicycle	14	8.75
Both Walking and Car	1	0.63
Both Bicycle and Car	2	1.25
Both Bicycle and Motor bike	8	5.00
No Response	5	3.13
Total	**160**	**100.00**

Source: Field Survey. April, 2009.

Forster (2008) in his presentation at the International Forum for Rural Transport and Development (IFRTD) Conference on Transport Solutions for Access to Health care in Rural Africa indicated that, access to efficient, affordable and safe transport in the developing world is limited and directly impacts the ability of individuals to seek timely health services. His assertion reflects the situation in the study area which calls for measures to increase accessibility of health care by people in the rural areas. The implementation of the outreach service system which is practiced by all the districts is one way of improving access to rural dwellers.

The contribution of Traditional Birth Attendants in health care delivery can not be overemphasized as they are the first point of contact at the community level, providing

care for women at birth and after birth. The survey revealed that, 75percent of traditional birth attendants interviewed had received some additional training from the District Health Directorate, while 25percent had not received any training. It was also revealed that all of them have been practicing for a period of 10 years and beyond.

They further indicated that the most common complications during birth included breach presentation, bleeding after birth and prolonged labour. The Traditional Birth Attendants indicated that, patients are referred to the nearest health facility if complications occur. The issue of inadequate transport was indicated as the cause of delay in getting to the health facility, which is detrimental to the health of both mother and child. Further discussions with the TBAs indicated that the issue of inadequate equipment hampered their work. They however indicated that some equipment in the form of aprons and hand gloves detergents as this will ensure reduced infection of both mother and child.

5.9 Situation of Outreach Service

Outreach services are carried out by health facilities in the rural areas of the country. This is done as part of their mandate to make health care accessible to the people living far from health facilities in the rural areas. The health facilities in the Gushegu District are no exception, due to inadequate health facilities in the District. All the communities in the district are to be reached by health personnel every month to provide them with both curative and preventive services.

The various health facilities in the District have a number of communities they are supposed to visit in a month. Due to transport constraints and inadequate health personnel, outreach points are created in each catchment area. These points are located in such a way that community members easily have access to them. Table 5.24 shows the health facilities and the number of outreach points.

Table: 5.24: Health facilities and their number of out reach points

No.	Health Facility	Number of Communities	Outreach points
1.	Gushegu	141	25
2.	Katani	70	15
3.	Kpatinga	35	15
4.	Zinindo	5	5
5.	Galwei	19	19
6.	Nabuli	70	12
7.	Damankon	12	12
Total		**352**	**103**

Source: Gushegu District Health Directorate, 2009.

Data from the field survey indicated that, all the health facilities duly carried out outreach services as expected of them. It revealed that, health personnel of the Zinindo health facility go for outreach 4 times a month. This signifies that they are able to visit at least four outreach points out of the five (5). Health personnel at Gushegu and Kpatinga health facilities go for outreach services eight times in a month. This falls short, since they cover less than half of their outreach points.

Also the Katani health facility is able to go on outreach nine (9) times in a month, Galwei Health Facility, once (1) in a month, Damanko Health facility, four (4) times in a month and Nabuli Health facility, two (2) times in a month. It is quite clear that, most of the health facilities are unable to visit all their out reach points as expected of them; but it is important to indicate that the Nabuli Health facility is at the moment closed down as a result of stealing and murdering of a health personnel which occurred 3 years ago.

The inability to visit all outreach points was said to be a result of the inadequate means of transport, health personnel and insufficient funds. However, almost all outreach services carried out by the health facilities is done by the use of motor bikes except for the Gushegu health facility that sometimes use a car. The amount that is spent per outreach service varies from one health facility to another due to the differences in distance between communities. It ranges between GH¢6.00 to GH¢12.00. The number of health personnel involved, ranges between one (1) and four (4) per each outreach service.

5.9.1 Challenges of Outreach service

The survey also revealed that health personnel faced some challenges in providing outreach services for communities. Below are some of these challenges:

i. The frequent breakdown of their motorbikes is a major source of worry to the health personnel as this delays their movement to and from communities. It also leaves them at risk especially if the motorbikes become faulty in the middle of their journey without a community being near;

ii. They further complained of insufficient fuel allocated to them. This they said was just not enough to visit their intended number of communities per outreach;

iii. Issues' regarding allowances was also mentioned as a challenge. This they said was not provided and as such did not motivate them enough to give out their best during outreach services; and

iv. The poor nature of the roads was also a major constraint to them. The situation has resulted in some communities being referred to as hard to reach especially in the rainy season.

The above constraints if solved will contribute to increasing accessibility to health care by the people in the rural communities in the District.

5.10 Statistical Significance Tests of Relevant Transport Variables

Access to the health facilities can be measured using the following transport related variables namely:

i. Mode of Transport to the health facility;

ii. Travel time to the health facility; and

iii. Cost of transport.

Considering the fact that in earlier discussions, maternal and child deaths are attributed to three (3) phases of delays to the health facility. The above transport related factors contribute to the second phase of delay which is delay in reaching an adequate health care facility.

Statistical test on these variables is carried out to find their significance to the second face of delay. The chi square as a statistical tool was used to establish the fact that the responses that were collected were not due to chance. It was also used test the significance of identified transport variables to the second phase of delay.

The null hypothesis of the mode of transport is that, bicycle is the main mode of transport to health facility while the alternate hypothesis is that bicycle is not the main mode of transport to the health facility. Results of the chi-square shown in Table 5.25 indicates that the null hypothesis is supported, as the statistical test points out a high chi square (chi-square = 138.000) and a significance probability of $p<0.000$. This result confirms the fact that bicycle is the dominant mode of transport to health facility as indicated by data gathered from the field. Since the bicycle mode has a large discrepancy between the observed and expected values as indicated in the residual column. It also supports literature by Heyen-Perchen (2005) which states that bicycles are prevalent in the northern part of Ghana.

Table 5.25:Chi-square of Modes of Transport to Health Facility

Modes of Transport	Observed N	Expected N	Residual
Walking	34	20.0	14.0
Bicycle	63	20.0	43.0
Motor Bike	10	20.0	-10.0
Car/Lorry/Truck/Buses	20	20.0	.0
Both Walking and Bicycle	14	20.0	-6.0
Both Bicycle and Motor Bike	9	20.0	-11.0
All Walking, Bicycle, and Motor Bike	3	20.0	-17.0
Both Bicycle and Motor Bike	7	20.0	-13.0
Total	160		
Chi-square		**138.000**	
Significance		**0.000**	

The mode of transport and nature of the roads determine the travel time in getting to health facilities to enjoy services provided. A chi-square test was also used to determine its significance to maternal and child mortality. The null hypothesis is that, time spent in reaching health facility causes delay in reaching an adequate health care facility. The alternate hypothesis is that time spent in reaching health facility does not cause delay in reaching an adequate health care facility.

According to the results shown in Table 5.26, the hypothesis of time spent in reaching health facility causing delay was supported, as the test statistic (Chi-square = 260.675) is highly significant ($p<0.000$). The highly significant result is not surprising given the large discrepancy between the observed and expected values as indicated in the residuals column. In this context more people spent more than 35 minutes. Therefore, time spent in getting to the health center causes delay in reaching health facility which Kavale et'al (2005) indicated that was a cause to maternal death. This implies that time spent in getting to the health facility is a contributory factor to maternal and child mortality.

Table 5.26: Chi-square of Time spent in getting to Health Facility (Travel time)

Response	Observed N	Expected N	Residual
<20minutes	24	26.7	-2.7
21-25minutes	8	26.7	-18.7
26-30minutes	18	26.7	-8.7
31-35minutes	7	26.7	-19.7
>35minutes	101	26.7	74.3
No Response	2	26.7	-24.7
Total	160		
Chi-square		**260.675**	
Significance		**0.000**	

Transport cost is also a disincentive to pregnant women and lactating mothers to visit the health facility. A chi square test shown in Table 5.27 confirms that transport cost was significant and therefore a contributory factor to maternal and child mortality. The test statistic (chi- square= 97.875) is highly significant with $p<0.000$. The statistical test goes to authenticate the findings in literature of Kalume (2000) that inadequate of transport services and transport cost are important reasons why people do not use health care service, especially services requiring a referral. It also shows that majority of respondents pay transport fares between GHp50 and GH¢1.00, therefore authenticates data collected from the field.

Table 5.27: Chi-square of Amount per trip (Transport Cost)

Response	Observed N	Expected N	Residual
No Money paid	4	32.0	-28.0
<GHp50	13	32.0	-19.0
GHp50-GHc1.00	73	32.0	41.0
>GHc1.00	23	32.0	-9.0
No Response	47	32.0	15.0
Total	160		
Chi -square		**97.875**	
Significance		**0.000**	

The importance of transport to maternal and child mortality is proved by the chi-square test of the identified transport related variables. The implication of them showing significance in the test proves that transport is vital in the reduction of maternal and child mortality.

5.11 Independent Sample T-Test

The independent sample T-test is used to compare the effect of rural transport and maternal and child mortality. Some related rural transport indicators such as transport cost, travel time and mode of transport are considered for test.

The independent sample T-test is used to compare the effect of transport cost and maternal and child mortality. Results of the T-test are shown in Table 5.28.

Considering the one sample test above, the null hypothesis is that there is no relationship between transport cost and maternal mortality. While the alternate hypothesis is that there is a relationship between transport cost and maternal mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance of ≤ 0.08 provide evidence against the null hypothesis while those with significance > 0.08 provide enough evidence in favour of the null hypothesis. Results of

the One-Sample Test shown in Table 5.28 however indicates t-value (5.745) for maternal mortality with significance probability of $p<0.010$ and a t-value of 21.629 for transport cost and a significance probability of $p<0.000$. This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample, transport cost and maternal mortality are related.

Table 5.28: One-Sample Test of Maternal Mortality and Transport Cost

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Maternal mortality	5.745	3	.010	2.75000	1.5027	3.9973
Transport cost	21.629	159	.000	4.77500	4.3860	5.1640

In a similar vain, with regards to child mortality and transport cost. The null hypothesis is that there is no relationship between transport cost and child mortality. While the alternate hypothesis is that there is a relationship between transport cost and child mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance of ≤ 0.08 provide evidence against the null hypothesis while those with significance > 0.08 provide enough evidence in favour of the null hypothesis. However, the one-sample test of transport cost and child mortality as indicated in Table 5.29 shows a t-value (21.629) for transport cost and a significance of $p<0.000$, also a t-value of 3.873 for child mortality and a significance probability of $p<0.030$. This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample, transport cost and child mortality are related.

Table 5.29: One-Sample Test of Child Mortality and Transport Cost

	Test Value = 0					
	t	Df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Transport cost	21.629	159	.000	4.77500	4.3860	5.1640
Child mortality	3.873	3	.030	2.50000	.8182	4.1818

Additionally, the one sample test for travel time and child mortality is indicated in Table 5.30 gives details of the t-test. The null hypothesis is that there is no relationship between travel time cost and child mortality. While the alternate hypothesis is that there is a relationship between travel time and child mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance probability of ≤ 0.08 provide evidence against the null hypothesis while those with significance probability > 0.08 provide enough evidence in favour of the null hypothesis.

However, the one-sample test of travel time and child mortality as indicated in Table 5.30 presents t-value (31.493) for travel time and a significance probability of $p<0.000$, also a t-value of 3.286 for child mortality and a significance probability of $p<0.046$. This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample, travel time and child mortality are related.

Table 5.30: One-Sample Test of Child Mortality and Travel time

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Time spent in getting to Health Facility	31.493	159	.000	4.03125	3.8057	4.2568
Child mortality	3.286	3	.046	3.00000	.6216	5.3784

Also a one sample test of travel time and maternal mortality is shown in Table 5.31. The null hypothesis is that, there is no relationship between travel time and maternal mortality. While the alternate hypothesis is that there is a relationship between travel time and maternal mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance probability of ≤ 0.08 provide evidence against the null hypothesis while those with significance probability of > 0.08 provide enough evidence in favour of the null hypothesis.

The one-sample test of travel time and Maternal mortality as indicated in Table 5.31 shows t-value (31.493) for travel time and a significance probability of $p<0.000$, also a t-value of 5.745 for maternal mortality and a significance probability of $p<0.010$. This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample; travel time and maternal mortality are related.

Table 5.31: One-Sample Test of Maternal Mortality and Travel time

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Time spent in getting to Health Facility	31.493	159	.000	4.03125	3.8057	4.2568
Maternal mortality	5.745	3	.010	2.75000	1.5027	3.9973

The mode of transport by which one travels has an influence on the travel time. A one sample t-test is used to test the hypothesis, which is indicated as, there is no relationship between mode of transport and child mortality as null hypothesis. While the alternate hypothesis is that there is a relationship between mode of transport and child mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance probability of ≤ 0.08 provide evidence against the null hypothesis while those with significance probability of > 0.08 provide enough evidence in favour of the null hypothesis.

The one-Sample test of mode of transport and child mortality as indicated in Table 5.32 shows t-value (19.521) for mode of transport and a significance probability of $p<0.000$, also a t-value of 3.286 for child mortality and a significance of $p<0.046$ This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample, mode of transport and child mortality are related.

Table 5.32: One-Sample Test of Mode of Transport and Maternal Mortality

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Mode of Transport to Health Facility	19.521	159	.000	2.94375	2.6781	3.2094
Child mortality	3.286	3	.046	3.00000	.6216	5.3784

Furthermore, with regards to mode of transport and maternal mortality, the one sample test is shown in Table 5.33. Given the null hypothesis as that, there is no relationship between mode of transport and maternal mortality. While the alternate hypothesis is that there is a relationship between mode of transport and maternal mortality. The criterion of acceptability of the test results is the 0.08 significance probability. Test values with significance of ≤ 0.08 provide evidence against the null hypothesis while those with significance > 0.08 provide enough evidence in favour of the null hypothesis.

All the same, the one-Sample test of mode of transport and maternal mortality as indicated in Table 5.33 shows t-value (19.521) for mode of transport and a significance probability of $p<0.000$, also a t-value of 5.745 for maternal mortality and a significance probability of $p<0.010$. This therefore provides evidence against the null hypothesis. The implication of this is that, the null hypothesis is rejected, on the basis of the sample. Hence there is a relationship between mode of transport and maternal mortality.

Table 5.33: One-Sample Test of Mode of Transport and Maternal Mortality

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	92percent Confidence Interval of the Difference	
					Lower	Upper
Means of Transport to Health Facility	19.521	159	.000	2.94375	2.6781	3.2094
Maternal mortality	5.745	3	.010	2.75000	1.5027	3.9973

5.12 Summary

This chapter has been a presentation of the analysis of the relevant data collected from the field. Key relevant data to the study was analyzed and discussed. This was done taking into consideration the objectives of the study. Some of the issues discussed include the socio-demographic characteristics of respondents, health seeking behavior of households, situation of rural transport, role of transport in accessing health care, accessibility analysis, influence of transport on maternal and child care, and situation of outreach services by health personnel in the district. Also a chi-square test, and independent sample T-test was carried out taking into consideration some relevant transport indicators. This was to establish the relationship between rural transport and maternal and child mortality in the Gushegu District. These issues discussed served as basis for drawing findings and making relevant recommendations.

The next chapter focuses mainly on presenting the findings and recommendations of the study. It also gives a general conclusion to the study.

CHAPTER SIX
FINDINGS, RECOMMENDATION AND CONCLUSION

6.1 Introduction

This chapter presents summary of key findings from the analytical discussions in the previous chapter. The main objective of this study was to examine the relationship between rural transport, child and maternal mortality and to propose measures for improvement. The survey has taken place during a period when there has been growing concern as to whether the country will be able to achieve the millennium development goals by 2015, considering the fact that NDPC (2006) indicated in their annual progress report of the Ghana Poverty Reduction Strategy that, progress in achieving targets of reducing child mortality (goal 4) and improving maternal health (goal 5) is slow.

The major problem facing health care delivery in the country especially in rural areas is the issue of access to health facilities. This situation has been worsened by the poor nature of transport infrastructure and services in rural areas.

The chapter is presented in three parts. Part one is a presentation on the findings which are based on the objectives of the study. Part two presents conclusion to the study while the last part is a presentation of the recommendations resulting from the study finding which are directed at ensuring development of rural transport and improving on access to health care delivery.

6.2 Study Findings

The major study findings in this section were from a careful analysis of both secondary and primary data relevant to the study. These findings serve as presentation of highlights from the study which serves as an impetus for recommendations and future research.

- **Objective One**

Examine the nature of rural transport and its effect on maternal and child mortality in the study area.

Issues that were considered under this section include rural transport infrastructure and services. It was found that, the general nature of transport infrastructure in the District was regarded as poor. This is because the presence of pot holes on the surfaces of the main trunk and feeder roads, narrow nature of some of the feeder roads make it difficult for two vehicles to move at a time. These roads are also poorly drained causing gully erosion any time it rains. The situation makes it difficult and sometimes impossible for vehicles to ply. This has resulted in the presence of low volume of vehicles in the district.

The survey also found that, foot bridges were constructed in areas on roads and paths that are impassable during the rainy season. This ensured that communities could still have access to basic services like health care services during the rainy season.

It was also found that, there was no properly constructed lorry station in the District. As a result of this, the Gushegu Township has become congested with vehicles parking in any available parking space. This hampers free flow of traffic especially on market days.

It was further found that, maintenance culture of these transport infrastructure in the District has been very poor. Maintenance of these infrastructure are only carried out occasionally, with funds provided by the Government of Ghana through the feeder roads departments. There is no allocation of funds in the District Assembly budget for road maintenance in the District. The District relies on funds from some development partners to maintain their roads.

With regards to transport services in the District, it was found that the main modes of transport are by either walking or riding of bicycle. It was further found that, the volume of motorized transport in the district was not enough to provide the required service to the

people of the district. This situation has come about as a result of the poor state of the roads in the district as it contributes to high maintenance cost of these vehicles. This therefore discouraging transport operators to ply the roads.

- **Objective Two**

Identify and examine the nature of accessibility to health facilities and its impact on maternal and child mortality in study area.

From the review of literature and data gathered from the field, it was found that, physical accessibility to health care delivery was a major problem in the District. The survey found that, about 20percent of respondents travel a distance of less than 1km to access health care which is an indication of high access to health care service. About 30percent of respondents travel a distance between 1-5km to access health care, while 50percent travel distances more than 5km to access health care. This situation goes to document that, about half of the respondents did not readily have access to health care in the district. Additionally, 67.40percent of respondents spend more than 30 minutes before they get to the health facility, which is also a reflection of low access to health facility.

It was further revealed that, though access to health facility is hampered by distance, issues of inadequate transport have aggravated the situation as women complain of transport as the major constraint to visiting the health facility for antenatal, and post natal care. However, they go to the health facility by either walking or use of bicycle, since antenatal and post natal care concerns their health and that of their children.

The implementation of the National Health Insurance Scheme was to reduce the financial burden on households, hence improving their access to health care in terms of financial access. However, the study found that, 45percent of respondents did not register, thereby could not have access to health care delivery.

It was also found that about 59.37percent of women preferred to give birth at the health facility, but due to the inadequate transport services, 40.63percent of them give birth at home. This does not auger well for reducing maternal deaths. This is because in case of emergency situations, delays to the health facility for obstetric care can increase the chances of losing the patient.

A chi-square test of travel time, transport cost and mode of transport which are transport related variables proved significant whiles, the independent sample T-test of the transport related variables and maternal and child mortality also showed significance. This therefore gives an indication that there is a relationship between transport related variables and maternal and child mortality. This however, suggest that transport is very important in reducing maternal and child mortality in the Gushegu District.

- **Objective Three**

Assess the nature of outreach service by health facilities and how transport facilitates the service.

The survey found that, all the seven health facilities could not visit their outreach points in a month as expected of them. It was also found that, outreach service by these health facilities was done by the use of motor bikes. The number of motor bikes per health facility was however inadequate coupled with their weak state.

The study also found that, the number of health personnel was inadequate, hence contributing to their inability to visit all their outreach points in a month. Additionally, it was found that, the inadequacy of motivation in the form of allowances did not encourage health personnel to give off their best.

6.3 Study Recommendations

Based on the findings from the analysis, the following recommendations are made to improve the role of rural transport improving access to health care thereby contributing to

the reduction of maternal and child mortality, and achieving the millennium development goals.

6.3.1 General Recommendations

i. Ensure continuous maintenance of road infrastructure especially those leading to health facilities by providing budgetary allocations for it in the District Assembly Common Fund (DACF);

ii. Provide ambulance services or immediate means of transport such as the motorized tricycle at all health facilities to aid in referral of patients to higher level health facilities;

iii. Provide safety gears such as aprons, hand gloves and detergents for the use of traditional birth attendants. This will reduce infections during deliveries that they handle at the community level;

iv. Ensure continual maintenance of vehicle mix of health facilities as it will facilitate movement of health personnel during outreach services;

v. Provide incentives in terms of allowances for health personnel during outreach services. This will motivate health personnel to give out their best;

vi. Continuously carry out campaigns on exclusive breast feeding, immunization of children, personnel hygiene and environmental cleanliness. As it will minimize the occurrence of diseases within households; and

vii. Encourage the formation of transport unions under the Ghana Private Road Transport Union (GPRTU) and Progressive Road Transport Owners Association (PROTOA) to enable easy monitoring of the activities of drivers.

6.3.2 Policy Options

With regards to the state of affairs of rural transport and health care delivery in the study area, the following policy implications are highlighted to provide bases for the improvement of rural transport and health delivery.

i. Ensure the full implementation of the Decentralization System as required by the Local Government Act.

The District Assembly does not carry out maintenance of roads often. This is because road construction and maintenance is capital intensive. However, this activity is done by the Feeder Roads Department, who are located at the National and Regional levels. Road projects are formulated at the national level and sent to the Regional level for distribution to the District for implementation. These projects are however not enough due to inadequate funds. Districts will have to lobby to get the projects for their areas. Decentralizing the department will ensure that, technical expertise are brought to the district. It will also ensure that the district gets its fair share of funds to be able to carry out construction of needed transport infrastructure while ensuring its maintenance.

ii. Generate additional funds through the Institutionalization of road user fees at the District level.

Considering the fact that road maintenance is capital intensive and can not be borne by the District Assembly alone, there is the need to look for additional funds to be able to maintain the standards of the roads. Therefore, the District Assembly could enact by-laws mandating road users to pay fees which will be used for the maintenance of the roads in rural areas.

iii. Increase access to health care by the establishment of more Community Health Planning Service (CHPS) Zones in the District.

The national policy framework of the health care system promotes the establishment of the Community Health Planning Service. This is meant to ensure increased access and equity to essential health care by improving on geographical access, financial access for the financially vulnerable and socio-cultural access.

Based on the above, the District Assembly together with the District Health Management Team should collaborate to increasing the number of the Community Health Planning Service in the District. They should also provide incentive for health personnel that

accept postings to manage these facilities, by the provision of adequate transport and allowances. Additionally, considering the fact that the transport policy does not allow Community Health Planning Service Zones to own vehicles, tricycles could be provided to these facilities. This will enable them refer patients especially pregnant women properly to the next highest level facility.

iv. Encourage collaboration between the health sector and the Traditional and alternative medicine practitioners as well as the Traditional birth attendants.

Attention should also be given to the traditional and alternative medicine practitioners. Improvement in the health care situation in the District involves the participation of all stakeholders especially those who render the service. The District Health Management Team should organize quarterly training for traditional and alternative medicine practitioners including traditional birth attendants. This training should focus on best practices and personal hygiene as well as encouraging them to refer cases to the hospital on time.

6.3.3 Areas for Further Research

The contribution of rural transport to development as a whole can not be overemphasized. Therefore, other factors which will ensure the sustainability of rural transport infrastructure and development should be considered urgently. Some of the issues worth exploring are presented as follows:

i. What are the best methods and materials used for the construction of rural roads that can ensure durability?

Due to the capital intensive nature of road construction, it is important that standards are set with regards to materials used and procedure or methods for effective construction work. This will ensure that, more roads in rural area are constructed, instead of the continuous use of funds to maintain major roads to the disadvantage of other minor but important roads.

ii. What ways can communities contribute to the maintenance of rural roads?

The road infrastructure is a public good with its maintenance being borne by government. There are other developmental projects in which Communities contribute in terms of labour and sometimes cash to ensuring their success. However, with regards to road projects, communities are always silent about it to the extend that when the roads become in motorable, they wait for the District Assembly to work on them. Therefore there is the need to find out reasons why communities behave in such a manner.

6.4 Conclusion

The study has demonstrated how imperative rural transport is in accessing health care in the district. The major objective of the study was to examine the relationship between rural transport and maternal and child mortality.

The study revealed that, the nature of rural transport was generally poor. This state of affairs has resulted in difficulty in accessing health care. It has also affected attendance to antenatal and post natal care by women, most of whom indicated that inadequate transport was a major constrain.

The National Health Insurance Scheme has been implemented to increase accessibility to health care. Unfortunately a considerable number of people have not been able to register on the scheme, making it difficult for them to access health care in case of ill health.

The various health facilities in the district organize outreach services to serve the population that are unable to visit the health facility. However, their work has been impeded by a number of difficulties of which transport is a major contributory factor, making it impossible to visit all their outreach points.

A cursory look at the findings and recommendations, give an indication that rural transport is essential in increasing access to health care. Therefore improvement in rural transport will also increase access to other social services and ensure the development of the District.

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List of Appendices

APPENDIX I: Household Questionnaire

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for Households (women with children or Household Heads)

INSTITUTIONAL IDENTIFICATION

Name of Community:.....

House number:.....s

Name of Respondent:.....

Name of Interviewer:.....

Interview Date:.....

SECTION I: PERSONAL RECORD

1. Name of Respondent:.....
2. Sex:.....
3. Age:.....
4. Name of community:.....
5. Marital status: 1. Single 2.Married 3.Divorced 4.Widowed
6. Level of Education: 1. No formal Education 2.Primary 3.JHS 4.SHS 5. Tertiary Education 6.Others (specify).....
7. Occupation:.....
8. Religion: 1.Muslim 2.Christian 3.Traditionalist 4.Other (Specify).....

SECTION II: HEALTH SEEKING BEHAVIOUR

9. For the past one year, how many times did any member of your household fall ill?
10. Did you seek medical care? 1. Yes 2. No
11. If yes, how did you seek medical care? 1. Self medication 2. Visit to Herbalist 3. Visit to Health center/clinics, 4. other(specify).....
12. Why did you seek medical attention from answer in 11?

    1.Affordability, 2. Easy access, 3. Proper care given, 4. Others (Specify).....
13. Have you ever attended health center/Clinic/Hospital? 1. Yes 2. No

SECTION III: TRANSPORT AND HEALTH

14. If yes, by what means did you use to get to the health center/Clinic/Hospital for medical care?

    1.Walking, 2. Use of Bicycle, 3. Use of Cars, 4. Others (Specify).....
15. What time do you take in getting to the hospital?.....
16. How long does it take you to get a car/bus/truck to go to the health facility? (Waiting time)...
17. How long does it take you to get to your destination (health facility)?.....

18. How much do you pay for a trip to the health facility?.....

19. Are you able to pay? 1. Yes, 2. No

20. How frequent do vehicle operators ply your roads?.....

21. What is the distance from your community to the health center?.....

22. Do you think transport is a major constraint for your inability to seek medical attention? 1. Yes 2. No

23. If yes, how?.....

24. If no, why?.....

25. Does your household have any means of transport? 1. Yes 2. No

26. If yes, specify the type of means of transport?.....

27. If yes, does it influence the ease in accessing a heath facility?.....

28. If no, why?.....

SECTRION IV: MATERNAL AND CHILD CARE

29. How many children do you have? .....

30. Have you encountered any unsuccessful delivery? 1. Yes, 2. No

31. If yes, how many unsuccessful deliveries have you had?.....

32. If no, what are the reasons that account for the successful deliveries?.....

33. Do you go for anti-natal care during pregnancy? 1. Yes, 2. No

34. If yes, where do you go?.....

NOTE: Have a look at your anti-natal card.

35. If no, why?.....

36. What are some of the challenges you face in seeking anti-natal care?.....

37. Are you aware of the free care for pregnant women? 1. Yes, 2. No

38. If yes, how did you get the information?.....

39. If yes, does that encourage you to go for anti-natal? 1. Yes, 2. No

40. If yes, how?.....

41. If no, why?.....

42. Where do you usually give birth? 1. Health center, 2. At home, 3.Other (specify)..

43. Have you suffered complications during delivery? 1. Yes, 2. No

44. If yes, where do you go during such complication?.....

45. By what means do you go?.....

46. TBAs and health center, which one do you prefer? .....

47. Why do you prefer answer in 41?.....

48. Do you practice exclusive breast feeding for your children after birth? 1. Yes, 2. No

49. If no, why?.....

50. Have you immunized your children against the six (6) childhood killer diseases? 1. Yes, 2. No

51. If no, why?.....

52. If yes, where did you go to immunize your child?.....

NOTE: Verify the child's hospital card.

53. By what means did you go to immunize your child?.....

54. Do you take your children for post-natal care? 1. Yes, 2. No

55. If no, why?.....

56. Does Transport affect your movement to the health center? 1. Yes, 2. No

57. If yes, how does it affect you?.....

SECTION V: NATIONAL HEALTH INSURANCE SCHEME

58. Have you heard about the NHIS? 1. Yes, 2. No

59. Have you registered? 1. Yes, 2. No

60. If no, why have you not registered?.....

61. Do you know the minimum premium being charged? 1. Yes, 2. No

62. Can you afford it? 1. Yes, 2. No

63. If you have registered, do you think it is beneficial? 1. Yes, 2. No

64. If yes, how?.....

65. If no, why?.....

Appendix II: Questionnaire for Traditional Birth Attendant

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for Traditional Birth Attendants (TBAs)

IDENTIFICATION

Name of Community:.....

House number:.....s

Name of Respondent:.....

Name of Interviewer:.....

Interview Date:.....

1. On the average how many deliveries do you take in a month?.....
2. How many are successful?.....
3. How many are unsuccessful?.....
4. Why are they unsuccessful?.....
5. What are some of the most frequent delivery complications that you face?.....
6. If yes, for the past one year how many incidences have occurred?.....

7. What are the reasons accounting for deaths?.....
8. How did you become a traditional birth attendant?.....
9. How many years of experience do you have in the practice?.....
10. Have you received any formal training during the period of your work? 1. Yes, 2. No
11. If yes, who trained you?.....
12. In which area were you trained?.....
13. How do you handle Complications beyond your capability? .....

Appendix III: Questionnaire for Transport Operators

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for Transport Operators

INSTITUTIONAL IDENTIFICATION

Name of Community:.....

Name of Station:.....s

Name of Respondent:.....

Name of Interviewer:.....

Interview Date:.....

1. Do you belong to a transport union? 1. Yes, 2. No
2. If yes, specify.....
3. Which routes do you operate?.....
4. Do you operate in rural area? 1. Yes, 2. No
5. If no, what are the reasons why you do not operate in rural areas?.....
6. What are the problems you face in your operations?.....
7. Do you carry patients to health centers? 1. Yes, 2. No
8. If yes, how often do you carry patients?.....
9. If no, why?.....
10. How often do you ply your routs?.....
11. Have you carried pregnant women to the health center before? 1. Yes, 2. No
12. If yes, how often do you carry them?.....
13. What type of transport services do you offer? .....
14. How much do you charge pregnant women before taking them to the health center?.....
15. Are pregnant women able to pay? 1. Yes, 2. No
16. How much do you charge other patients?.....

Appendix IV: Questionnaire for Heads of Health Facilities

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for Health facilities (Heads/ Health personnel)

INSTITUTIONAL IDENTIFICATION

Name of Institution:.....

Name of Respondent and Position:.....

Name of Interviewer:.....

Interview Date:.....

1. What is the type of health facility?

   1. Health centre 2. Clinic 3. C H PS Zone 4. Hospital 5. Others(Specify).....

2. How many health personnel are employed here?.....

3. Please indicate the categories of personnel at the health facility

No.	Category	Number of Health Personnel
1.		
2.		
	Others (Specify)	

4. Is the present number of staff adequate in carrying out your work at the health facility? 1. Yes, 2. No

5. How many communities does your health facility service cover?.....

6. What services do you provide in your facility? .....

7. What are the common diseases that bring people to your facility?.....

8. How many cases are you able to attend to in a day?.....

9. How many vehicle mixes do you have? Please fill below ;

No.	Vehicle mix
	1.

10. Are you able to easily transfer patients to other facilities in the district? 1. Yes, 2. No.

11. If yes, how do you do it?.....

12. By what means are referral cases transported?

    1. Ambulance, 2. 4x4 pick up, 3. Trucks, 4. Motor –bike, 5. Bicycle,
    6. Others (specify).....

13. If no, what are the reasons are the reasons why you can not transfer patients?.....

14. Do you have the requisite equipment to carry out your work? 1. Yes, 2. No.

15. If yes, what are they?.....

16. If no, why?.....

17. Do you have adequate means of transport in this area? 1. Yes 2. No.

18. If no, do you feel motivated working in this environment? 1. Yes, 2. No.

19. If no, why are you not motivated?.....

20. If yes what motivates you?.....

21. What other activities do you carry out? 1. Community health education, 2. Immunization (outreach) 3. Others (specify).....

22. Do you have reported cases of maternal mortality? 1. Yes, 2. No.

23. If yes, what accounted for it?.....

24. Do you have reported cases of child mortality? 1. Yes, 2. No.

25. For the past one year, how many cases of child mortality did you record? .....

26. If yes, what accounted for it?.....

27. How much time does patience have to wait before they are attended to?.....

28. Is your facility easily accessible to the community? 1. Yes, 2. No.

29. By what means do patience come to the health facility?.....

30. Do you go for outreach services? 1. Yes, 2. No.

31. How many times do you go for outreach services in a month?.....

32. How many health personnel are involved in the outreach services?.....

33. By what means do you go for outreach services? .....

34. What is the cost per outreach service carried out?.....

35. What are some of the problems you face during outreach services?.....

36. What are some of the challenges this facility faces?.....

37. What solutions do you propose?.....

Appendix V: Questionnaire for District Health Directorate

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for District Health Directorate

INSTITUTIONAL IDENTIFICATION

Name of Institution:.....

Name of Respondent and Position:.....

Name of Interviewer:.....

Interview Date:.....

1. What is the number of health facilities in the district? Please fill below;

Category	Number	Location
District hospital		
Sub-district health centers		
Clinics		
CHPS Zone		

2. What is the number of vehicle mix for each level of health provider in the district?

Category	No.	Vehicle mix
District Hospital		1.
		2.
Sub-District health center		1.
		2
Clinics		1.
		2.
CHPS Zones		1.
		2.

3. What are the ten (10) top causes of morbidity in the District?.....
4. What are the ten (10) top causes of mortality in the district, from the highest to lowest?.....
5. What are the causes of maternal mortality in the district?.....
6. What are the causes of child mortality in the district?.....

Some District health indicators

7. What is the infant mortality rate?.....
8. What is the under five (5) mortality rate?.....
9. What is the maternal mortality rate?.....
10. What is the patient /Doctor ratio?.....

11. What iss the population/Nurse ratio?.....

12. What are the problems you face in ensuring efficient health delivery in the district?.....

13. What proposal do you have for these problems?.....

14. Do you think transport has a role in reducing maternal and child mortality? 1. Yes, 2. No

15. If yes, how?.....

16. If no, why?.....

17. What could be done to reduce the maternal and child mortality in the District?.....

18. Do you undertake outreach services? 1. Yes, 2. No

19. If yes, how often do you do it in a month?.....

20. If no, why?.....

21. How many personnel are involved? .....

22. What is the cost per outreach?.....

23. What are the problems you face in undertaking outreach services?.....

24. What possible solutions do you propose?.....

Appendix VI: Questionnaire for District Assembly (Roads Engineer and Planner)

DEPARTMENT OF PLANNING

Faculty of Planning and Land Economy

College Of Architecture and Planning

Kwame Nkrumah University of Science and Technology, Kumasi

GUSHEGU DISTRICT

THE ROLE OF RURAL TRANSPORT IN ACHIEVING REDUCTION IN MATERNAL AND CHILD MORTALITY IN THE GUSHEGU DISTRICT OF GHANA

Interview Guide for District Assembly (Roads Engineer and Planner)

INSTITUTIONAL IDENTIFICATION

Name of Institution:.....

Name of Respondent and Position:.....

Name of Interviewer:.....

Interview Date:.....

1. What are the major classifications of roads in the district?.....
2. What distances do they cover?.....
3. Apart from roads, are there any transport infrastructures in the district?1. Yes, 2.No
4. If yes, name them?.....
5. Do you carry out maintenance work on transport infrastructure in the district? 1. Yes, 2. No
6. If yes, how often do you carry out maintenance works?.....
7. What is the current state of transport infrastructure (Roads) in the district? 1. Good, 2. Fair, 3. Poor
8. What is the frequency of motorized transport in the district?.....
9. Are there transport associations in the District? 1. Yes, 2. No
10. If yes, what role do they play in rural transport in the District?.....
11. What is the key trend in rural transport service and access to rural services?.....
12. What is the role of the District Assembly in connecting rural transport services?.....
13. What are the key problems of rural transport in the district?.....
14. Do you think rural transport is essential in people's access to services in the district? 1. Yes, 2. No
15. If yes, how?.....
16. If no, why?.....
17. What are the main modes of transport in the District? Please tick below;

Motorized	Non-Motorized
Trucks (light,lessthan 3tons and heavy)	Bicycle
Buses (More than 20 Seats)	Animal drawn carts
Rural Taxis (mini bus, pick ups 4x4)	Pedestrians.
Motor cycles	
Others (specify)	

18. Which of the above are the most used by people in the District? (Specify).....
19. Why do you think it is the most frequently used?.....