THE IMPACT OF ROAD TRANSPORT ON AGRICULTURAL PRODUCTION: IN MOROGORO DISTRICT, TANZANIA

BY

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ABSTRACT

Tanzania economy depends much on agriculture as its main stay, but still rural farmers suffer from poor road transport and high cost of transport of products to markets. Problems in transport sector affect agricultural production in two ways. Firstly, the time and energy spent on transport related activities reduce labour productivity because the transport charges have led the price of fertilizers to be very high, hence reduces the profits which labour could get. Secondly, increased market costs as a result of inadequate and poorly maintained roads that are passed on to the farmers in terms of low farm –gate price. In many food-growing areas, crops are carried in many kilometers by head to the assembly markets or roadsides. Despite the efforts made by the government concerning road transport, still there is inadequate agricultural production in rural areas. Because of this structure of human settlement and production, road transport system assumes an extraordinarily important role in the economic development of an area. The study evaluates the impact of road transport on agricultural production. It was conducted at Mikese, Kiroka, Kinole and Mkambarani wards located in Morogoro District. It involved 100 respondents who were household members; other participants include government officials and political leaders. Data were collected through structured questionnaire as a major tool for data collection. The Statistical Package for Social Sciences (SPSS) was used to analyze data. The results reveal transport improvements are thus critical for rural development and poverty reduction. The link and impact lies in the fact that improved transportation improves access to economic opportunities by reducing transport costs. It also ensures increased agricultural productivity, opens up room for participation in non agricultural activities through time saving effects, eases accessibility to markets and social services, and links the rural sector to the rest of the economy.

DECLARATION

I, BENEDICTO MSANGYA, do hereby declare to the Senate of Sokoine University of Agriculture that this dissertation is my own original work, and has not been submitted for a higher degree in any other university.

26/11/2008

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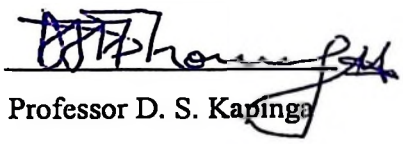
Date

The above declaration is confirmed



26/11/2008

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DEDICATION

This work is dedicated to Lord Jesus Christ who is my shepherd, and my salvation. My help comes from Him, the maker of heaven and earth. In all our ways we should acknowledge, since He will make our path straight (Psalms 23:1, 121:2; Proverbs 3:6). This dissertation is also dedicated to my beloved mother Felister Akolth, for her inspiration, encouragement and sacrifices to support me throughout my educational journey.

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LIST OF ABBREVIATIONS

AIDS	-	Acquired Immune Deficiency Syndrome
DSI	-	Development Studies Institute
GDP	-	Growth Domestic Product
HIV	-	Human Immuno-deficiency Virus
IFPRI	-	International Food Policy Research Institute
IMT	-	Intermediate Means of transport
MAC	-	Ministry of Agriculture and Cooperatives
MADIA	-	Managing Agriculture Development in Africa
MDG	-	Millennium Development Goals
MWCT	-	Ministry of Works and Communication Transport
NALP	-	National Agricultural and Livestock Policy
NBS	-	National Bureau of Statistics
NMT	-	Non-Motorized Transport
NSGRP	-	National Strategy for Growth and Reduction of Poverty
PORALG	-	President's Office, Regional Administration and Local Governments
PRSP	-	Poverty Reduction Strategy Paper
REPOA	-	Research in Poverty Alleviation
RETCO	-	Regional Transport Companies
SADC	-	Southern Africa Development Community
SNAL	-	Sokoine National Agricultural Library
SPSS	-	The Statistical Package for Social Sciences
SSA	-	Sub- Sahara Africa
SUA	-	Sokoine University of Agriculture.

TANROADS	-	Tanzania National Roads Agency
TEC	-	Tanzania Episcopal conference
URT	-	United Republic of Tanzania
VEO	-	Village Executive Officer
WEO	-	Ward executive Officer

CHAPTER ONE

1.0 INTRODUCTION

This chapter presents the general background of the study by discussing the link between road transport and agricultural production; problem statement; justification of conducting the research and objective of the research.

1.1 Background Information

In developed countries road transport fulfils an essential role in maintaining national economic and social well-being, bringing goods to market and getting people from place to place. Transportation refers to the transport of goods and commercial passengers (http://www.statcan.ca/).

In developed nations agricultural producers depend upon transportation, for it is transportation that links the fields of producers to the tables of consumers, both within and abroad. Lowering the cost of transportation services (or increasing the quality of those services) creates opportunities for specialization among producers that are beneficial to society. For example, because of refrigeration, consumers can purchase more and better quality produce, much of which is grown in areas far from this Nation's metropolitan areas.

Tanzania economy still depends much on agriculture as its mainstay. In 2001 agriculture accounted for 48.1% of the overall GDP. It also contributed 70-80% of total employment and 55% of country foreign exchange earnings. Its contribution to the overall GDP between 1996 and 2001 was bigger than other sectors. This can show us that agriculture is

important to the country immediate and long term economic and social developments (World Bank, 2000).

In Tanzania; the agricultural sector is far from modernized. Most of the agricultural output is produced by using rudimentary technology, mainly by smallholder farmers scattered in rural communities. On the other hand, the major market and processing facilities for crops as well as inputs sources are located in urban centres usually at considerable distance from each other and from the major sea ports. Because of this structure of human settlement and of production, access to markets in terms of transport system assumes an extraordinarily important role in the country's economic development.

A well developed road infrastructure benefits the farmers in two ways. It opens village to other villages and market centers, and also it reduces transport costs and improves competitiveness in the market system. These increase producer's prices and raise income of the poor. The sustainable economic development of a country is a long process that occurs over decades and generations.

There is explicit consensus among economists that development of agriculture is a necessary starting point (Johnston *et al.,* 1961). The views presented above concede with those of World Bank which underscore the gravity of rural transport bottlenecks in Sub-Sahara Africa (SSA). The Bank observes that improving rural infrastructure is an essential requirement for modernization and growth of agriculture (Rizet, C and Hine, J 1993). It further caution that although better market incentives (especially related to price and inputs) to farmers remains important factors in agriculture, their impacts would be blunted if the physical barrier and economic costs of transporting to and from local market remain high (World Bank,1991).

Furthermore Mellor and Pandya (1990). In research project managing Agriculture Development in Africa (MADIA), estimate that the present rural road network of SSA needs to be substantially increased, if the fully agricultural potentials of the region necessary to support population are to be realized.

There is vivid evidence to show that road infrastructure rehabilitation exerts significant impacts on the life of people in the area influenced by a particular road project. For example an economic and social impact assessment study which was carried out by the Ministry of Works Communication and Transport (MWCT), on Kwa sadala- Mbweera road in 1992, showed that in two years since the road was rehabilitated annually traffic flows had increased from 66 to 1 300 per day, vehicle operating costs declined by 31%, agricultural input supply and others social amenities improved substantially.

With this background this study assert that if the possibility of inputs to the farmers remains a problem due to high marketing and transportation costs in Tanzania, strategies to improve agricultural production and fight poverty will not be successful.

1.2 Problem Statement

Despite the efforts made by the government concerning road transport, still there is inadequate agricultural production in rural areas. Since 2001, the government has been setting aside Tsh.1.8bn per month for roads improvement. This amount is in addition to the road fund and donor funds, generally rural roads have improved around the country (Kapinga, 2007). However, the agricultural production is still poor, since there are limited researches on how these roads have been affecting agricultural production; there was a need to undertake this study to know the impact of roads transport on agricultural production.

1.3 Problem Justification

The research will identify the problems and come up with recommendation of appropriate solutions that lead to smooth operations of the road transport leading to more production of agricultural products. This study will help the government to know the importance of rural road transport in agricultural production which has not been emphasized. The study will help the policy makers to acknowledge the positive contribution of road transport to agricultural production in boosting up the economic development and well being of the society.

The study is in line with Millennium Development Goal (2000-2015) number one that is to reduce abject poverty, and the Tanzania Development Vision 2025 which is to reduce the proportion of food poor Tanzanians from 27% in 2000 to 14% by 2010 and also in line with NSGRP cluster 2 on the improvement of quality of life and social wellbeing.

1.4 Objectives of the Study

1.4.1 General objective

- To assess the contribution of road transport on agricultural production

1.4.2 Specific objectives

- To assess the impacts of increased transport operation cost to the farmers.
- To examine how rural areas inaccessibility by roads affect agricultural production.
- To assess Peasant's perception on the contribution of road transport and accessibility to markets.

1.5 Research Questions

- Does area inaccessibility by roads affect agricultural products.
- What are the impacts of increased transport operations cost to the farmer.
- How does road transport affect the livelihood of rural people.
- How road inaccessibility limits the delivery of agricultural inputs.

1.6 Conceptual Frame Work

The conceptual framework details depict variables that are examined and their expected relationship. It groups the variables into independent and dependent variables

Independent Valuables

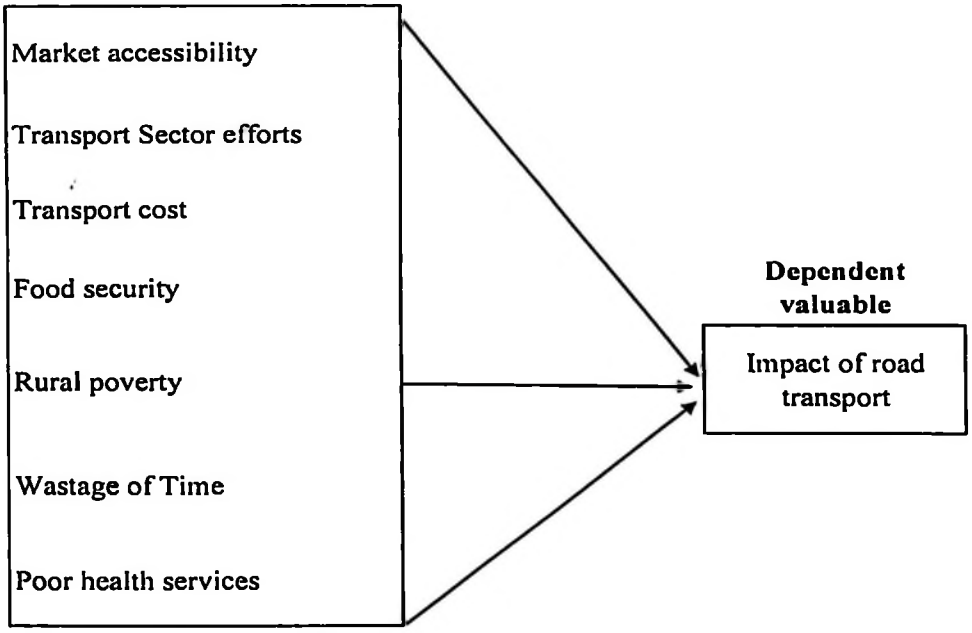

Figure 1: Conceptual Framework

CHAPTER TWO

2.0 LITERATURE REVIEW

The objective of this chapter is to provide an overview of literature review conducted. In general the literature review indicates that where there is low accessibility level in agricultural products, the production of the area is low too which indirectly leads to high poverty in that area. Since this study aims at evaluating the effects of road transport on agricultural production, an issue is directly related with national economy, the literature review went deeper by including the effects of accessibility levels to the national economy.

2.1 Road transport

Southern Africa Development Community defines road transport as the conveyance of passenger and freight on the road network between origins and destinations by the means of road transport vehicles. The quality and levels of accessibility of road transport infrastructure determine the level and quality of services provision, where there are poor maintained roads, there is usually high operating costs (Mwingira, 1999). Also where there is a low accessibility level, transport costs become extremely high.

2.2 Agriculture

Agriculture is the leading sector in the Tanzanian economy, accounting for nearly half of the Gross Domestic Product. About 85% of the Tanzanian population is involved in farming; it is estimated that there are 4.8 million smallholder farmers and nearly 3.9 million households keeping livestock. Over 80% of poor Tanzanians live in the rural areas, that is why it is important to support those families who depend on agriculture to make a better living. Tanzanian agriculture is almost completely rain dependent. In years when

rain is not so plentiful, thousands of Tanzanians require food aid to ensure that they do not go hungry (World Bank, 2000).

2.3 Market access

Market access is a part of accessibility concept, which is a very wide concept, Barwell (1999) whose work on transport in rural areas of developing countries is appreciated by many scholars, defines accessibility as ability or easy to reaching various destinations or places offering opportunities for a desired activity. He identifies three levels of accessibility, namely: (i) of basic needs such as food, education, health services; (ii) of wider needs through access to major centre of activity, for example towns and markets; (iii) of personal movement or travel for non-essential purposes. This study deals with accessibility level; (iii) in which physical access to agricultural market is difficult. Agricultural market access is difficult for producers to reach markets for inputs and outputs.

At country level, for example East Africa region, the regional with a good road network the level of agricultural productivity is higher so even the region with poor road network the level of agricultural productivity is lower. For example Tanzania has 95.5 meters of road network for every one square kilometer, Kenya has 261.9 meters in every one square kilometer and Uganda has 330.8 meters in every square kilometer (Ministry of Communication and Transport 2003). From this data, we see that in term of poverty level Tanzania is having the worst while Uganda is having the best (Bjorn, 1994)

Results from the research and from the two examples at the region level in Tanzania and the country situation in East Africa indicated that where there is inadequate road network, there is lower agricultural productivity and poverty level is higher. These findings

underscore the importance of continuing to improve the road network and its condition in order to guarantee adequate road access in rural areas with good agricultural productivity and the market places.

The level of market accessibility is facilitated together with other things, by the social institutional framework, purchasing power of the farmers, availability of market places, roadways and rolling stock-vehicular capacity in this case (Likwelile, 2000).Any problem on the issues mentioned, hinder farmers from reaching the market.

2.4 Rural Transport on Poverty Reduction

Tanzania belongs to the group of the Highly Indebted Poor Countries. This means that Tanzania is poor. Most of the time a large proportion of Tanzanians (up 50%) have little or no food, live in ramshackle shelter, have limited access to health services and exist in a state of almost complete ignorance of the possibilities and opportunities available outside their immediate environments.. Many reasons have been given for this condition. Among these are lack of education, lack of technology, lack of capital, low world market prices for agricultural commodities, rampant diseases including HIV/AIDS, privatization and liberalization of economic activities and natural causes including bad weather and so on. While these factors are important contributors to Tanzania's poverty it is suspected that there are more fundamental reasons for the nation's state of persistent and increasing poverty. An argument has been advanced that Tanzanians place little value on their time. Partly because of having been brought up under a socialist world outlook.

Tanzanians have limited understanding of modern markets, and the marketing expertise needed to operate therein. The valuation of time is central to poverty reduction. The essence of transport improvements is minimization of time and effort needed to move from

place to place. The peasant economy is characterized by unnecessary expenditure of large amounts of time and effort on movement and carriage. Considerable time and effort is expended in the rural areas in fetching water and firewood, in attending to grain milling activities and in moving to and from the fields for ploughing, planting, weeding or harvesting crops. Time is also wasted in getting to hospitals and marketing centers. Yet transport in general is rarely considered an explicit and direct part of the country's poverty reduction strategy (URT, 2003).

In fact the Poverty Reduction Strategy Paper (PRSP) mentions transport, almost in passing. And when it does it is only the roads that find space therein. Many transport economists, brought up in the advanced industrial societies with well developed and plentiful transport facilities and services, consider transport as having only a marginal impact on poverty reduction. Yet transport reduces absolute poverty by increasing economic efficiency and by lowering costs and prices as well as enhancing access to social and economic opportunities.

The provision and production of transport infrastructure, equipment and services can also be designed so as to have maximum impact on poverty reduction. According to Likwelile, poverty can be defined as inability to meet basic minimum requirements of life. It is the lack of access to basic needs including food, shelter, education, health services and movement or travel for essential purposes. Improved accessibility to goods, facilities and services involves a three-pronged action concerning their affordability, availability and reachability.

Affordability is basically a question of prices and cost. Ultimately it is a question of production and distribution technology. Availability involves the location of goods and

services. Reach ability is largely a question of mobility. It is a matter of the state of transport development. Transport, therefore, enables us to reach goods that are not located in our immediate environs. The cost of transport is the price paid for not having the goods or services located where they are needed for consumption. In a modern economy where production efficiency dictates that goods should be produced for the market and not for personal consumption, transport is an absolute necessity.

For optimum efficiency transport and facility location should be considered concomitantly. Accessibility is facilitated by availability of transport facilities (infrastructure and equipment) and services. Transport is required to provide physical presence at places offering opportunities. To improve access one needs to improve the transportation system. The transport system consists of infrastructure and equipment, the management system, and the transport modes, and operators. This makes investment in rural transport infrastructure a major development priority for developing countries.

Furthermore, according to the World Bank, (1996) improved infrastructure and the resulting better access has a positive impact on household welfare. In a rural setting this can be looked at from both production and consumption dimensions. From the production side the impact of transport can be seen through accessibility to areas with agricultural potential provision of inputs, and accessibility to markets. Transport deficiencies add to input costs. This raises production costs as farmers are forced to pay more for inputs. It also stymies agricultural productivity (Heggie, 1995)

Transport inadequacy affects efficiency in marketing, as competitive market centers cannot be reached with ease. Inadequacies in transport also affect labour mobility. Deficiencies in transport also constrain the carrying out of many income-generating activities. As a result

of the above, farmers incur substantial production and marketing costs, are forced to face narrowed down windows of opportunity; earn less in terms of incomes, and experience in the process (as income is negatively related to poverty) increased incidence of poverty and reduced personal welfare.

Welfare effects, including accessibility to social amenities, explain the consumption dimension of the role of transport. Improved transportation facilitates access to social services like education, health care, sources of clean and safe water and so on. Ability to access these services enhances the quality of human capital and positively impacts on labour productivity. Human capital development is a critical input in poverty eradication initiatives. A disproportionate number of the poor live in the rural areas.

The agricultural sector is dominant in the rural economy. Agricultural income flows are uncertain on account of reliance on the vagaries of nature, poor technology and limited access to competitive markets. Rural poverty is aggravated by the fact that the rural sector is poorly served with transport facilities. Feeder roads connecting farmers to farming areas and to markets do not meet people's requirements, are poorly maintained and costly to use. Rural transport services are inadequate due to lack of affordable and appropriate infrastructure and means of transport. To eradicate rural poverty one must take into account the nature of the rural economy. The rural economy is agricultural. A majority of the economic agents are poor and depend, for their survivals on low skilled labour.

Transport improvements are thus critical for rural development and poverty reduction. The link and impact lies in the fact that improved transportation improves access to economic opportunities by reducing transport costs. It also ensures increased agricultural productivity opens up room for participation in non agricultural activities through time saving effects,

eases accessibility to markets and social services, and links the rural sector to the rest of the economy. Also important is the income generation aspect of the construction, rehabilitation and maintenance of transport infrastructure.

The choice of technology for road works is an important consideration in this regard. The use of labour based technology for rural works can generate employment for the rural poor during the off-season for agricultural activities. This can also be affected through employing small scale labour based local contractors. Related to this, is a question of identifying the most appropriate means of transport to use in the rural areas. A survey conducted by REPOA (Research in Poverty Alleviation) shows that out of the means of transport available in the rural areas walking accounts for 64.9% and bicycles and carts 35.5%, with cars and trucks accounting for 18.2% (Likwelile, 2000). The intermediate means of transport (IMT) are, therefore, the most used vehicles in the rural areas. They may also be the most appropriate means given the nature of the rural economy and the type of transport infrastructure available.

2.5 Gender and Transport

The discussion up to this point has concentrated mainly on road transport and the related infrastructure. One issue that requires separate treatment and emphasis is the question of gender. For, the transport burden impacts differently on men and women. Women constitute the primary transport vehicle in the rural areas. The backs and heads of women are the main tools for transporting water, firewood, grain and babies.

Women also provide the main source of labour for agricultural activities and sometimes for livestock rearing. On average, women are responsible for nearly 67% of traveling time, while men and children are responsible for 21% and 12% respectively. Also women are

responsible for 85% of the total load carried, 90% of which walking transports and head loading (Republic of Korea 2006). Furthermore women have limited access to immediate means of transports (IMTs).

2.6 The Transport Sector in Tanzania

The transport sector in Tanzania currently comprises: A road network of approximately 85 000 km of which about 5% is paved. 35 000 km of the network are classified as National Roads and has since 2000 been managed by the Tanzania National Roads Agency (TANROADS), a semi-autonomous body under the Ministry of Infrastructure. The remaining approximately 50 000 km are district, feeder and community roads and are managed by the various districts under the President's Office, Regional Administration and Local Governments (PORALG). The road network carries over 80% of passenger traffic and over75% freight traffic in the country.

In Tanzania roads are the most common mode of transport for both freight and passenger. It accounts about 70% of the freight with balance carried mainly by railway and much small amounts by coastal and lake shipping and also it is the main mode of passenger traffic, carrying the vast majority of long distance and local passenger movements (Temba, 1997).As it has shown in a previous chapter, Tanzania has about 85 000 km of roads network.

However little has been done to maintain the road network in Tanzania at a reasonable level of services to the extent that it becomes a liability rather than an asset to national economic development process. High use of lubricants, tires and spare parts, the consumption of these items is due to poorly maintained roads. Where the roads surface is

bad, the rate of wear and tear of vehicles becomes high and thus requiring high maintenance costs; fuel consumption also becomes high (Mwingira, 1999).

2.7 The Role of Road Infrastructure in Economic Development

There is a strong theoretical justification that infrastructure is a sine-qua-non for economic development, if economic development of any region is termed as the development of its agriculture, manufacturing and services sectors, then the infrastructure may be considered as those basic facilities which are required to sustain the development of these sectors in a long run.

The role of roads in a society dates back to the emergence of humanity. From the earliest days men realized that different men could make different products and that trade could make products available. Trade started from person to person, but grew to involve different towns and different lands. Transport emerged as an important activity in the trade process. History shows that a well- designed system of roadsways played a vital role in the growth and maintenance of Roman Empire.

The importance of roads infrastructure is also acknowledged by Likwelile (2000), who argues that the prosperity of a nation is bound up with state of roads. Throughout the world roads carry the bulk of the goods being traded and transported, even if sophisticated alternatives have been created. Thus suitable roads networks provide an essential foundation for economic growth and prosperity, and are indeed critically for the sustainability of a country economic development. To this Balton and Karlsson (1996) add that roads network has also important to non-economic components such as political, social and military cohesion of a country.

This happens via two channels. Firstly is through shifting the costs per unit of output in the industry downward. Secondly relates to the factor adjustment effects where the firms tend to adjust their production decisions with respect to inputs hiring (own labour, intermediaries. and capital stocks) if services they received from infrastructure are substitute or complements of their own factor of production. Roads infrastructure do play an important role in ensuring timely communication, reasonable utilization of installed capacities and provide access to source of supplies and marketing outlets (Ndulu and Wangwe, 1997).

In this way, roads strongly influence spatially allocation of processing plants for agricultural products, inadequate roads networks lead to numerous small-scale processing plants, whereas good roads system makes it possible for processors to construct large plants and enjoy economies of scale. Roads transport deficiencies add to inputs costs, which in turn raise production costs as manufacturing firms and farmers are forced to pay for inputs. In addition, inadequacy in infrastructure and transport hampers labour mobility, resulting into wasting of time. Infrastructure deficiency constrains the carrying out of a wide range of income generating activities. All these constraints, translate into substantial production and distribution/marketing costs, which force economic agents to face narrow window of opportunity and they earn less in terms of income.

In a way, this culminates into reduced personal welfare and thus increased incidences of poverty. A good example is given by Potkanski quoted by Mbilinyi and Nyoni (1997), who argued that economic reforms in Tanzania have benefited smallholder-farming community, especially those near urban centre and along truck roads, who have access for their crops, for those situated in remote areas the situation has become worse. The state owned Regional Transport Companies (RETCO) which used to provide transport services in rural

areas regardless road condition have either collapsed or have been privatized in the market economy.

The most coverage of the role of road infrastructure on economic development is given by Balton and Karlsson (1996), who summarizes some of the economic benefits of infrastructure in the context of developing countries. Her main argument is that, infrastructure contribute to economic development both by increasing productivity and by providing amenities that enhance the quality of life.

2.8 The Relationship Between Agriculture and Road Transport

As regard to poor transportation network in remote areas, households may be forced, however, to produce most or all of their food requirements (Gittinger and Hoisoghton 1983). While agricultural development is essential for increasing food production, it also has an important role in creating effective demands that is the capability of people to purchase food.

A survey by MAC in 1995/1996 indicates that the availability of food varies by farming system and regions, but the main source of calories for Tanzania is maize and rice, which provides 62% of the calories and other preferred staple contributes 8%.The rest of calories intakes comes from cassava(13%), sorghum, roots and bananas (8%)(Sahn, 1999).

The World Bank (1996) assets that even if the economy of Tanzania grew by 8% from the current 4% with the population growing at 2.8% per annum by year 2010 about one third of the population in Tanzania would be estimated to be living in absolute poverty. Today over 60% of the population in Tanzania is estimated to be living below the international

poverty line of 2 dollars per day (World Bank, 2004). This underlines the magnitude of the challenge facing the country in implementing her National Development Vision 2025.

However tremendous achievement could be realized if the government addresses the problems facing the farm sector and allied industries which support over 70% of the population. The major agricultural concerns have been stipulated in the National Agricultural and Livestock Policy (NALP). They include low productivity, poor coordination, and limited capacity, under developed supporting facilities, erosion of natural resources base, inappropriate technology, drought, and lack of access to financial services.

These policies have not produced desired fruits, there are still numerous constraints: exports are lower than they were in the late 1960's and 1970's and agricultural productivity is unrealizable and lower than world average. By the way of comparison while one farmer in Tanzania produces enough food to feed 3 people per year, in a developed country like Germany one farmer feeds 104 people (MAC and NBS, 1995/1996). In recent years food shortage has been extensive and the government declared 1997/98 as a famine year. Food shortage forced a country to import tones of food staffs especially cereals like maize and rice.

In this way the country loses not only foreign exchange that could be used to import industrial inputs, but also revenue when the importation is accompanied by tax exemption. A common feature is that while other people from one part of the country are starving, in other parts they are complaining of the lack of market of their products. This indicates bottleneck in the procurement and distribution process that is market and infrastructure particular good roads.

Indeed infrastructure especially road network has not been given due attention as a catalyst for stimulating agricultural productivity, Tanzania just like other developing countries road transports are highly insufficient in many food-growing areas, crops are carried in many kilometers by head porterage to the assembly markets or roadsides (Riverson and Carapetis, 1991). Barwell and Calvo (1989) found that activities involving transport consumes inordinate of household time and energy in rural areas. The average total time spent by village households in transportation is estimated at 1 875 hours a year in Tanzania (for about 80 ton-kilometers, with an average households size of 4.5).

Problems in the transport sector affect agriculture production in two ways. Firstly the time and energy spend on transport related activities reduce labor productivity because the transport charges make the price of fertilizers to be very high, hence reduces the profits which labour could get; secondly, increased market costs as a result of inadequate and poorly maintained roads are passed on the farmers in terms of low farm –gate price.

2.9 The Relationship Between Road Transport and Agricultural Development

It has been established that Tanzania is endowed with various natural resources and a vast untapped land area which can be effectively utilized for agricultural production. Thus there is a large potential for increased production of many cash and food crops as well as livestock and its associated products to exports abroad and to the neighboring countries.

Moreover, agricultural production and marketing can take advantages of the vast size of the country. There is always a ready market for food in both the rural and urban areas. Since not all regions in the country are endowed with fertile land, and reliable rainfall, there are always regions in the country with food deficiency, these are the most reliable and ready markets for the food crops. With the economic reforms and liberalization of the

economy a number of agribusiness enterprises and large scale enterprises are coming up in different parts of the country. This needs to get necessary input and market outlets for their products. Success to all these agricultural production and marketing enterprises cannot be realized unless there is a sound and efficient transport sector.

A link or relationship can thus be established that enhancement of agricultural productivity and marketing greatly depend upon availability of adequate and efficient road transport system.

2.10 Contribution of Road Transport in Achieving the Millennium Development Goals

The Millennium Development Goals are an agenda of the United Nations agreed upon by world leaders at the Millennium Summit in September 2000 in order to reduce poverty and improve lives. With a central focus on poverty reduction and defined targets to be achieved in a specified time frame, the main thrust of the Goals is to make economic development more inclusive than it has been in the past and to bring all people to a readily feasible set of basic standards of health and education.

With the adoption of the Millennium Development Goals, there has been a necessity for new approaches in analyzing and targeting the needs of the poor as well as monitoring the progress in achieving the Goals. The eight Goals range from eradicating extreme poverty and hunger to ensuring environmental sustainability, reducing child mortality and improving maternal health, promoting gender equality and developing a global partnership for development.

The transport sector is a major source of employment for the poor, particularly in the informal sector involving low or intermediate technology. Labour-intensive public works on transport infrastructure can be used as safety nets for the rural poor, especially in slack seasons and in post-disaster rehabilitation phases. Employment in labour-intensive rural food works can generate additional benefits through the multiplier effect. Transport has an important role in eradicating hunger by improving food security in terms of access to and availability of food, and by improving resource distribution to produce food through increased efficiency of the supply and marketing chain. Transport is needed at all stages through which people may acquire food, produced either by themselves outrightly or by others for them.

2.11 Road Transport and Eradication of Extreme Poverty and Hunger

Improvement of transport infrastructure and services can have a big impact on poverty reduction, as well as a significant impact on productivity and economic growth. Improved market access through better transport conditions can lead to increased surpluses due to higher producer prices, lower production and transport costs and reduced spoilage in the marketing chain, higher value crop substitution and better market information.

On the other hand, deficiencies in transport can have significant adverse impacts on the rural agrarian economy and on the rural poor. Owing to deficiencies in transport and other logistics in most developing countries, a significant part of the agricultural output, including fruits and vegetables and dairy products, is lost on the journey from farms to consumers. The majority of the region's population live in rural areas and vast rural areas are experiencing a basic access problem. Deficiencies in access result in high transport and production costs, low profits, little social interaction, slow spread of new ideas and innovations.

2.12 Road Transport and Achievement of Universal Primary Education

Improvement of roads and transport services has major implications for children's school enrolment, particularly that of girls. Many studies from Asia and Africa have shown that school enrolment increased significantly after transport facilities in rural areas were improved. The combined cost of education and transportation (including the time cost) can be a major reason for children dropping out of school. The time constraint of poor households can be a major factor in school enrolment when elder children are needed to assist their parents in productive and household tasks, including the care of younger children.

Adequate transport decreases time and money costs and helps lower the dropout rates in the early years of schooling. In addition, lowering transport costs can have a beneficial effect on other school services, for example, by enabling more teaching materials to be purchased and more meals to be provided. The quality of education can be affected where isolation of rural communities fails to attract teachers, and lack of adequate transport services can cause their attendance to be irregular.

2.13 Road Transport and Promotion of Gender Equality and Empower Women

The travel and transport needs of women and men are different and they face different constraints. As such, access to transport technologies and services is gendered. Very often, the available transport services in developing countries are highly congested, insecure and unsafe. It is difficult for women to compete with men for a modest space on board. In the absence of adequate transport, many women are forced to rely on more expensive modes of transport, spend more time walking or simply abandon the idea of making a trip. They may also risk sexual and other forms of harassment. These adverse conditions can

seriously limit women's labour force participation and access to facilities and services, which affects their personal attainment and welfare.

The economic and social benefits of improving women's access to travel and transport could be very high. Improvement in transport infrastructure and gendered facilities and services can significantly increase girls' school enrolment, help to reduce gender inequality, facilitate women's access to labour markets and paid employment and other economic and social opportunities.

Improvement of transport infrastructure and services can also play an important role in empowering the poor, particularly women. The participation of women in the wider social and political processes and local decision-making processes is necessary for their empowerment in the society. The provision of gendered transport services can greatly assist in their participation by increasing their mobility and enhancing their opportunities for networking. This is crucial for the diffusion of ideas to improve their personal and family's welfare and to educate them about their rights and obligations.

2.14 Road Transport and Reduction of Child Mortality

There is a clear link between levels of infant and child mortality and accessibility to health services/centers. When transport costs are high or health centers are difficult to reach, poor people fail to seek health-care services altogether. Transport has an important role to play in combating major preventable diseases, such as tuberculosis and measles. The success of national immunization programmes, for which repeat visits are often required, depends on the availability of affordable transport services to the poor. National immunization programmes require timely delivery of vaccines to health facilities in a cold-chain supply environment for which a dependable transport service is necessary.

Faster access to health services is critical to children's health. Transport is crucial for children's survival in medical emergencies, such as accidents (not only road accidents but other types, such as snake bites which may be common cause of death in many countries), and for effective response to outbreaks of communicable diseases (diarrhoeal diseases such as dysentery) (Republic of Korea, 2006).

2.15 Road Transport and Improvement Maternal Health

The link between levels of maternal mortality and accessibility to health services/centers is very clear. Improved transport facilities and services make it possible to increase the use of (reproductive) health-care facilities, antenatal care and professional child birth attendants. These services can reduce maternal mortality, which remains a major concern in achieving the relevant Millennium Development Goal targets in many countries of the Asian and Pacific region, particularly in South Asia. Research in the Lao People's Democratic Republic has shown that health and other recent studies. When disaggregated by gender, this relationship has been found to be much stronger for women. Lack of access to appropriate transport services is one of the main reasons for the poor reproductive health of rural women in many countries. Low-cost transport interventions can help to reduce maternal mortality rates by improving access to health centres and facilitating child delivery at a health facility (Republic of Korea, 2006).

2.16 Road Rransport and the Combating of HIV/AIDS, Malaria and other Diseases

The increased mobility of individuals and transport sector workers is often blamed for the aggravation or spread of HIV/AIDS and other sexually transmitted diseases. Although transport may have contributed to the spread of these diseases, interventions in the transport sector can also be instrumental in combating HIV/AIDS and other diseases. Often, responses have focused on educating and counseling transport workers and taking

preventive measures such as issuing condoms to them, particularly at major terminals and transport infrastructure construction sites.

Long distance transport modes, such as intercity trains and buses, have also been used as focus points in HIV/AIDS prevention communication programmes. Persons infected with HIV/AIDS or other sexually transmitted diseases require repeat visits to health facilities for treatment and access to antiretroviral drugs. The success of treatment programmes for these diseases often depends on the availability of affordable transport services to the poor. HIV/AIDS-infected persons also require assistance in order to be rehabilitated in their communities. For this purpose and for regular monitoring of their treatment follow-ups, they require regular visits by social and health workers. The availability of adequate transport services to social and health-care workers can greatly facilitate these vital visits and make them more cost-effective (Republic of Korea, 2006).

2.17 Road Transport and Ensuring Environmental Sustainability

The transport sector generates externalities that can have serious welfare implications for the poor. Major transport developments may have a substantial negative impact on the environment through pollution and congestion, health, safety and other related aspects. transport infrastructure that opens up mineral deposits and forest frontiers destroys the natural habitat, and reduced forests contribute to the degradation of the environment. Exhaust emissions from transport operations are among the major sources of pollution. Very often the poor take a heavier burden of the negative externalities of the transport sector. While it may not be possible to avoid such externalities altogether, it is possible to decrease their current level of production and reduce their negative effects through new technologies and other intervention/mitigation measures in the sector. For example, the

burden of accident costs on the poor can be reduced significantly by improving road safety standards and achieving the related targets

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Description of the Study Area

The research was conducted in Morogoro District. Morogoro District is one of the six districts of Morogoro Region of Tanzania. It is bordered to the east by the Coast Region, to the south by the Morogoro urban District and to the west by the Mvomero District. According to the Tanzania National Census (2002) the population of the district was 263 920; 129 285 male and 134 635 female. There are several villages which encounter the problem of road transport on agricultural activities but the study was conducted in four villages.

The district has six administrative divisions, which are divided into 25 wards (Tanzania National Census, 2002) [http://en.wikipedia.org/wiki/Morogoro_Rural] and 132 villages. Together with other relevant reasons given in the identification and justification of the problem under study, the district has been chosen because of its general economic situation. Morogoro rural is among the 50% most deprived district in Tanzania, according to the poverty and welfare indicators for 1999 of the Vice President's Office. The main economic activity in the district is farming; the main crops cultivated include; maize, bananas, rice, beans, sisal and coconuts.

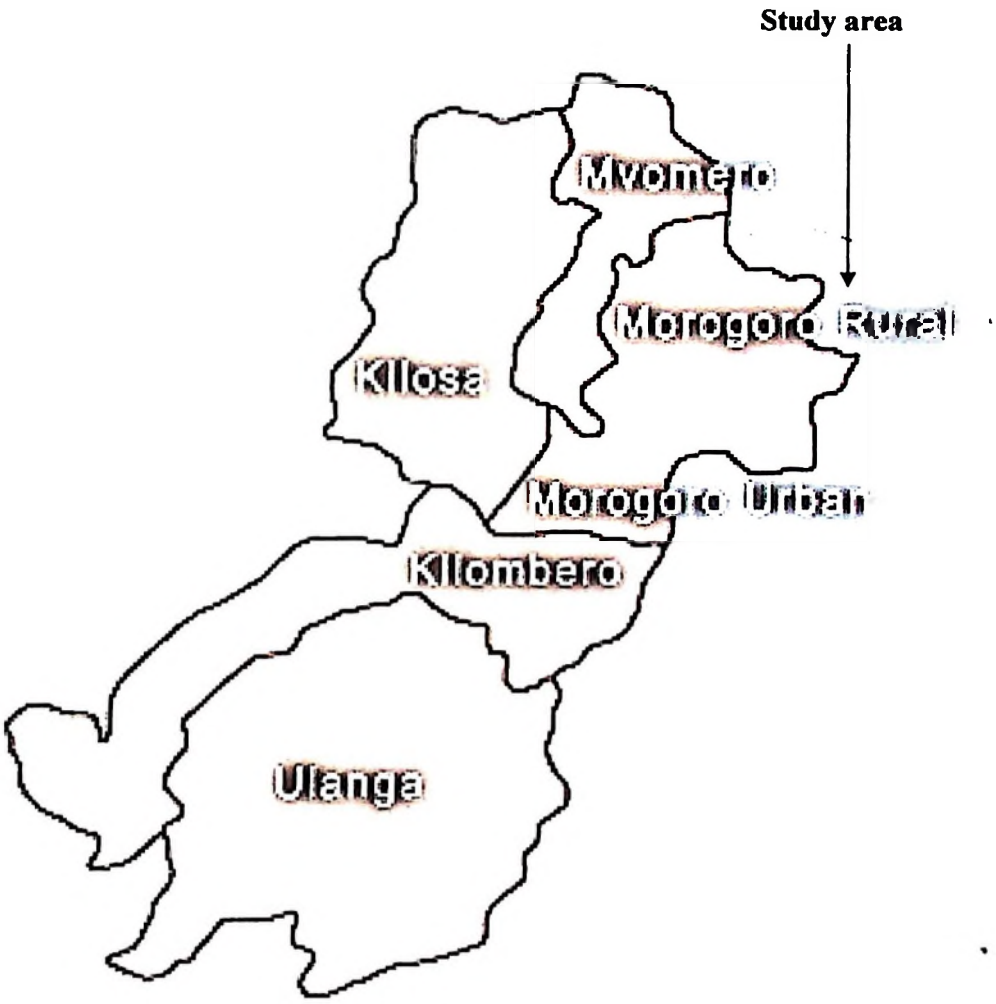

Figure 2: Location of Morogoro Rural District

Morogoro rural district is explicitly situated between latitude 5^0 8' and 7^0 35' to the south and longitude $37^0$33' to the East. The district can be divided into three geographic zones namely; Mountainous/Highland, Semi mountainous/lowland and Savannah (URT, 2002). Kinole and Kiroka are located on the eastern side of the Uluguru Mountains in Morogoro rural District. The two wards Kinole is about 46km while Kiroka is about 30 km away from Morogoro town. The division makes the North Eastern border with North Uluguru Mountain Forest reserve. Topography of this area is hilly with few patches of flats along valley bottoms. The altitude ranges from 300m to over 1 800m.

Mikese and Mkambarani covers 55% of the District with an altitude of 600-800m above the see level. The zone is also characterized by sandy clay type of soils, which are suitable for paddy, maize and cassava for food and cash; and sugar cane, cotton and sisal as cash crops (URT, 2002).

3.1.1The climate

Kiroka and Kinole are generally tropical humid at lower altitudes and subtropical at higher altitudes. Total annual rainfall amount ranges from 1 300mm to 2 900mm. The area experiences very short dry seasons (less than 2 months in a year). This makes the place to be almost evergreen throughout a year. Crops grown in the area are banana, pineapple, coconuts, fruit trees (oranges, mangoes and jack fruits), yams, Maize, upland rice, spices, and vegetables.

Rainfall is unimodal except in the mountains. In Mikese and Mkambarani some short rains start in October and last to January while long rains during mid-February to May (Joune, 2004). The average annual temperature is 29 degrees centigrade. This amount of temperature may become lower and sometimes reach 15 degrees centigrade in May up to July in Uluguru Mountains.

3.1.2 Communication

Morogoro rural District is a prominent mode for road transportation. The District has a total of 1 036km roads, out of which, 511 kilometers are the feeder or village roads; 188 Kilometers are trunk roads while 337 kilometers are District roads. Most of the village roads are not accessible especially during the rainfall seasons. Bad roads are hampering the efficiency of service delivery to the villages (URT, 2002).

3.2 Research Design

The study used a cross-sectional research design so as to allow the collection of data from different groups of respondents at relatively the same time. The design was also used in descriptive study and for determination of relationships of variables. The cross-sectional research design was considered to be favorable because of resources limitations for data collection.

3.3 Sampling Procedure

3.3.1 Sample population

The study involved rural farmers, politicians like village chairpersons, and ward councilors. Also governmental officials like the district extension officer, village extension officers and Village Executive officers were also involved.

3.3.2 Sampling Unit and Sample size

The sampling unit was household members, and the total sample size was 100 respondents. The study was conducted in four wards namely: Mikese, Kiroka, Mkambalani and Kinole and each ward had 25 respondents. The information was obtained from key informants that is, the Village Executive officers, district agricultural officers and political officials.

3.3.3 Sampling methods

Purposive sampling technique was applied in the study. A simple random sampling procedure was applied to select four villages. Purposive sampling was employed to select key informants.

3.4 Data Collection

3.4.1 Primary data

The study was subjected to quantitative (more in numbers) and qualitative (more in words) data collection methods. Quantitative data were obtained through interviews schedule (face to face) and questionnaire, qualitative technique was employed for collection of data through key informants' discussion (Appendix 1).

3.4.2 Secondary data

Data from secondary sources were obtained from published documents, unpublished documents and reports from different organizations. Various records and references from Sokoine National Agricultural Library (SNAL) were also utilized.

3.5 Data Processing and Analysis

The data processing and analysis was done at Sokoine University of Agriculture Morogoro, Tanzania. The Statistical Package for Social Sciences (SPSS) computer software was used in analyzing and coding the data. Descriptive statistics such as frequencies and percentages were used to find the simple means for studying variables and show the linkages between independent variables and dependent variables.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Overview

In this chapter the analysis of the results of the study is made. The analysis corresponds to the specific objectives. The study was directed mostly on the impact of road transport on agricultural production. This was verified during the field research whereby the effect of road transport was examined by means of literature reviews consultation and later on through investigation conducted by means of questions to farmers. The research findings are as follows:

4.2 General Characteristics

The general characteristics represent a sample of household members on the impact of road transport on agricultural production. The characteristics of respondents which were examined in the study include age, sex, marital status, education and occupation.

4.2.1 Age of respondents

The age of household members ranged from 20 to 60 years. All selected respondents were mature enough to cooperate and give clear information because they had a practical experience on the impact of road transport on agricultural production. The respondents were from four wards namely: Mikese, Kiroka, Kinole and Mkambarani. The study interviewed 100 respondents in four wards, 25 respondents were from each ward. All respondents in four wards were cooperative, active and open enough to deliver the information regarding the impact of road transport on agricultural production.

Table 1: Distribution of respondents by age

Age (Years)	Frequency	Percentage
20-24	9	9.0
25-29	8	8.0
30-34	16	16.0
35-39	14	14.0
40-44	15	15.0
45-49	20	20.0
50-54	12	12.0
55-59	5	5.0
60-64	1	1.0
Total	100	100.0

Table 2: Distribution of respondents by wards and villages

Wards	Villages	Frequency	Valid Percent
Mikese	Newland	25	25.0
Mkambarani	Kizinga	25	25.0
Kiroka	Lukenge	25	25.0
Kinole	Kinole	25	25.0
Total		100	100.0

4.2.2 Marital status

The study showed that the majority of household members, that is 94.0%, were married. Majorities are married due to religious convictions; this is because, all of the household members surveyed are either Christians or Muslims and 6.0% accounted for respondents who were single.

Table 3: Distribution of respondents by marital Status

Marital Status	Frequency	Valid Percent
Married	94	94.0
Single	6	6.0
Total	100	100.0

4.2.3 Sex

Majority of the respondents were men, despite of the fact that selection of respondent was regardless of sex. Data from table 4 shows that the proportion of women interviewed was less compared to men. The proportion of males accounted for 67.0% and 33.0% for women, despite the fact that women comprise the largest provider of agricultural labour in Tanzania. In all cases, decisions were made by the family (jointly between husband and wife), husbands always seem to take the leading role. Women are dominated in every aspect of domestic activity. Control of cash obtained from sale of cash crops, food crops, livestock and land was a responsibility of men.

Table 4: Distribution of respondents by sex

Sex	Frequency	Valid Percent
Male	67	67.0
Female	33	33.0
Total	100	100.0

4.2.4 Education status

Education levels of Morogoro rural farmers are generally lower than in urban areas. As a result, rural farmers' ability to overcome crop diseases or to take up new innovations is relatively low, as they have only limited access to agricultural information from written sources and the media.

During the study it was found that 78.0% of respondents attained primary education, 5.0% attained ordinary secondary school, and 17.0% of respondents had never gone to school. From the survey it was revealed that some household members in rural areas do not know the importance of formal education in human life. They perceived formal education as a worthless thing in human life. This attitude has led some parents in rural areas to convince their children to leave school and engage in income generating activities or get married.

Table 5: Distribution of respondents by education

Education	Frequency	Valid Percent
Primary Education	78	78.0
Secondary Education	5	5.0
No Schooling	17	17.0
Total	100	100.0

4.2.5 Occupation

Majority of people in Morogoro District are small scale farmers. The results showed that 100% of respondents interviewed were farmers. They grow maize, bananas, yams, fruits and vegetables. About 83% of respondents were both farmers and petty traders. Petty traders in the study area sell different food products to customers and middlemen from Morogoro Region and other regions like Dare es Salaam, Dodoma, Iringa and Singida. Despite the achievements attained in agriculture, the researcher observed that most of people in the study area are poor. This terrible situation has brought adverse effects to rural farmers partly due to poor road transport. In the foregoing observation it has been elaborated clearly that improving accessibility of household to the road infrastructure generates gains to the society. But critical examination reveals that these gains are not equally distributed between men and women.

Men gain more than women, for example where there is improvement access to unpaved road for men would increase aggregate agricultural productivity more than women. The same as to improved access to paved road where gain is more for men than women. Analysis of gender basis reveals that, at every village along the highway, men were more market oriented than women. A critical issue in many rural areas is that men frequently control income from agricultural production, while women have both limited control over financial resources, and limited incentives to participate in many kinds of agricultural production activities.

Table 6: Distribution of respondents by occupation

Respondent's Occupation	Frequency	Percentage
Agriculture	17	17
Petty trade and Agriculture	83	83
Total	100	100

4.2.6 Economic activities

Generally, agriculture is the major source of income in lowlands; Maize, beans, fruits, vegetables; coffee and cardamom are grown in the highlands. In addition, maize, sorghum, cassava, sugar cane, cotton, sunflower, sisal, simsim and rice are also cultivated. Other activities include livestock keeping and pit sawing, the staple foods in the study area are maize, rice, beans, vegetables and the excess is sold to get cash. Cotton, sugar cane, coffee, sunflower, simsim, sisal and bananas are the cash crops for the District (Burgess *et al*, 2002).

4.3 The Situation of Road Transport in the Study Area

Road access is a problem in many villages in the area. Majority of the villages cannot be reached during wet seasons. The available roads are poorly constructed with limited provision of drainage. Other villages are not accessible at all. In Kinole and Kiroka wards harvesting season for pineapples, mangoes, and oranges coincide with the rainy seasons. The situation has serious impact on marketing of those perishable products. During the rainy seasons farmers are forced to sell their products at lower prices. For example a pineapple worthy 500/= in Morogoro town can be bought at 50/= on field during rainy season. Villagers in Kinole have formed a group of youths who are responsible for road rehabilitation; the group is given a Luguru name *lamkeni* which means get up whenever there is road rehabilitation in the village.

Moreover, every truck that enters at Kinole market is being charged with some amount of money, and that money is used to pay the *lamkeni* group during road rehabilitation. Lukenge village is located within Kiroka ward; the village does not have road transport at all; the area is very productive and farmers in the area produce agricultural products like bananas, yams, oranges, pineapples, coconuts, paddy, maize, and vegetables. The distance from Lukenge to Kiroka is approximated 20km. Since there is no road transport from Lukenge to Kiroka, then farmers in this village always carry their agricultural products on the head up to the market center called Soweto.

Kizinga village is within Mkambarani ward. Its distance is estimated tobe15km from the ward. During the rainy season roads are not passable and hence hinder the delivery of agricultural products from the farm to market places. Newland is a sub village of Mikese ward whose distance is estimated to be 7km from the main road. Different agricultural

products are cultivated in the area, and these include maize, cassava, millet, sunflower, water melons, and beans. In Newland there is a big problem of road transport. The current road transport going to the farm places is out of order and therefore not passable by vehicles, hence farmers are forced to carry their products either by bicycles or on the head up to the market center named Fulwe.

The study is similar with the research done by Chibehe, M. M. (2004) on the factors affecting sustainability of farmers groups: the case of Twikinde Malimbichi Cooperative Society of Mgeta. The results reveal that, all contacted members and non-members complained about unfavorable market prices for their products. They said that, *"many people are interested in joining the farmers groups believing that the problem of market for their agricultural products will be solved by these groups but on the contrary, they are discouraged to join these groups because the groups have failed to solve marketing problems for their members."* For example, from the survey it was observed that the average price of 1kg cabbage at the village market (Nyandira) ranged from Tshs. 30 to 50, but the same 1kg cabbage in Morogoro town was sold at the average price ranging from Tshs. 200 to 300.

The study is also similar with the CROMABU Project that was designed to gather and disseminate relevant information regarding crop prices in local and international markets. Based in the Magu area of Mwanza, near the southern shores of Lake Victoria, CROMABU is supported by the Dutch International Institute for Communication Development (IICD). The results reveal that, small-scale farmers have benefited greatly from the project. The Internet services have helped them get the best market prices for their produce, namely cotton, groundnuts, maize, beans, finger-millet and sunflower. When prices are low in Tanzania, the Internet enables them to secure direct buyers from abroad -

some of whom are sometimes ready to pay above the world market price. Before 2002, middlemen (Madalali) in Magu were conspiring to lower crop prices in order to reap unfair profits. The price of good cotton, for instance, ranges from Tanzanian shillings 200 (US$ 0.2) to shillings 250 (US$ 0.25) per kg, while before the project it could be as low as shillings 150 (US$ 0.12) to shillings 180 (US$ 0.18) per kg (Menda, 2001). In the Eastern Zone, the price of cotton in 2007/2008 season ranges from 450tsh to 500tsh per kg.

The affordable incentive goods by farmers/peasants enable them to produce for the market to get money and buy certain household goods, cars, motorcycles and build modern houses. The agricultural input prices in Morogoro District are very high. In fact half of the interviewed farmers/peasants can't afford to buy these inputs due to finance incapability of which has been caused by poor Road Transport. Moreover, Farmers in the study area have no access by financial institutions for lending because the financial institutions avoid remote, inaccessible areas to avoid operating costs.

4.4 Transport Operation Costs to the Peasants/Farmers

A high transport cost is of a significant concern for peasant/farmers who were interviewed. From that observation 56% of them said that high transport cost affect the sustainability of livelihoods and reduce the life chances of rural people. Impassability of most of the rural roads during the rainy season affects the incomes of petty trader and peasants hence decline of agricultural productivity, as traders cease to come and buy agricultural products.

Table 7: The distribution of respondents by constraints that hinder Farmers from producing more

constrains from producing	Frequency	Percentage
price of farm implements are very high	6	6.0
transport costs are very high	56	56.0
poor road accessibility to the farmers	31	31.0
lack of enough capital	7	7.0
Total	100	100.0

The major means of transport in the remote areas of Morogoro district is on foot, though trucks and pick ups are used but they do not reach the remote areas especially the production areas, due to bad and seasonal roads. In Morogoro District transport is predominantly non-motorized, walking and head-loading, poor infrastructure development, high transport operation costs and charges experienced by operators and users respectively. Low demand of transport is duc to low level of affordability.

Morogoro Rural farmers are unable to transport their agricultural products far at the market because of poor road in transporting goods to the market. Subsequently, it becomes necessary for peasants to sell products at a much reduced price to traders or pay excessive transport fees in order to generate surplus capital with which to pay for health care and education.

The road transport in Morogoro District is characterized by high cost, therefore the transport costs of min buses and trucks from Morogoro town to Kiroka and Kinole ranges from 2 500/= to 3 000/= and from Morogoro town to Mkambarani and Mikese ranges from 1 000/= to 1 500/= per person as fare.

4.5 Road Accessibility to Farmers

Accessibility is a key problem in Morogoro District and good rural planning needs to address access to a full range of goods and services required by the rural population. Unfortunately, off-the shelf rural planning methodologies appear inappropriate to local level planning for rural farmers and are primarily designed for state level 'top-down' planning. Results indicated that for all farmers who move agricultural products from areas that are having poorly maintained roads received very low profit, and sometimes loss from their agricultural products. Therefore 77% of the interviewed farmers indicated that the low profit or loss they received from the sale of their agricultural products is due to the fact that transport charges are of very high resulting from the poor condition of road transport. Since there was inflation on price of oil, the price of both petrol and diesel ranged from 1 400/= to 1 600/= per liter.

Table 8: Distribution of respondents by high transport costs

Transport cost	Frequency	Percent
because of the high price of oil	23	23
because of poor road transport	77	77
Total	100	100

In order to curb this trend of wasting resource in term of vehicle operating costs, this is due to poor maintained roads and low road network in Tanzania. The National Transport Sector Plan aims at sustaining the transport sector through monitoring, implementation of rules and procedures of Road Fund. Transport Master Plan has the objective of outlining how, where and when the transport infrastructure in Tanzania is to be developed basing on demand and supply.

Morogoro District lacks road network which limit creation of new opportunities for markets, employment, trade (domestic and foreign) and constrain actions towards social outcomes (e.g. delivery of and quick access to medical attention, schools, courts and markets or trade).

As indicated earlier road transport in Tanzania carries about 70% of the total freight in the country. However, majority of people interviewed indicated that more freight could have been available for transporting by the road sub sector had only there been an effective road transport infrastructure. Taking example about half of the farmers interviewed indicated that due to high cost of farm implements they could not cultivate large land area although they had ability to do so. About one third of the farmer indicated that more agricultural products could have been produced if the freight charges could have been lowered.

The finding indicates that if there had been adequate road accessibility to rural areas there could have been no problem of acquiring farm implements, and therefore a higher volume of agricultural products would be produced. The results will be an increased earning in the rural areas from agricultural products and hence leading to improvement to agricultural products and in the long run reduce poverty.

Road is the dominant mode of transport in most parts of the rural areas. By virtual of the fact that poverty is a rural phenomenon, Morogoro rural farmers lack good road infrastructure development and services that would stimulate production in the rural areas and facilitate transport to the major transport networks and market centers.

Farming in Morogoro District is predominantly low-technology, 95% of all farms are cultivated by using traditional farm implements that is by hand hoe. Therefore accesses to

markets are a problem for rural farmers; rural road network are poor and hence making rood transport to cities expensive. Lack of inputs such as seeds, fertilizer and pesticides limits the yields to rural farmers.

Road infrastructure is crucial in providing linkage among Morogoro rural communities to the urban market, where the agricultural inputs and products are transported to and from the farm gates respectively. The state of the existing road transport is poor and can hardly be used especially during wet seasons due to inadequate maintenance. This leads to poor or unreliable road transport services, which in turn contribute to post harvest loss in agricultural products. The poor condition of road infrastructure in rural communities has imposed a significant penalty on agricultural activities through higher vehicle operating costs, delays caused by long travel time to the nearest transport services, decreased crops and animal production, and therefore adversely affecting the economy.

Table 9: Distribution of respondents by road transport problem during rainy season

Transport Problems in rainy season	Frequency	Percentage
Yes	97	97
No	3	3
Total	100	100

In Morogoro District 97% of respondents said that, road transport is hardly passable especially during the rainy seasons. The road transport sometime gets completely destroyed making accessibility impossible. Most of village dwellers are not aware of their role in making their contributions of the improvement of their roads, bridges and other transport infrastructure. Maintenance has been irregular and largely limited to spot improvements made by villagers with little or inadequate resources and skills, yielding just

short-term results. Such infrastructure blocks growth of economic activities as well as hindering local road transport

Poverty reduction is one of the major themes on the current development agenda. The Tanzanian government has developed a long-term strategy on poverty reduction. The government has also prepared a short and medium term Poverty Reduction Strategy (PRS) including the National Growth and Reduction of Poverty Strategy (MKUKUTA). Despite these efforts the problem of increasing poverty stubbornly refuses to go away. Many reasons have been advanced for this situation. Transport specialists, for example, suspect that the government efforts on poverty reduction pay insufficient attention to problems of rural accessibility and mobility.

4.6 Farmer's Perception on the Contribution of Road Transport to People's Livelihood

Farmers in Morogoro District had different perceptions regarding the impact of road transport on agricultural production. They said that the presence of poor road transport in rural communities result to a number of problems such as child mortality, maternal mortality, HIV/AIDS, malaria and other diseases, wastage of time, lack of socio-economic development, and inadequate communication network.

4.6.1 Child mortality

Rural dwellers in Morogoro District said that, there is a clear link between levels of infant and child mortality and accessibility to health services/centers. They said when transport costs are high or health centers are difficult to reach, poor people fail to seek health-care services altogether. Transport has an important role to play in combating major preventable diseases like tuberculosis. The success of national immunization programmes, for which

repeat visits are often required, depends on the availability of affordable road transport services to the poor communities.

National immunization programmes require timely delivery of vaccines to health facilities in a cold-chain supply environment for which a dependable road transport service is necessary. Faster access to health services is critical to children's health. Road transport is crucial for children's survival in medical emergencies, such as accidents (not only road accidents but other types, such as snake bites which may be common cause of death in many rural dwellers), and for effective response to outbreaks of communicable diseases (diarrhoeal diseases such as dysentery). At the same time costs increase for drugs, treatment and care for children, as a results less time is spent on agricultural production and hence less food is produced and rural farmers do not have enough money to buy other essential goods and services.

4.6.2 Maternal mortality

The link between levels of maternal mortality and accessibility to health services/centers is very clear. Improved transport facilities and services make it possible to increase the use of (reproductive) health-care facilities, antenatal care and professional child birth attendants. These services can reduce maternal mortality, which remains a major concern in rural communities. Lack of access to appropriate transport services is one of the main reasons for the poor reproductive health of rural women in Morogoro District. Low-cost transport interventions can help to reduce maternal mortality rates by improving access to health centres and facilitating child delivery at a health facility.

Poor farmers caring for family members and falling ill themselves and eventually dying will inevitably reduce the amount of time spent in the fields. The labour force in the

agricultural sector will be diminished and weakened, which will results in a decrease in food or cash crop productiona

4.6.3 Combating HIV/AIDS, malaria and other diseases

Interventions in the transport sector would also be instrumental in combating HIV/AIDS and other diseases. Persons infected with HIV/AIDS or other sexually transmitted diseases require repeat visits to health facilities for treatment and access to antiretroviral drugs. The success of treatment programmes for these diseases often depends on the availability of affordable road transport services to the poor communities.

HIV/AIDS-infected persons also require assistance in order to be rehabilitated in their communities. For this purpose and for regular monitoring of their treatment follow-ups, they require regular visits by social and health workers. The availability of adequate transport services to social and health-care workers would greatly facilitate these vital visits.

The economy of Tanzania is affected by the HIV/AIDS epidemic largely because it depends on agriculture, which again depends mainly on human labour. This can simply be concluded that HIV/AIDS epidemic has profound effects to the agricultural sector and therefore a major limiting factor for rural development.

4.6.4 Inadequate communication

In Morogoro district 83% of interviewed peasants had a perception on the lack of adequate communication networks. This led to untimely delivery of agricultural products at market places at a time when demand is very low leading to very low price and hence very low profits or sometimes loss occurring to the peasant and petty traders. Also the inadequate

communication network led to poor provision of credit facilities, farm inputs, technology and knowledge on better farming practices.

In that manner suitable roads networks would provide an essential foundation for economic growth and prosperity, and are indeed a critical aspect for the sustainable economic development of a country. In this way, roads strongly influence spatially allocation of processing plants for agricultural producers. Roads transport deficiencies add to inputs costs, which in turn raise production costs as manufacturing firms and farmers are forced to pay for inputs.

Inadequacy in road transport hinders labour mobility, resulting into wasting time. Infrastructure deficiency constrains the carrying out of a wide range of income generating activities. All these constraints, translate into substantially production and distribution/marketing costs, which force economic agents to face narrow window of opportunity and they earn less in terms of income.

Indeed infrastructure especially road network has not been given due attention as a catalyst for stimulating agricultural productivity, supply of road in Tanzania just like other developing countries is highly insufficient, in many food-growing areas, crops are carried in many kilometers by head to the assembly markets or roadsides.

Consequently, insufficient road transport hinders social and economical development of rural dwellers, because of inadequacy of road network, the following factors seemed to be common to Rural population, these factors include; ignorance, òl levalence of púse□Úes8+squalid surrounding, high infant, child and maternal mortality, low life expectancy, low per capita income, poor quality housing, inadequate clothing, low

technology utilization, environmental degradation, unemployment, rural urban migration and poor communication.

4.6.5 Socio-economic development

Good road transport in Morogoro District is necessary for socio-economic development, because it would provide essential links between centers of production and markets in economic sectors particularly agriculture. Transport infrastructure also provides access to employment, health and education, recreation and other social services. Transport makes a significant contribution to (GDP).

In Sub-Saharan Africa, the transport sector contributes an average of 5 to 6% of GDP. Road transport is one of the key factors that determine the price of goods and services. A properly functioning transport system can minimize transport costs. It is therefore essential that the sector is operated efficiently and effectively to enable the rural economic sectors contribute optimally to socio-economic development. Transport, therefore, has the potential to help and reduce poverty through supporting economic growth by directly and indirectly promoting trade and higher productivity in the economic sectors. The provision, expansion and maintenance of road infrastructure create employment which can reduce income poverty while easier access to services such as health facilities and schools reduces non-income poverty.

The quality and quantity of rural transport services profoundly affect the daily lives of millions of residents of rural communities. Goods and agricultural inputs need to be transported to villages and market centers. Social interactions generally require significant level of transport.

Despite all these, transport services are limited making the mobility of Morogoro rural communities difficult and costly. In order to facilitate movement of goods and services in rural areas the policy directions are to be followed; firstly, is to increase private and public sectors participation in the construction of rural road transport, and secondly, is to give development of rural infrastructure a deserving emphasis during planning and allocation of transport resources at the national level.

In rural areas walking and head loading dominate travel and transport activities, and in most cases the movements takes place on footpaths. Availability of means of transports such as bus, tractors, pick-ups, and lorries are very low and limited. Many households use NMT like bicycles, tricycles, animal drawn carts and wheelbarrow to transport agriculture inputs and outputs from their fields. The Non-Motorized Transport (NMT) is used at a varying scale depending on the income levels. Out of the total carriage in the rural areas, only 25% is done using NMT. This situation reduces efficiency in economic activities and marketing, hence accelerates poverty in the rural communities (Finn Amundsen, 1995).

The efficient transport service in Morogoro rural is needed for speedy delivery of agricultural inputs such as improved seeds, fertilizers, ploughs and other farm implements to the village and household levels, as well as transportation of crops from farms and villages to the markets and other consumption areas. Some of the village and district dwellers have no access to transport services because such services are either unavailable or are hardly affordable. Poor transport services impede the growth in agricultural activities and standard of living of Morogoro rural communities.

Rural areas need to be given primary consideration in transport services through increased transport supply and investment. Since the transport demand side would wish have an

effective transport in rural areas to foster agricultural growth, the policy direction to meet this expectation is to promote private sector participation in the provision of transport services, and encourage private sector in collaboration with public sector to provide competitive road transport services to make them affordable to rural communities.

4.6.6 Wastage of time

The peasant economies in Morogoro rural communities are characterized by unnecessary expenditure of large amounts of time and effort on movement and carriage. Considerable time and effort is expended in the rural areas (particularly by women who are the major rural productive force) on fetching water and firewood, on attending to grain milling activities and on moving to and from the fields for ploughing, planting, weeding and harvesting crops. Time is also wasted in getting to hospitals and marketing centers. The essence of transport improvements is minimization of time and effort needed to move from place to place. For example, a woman who spends 30 minutes to go to the water well will only bring back 20 liters if she carries the water container on her head. If she uses a handcart, she can bring back 6 to 8 water containers of 20 liters each or 120 to 160 liters. If she users a half - ton donkey cart she will bring back 500 liters.

Thus with simple transport innovations, her productivity would improve tremendously. Rural road transport is required to provide physical presence to places offering opportunities. In a rural setting this can be looked at from both production and consumption dimensions. From the production side the impact of transport can be seen through accessibility to areas with agricultural potential, provision of inputs, and accessibility to markets.

Transport deficiencies in Morogoro district add to input costs and lead to marketing inefficiencies. Welfare effects explain the consumption dimension of the role of road transport; improved rural road transportation would facilitates access to social services like education, health care, sources of clean and safe water. This enhances the quality of human capital and positively impacts on labour productivity.

Human capital development is a critical input in poverty eradication initiatives. In addition to enhancing general economic efficiency, transport improvements can lead to poverty reduction, through the activities involved in the provision and production of rural road transport infrastructure and equipment. The choice of labour based technology for rural transport infrastructure works, for example, lead to considerable increase in rural income.

For many years the transport system in Tanzania has been characterized by immense deficiencies including the existence of multiple Government ministries responsible for transport planning and management, lack of coherent transport policy guidelines, inadequate formalized co-ordination and consultation, shortage of trained and experienced personnel, inadequate infrastructure and facilities, lack of regulatory regimes that are adequately equipped to enhance competition and insufficient dialogue between the public and the private sectors.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

a) The findings presented in this study bring a number of issues that are important for improving rural access ability and mobility of the isolated poor peasants; pave the way for access to market, services and other opportunities. In this way, road transport access is a critical issue for economic activities that would improve the living standard of the rural people. The impact of improved market access in terms of road infrastructure would be seen among other things such as increased aggregate agricultural productivity, commercialization, household income and improved well being of rural people.

b) The impact of road transport on agricultural production was seen stronger in social and economic linkages between rural and urban areas and in opening up opportunities for the rural people to engage in non- farming activities. It can undoubtedly be concluded that the road transport is a powerful tool to commercialize agriculture in developing countries particularly Tanzania.

c) Apart from that improved road access, the ability of an individual to take advantage of improved market access depends on the economic power or social function of an individual. The rich or the stronger are likely to benefit more than the poor or the weak. This has been confirmed by the results that households' characteristics were better for men than women. Furthermore it was found that investment in paved roads in the study area is a viable for economic venture. From this observation the following recommendation for consideration by Policy -makers are made.

5.2 Recommendations

a) Police-makers in Tanzania acknowledge the positive contribution of good road to economic efficiency and well being of the society. However many of them lack an understanding of empirical relationship between road and other sectors of the economy.

In order to improve road transport in rural communities, the Government of Tanzania has to put more emphasis on enhancement of institutional reforms, which have been going on in all aspects of the transport sector.

b) There is a need for enhancement of formal coordination and consultations through sectoral technical consultative meetings and annual national consultative technical meetings such as the Transport Policy and Planning Workshops, Rural Access Group consultative meetings, and Annual Road conventions.

c) Since it has been shown empirically that agricultural productivity is linked to physical market access in terms of good road network, the issue of investment priorities in road network is of great importance for transforming the agricultural sector in Tanzania. In this respect road network improvement could be used to address the challenges of poverty reduction and rural development in general. However in improving road network should always be remembered that building roads is one thing and maintaining them is another.

d) The government should come up with a short term plan aiming at adequately maintaining the current rural road transport in order to reduce vehicle operating costs

using existing rural road network. The Local Government Authorities should make sure that available resource collected through road fund are able to meet all expenditure requirements, which includes addressing the requirements for roads transport maintenance/rehabilitation and development needs.

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APPENDICES

Appendix 1: Farmers Interview Schedule

Title: The impact of Road Transport on agricultural production in Morogoro Rural District.

Division.....

Ward.....

Village.....

A. Basic information

1. Questionnaire number .....
2. Respondents' age .....
3. Sex:
   i. Male
   ii. Female
4. Marital status:
   i. Married
   ii. Single.
   iii. Widow/widower
   iv. Divorced/Separated.
5. Level of education:

i. No schooling.

ii. Primary educations.

iii. Secondary education.

iv. Tertiary education.

6. Number of children .....

7. Occupation

Agriculture

Trade

Mining

Tourism

Worker

SECTION A: INACCESSIBILITY TO RURAL ROADS TRANSPORT

1. A). Do you experience road transport problem in the village?

i. Yes

ii. No

B). If Yes, what are the problems

.....

.....

2. A). Does area inaccessibility by road affects agricultural products?

i. Yes

ii. No

B). If Yes, explain how does it affect

.....

.....

3. A) Do you face any other Constraint from the agricultural production?

i. Yes

ii. No

B). If Yes, what are those constraints

.....

.....

4. By which means do you transfer your products to the market place?

1. by car

2. by bicycle

3. Carrying on head

5. A). Does road inaccessibility limit the delivery of agricultural inputs?

i. Yes

ii. No

B). If Yes, what are those limited agricultural inputs

.....

.....

6. A). Is your farm located far away from your home?

i. Yes

ii. No

B). If Yes, how far is it?

.....

7. What type of farming are you practicing?

1. Traditional farming system
2. Modern Farming System

8. A) Does the road transport have any positive contribution to agricultural production?

i. Yes

ii. No

b) If Yes, what are the contributions

.....

.....

9. A) Does the existing road transport satisfy farmer's products?

i. Yes

ii. No.

B).If No, why it doesn't satisfy farmer's products

.....

.....

10. A) Is rural road transport plays a big role to farmer's development?

i. Yes

ii. No

B). If No, why it doesn't play its role to the development rural communities

.....

.....

11. For how long have you been cultivating?

1. One year

2. Two year

3. Three years

4. More than three years

12. When is the season for crops cultivation?

1. Dry seasonal
2. Rain seasonal
3. Throughout the year

13. What is the kind of crops do you grow?

1. Cash crops
2. Food crops
3. Cash and food crops

14. What is the size of your harvest per year?

1. Less than one sack
2. One sack
3. Two sack
4. Three sack
5. More than four sack

15. Where do you sell your products?

1. At market place
2. At home

16. A) Do you have any other source of income apart from agricultural?

i. Yes
ii. No

17. What is the main source of your income?

1. Cash crops
2. Food crops
3. Both cash and food crops

18. What is the size of your farm?

1. Less than 1 acre
2. One acre
3. Two acres
4. Three acres
5. four acres
6. Five acres
7. More than five acre

19. Is the income enough to sustain your family in a year?

1. Absolute no
2. Not adequate
3. Fairly adequate
4. Adequate
5. Absolute adequate.

SECTION B: INCREASED TRANSPORT OPERATION COST.

20. How is the cost of producing Cash/Food crops?

1. Very high
2. Constant
3. Very low

21. What is the Constraint that hinders you from producing more?

1. Price of farm implement very high.
2. Transport Cost very high.
3. Poor road Accessibility
4. Very high freight Charges

22 Why is transport cost very high?

1. because the price of oil is very high
2. because of poor road construction
3. because the agricultural products are not easily obtained

23. A) Is there any impacts of increased transport operations cost to the farmer?

1. Yes
2. No

B). If Yes, what are the impacts derived from transport operation costs

.....

.....

SECTION C: PEASANT'S PERCEPTION ON THE ACCESS TO ROAD TRANSPORT

24. A). How is the road transport problem?

1. Big
2. Normal
3. Small

25. A). Do you have transport problem during the rain season?

i. Yes
ii. No

B). If Yes, explain what are the transport problems during the rain reason

.....

.....

26. A). Do you have any opinion to the government with regard to road transport problem?

i. Yes
ii. No

B). If Yes, what are your opinions

.....

.....

27. A). Do you have transport problem during the dry season?

i. Yes
ii. No

B). If Yes, what are the transport problems

.....

28. What should be done in order to do away from transport problem?

1. To reduce the price of the fuel
2. To construct good road transport
3. To reduce transport costs

29. Do you benefit from the present road transport?

i. Yes

ii. No

B). If No, what are the constraints

.....

.....

30. A). Have you taken any measure to alleviate the problems of road transport?

1. Yes
2. No

B). If Yes, what measures have you taken.....

.....

.....

31. A). Does poor road transport affect the livelihood of rural people?

1. Yes
2. No

B). If Yes, what are the effects derived from poor road transport

.....