EVALUATING "GAMISARIYA" RURAL BUS SERVICE PROGRAMME

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Declaration of the Candidate & Supervisor

"I declare that this is my own work and this thesis/dissertation does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any University or other institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text"

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Abstract

"Public Passenger Transport (PPT) is very often associated with subsidies in almost all countries in the world". When consider Sri Lanka, as a developing country, this statement is true with the PPT for Rural communities. Rural Passenger Services are making loss due to different reasons. As a result of this fact private bus owners are reluctant to operate bus services in uneconomic rural routes. But as an agricultural base country, over 70% of Sri Lanka's population lives in rural areas.

Therefore rural passenger transport services are very important for the commercial, industrial, social and educational activities in rural communities and such services can provide several benefits to the rural societies.

The National Transport Commission (NTC) is implementing the project called "Gamisariya" to subsidize the identified uneconomic rural routes. Under this project transport services are provided for more than 1014 rural villages and for more than 77000 rural passengers.

The objective of the study was "To find out social & economical benefits created by "Gamisariya" project to the rural communities and to find out whether operators get sufficient subsidy amount to provide a reliable service to the villages."

To achieve the objective following methods were used to collect data;

- Interview with bus passengers/villagers and operators in selected routes
- Interview with village committees who investigate the service.
- Discussion with the officers in NTC who are involving with Gamisariya Project.

According to the results of analysis, the Gamisariya Rural Bus service (GRBS) Programme has increased the number of social and economical trips of the rural people. Further, the villagers are gaining more income for their production due to less transportation cost and higher volume of production. The project has higher economic benefit level to the society and road development and increasing land value are some indirect benefits that have been taken place due to the project.

Although several advantages are gained through this project the operators are not provided subsidies on time and some operators are not provided enough subsidy amounts to maintain their services. G.R.B.S has a significant impact on school trips of the children in selected villages and employment trips of the people. Further, to provide more useful service the time table of GRBS is needed to be coordinated with the timetables of buses, trains which have a grater demand from the passengers.

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LIST OF ABBREVIATIONS

Abbreviation	Description
CSMC	Community Service Monitoring Committee
CTB	Ceylon Transport Board
GRBS	Gamisariya Rural Bus Service
KPIs	Key Performance Indicators
NTC	National Transport Commission
NWP	North Western Province
PPT	Public Passenger Transport
RBSG	Rural Bus Subsidy Grant
SLTB	Sri Lanka Transport Board
URBTS	Unremunerated Rural Bus Transport Services
URR	Uneconomic Rural Routes
WP	Western Province

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CHAPTER 01
INTRODUCTION

1.1 Introduction

"Public Passenger Transport is very often associated with subsidies in almost all countries in the world" (Sri Lanka Transport Board, 1987).

When consider Sri Lanka, as a developing country, this statement is true with the public passenger transport for Rural communities. Rural Passenger Services are making loss due to the fact that such areas have lower household income and therefore unable to generate higher volume of travel. Further, rural communities are unable to pay higher fares. As a result of this fact private bus owners are reluctant to operate bus services in uneconomic rural routes (URR). But as an agricultural based country, over 70% of Sri Lanka's population lives in rural areas.

Therefore, rural passenger transport services are very important for the commercial, industrial, social and educational activities in rural communities and through such services, it can provide several social and economical benefits to the rural societies.

According to the report of second committee on uneconomic bus routes, With establishment of Sri Lanka Transport Board (SLTB) in 1958, Sri Lankan government took steps to provide subsidies to operate bus services in URR and during the past several years 300Mn. rupees per year were distributed among SLTB depots as subsidies to meet the cost of operations carried out on uneconomic routes. There were 2187 routes identified as uneconomic routes since late 1980s.

After establishment of the National Transport Commission (NTC), under the Act No. 37 of 1991 the subsidies for operation of buses in URR have been issued to the SLTB through National Transport Commission.

Until the year 2005 these unremunerated rural bus transport services (URBTS) were operated only by state buses and in the same year the NTC initiated a compensation

scheme for subsidizing URBTS under the project called “Gamisariya” and from the year 2004 both the state and private operators are provided subsidies under the project.

Under this project, transport services are provided for more than 1014 rural villages and for more than 77,000 rural passengers. The NTC deploying this under a better supervision and Gamisariya bus service is the only public transport mode for these uneconomic rural villages.

Table 1.1 Gamisariya Subsidy payments - Year 2004 to 2010

Year	Subsidy Payment for State Buses (M.)	Subsidy Payments for Private Sector (M.)
2005	91.80	0.4
2006	74.60	4.2
2007	100	4.3
2008	172.07	8.4
2009	170.00	14.8
2010	48.1 (related to previous year)	-

Source: National Transport Commission

The following table shows the allocation & received amount of subsidies from treasury to the National Transport Commission.

Table 1.2 Allocation & Received Amounts of subsidies

	2008		2009		2010	
	Allo.ted Amount	Received Amount to the NTC	Allo.ted Amount	Received Amount to the NTC	Allo.ted Amount	Received Amount to the NTC
Subsidies for un economic rural routes (M)	492.5	181.1	259.2	184.08	-	48.1 (related to previous year to SLTB)

Source: National Transport Commission

In year 2010 NTC has paid only 48.1 million rupees as subsidies for the SLTB. But this amount is arrears amount that was to be paid in the year 2009 for the months of October to December and there is no any allocated amount from the treasury for the year 2010.

In the year 2009, 479 Gamisariya buses were operated in URR and rupees 184.08 M. were distributed as subsidies. In 2010, 456 buses are providing services under the project. But up to the end of July 2010, the NTC has not provided any subsidy amount to the SLTB or private sector operators due to non allocation of finance by the general treasury.

Table 1.3 Arrears subsidy amount to be paid to SLTB

	Arrears to be paid to SLTB up to the end of July 2010	Arrears to be paid to SLTB up to the end of August 2010	Arrears to be paid to SLTB up to the end of December 2010
Subsidies for un-economic rural routes (M.)	103.5	112.0	215.5

Source: National Transport Commission

Due to unavailability of financial support, the SLTB already has stopped about 15 Gamisariya Services. But as described above, a number of social & economical benefits are gained by rural communities from this project. Therefore, the aim of this research is to show the importance of Gamisariya project initiated by the NTC and evaluation is carried on to find out what are the social and economical benefits perceived by the rural communities through this project and to find whether the Gamisariya bus operators (here only the private operators who are involved with the Gamisariya Project are considered) get sufficient subsidy amount to maintain a reliable bus service for the villages.

1.2 The Objective and Scope of the Research

Objective

To find out social & economical benefits created by Gamisariya project to the rural communities and to find out whether operators get sufficient subsidy amount to provide a reliable service to the villages.

The following factors were evaluated;

a. Using Gamisariya service by the school children to attend schools and its impact. (before & after the project)

b. Using Gamisariya service by villagers to visit relations/cinemas/ for religious & cultural events .(before & after the project)

c. Using Gamisariya service by the villagers for their employment .(before & after the project)

d. Using Gamisariya service to visit market/Groceries

e. Using Gamisariya service for other purposes (Hospitals /tuition classes etc.)

f. Number of small industries created due the project.

g. Quantity of production, transportation cost, transportation time and profit levels of agricultural production. (before & after the project)

h. Infrastructure developments (Road Building etc.)

To find out whether the operator gets sufficient subsidy amount, the Operator's income /expenditures/investments & subsidies are considered.

The scope of the research is to review benefits of Gamisariya project deployed by the NTC and to show the importance of the project by analyzing surveyed data and to recommend the government to continue the project by making necessary financial allocations.

Due to lack of time and other resources the study was limited to evaluate 03 routes only in North Western province (NWP) and Western Province (WP) where the project started in December 2007;

1. Saliyawewa – Puttlam
2. Gepallawa-Kurunegala
3. Giriulla-Mirigama

1.3 Transport Services in Sri Lanka

Public transport accounts for nearly 68% of the total motorized passenger transport and serves as the only means of transport for majority of the population. Of this, bus

transportation accounts for nearly 63%, provided by both state owned, privately operated buses and Sri Lanka Railway accounts for around 5% of the share.

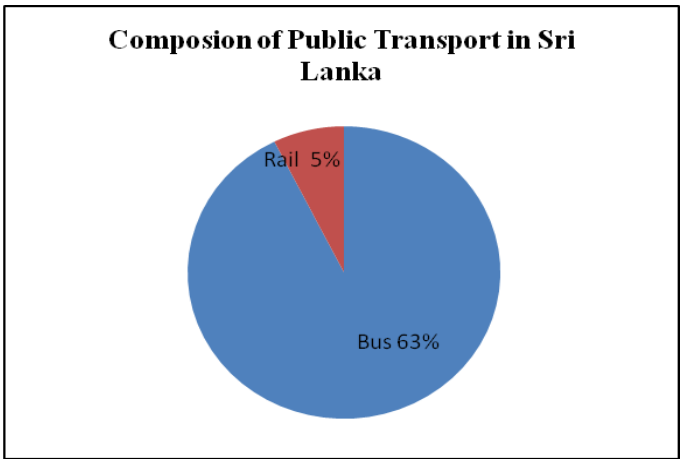

Figure 1.1 Composition of Public Transport

Source: National Transport Policy -2009

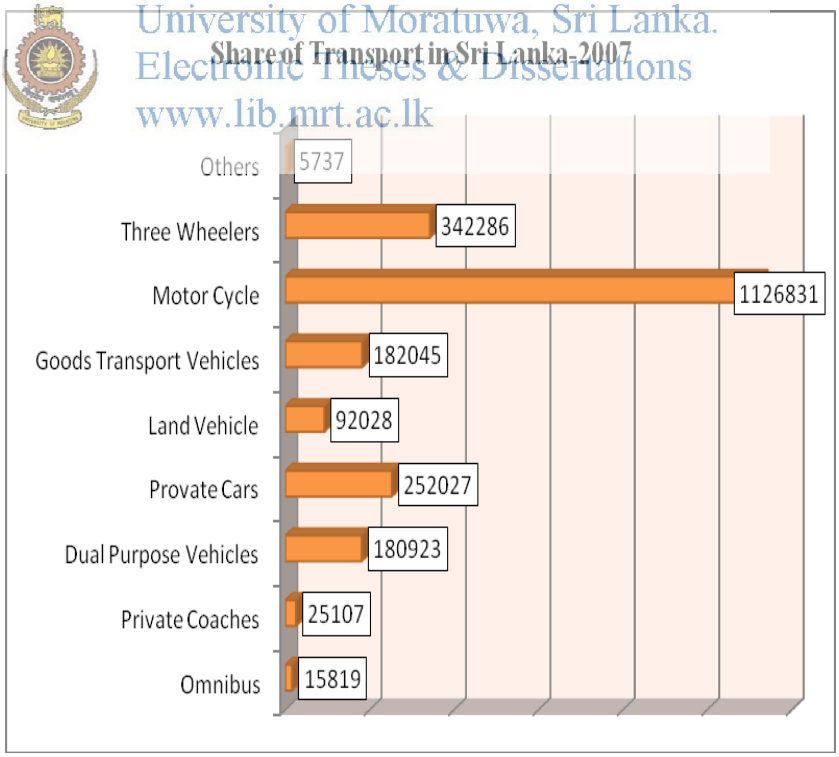

Figure 1.2 Share of Transport in Sri Lanka -2007

Source: National Transport Policy -2009

1.4 Bus Passenger Transport Service in Sri Lanka

Sri Lanka has a public transport system that dates back to the 1860s. Busses entered the service in 1907 and the first Omni bus service stared between Colombo and Chilaw, and the main target of the service was making profits, neglected requirement of passengers (Kumarage et al., 2009).

In 1928 Local Authorities intervened with the Omni bus industry by controlling the service through revenue licenses and with the regulations of insurance. The aim was to safeguard the passenger and to make a better framework for the industry. But this process gave multiple routes for operators and some routes were over crowded with busses while others were neglected. Here also the URR were neglected and buses were not operated in those routes. This process was in operation from 1928 to 1938.

After 1939, the public bus industry of Sri Lanka was regulated as a private monopoly system and based only on profit. Therefore, to overcome the difficulties of bus passengers', Sri Lankan government introduced central regulation for bus routes; licensing, fixing of bus fares, determination of working hours for bus crews, third party insurance. But there was no step taken to provide passenger services for the people who live in uneconomical rural areas. Therefore, the government had to find out possible ways of making a good path to establish acceptable transport facilities for all citizens of the country.

In 1954 all bus companies were converted into public liability companies and this also failed to provide benefit to the rural people and they were neglected the services.
In 1955 public, private companies were formed with 50% by the state, 25% by the operators and 25% by the general public.

The Ceylon Transport Board (CTB) was established on 1st January 1958 by nationalizing the Public bus passenger transport service and started to provide passenger bus services in URR. In 1960s & 1970s there were improved passenger services to the rural communities. It was the largest bus organization with 6000 buses.

But due to politicization, lack of reinvestments, not increasing bus fares with increasing cost, overcrowding, breakdown of busses and passenger dissatisfaction the CTB was deteriorating and most of the services were gradually abandoned (Sri Lanka Transport Board, 1987).

Meanwhile, with the liberalization of the economy in late 1977 the demand for transport was increasing sharply in the following years. A major institutional change that followed this revival of economic activity was the decentralization of CTB. Functions of the CTB were decentralized by creating 9 regional Transport Boards and a central Board on 15th June 1978. Such decentralization was deemed necessary in the light of the rapid expansion of the bus transport services.

In 1983 Department of Private Omnibus Transport was established to regulate the private bus industry. Further, the State operator continued its activity as an unregulated monopoly. Under this process profitable routes were over crowded with busses and other bus services of unprofitable routes declined.

Again in 1989 the government intervened and provided subsidy to the State operator to provide services in identified uneconomic rural routes. But this program was not successful due to insufficient subsidy amount.

In 1991 The National Transport Commission was set up under the NTC Act No. 37 of 1991. The functions of the Commission are to advise the government on the national policy relating to passenger transport services by omnibus.

1.5 History of Rural Transportation

The total land area of Sri Lanka is 65610 sq. Kms. and out of that 79% are rural lands. In 2009 the mid year population of the country was 20,450 million and rural population was nearly 17 million. 65% of the rural families secure their livelihood from agriculture (Sri Lanka Central Bank, 2010).

The history of civilization in Sri Lanka dates back to 5th Century B.C. where society was organized in units of agriculture based villages each of which had a temple, lake

and paddy fields as fundamental components of village existence. The people of this era had very limited needs and most managed with resources that were available within the village. Thereby travel needs of these people were minimal and limited only to trips of a religious and social nature.

When Lanka was under the British rule, many urban centers were created. Rail line was built mainly with the purpose of transporting the harvest of tea and spices to Colombo from the up country. Bullock Carts were the dominant mode of passenger transport at that time.

As mentioned above, the first recorded motorized road passenger service which was a bus-cum-lorry service from Colombo to Chilaw had commenced in 1907 and later extended to Puttalam in 1910. The first bus service, Colombo to Kandy, was introduced only after the World War I. These buses operated by private individuals carried both passengers and goods.

Unavailability of proper infrastructures, low population, and high transport cost, lower safety, higher time consuming and poor reliability were the major issues of rural transport and the transport facilities of those areas were growing very slowly.

But with growing of commercial, industrial, educational and social activities of the urban nodes the bus services between urban centers increased in number. Therefore, more rural communities were attracted to urban centers because of employment, trading opportunities and educational and to have health facilities (Kumarage et al., 2009).

In 1958, with establishment of CTB the government attention was focused to provide bus transport services to the URR. In 1960s and 1970s a number of such uneconomical rural routes were identified. These routes could be managed due to following of the method of cross subsidizing. That is covering the losses of uneconomic routes from the revenue of inter-urban and urban services (Kumarage et al., 2009).

Though rural transportation considerably improved after the establishment of the CTB, it began to deteriorate and most of the services were gradually abandoned.

In 1989, the government intervened and provided subsidies to the state operator to provide services in routes identified as URR. However, this was not successful since more and more uneconomic routes were added to this list without an increase in the subsidy amount. Thus amount of subsidy was too small to motivate the operators.

At the establishment of the National Transport Commission, it was stated that the NTC is required to provide "financial support" to those selected to serve "un-remunerative routes". Based on this and the poor state of rural transport, the NTC deployed "Gamisariya" project in 2004 to address problems encountered in rural transportation in Sri Lanka. This project provides subsidies for both state and private sector.

1.6 Public Transport and Subsidy

The finance involved in transport subsidies is normally provided by either the Local Authorities or Central Government or both. Theoretically, a case for subsidies may be justified, as all sectors of passenger transport cannot be operated on a commercially viable basis in situation where operational performances are measured in terms of conventional accounting principles. This is because the wider social benefit in traditional accounting is only confined to financial revenues and financial cost.

The difficulties encountered by the state transport operators in operating services, particularly in rural and developing areas, having regard to reliability, frequency, safety, convenience, cost etc., can be attributed to certain exogenous factors. In addition to being a development infrastructure and a community service, transport posses a significant social obligation on the part of transport operators. However, private operators of public passenger transport quite naturally pay least attention to this aspect as their prime motive is to maximize profit. On the other hand the decision by public sector operators not to operate commercially non-viable routes has to be

made at a high social cost. The non-operation of socially desirable services results in a loss of social benefits and therefore, the necessity to operate on routes which although uneconomic, but significant from the point of view of a community service or as a part of development infrastructure is justified by the resulting net improvements from increased social benefit and decreased social cost. The important contribution made by public transport to the way of life therefore, has to be recognized particularly in the organization of large human settlement and townships mainly in developing areas of the country.

1.7 Uneconomic Rural Routes in Sri Lanka

According to the details of NTC, basically an uneconomic route can be described as a route which does not earn adequate revenue to cover its actual cost components in providing passenger transport services. On the other hand these services unable to cover the short term variable costs by operating these services. These services can be classified into three categories as follows;

- Partially uneconomic services

  The routes in which portions of the routes may be profitable and the rest of the routes are not profitable. Here both private and SLTB buses are operated competitively in profitable portion and uneconomic portions are served only by SLTB.

- Totally un-served routes

  The routes in which either SLTB or private buses are not operated are considered as totally un-served routes. These routes can be identified as entirely un-economic routes.

- Un –economic times (considering the operating time)

  There can be services which may be profitable during day time and may not be profitable at late night and early morning hours.

Uneconomic routes

There are 2178 routes in Sri Lanka identified as uneconomic routes since late 1980s.

Table 1.4 Number of Uneconomic routes in Sri Lanka

Province	Number of Total operating routes	Number of uneconomic routes	Percentage of uneconomic routes
North-central	206	152	73.7
Sabaragamuwa	434	319	73.5
Eastern	163	115	70.5
Uva	556	384	69.0
Central	648	430	66.3
North-western	440	284	64.5
Northern	31	20	64.5
Southern	290	182	62.7
Western	588	292	49.6
Total	3356	2178	64.9

Source: Payments of subsidies for unprofitable rural routes – new procedure implement from September 2000 (NTC)

CHAPER02

GAMISARIYA RURAL BUS SERVICE PROGRAMME

2.1 Initiating the Gamisariya Rural Bus Service Programme by the National Transport Commission

People of many rural villages of Sri Lanka face serious difficulties due to lack of formal modes of transport. Therefore, the Sri Lankan government has been giving subsidies to SLTB during last 2 decades for operating buses in such areas with the aim of improving passenger transport facilities of rural people

.

Table 2.1 Subsidy payment for SLTB by treasury to operate bus services in URR

Subsidy payment for SLTB by treasury to operate bus services in uneconomic rural routes	Year	Amount Rs. (Mn.)
	1994	200
	1995	200
	1996	212
	1997	212
	1998	212
	1999	212
	2000	212

Source: SLTB

As mentioned above, subsidies were given for identified uneconomic 2178 SLTB routes in 1980s. But later there were complaints from SLTB that the subsidies given for those routes were not adequate to improve the services. Same time there were complaints from the rural people that they were not getting a reliable service.

Accordingly, a survey was done by the NTC in year 2004 and it revealed that the actual number of uneconomic routes were below 1000 out of the above services of 2178. However, subsidies were given to all 2178 routes until the year 2007.

As rural people were not getting a good service and bus fares were equitable for all people and rural people should not be required to pay more for basic transport services than citizens elsewhere in the country, the NTC started "Gamisariya" project as a testing in collaboration with the MOT in the year 2004 with the intention of providing a better formal bus service to the rural people. This project provides subsidies for both state and private operators.

Such compensatory payments are paid on actual delivery of service as stipulated through a contract with the NTC.

2.2 Objective of the Gamisariya Project

The objective of the Gamisariya Project is to maintain a reliable transport service under the concept "A separate bus for the village itself" and give subsidies for a period of three years by selecting non economic rural routes island wide with the intention of developing the selected villages.

2.3 Condition of Paying Subsidies Before 2009

At the beginning of the project the condition for paying subsidies were as follows;

- Any bus should not be operated in selected part of the route.
- Pay subsidies only for the distance of the route where services are not operated.
- At least 50% of the scheduled number of trips has to be completed in order to get subsidies. Payment related documents (Log sheets) have to be submitted before 15th of each month.
- There should be an adequate demand for at least 3 trips (morning, mid-day, evening) per day.
- Make arrangements to supervise the service through Rural Transport Community Service Monitoring Committee.

But as it was identified that under that system also the rural people did not get a good, successful transport service, the NTC reintroduced the Gamisariya project with new characteristics in the year 2009.

2.4 Identification of Rural Routes and Conditions for Subsidies After 2009

- In selecting routes, there should be a part of the route in which no other bus is operating.
- It is compulsory to operate 90% of scheduled trips in order to receive subsidies.
- A separate bus should be operated to the relevant village.
- The rural uneconomic portion should be 50% of the total distance of the route or more than that.
- Rupees 17.50 is paid as subsidies for 1 km for private operators and SLTB is paid subsidies in following manner

  Step -01 determine the potential earning capacity.

  The higher value of

  - Average way bill revenue per km of the depot or
  - Average way bill revenue per km of the all island

  Step -02 determine the actual revenue from uneconomic route.
  Here 50% of actual revenue per km is considered.

  Step-03 determine the subsidy payable
  Calculate the difference between above two values and assume the rate payable per km.

- The total distance of the operation of the bus per day should be maximum of 150 Kms.
- At least 4 trips should be operated per day.

- The relevant operation log sheet should be certified by the rural monitoring committee.
- Issuing tickets for the passengers.
- Necessary stickers should be displayed on the bus.
- Subsidies will be paid continuously for 3 years for the selected routes.
- At the end of 03 years, another rural route in which the same depot is providing services will be selected.

2.5 Community Service Monitoring Committee and Supervising the Project by NTC

After the operator is selected, it is needed to appoint a Community Service Monitoring Committee (CSMC) to report the quality of the service. The monthly subsidy payment to an operator is processed after receipt of a report from the CSMC recommending the service and assessment of service provided for the month.

Other than monitoring of these committees the NTC conducts service supervision through the mobile Service Monitoring and Enforcement Unit and complaints received by phone or letters from the users of the service are also investigated.

Members of CSMC are usually leading citizens of such communities and have been found not providing false information as they are liable to be questioned by the other members of the community if services fail. Monitoring Committee consists with;

- A School Principal
- Gramaniladari (village official)
- A retired senior citizen of the village
- A priest

- A school child
- A person who uses this service regularly

Further, the service is supervising through the log sheets maintained by the relevant transport authority.

2.6 The Information that should be Displayed in the Gamisariya Bus

- The starting and ending points of the journey.
- Stickers with the Gamisariya symbol.
- The time table of the bus and the bus fare chart.
- The address/telephone numbers of the chairman of the CSMC
- Telephone number of the bus depot.
- Hot line number of the NTC.

2.7 Number of Gamisariya Services

Following table shows the number of G.R.B.S from 2005 to 2010.

Table 2.2 Number of Gamisariya Services

year	SLTB Services	Private services
2005	2183	32
2006	2183	32
2007	2183	32
2008	515	34
2009	479	29
2010 up to June 30	456	40

Source: National Transport Commission

The following table shows the Province wise number of Gamisariya Services.

Table 2.3 Gamisariya Services- 31st December 2009

province	District	No. of villages served by the project	Number of SLTB services	Number of private services	Total Services
Western		288	94	4	98
North Western		368	77	4	81
Uva		133	40		40
Central		NA	64		64
Sabaragamuwa		NA	55		55
Southern	Galle Matara Hambantota	126	13 4 20		13 4 20
North Central			53	13	66
Eastern	Baticaloa Trinco Ampara	99	25 14 11	8	33 14 11
North			9		9
Inter provincial				4	4
Total		1014	479	33	508

Source: National Transport Commission

Other than the above services, the NTC is planning to deploy following number of new services province wise.

Table 2.4 Number of Gamisariya services waiting for deployment- 2010

Province	Services
Southern	12
Sabaragamuwa	58
North Central	25
Central	16
Eastern	43
Total	154

Source: National Transport Commission

But these services can not be started due to unavailability of funds for the Gamisariya Project.

CHAPTER 03
LITERATURE REVIEW

3.1 The Nature of Rural Travel and Transport

Rural travel and transport is about rural people's mobility and their access to goods and services. It covers a wide range of transport infrastructure and modes, non-motorized and motorized, for passenger and freight, at national, district and local government, community and household levels. Rural people devote considerable amount of personal time to travel and transport. Poor people usually travel shorter distances and make fewer trips, but take more time to do so than those who are not poor (Attapattu, 2005).

Rural bus services have always been loss making. However, an important element in rural bus services was the mobility the state controlled bus service provided to rural areas. A large number of such routes were established in the 1960s and 1970s and even though many of them were unprofitable, the CTB being a monopoly state operator was able to cross subsidize these losses with the more remunerative inter-urban and urban services (Kumarage et al., 2009).

Though rural transportation considerably improved after the establishment of the CTB, it also experienced a rapid decline with the deterioration of the CTB mainly due to the government policy on low fares and inability to continue subsidizing the loss making services many of which were from the rural areas.

There is increasing evidence that rural transport services that are currently provided in many rural areas of developing countries are unsatisfactory. Service frequency is usually very low and, often effectively non existent for the local communities, even for areas that have relatively good road access (Witkiss et al., 2001).

3.2 Transport and Dimension of Poverty

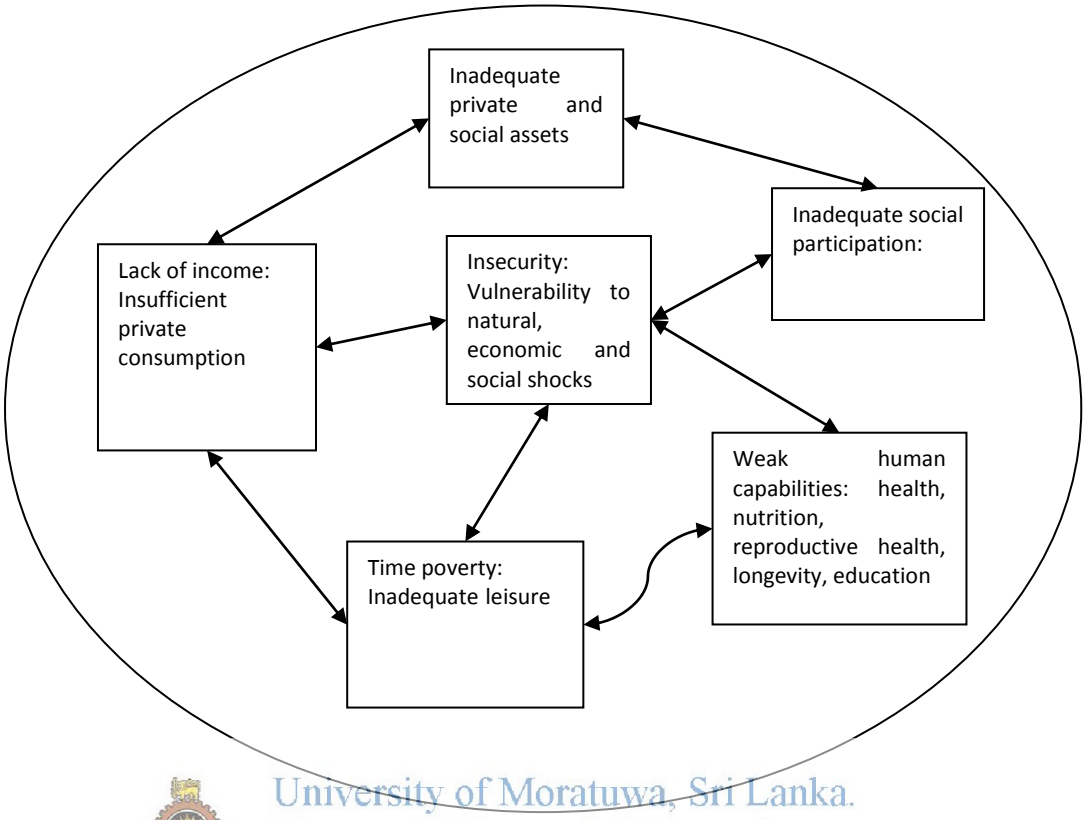

Figure 3.1 Dimensions of Poverty and their Interactions

Source: Attapattu, Danny, Rural transport and poverty in Sri Lanka 2005.

(1) Inadequate private and social assets:

Inadequate infrastructure is a common symptom of rural people. Geographical isolation and difficulty of access by national roads, rail or other transport infrastructure can limit rural communities' participating in labor and product markets and constrain their economic opportunities. Lack of affordable transport services or means of transport can mean that provision of transport infrastructure alone may not alleviate this constraint. Inadequate transport conditions can thus contribute to the inability to accumulate private and social assets.

(2) Weak human capabilities

Lack of transport infrastructure and services in rural areas may constrain access to facilities and resources such as schools, health centers, and water by the poor, restrict their accumulation of human capital and impede the strengthening of human capabilities. Improvements in transport conditions can have greater welfare implication for the poor than the rich.

(3) Time and energy intensive production

Rural people's lack of access to assets and technology means that production for the markets and for the household is time and energy intensive. Because the poorest rural groups are not able to afford suitable transport services, they have to carry heavy loads (for example agricultural inputs and outputs, water, and fuel for home needs) on their backs and heads over long distance. This is a more time consuming work with the lower productivity. Many of rural people are not able to afford transport vehicles and head load their products to markets. Reducing the transport burden of rural people can release their time and energy for more productive and socially beneficial activities.

(4) Inadequate social participation

The voice of the rural poor in the political process is often weak. Poverty is often associated not only with geographical isolation, but also cultural and political isolation. Lack of transport services and infrastructure can exacerbate voicelessness and isolation from the wider society because inaccessibility separate rural men and women from decision making in the broader society participating in cultural events and developing social relations.

(5) Vulnerability to natural, economic and social shocks

Poor access increases vulnerability to shocks and may increase their costs. For example, without good access food can not be brought to food-deficit or faming areas. If there is poor access to health services, people will remain unhealthy, children will

die, and any epidemic is likely to have catastrophic results. Provision of access roads and transport services can greatly reduce vulnerability, and the severity of the impacts of household-level risks like medical emergencies. Sometimes, however, alleviating the constraint of transport may become exposure to risk. As an example the rural communities may expose to new diseases.

(6) Lack of income and consumption

This is because inability to accumulate private and social assets, inability to strengthen human capabilities and lack of access to technology, are major factors responsible for the low income levels in the rural sectors. (Attapattu, 2005).

3.3 Rural Transport Modes

A full range of motorized and non motorized vehicles is in use throughout rural areas. However, their standards, regularity, quality and availability vary among different regions depending upon the geography, population density, economic activity etc. (Jayaweera, 2005).

Bus Service

The main form of the passenger transport in rural areas is provided by the buses operated by both the public and private sectors (Jayaweera, 2005).

Motor Cycle

Motor Cycles appears to be widely used in rural areas for goods transport and are ideal for use on through rural roads. Bikes ranging from 50cc to 175cc are typically owned by small businesses (e.g. self employed traders, retailers, bakeries etc.) and are invariably fitted with a solid carrier at the rear of the seat. Despite the growing use of motor cycles in rural areas, their use appears to be restricted to wealthier members of the community. It is doubtful whether motor cycles would be an appreciate mode of transport for rural people (Jayaweera, 2005).

Two-wheeled tractor and trailer

The two-wheeled tractor was first introduced to Sri Lanka in 1956. Since then it has rapidly become the most important multi-purpose agriculture and transport vehicle. It is used for ploughing, threshing, pumping water, and the transport of harvest,

firewood, products to market and passenger movements. It is observed that of all the motorized transport devices in rural areas, two-wheeled tractor trailers would seems to be the most prevalent and widely used. In many rural areas, it is the only form of public transport available for the people while in others, it supplements the conventional bus services where such services are inadequate (Zille, 1990). In some instances it serves as a village ambulance. It is also used for social, religious, and cultural pursuits (Sahabandu, 2002). However, the rapidly rising fuel and capital cost associated with the two-wheeled tractor are major constrains for its wider dissemination in poorer and more remote communities.

Animal traction (ox carts/bullock carts)

Buffaloes and cattle have been the longest standing form of animal draught power in Sri Lanka. They can be attached to a plough, and are used for the transport of firewood and paddy in the village as well as for the transport of agricultural products to the market. Carts pulled by a single animal are widely used in farming related transport activities in rural villages (Jayaweera, 2005).

Bicycle

Bicycles are undoubtedly the most widely-used forms of short-range transport vehicle in rural Sri Lanka. At a cost of around Rs. 5,000 they are the cheapest transport device available and ownership throughout Sri Lanka is very high. Although in the central highland region, the use of bicycle is less common, in the other regions, particularly in the North and East, there is a high density of bicycle ownership. Bicycles are primarily used by men but the slow process of the acceptance by women has stared. In the rural sector, the bicycle serves a variety of transport needs (Jayaweera, 2005).

3.4 Impact of Transport on Economic Growth

Once a transport service is deployed for a rural area, the transport based socio-economic parameters are also expected to improve. According to them it is observed that once a reliable Gamisaeriya bus service is established, the rural population gradually shifts from their expensive modes of transport to this service with the intention of reducing their transport cost. Basically this leads to an increase in the passenger km carried and revenue in the short-run. Thus it makes current socio-economic activities more efficient (Kumarage et al., 2009).

Operation of Gamisaeriya bus services for a certain period have created new socio-economic opportunities. It induces development resulting from the lower transport costs. This in turn increases the value of rural properties such as lands and buildings in the long run. Travel demand of working and schooling population is among the best representatives of socio-economic enhancements of the region. Authors have used the following Key Performance Indicators (KPIs) along with their short and long term trends for assessing the respective socio-economic development due to the Gamisaeriya transport service;

1. Number of persons working outside community
2. Schooling population
3. Average Ridership of community
4. Land value

Accordingly, success of the subsidized bus services in operation under Gamisaeriya scheme shows the efficiency and the effectiveness of this scheme over other concessionary programs tried out in the past (Kumarage et al., 2009).

Transport condition affects the people who live in uneconomic rural areas and their opportunities for livelihood enhancement, in a host of direct and indirect ways. Investment in transport can create economic and other opportunities for the people by providing employment through enhancing the mobility of members of household. Investment in transport may be equally relevant to reducing poverty because of their impact on the process of sustained economic growth, indirectly enhancing the opportunities for the poor people who live in uneconomic rural areas (Atapattu, 2005).

There can be a multitude of ways in which transport contributes to economic growth. "Transport provides intermediate services to facilitate interactions between productive activities. The microeconomics mechanisms through which the benefits of transport investments are translated into income growth are quite well recognized. Transport investment reduces the cost of assembling intermediate inputs for production (raw Materials, energy, labor, other intermediate products, and information) from different locations, directly reducing the cost of production. Reduced cost and improved quality

in transport services also reduces the delivered price of products and hence promotes regional and international trade, making it possible for agriculture to commercialize, for industry to specialize, and for production and employment to expand by exploiting scale economies. Transport investment contributes to economic diversification as well, which enables exploitation of economies of scope and increases the economy's ability to handle risks" (Gannon and Liu, 1997*).*

While the importance of transport in economic growth is well noted, its role and impacts have long been subject to debate. Much of the debate has centered on the question whether transport plays a leading role when transport investment stimulate economic growth through their market widening effect. Transport plays a complementary role when transport investments are required to serve the growth in demand. Historically this is a seen to depend on "the stage of economic development and the incident of technological innovation in transport" (Gannon and Liu, 1997*).*

The link is confirmed by a large number of empirical studies (Owen,1987). According to the 1994 World Development Report many studies attempting to link aggregate infrastructure spending to growth of GDP, show very high returns in a time series analysis. Some cross-national studies of economic growth and infrastructure also show that infrastructure variables are positively and significantly correlate with growth in developing countries (World Bank, 1994).

Several studies focusing on rural infrastructure's effect on the local economy of certain developing countries have revealed more about the nature of apparent benefits. Studying data from eighty-five randomly selected districts in thirteen Indian States, researchers found that lower transport cost increased farmer's access to market and led to considerable agricultural expansion. At the same time, because improved communication through road lowered banks' costs of doing business, banks expanded lending to farmers, and the farmers used the funds to buy fertilizer, further increasing yields (Binswanger,1993).

Investment in transport infrastructure can contribute to economic growth many ways as listed bellow;

(1) Growth of the sector itself, creating employment in the transport sector, opening up new opportunities for entrepreneurs in transport infrastructure and services and making existing businesses more profitable.

(2) Public works that provide employment as a counter cyclical measure to stimulate the economy in recession.

(3) Lowering the cost of inputs used in the production of almost all goods and services.

(4) Raising productivity through reducing the time and effort needed in production.

(5) Opening up new domestic and international markets.

If these contributions encompass the economic activities and sectors in which the rural poor participate, investment in transport infrastructure will have a direct poverty reducing impact and will contribute to the increase in real income of the poor.

Government expenditure on roads has the largest impact on poverty reduction as well as an impact on significant productivity growth (Shenggen and Thorat, 1999).

3.5 Constraints of Rural Transport

Rural bus services have always been loss making. This is due to the fact that such areas have lower household incomes and are therefore unable to generate high volumes of travel and are also unable to pay higher fares for resulting lower vehicle occupancies. Since over 70% of Sri Lanka's population resides in rural areas, successive governments have provided subsidies for such bus services. However, many such rural routes have remained loss-making in spite of receiving grants for decades. This has resulted in the government being unable to expand the rural bus services as it has not been possible to develop the revenues on such routes to ensure profitability and to move on to other routes. As a result, the reliability of such services

has diminished and rural communities do not have appeared to have developed on account of the provision of subsidized bus services (Kumarage et al., 2009).

Currently many countries suffer from very poor service provision and high transport charges. Although most services are provided by the private sector, vehicle utilization is low, cartels are common and government regulation is weak. In this paper key problems are identified which might be solved through various forms of intervention. The followings have been identified as the major constraints on the satisfactory development of rural transport services:

- Low density of demand for transport
- Poor quality infrastructure
- Poor diversity of vehicle types
- Uncompetitive transport markets
- Lack of understanding by government donors and other agencies of the potential benefits of increasing the efficiency with which transport services are provided.

The Key issues identified are as follows;

- Controlling transport cartels, reducing tariffs and increasing service frequency
- Reducing import prices of vehicles and parts
- Devising training programmes to indicate the advantages of slow and careful driving and the importance of routine maintenance
- Consider ways that surplus capacity of old vehicles may be removed from the market
- Promoting the use of Intermediate Means of Transport
- Devising methods to financially support a minimum of frequency of transport services that cannot be supported through other means
- Public Private Partnerships

Although low incomes and the low density of demand are the main factors inhibiting the provision of better services there is much evidence of high transport charges, inefficiency and the operation of trade unions (Witkiss et al., 2001).

3.6 Funding for Transport

Greater investment in transit has coincided with an increasing level of public involvement in transit finance. The public subsidization of transit has been controversy. Debates over which level of government—federal, state, or local—should bear the heaviest burden in support of public transit, and how public money can be used most effectively, are recurrent in years of both surplus and scarcity. In recent years, public sector support for transit has fluctuated. Federal support has become proportionately less significant while local and state governments have grown increasingly responsible for transit's operating and capital expenses. The authors have found 3 things:

(a) The characteristics of local transit funding are strongly influenced by the funding approaches of state governments;
(b) Dedicated funding for transit is increasingly critical, especially where funds must be raised locally; and
(c) Metropolitan areas with considerable dedicated funding sources are at an advantage for undertaking large capital projects.

An analysis of the funding arrangements for the transit systems in the 10 selected cities has revealed three key findings.

(1) States Have Considerable Influence Over the Characteristics of Local Transit Funding, Especially Funding for Operations.
(2) Dedicated Funding Plays an Important Role in All 10 Cities, Especially Those in States With Decentralized Transit Funding.
(3) Dedicated Funding Is an Important, and Often Decisive, Capital Contribution for the Expansion of Transit Facilities.

In England, outside London, local authorities support services that are not commercially viable to meet specific local needs. Public transport in rural areas has a range of characteristics that set it apart from urban-based operations. On the supply side, it can be difficult to operate a profitable commercial service. This has led to the withdrawal of commercial services. Constraints on public sector funding have limited

the ability of many local authorities to subsidize replacement services. On the demand side, the requirements of rural dwellers to access key services are time sensitive (access to jobs, access to healthcare, for example) but require different time windows (journeys to work at each end of the day, healthcare visits during the day, for example). Despite this, there appears to have been some improvement in the availability of bus services in rural areas in recent years. One reason for this improvement is the availability of new funding streams for rural transport. In particular, the Rural Bus Subsidy Grant (RBSG) was introduced in 1998 (MacDonald and Mulley, 2007).

3.7 Methods of Subsidizing Rural Transport

In some countries fuel prices and bus fares have been held down. Because rural transport is more informal, and is very largely supplied by the private sector, rural transport operators have not received direct operating subsidies to the same extent as their urban counterparts. In high income countries a variety of transport subsidies have been employed. In the past the UK government has employed fuel subsidies for buses and bus grants (provided on rural travel distance basis) for rural routes. Specific route subsidies have been provided by the Local Authorities. It has been argued that subsidizing services does not always reach those people most in need of help with transport costs. The major beneficiaries are usually the richer sections of the population that travel most.

The paper says that the methods of directly targeting specific groups are travel passes and travel token schemes which can be adjusted to suit local conditions. For example travel passes can be issued to allow for free fare, half fare etc. and like tokens they can be distributed according to specified criteria (Witkiss et al., 2001).

Travel tokens and passes have long been used in the UK to aid the mobility of the elderly with schemes varying from county to county. Results of some schemes are reported in. In the current environment it is unlikely that subsidies will play a large universal role in a new Public Private Partnership arrangement however, they should be examined carefully particularly as a solution to providing transport to the most

remote locations where there may be no regular transport service provided. Or where service frequency is measured in weeks or months (Witkiss et al., 2001).

The pricing of public transport may range from charging the full price to supplying it for free. According to the paper the present situation in most European countries is between the two extremes implying a partial cost recovery. This paper explores both extremes on the axis of cost recovery: free public transport, and public transport without subsidies. The paper discusses in more detail the experiences with free public transport in four real world cases, two from Belgium and two from the Netherlands. Same way the paper discusses the other extreme: public transport without subsidies.

The paper says that large scale public transport was developed in the 19th century and at that time it was an economic activity that did not need subsidies. In most countries the subsidy issue only emerged during the second half of the 20th century, when ownership and use of the car grew rapidly and the cost of public transport developed in an unfavorable way due to the relative increase of labour costs. In most countries governments decided to cover the deficits by some kind of subsidy scheme (Goeverden et al., 2006).

Technical report titled "Size, structure and distribution of transport subsidies in Europe" published by European Environment Agency is the first ever attempt to estimate the total amount of subsidies to the transport sector in the European Union. Based on available sources, four subsidy categories have been examined: infrastructure subsidies, other on-budget subsidies, fuel tax exemptions and rebates as well as VAT exemptions and rebates.

The report says that;

- More than two-thirds of the subsidies found in public budgets are for infrastructure. Infrastructure subsidies, however, only make up one half of the total subsidy.
- Around two-thirds of the infrastructure subsidy goes to road transport.

3.8 Motivations for Subsidies

There are various motivations for a subsidy policy. First, subsidies may be motivated because of the 'social function' of public transport. Vulnerable groups such as low income households, persons without a driver license, elderly and persons with a handicap need public transport to avoid problems of social exclusion. Second, public transport subsidies may be motivated as a second best instrument to address transport problems caused by car use when the possibilities of directly addressing these problems are restricted. These problems relate to noise, pollution, parking externalities and congestion. By subsidizing public transport it is expected that a modal shift will take place away from the private car. A third argument for subsidies may be that public transport is characterized by economies of scale, so that marginal costs are below average costs. Hence, marginal cost pricing –being welfare optimizing– would lead to deficits to be covered by subsidies. A fourth argument would be that there are positive externalities in public transport: an increase in travel volumes leads to a supply response in terms of higher frequencies and this leads to a decrease of scheduling costs of new and existing travelers (Goeverden et al., 2006).

The present developments in the public transport sector are twofold. On the one hand there is a tendency to reduce subsidies and improve cost coverage in many countries. On the other hand, in several countries far going subsidy schemes, including entirely free public transport schemes have been introduced.

The choice for the level of subsidies in public transport is of course a political one and hence cannot be made on the basis of scientific research only. It is clear, that the introduction of entirely free public transport for everybody may score well according to the equity argument to prevent social exclusion, but that it has considerable disadvantages because of rebound effects that make the environmental effects less attractive than anticipated. Also the burden imposed on the tax payer obviously is a negative effect.

There are, however, good arguments for free public transport (or strongly reduced fares) for specific groups such as students and the elderly, especially when this is restricted to off-peak periods when marginal costs are low. Full suspension of subsidies may have serious impacts on service quality of public transport. In particular in urban and regional transport a considerable decline of services may be expected. Moreover, fares will increase. Subsidy suspension contributes to the social exclusion of low income groups that have no car. In long distance transport the effects may be moderate. Operation of long distance services is already profitable.

Generally, the impacts of subsidy suspension depend on the strategy of the operators in achieving full cost recovery. If they focus on cost reduction and earning a high profit, the negative consequences are expected to be significantly larger then if they focus on providing a high service level in order to attract more customers and so increase the revenues.

3.9 Effect of Transport Difficulties

Uthuruwella Grama area is situated in Polpitigama Divisional Secretariat of Kurunegala District. In the area 226 acres are cultivated with coconut as a permanent cultivation. 60 acres are paddy lands. Vegetables like beetroot and radish, and crops like chilies are also cultivated (Tilakarathna, 2005).

01. No reasonable prices for products

The total agricultural yield in one season (kanna) of the year is 400,000 kg. of paddy and 950,000 kg. of vegetables. Due to transport difficulties in the village this production does not fetch a reasonable price. Though a few dealers come to the village from other areas to buy the products they do not pay the standard price per kilogram or give money on the spot. They take the product, price them after their sale and make the payments afterwards. Some who own hand tractors and those involved in cultivation in large scale are able to sell their product at reasonable price after transporting the products themselves to the town.

02. Lack of necessary service and facilities

Since the main livelihood of the community is agriculture, advice on cultivation is crucial, but people are able to access such information only from dealers of agro chemicals, with potentially negative health implications. However, they do not get information as officers do not visit village due to transport problems. During the rainy season, travel problems constrain the services of the midwife and health providers.

03. Impact on education

The Nakwattagama School situated in the village holds classes from grade 1 to 11. There are about 225 students and seven teachers in the school. Teachers are often unable to attend School on time due to the persisting transport difficulties and often ask to be transferred out of the school. Attendance of both students and teachers drop sharply during the rainy season. This has a direct impact on children's education.

About eighty students study in the villages of Makulpotha, Ibbagamuwa, Polpitigama and Kumbukge. Students studying at the Makulpotha School are particularly inconvenienced-they should reach Makulpotha junction by 6.30 a.m and return by 3.30p.m. as there is no transport service available afterwards. Students are therefore unable to attend tuition classes also.

04. Emergencies

When there is a critical illness or a delivery of a baby, people have to travel to Polpitigama Hospital by hiring a van that charges about Rs.600 because of unavailability of suitable transport services.

05. Other Problems and Impacts

The community in Uthuruwella finds it difficult to maintain links with their relations who live outside the village. People see this as a serious social disadvantage because the younger generation is losing out on opportunities to socialize and lose opportunities for marriage.

06. Migration from the village.

A considerable number of villages have migrated from the village. Even the only doctor available in the village resides outside the village. In the past decade six families migrated out of the village. The main reason for the migration is lack of transport facilities available (Tilakarathna, 2005).

3.10 Sustainable Rural Transport Service

The paper titled "The Rural Transport Strategy for South Africa" indicates a need to "move beyond roads" and start exploring innovative and/or integrated interventions to address rural access and mobility needs in a sustainable manner.

The trend in recent years is the variety of innovative rural transport services, including demand responsive services.

Despite positive developments rural public transport services in many areas fall far below the standard for what rural transport in Britain should be like. A more flexible approach is required. This might entail conventional timetabled bus services on main corridors where there are high passenger numbers, supplemented by smaller vehicles operating only on demand in quieter areas or at off-peak times.

Services would be part of a co-ordinated approach - road-based public transport services would be designed to connect with each other and with train services. Ideally, passengers would be able to purchase one ticket for their entire journey, even where the journey involved changing modes.

The demand-responsive transport services require new ways of enabling passengers to make their needs known and of matching passenger demands to appropriately sized vehicles. Door-to-door services may be the most effective solution in areas of dispersed population. However, for many rural dwellers (for example, those living in small market towns or villages on main road corridors) an on demand service operating along a core route could provide a cost-effective improvement over

conventional services - for example, through an extension of operating hours. Matching vehicles to passengers is an important step in increasing the efficiency.

Where passengers request journeys at the same time of day, it should be possible to combine trips, increasing the loading of a vehicle and bringing significant cost efficiency. Differently-sized vehicles might be better at different times of day (MacDonald and Mulley, 2007).

3.11 Summary of the Literature Review

Rural travel and transport is about rural people's mobility and their access to goods and services. Rural people devote considerable amount of personal time to travel and transport. Poor people usually travel shorter distances and make fewer trips, but take more time to do so than those who are not poor.

Rural bus services have always been loss making. However, an important element in rural bus services was the mobility the state controlled bus service provides to rural areas. Rural transport services that are currently provided in many rural areas of developing countries are unsatisfactory. Service frequency is usually very low and, often effectively non existent for the local communities, even for areas that have relatively good road access.

There is a link between transport and poverty level. Inadequate private and social assets, Weak human capabilities, Time and energy intensive production, Inadequate social participation, Vulnerability to natural, economic and social shocks, Lack of income and consumption arise due to geographical isolation and difficulty of access to the developed society and also these factors sharpen the poverty level of the society.

Bus Service, Bicycle, Two-wheeled tractor and trailer, Animal traction (ox carts/bullock carts), Motor Cycle are the most popular rural transport modes in most countries.

There can be a multitude of ways in which transport contributes to economic growth. Transport provides intermediate services to facilitate interactions between productive activities. Transport investment reduces the cost of assembling intermediate inputs for production (raw materials, energy, labor, other intermediate products, and information) from different locations, directly reducing the cost of production. Reduces the delivered price of products and hence promotes regional and international trade, making it possible for agriculture to commercialize, for industry to specialize, and for production and employment to expand by exploiting scale economies. Transport investment contributes to economic diversification as well. Further lower transport cost increases farmer's access to market and lead to considerable agricultural expansion.

Low density of demand for transport, poor quality infrastructure, poor diversity of vehicle types, uncompetitive transport markets, lack of understanding by government donors and other agencies of the potential benefits of increasing the efficiency with which transport services are provided are the factors which have been identified as the major constraints on satisfactory development of rural transport services.

Held down fuel prices and bus fares, fuel subsidies for buses and bus grants (provided on rural travel distance basis), specific route subsidies through Local Authorities, travel passes and travel token schemes, infrastructure subsidies, other on-budget subsidies, fuel tax exemptions and rebates as well as VAT exemptions and rebates are the different methods of subsidizing rural transport.

Lack of necessary service and facilities, impact on education, emergencies, no reasonable prices for products, migration from the village are some identified effect of transport difficulties in Sri Lankan Rural villages.

The importance of coordinating or synchronizing rural bus time tables with the time tables of bus / train services in other main corridors are shown. Further, the need to match the sizes or capacity of the vehicles which are used for rural transport with the demand for that specific service are also revealed.

CHAPTER 04

DATA & ANALYSIS OF GAMISARIYA PROJECT

As mentioned in chapter 01 the following 03 Gamisariya Rural Bus Services of the North Western Province (NWP) and Western Province (WP) were selected for evaluation;

1. Mirigama - Giriulla
2. Saliyawewa – Puttlam
3. Gepallawa-Kurunegala

Questionnaires were used to collect data from both passengers and operators. Further, bus operators and Members of the CSMC were interviewed to collect some data.

4.1 Mirigama –Giriulla Gamisariya Rural Bus Service

This service started in the year 2006 December, in Gampha District of Western province. The total distance of the route is 25 km, of which 5km portion is un-served area which doesn't have any public transport mode. The total length of the route covers 07 villages such as Mirigama, Nawana, Paragoda, Divuldeniya, Karawilakumbura, Nalla and Giriulla. The un-served Rural Portion starts from Doruvwa School (Avase Junction) to Divuldeniya and this was the portion considered for the evaluation. This un-served portion consists of 02 Grama Niladari Divisions which are Paragoda North, and Paragoda South. These GN Divisions belong to Divulapitiya Divisional Secretariat. About 319 families live in these 2 GN Divisions.

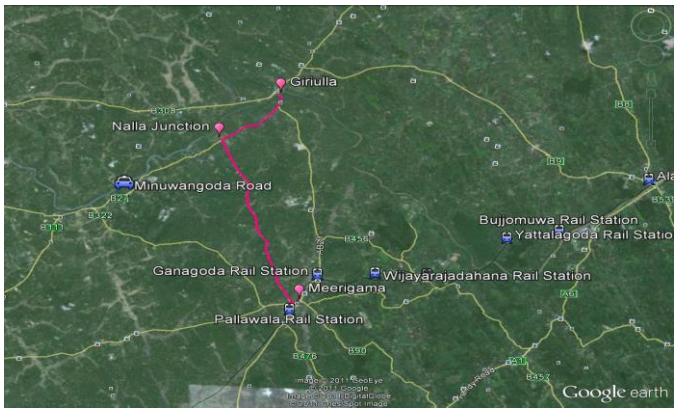

Figure 4.1: Mirigama-Giriulla Gamisariya Rural Bus Service Route

Table 4.1: Details of population in un-served areas in Mirigama-Giriulla Bus Service

G.N.Divi. Number	G.N.Division	Total Population	Sex		Age (in Years)	
			Male	Female	Under 18	18 years & over
53F	Paragoda North	831	422	409	243	588
53A	Paragoda South	756	366	390	210	546

Source: Department of Census & Statistics

Agriculture is the major form of live-hood of these people. Rice, vegetables like lady's fingers, Pumpkin, Brinjals, Bitter gourd etc. and fruits mainly like pineapple, Banana and small scale cultivations like betel, pepper can be seen in the area. Further, some people are involved with bricks manufacturing industry.

Figure 4.2: Bricks manufacturing industries in Paragoda North

Due to the GRBS the road of the area was repaired and a portion was covered by a concrete layer and other portion with tar.

Figure 4.3: Road development due to G.R.B.S project

Following are the important places from Doruvwa School to Divuldeniya in Mirigama to Giriulla route.

* Doruvwa School

* Sanasa Bank - Divuldeniya

*Paragoda Co-operative shop

*Divuldeniya Junction

The service has 04 round trips per day and operates 25 days per month. A 30 seater bus is deployed for this service.

Following table shows the time table of the bus service;

Table 4.2: Time table of the Mirigama –Giriulla Gamisariya Rural Bus Service

Giriulla	Mirigama
6:00 →	6:40
7:30	← 6:50
7:40 →	8:20
9:10	← 8:30
14.10 →	14.50
15:40	← 15:00
17:30 →	18:10
20:00	← 19:15

Source: National Transport Commission

According to the details given by bus operator the average passenger per day is 275.

Following data shows whether operator in Mirigama-Giriulla get sufficient subsidy amount to maintain the service.

Operator's income for the year

Income from Bus fare per day = Rs. 6500[1]

Income from Bus fare per year =Rs. 1950000 (operates 25 days per month)

Operator's expenditure for the year

Operating Cost per Km =Rs.58.41[2]

Total Operating Cost per day =Rs. 7189.2 (operate 120 Kms per day)

Total Operating Cost per year =Rs. 2102760

Profit/Loss per year = Rs. (152760)

Allocated amount of subsidy per year = Rs. 210000[3]

Net profit/loss =Rs. 57240

Therefore the operator is provided enough subsidies to operate this service.

[1] The amount is according to survey result done by NTC

[2] Bus operating cost was calculated according to the National Transport Commission "Rural Road Bus Operating Cost" chart. [See annexure C.]

[3] Whole subsidy amount that can be paid by the NTC for Mirigama-Giriulla Gamisariya Bus Service

4.2 Saliyawewa – Puttlam Gamisariya Rural Bus Service

This service started in the year 2007, in Puttlam District of NWP. The total distance of the route is 55.1 Km of which 27.7 km portion is un-served area. The un-served Rural Portion starts from 17th Post to Saliyawewa and this was the portion considered for the evaluation. This uneconomic portion is consisting of 03 Grama Niladari Divisions which are Pahala Puliyankulama (Ottupallama), Moonamalgaswewa (Neelabamma) and Saliyawewa. These GN Divisions belong to Karuwelagaswewa Divisional Secretariat. About 700 families live in these 03 GN Divisions.

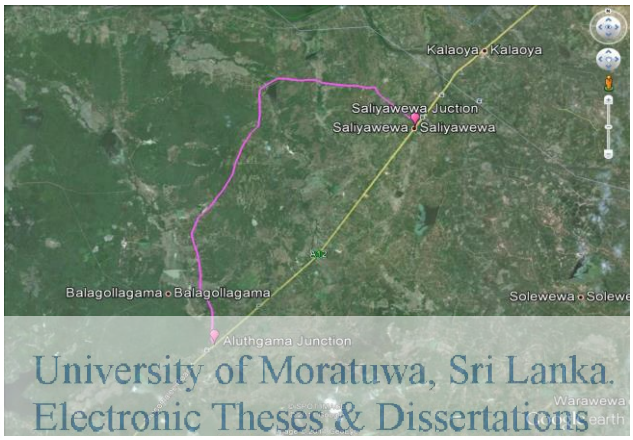

Figure 4.4: Saliyawewa – Putlam Gamisariya Rural Bus Service Route

Table 4:3 Details of population in Un-served area in Saliyawewa-Putlam Gamisariya Rural Bus Service

G.N.Divi. Number	G.N.Division	Total Population	Sex		Age (in Years)	
			Male	Female	Under 18	18 years & over
638	Pahala Puliyankulama	786	419	367	229	557
638D	Moonamalgaswewa	799	420	379	282	517
638A	Saliyawewa	1772	957	815	636	1136

Source: Department of Census & Statistics

Agriculture is the major form of live-hood of these people. Rice, vegetables like pumpkin, brinjal, bean, snake gourd, melon, etc. and grains like green gram, kauvpi and peanuts are also cultivated in the area.

Following are the important places from 17th post to Saliyawewa in Puttlam to Saliyawewa route.

- Puliyankulama Vidyaa Chakrawarthi school
- Puliyankulama Primary school
- Viharagala Raja Maha temple
- Puliyankulama lake
- Neelashokaramaya temple
- Ottupallama Junction
- Weherabedigala temple
- Neelabemma Sarvodaya Development Bank
- Rathmalana watta /Dissanayake farm
- Samanala primary school
- Neelabemma Project/ Welfare society
- Neelabemma Police Station

The service has 02 round trips per day and operates 25 days per month. A 28 seater bus is deployed for the service.

Following table shows the time table of the bus service

Table 4:4 Time table of Saliyawewa-Putlam bus service

Saliyawewa	Puttlam
6.00 →	8.00
16.30	← 14.30
16.45 →	18.45
21.00	← 19.00

Source: National Transport Commission

According to the detail given by the operator the number of average passengers per day is 350.

Following data shows whether operator in Saliyawewa-Putlam get sufficient subsidy amount to maintain the service.

Operator's income for the year

Income from Bus fare =Rs. 8750 (per day)

Income from Bus fare per year =Rs. 2625000 (operates 25 days per month)

Operator's expenditure for the year

Operating Cost per Km = Rs. 58.41

Total Operating Cost per day =Rs. 12873 (220.4 Km)

Total Operating Cost per year =Rs. 3861900

Profit/Loss per year = Rs (1236900)

Allocated amount of subsidy per year = Rs. 1277412[4]

Net profit/Loss = Rs. 40512

Therefore the operator is provided enough subsidy amount to cover the operation cost of the bus.

[4] Whole subsidy amount that can be paid by NTC for Saliyawewa putlam gamisariya route within a year

4.3 Gepallawa-Kurunegala Gamisariya Rural Bus Service

This service started in the year 2007 September, in Kurunegala District of NWP. The total distance of the route is 10.4 km of which 4.1 km portion is un-served area which doesn't have any public transport mode. The un-served Rural Portion starts from Halpara junction to Gepallawa and this was the portion considered for the evaluation. The un-served portion is in Rathgalla Grama Niladari Division. This GN Division belongs to Kurunegala Divisional Secretariat and about 300 families live in this area.

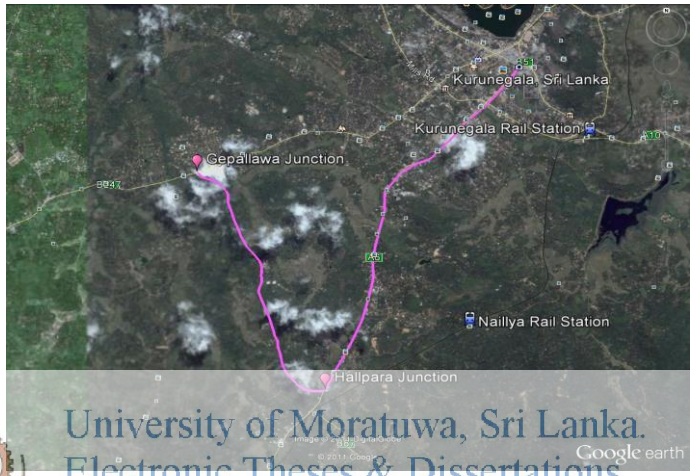

Figure 4.5: Gepallawa-Kurunegala Gamisariya Rural Bus Service Route

Table 4.5: Details of population in un-served area in Gepallawa-Kurunegala G.R.B.S.

G.N.Division Number	G.N.Division	Total Population	Sex		Age (in Years)	
			Male	Female	Under 18	18 years & over
821	Rathgalla	1164	546	618	354	810

Source: Department of Census & Statistics

Most of people within this area are daily travelers to private and government institutions and a few number of small scale industries like Bristol Products, Papadam also can be seen. Further, a few number of farm products and cultivations like vegetables, coconuts also visible in this area.

Further, due to G.R.B.S Project the road of this area was developed.

Figure 4.6: Road Development in Rathgalla Area

Although a SLTB bus operated from 2002 to 2005 in this route it was stopped due to inadequate income level and now people who are living in this area has only this Gamisariya Bus Service as a public transport mode.

Following are the important places from Halpara junction to Gepallawa in Kurunegala Gepallawa Gamisariya Rural Bus Service;

- Munchi Biscuits Store
- Richard Book Store
- Co-operative shop -Rathgalla
- Army Camp
- Forest Research Centre

The service has 04 round trips per day and operates 25 days per month. A 30 seater bus is deployed for this service.

Figure 4.7: Gepallawa-Kurunegala Gamisariya Rural Bus Service

Following table shows the time table of the bus service;

Table 4.6: Time table of the Gepallawa- Kurunegala Rural Bus Service

Gepallawa	Kurunegala
6:30 →	7:00
7:40	← 7:10
7:50 →	8:20
9:00	← 8:30
09:10 →	9:40
11:00	← 10:30
15:40 →	16:10
17:30	← 17:00

Source: National Transport Commission

According to the details given by the bus operator the average passengers per day is 240.

Following data shows whether operator in Gepallawa-Kurunegala gets sufficient subsidy amount to maintain the service.

Operator's income for the year

Income from Bus fare per day = Rs. 3500

Income from Bus fare per year =Rs. 1050000 (operates 25 days for a month)

Operator's expenditure for the year

Operating Cost per Km = Rs. 58.41

Total Operating Cost per day =Rs. 4859 (83.2 Km)

Total Operating Cost per year =Rs. 1457700

Profit/Loss per year = Rs. (407700)

Allocated amount of subsidy per year = Rs. 315960[5]

Net profit/loss =Rs. (91740)

Therefore, the operator is not provided enough subsidies to operate this service.

[5] Whole subsidy amount that can be paid by NTC for Gepallawa-Kurunegala Gamisariya Route within a year.

4.4 Evaluating Passenger's Profile in Selected Routes.

The villagers in selected samples have been living in their respective villages for more than 10 years and details of selected samples are as follows;

Table 4.7: details of selected samples

Route	Selected Villages	Total number of families in un-served area	Number of families selected as sample	Number of families in selected sample with school children	Vehicle ownership of the sample
Mirigama.-Giriulla	Paragoda North Paragoda South	319	32	24	few families have a three wheeler/Motor bicycle/ Lorry/Van and / car.
Saliyaw.-Putlam	Pahala Puliyankulama Ottupallama, Neelabamma Saliyawewa.	Nearly 720	75	61	very few families have three wheeler/ Motor bicycle or a lorry
Gepallawa-Kurunegala	Rathgalla	300	20	13	Considerable number of families have three wheeler/Motor bicycle/ lorry/Van and car

4.4.1 Evaluating the medium used by children to attend the school

Before starting G.R.B.S Project and after starting the G.R.B.S Project school children in selected families used following modes to attend to schools;

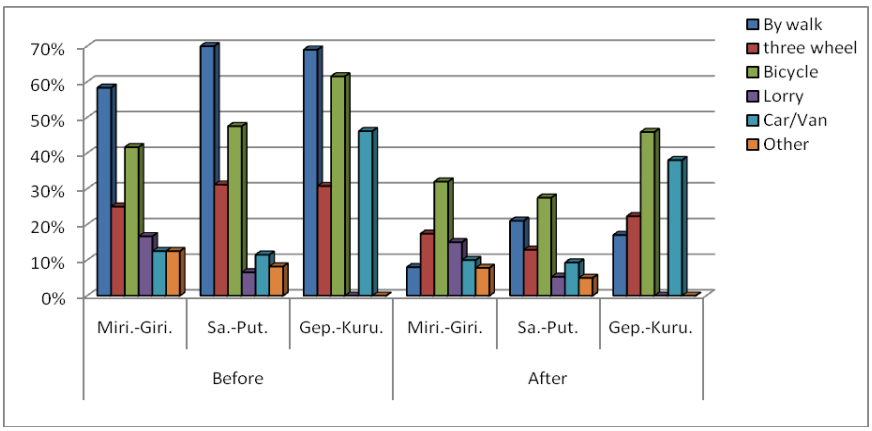

Figure 4.8: Medium used by school children to attend school – Before and after the project

Before starting the G.R.B.S project School children in selected villages had mostly used walk and three wheelers to attend to school.

But after starting G.R.B.S in the above areas school children of selected families are using G.R.B.S in following manner.

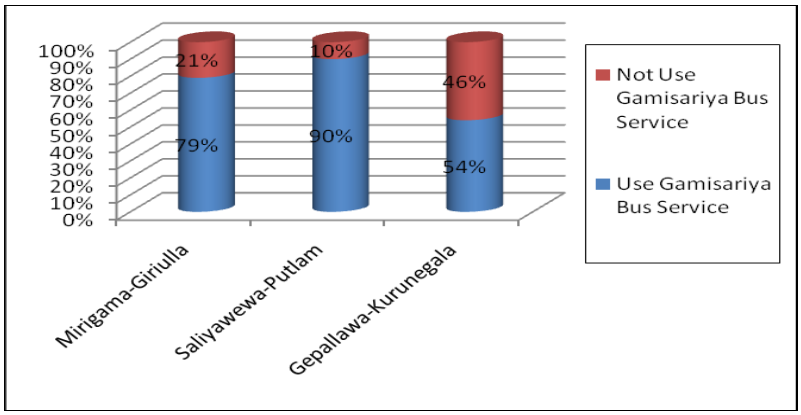

Figure 4.9: Using Gamisariya Bus Service by school children

From the above figure it can be proved that G.R.B.S has significant impact on school trips of the children in selected villages and Gamisariya Bus in Saliyawewa-Putlam offers a good service for the school children in un-served areas.

Due to introduction of a new transport mode to the villages the usage of existing modes have reduced and most of school children tend to use G.R.B.S. But in Gepallawa-Kurunegala route a higher rate of children used school vans to attend school and after starting the project a little amount of children have involved with the service.

Before starting the project 66% school children in selected families walked to the schools and after the project only 15% children are walking to the school.

Further before starting the project school children in 29% of families used three wheels to go to schools and after the project the amount has reduced up to 17% because of G.R.B.S in selected villages.

When talking about the school trips on lorry and car/van users, there was no significant trend to use the G.R.B.S.

Further school trips of the children have increased due to this service as follows;

- In Mirigama-Giriulla -45.8%
- In Saliyawewa-Putlam- 37.7%
- In Gepallawa-Kurunegala -15.4%

Following chart illustrates the reasons to select G.R.B.S by the school children of selected families.

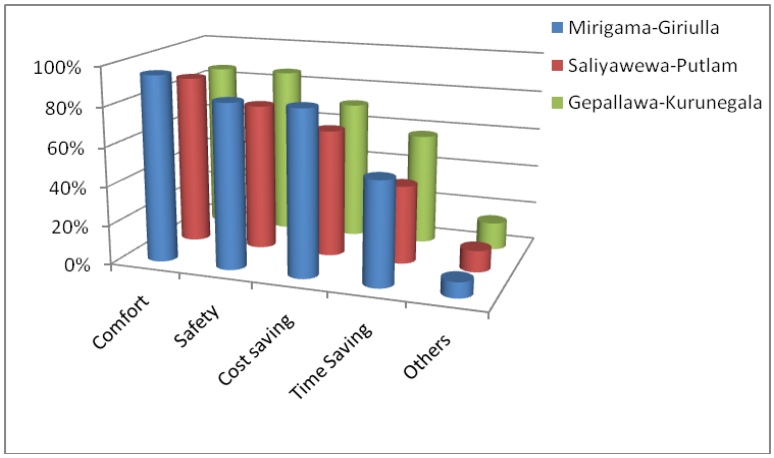

Figure 4.10: Reasons to use Gamisariya Rural Bus Service by School Children

Among school children in selected families who use G.R.B.S most of the children who walked to the school before starting the project have selected this service due to comfort, time saving and safety.

The main reason to three wheel users to select this service is cost savings and most of bicycle users have selected this service due to safety.

4.4.2 Details of medium used to visit relations/entertainment activities and visit religious/cultural activities.

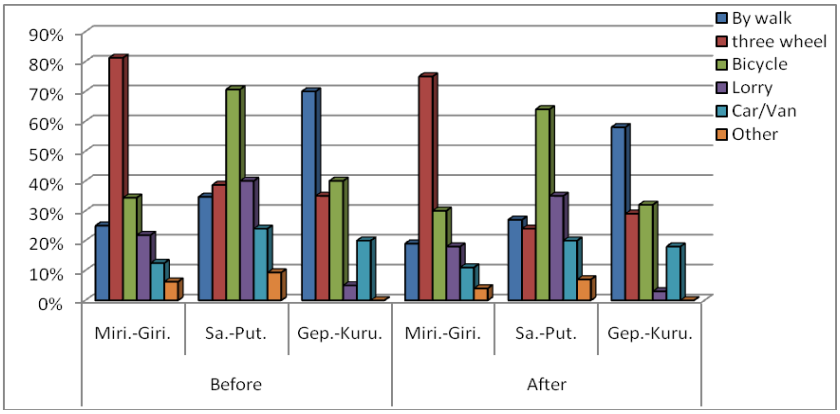

Figure 4.11: Medium used to visit relations, Entertainment activities before and after the project

Before implementation of the G.R.B.S, three wheelers had been the most popular transport mode to visit relations/Entertainment activities among families who live in Mirigama-Giriulla route. In saliyawewa-Putlam route bicycles had been the most popular transport mode for visit the same trips and people who are in Gepallawa – kurunegala route mostly used cars/vans for visit relations/entertainment activities.

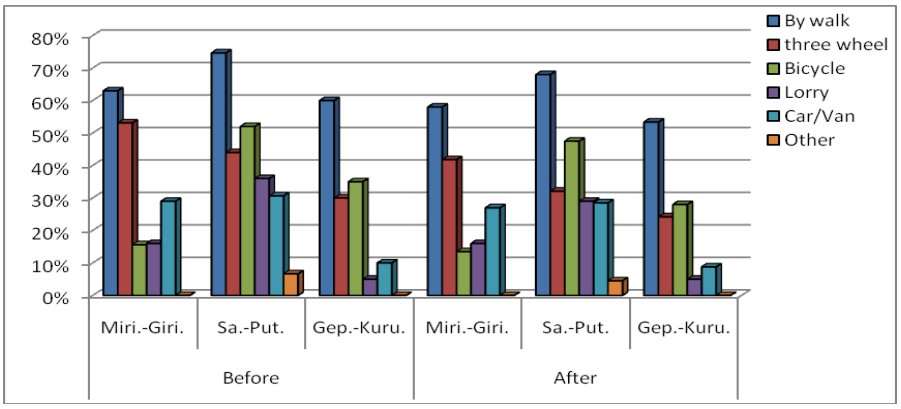

Figure 4.12: Medium used to visit Religious, Cultural, Relations and Entertainment activities before and after the project

The above chart shows the details of village families who used transport modes for religious & cultural events before implementation of the G.R.B.S. Most of the families within selected area had been used walk, three wheels and bicycles to do this kind of trips before starting the project.

But when compare with other trips of the rural people GRBS has less impact to visit relations/Entertainment activities and Religious and Cultural activities of the villagers. This situation can be clearly understood by comparing the before and after situation of the above figures. With regard to all transport modes it has very little impact on implementation of GRBS.

The reason is unavailability of Gamisariya bus service on most holidays and poya days to fulfill passengers' necessities and people have short distance religious and cultural trips. Further rural people have very less number of trips to visit relations and entertainment. The situation is clearer from the following figure also. When compared

to other trips there is high percentages of passengers who not use GRBS for the trips to visit relations, entertainment, religious and cultural activities.

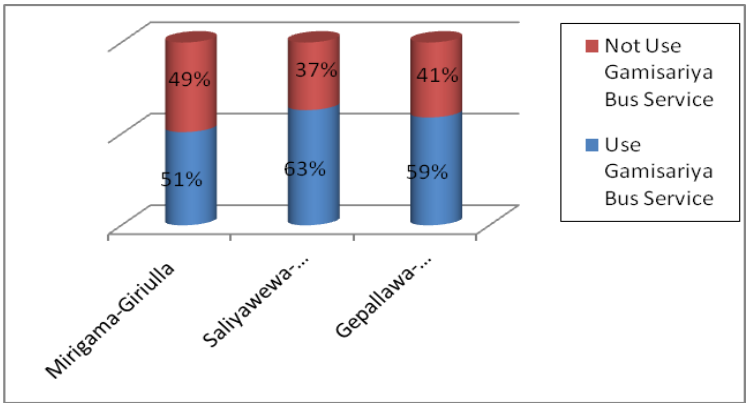

Figure 4.13: Using Gamisariya Bus Service by villages to visit relations / Entertainment /Religious and Cultural activities.

The above figure shows the using/not using of GRBS to visit relations, entertainment, religious and cultural activities.

4.4.3 Details of medium used to go for the employment

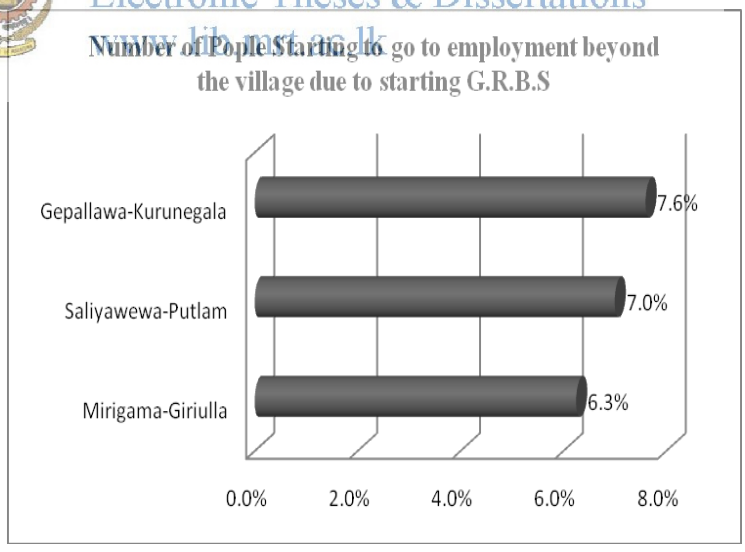

Figure: 4.14: Starting to go to employment beyond (out of) the Village – due to the G.R.B.S Project

Due to starting G.R.B.S in Gepallawa – Kurunegala Route 7.6 % of people have started to go to employment to other areas by using this bus service while 7% and

6.3% people in Saliyawewa-Putlam and Mirigama – Giriulla Route respectively have started to go to employment to other areas by using this bus service. Further it can be said that most of ladies have started to go outside employment due to this bus service. Therefore, the service has contributed to encourage people to attend employment especially in their respective towns.

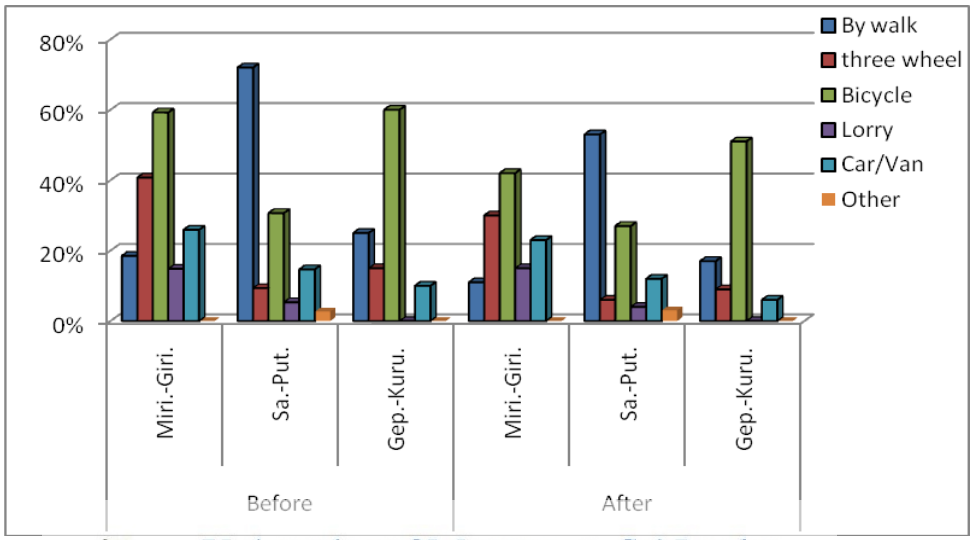

Figure4.15: Medium used to visit for employment – Before and After the Project

Before starting the G.R.B.S 59% of the families in the area covered by Mirigama-Giriulla route used bicycles to visit employment. 72% of families in the area covered by Saliyawewa-Putlam route visited employment by walk and 60% of the families in Gapallawa-Kurunegala route used bicycles to visit their employment before starting the G.R.B.S project.

But after starting the project only 42% families use bicycle to go to employment in Mirigama-Giriulla route, 53% by walk in Saliyawewa-Putlam and 51% Gepallawa-Kurunegala route use bicycle for the same kind of trips. The situation can be clearly understood through the following figure.

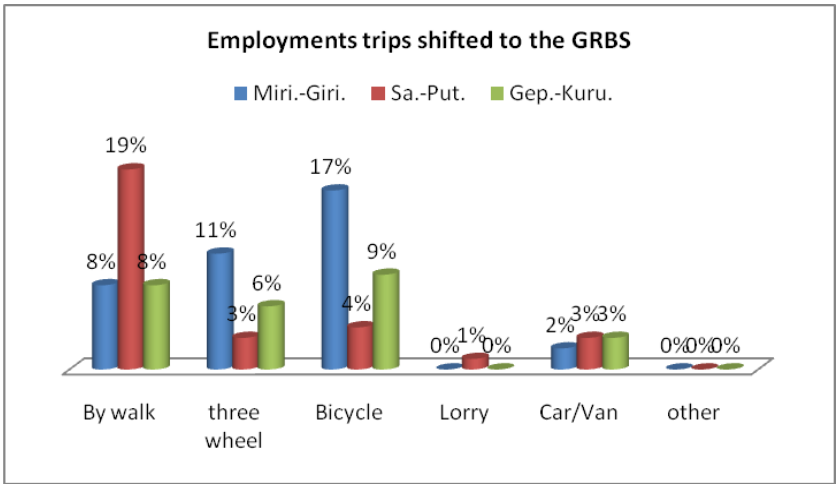

Figure 4.16: Percentage of people shifted to use GRBS for employment trips

Therefore GRBS project has significant impact on employment trips of the villagers. 19% families who walked for employment before starting project in Saliyawewa-Putlam, 11 % three wheel users in Mirigama-Giriulla, 9% bicycle users in Gepallwa-kurunegala route have shifted to use this service due to comfort, time saving ,cost saving and safety. Therefore it can be said that people who visited to employment by walk, by using three wheel and bicycle have mostly shifted to use this implemented bus service while users of car/vans and lorry have very little impact to shift to the GRBS. When analyzing the reasons to select this bus service, most of people who used to walk before the service have selected this service due to comfort and time saving while three wheel and bicycle users selected this due to cost savings.

A number of Passengers who live in Mirigama-Giriulla and Gepallawa-Kurunegala routs use this service to come to railway Station to go to employment. Therefore most of people who come to railway station by walk, three wheel and bicycles have shifted to use this service. Further passengers emphasis the need to synchronize the time table of the GBRS with the time table of the trains.

Before the project some people in Gepallawa-Kurunegala route used parking facilities to park their vehicle near Kurunegala Railway station and now they can save cost for parking as another advantage passengers gain through this service.

When talking about the Saliyawewa-Putlam GRBS most people doing jobs within the village and most of them have short distance trips for the employment. Therefore people who used walked and bicycle have shifted to use the service.

Due to starting of the G.R.B.S the trips of employment have increased as follows;

- In Mirigama-Giriulla – 12%
- In Saliyawewa-Putlam- 08%
- In Gepallawa-Kurunegala -15%

4.4.4 Details of new industry / business started after implementing Gamisariya Bus Service to the village

After Starting the G.R.B.S in Mirigama-Giriulla Route some families have started small scale cultivations to grow fruits and vegetables and they are using the Gamisariya service to transport their harvest to the market, bring fertilizer, and transport workers etc. Some families have started grocery shops / hardware stores due to road development for the bus service.

In Saliyawewa-Putlam route families have started grocery shops, carpentry industries and some families have started to take their harvest to Putlam market and sell them at the market to have extra profit other than giving their harvest to whole sellers.
In Gepallwawa-Kurunegala route some families have started to cultivate fruits and vegetables while a family has started a grocery shop and a hardware store.

4.4.5 Evaluating the medium used by village families to go to groceries/market/weekly market

Before starting the Gamisariya Rural Bus Service, most of the families in selected areas have mostly used walk, bicycles to go to groceries/Market/weekly Market. But after the project people have shifted to use new bus service as follows.

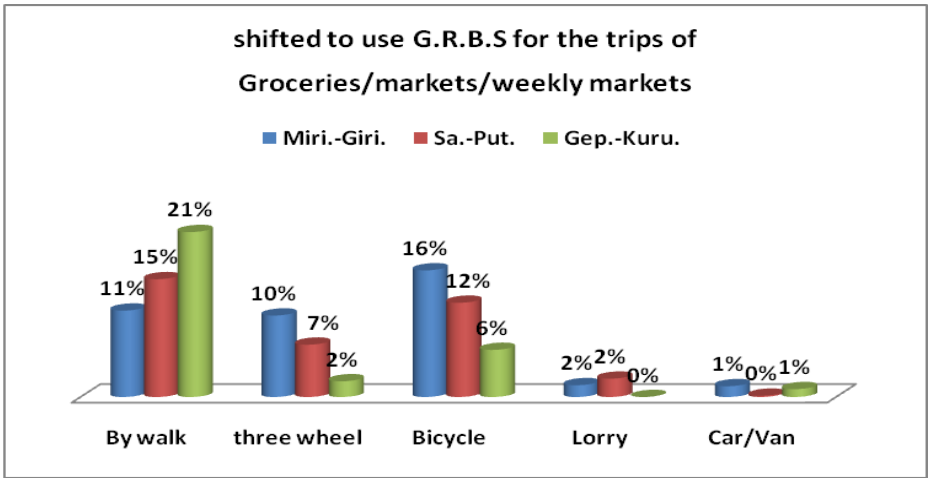

Figure 4.17: Shift to use G.R.B.S for Groceries, Markets and weekly market

Here it is clear that people who used walk and bicycles to go to groceries/ markets/ weekly markets have shifted to the G.R.B.S and 10% of the three wheel users have shifted to the bus in Mirigama –Giriulla Route.

Further villagers' trips to visit Groceries/Markets/weekly markets have increased in following manner.

- In Mirigama-Giriulla – 35%
- In Saliyawewa-Putlam- 24%
- In Gepallawa-Kurunegala -19%

4.4.6 Details on usage of G.R.B.S by families for transportation of their production items

According to the details given by the families who live in the area covered by Mirigam –Giriulla G.R.B.S, they are using the service mostly to transport the following items;

- Rice
- Vegetables
- Fruits
- Betel

The above items were transported by walk, three wheels, Lorries, Bicycles and Tractors before starting the project.

After starting the project, following details were found among families who live in Mirigam –Giriulla area on usage of G.R.B.S for transport their production items.

Table 4.8: Impact of G.R.B.S to Product items in Mirigama-Giriulla Route

Travel Time after implementing G.R.B.S % of families		Production quantity after G.R.B.S % of families		Cost of transport after G.R.B.S % of families		Profit level after G.R.B.S % of families	
increased	50%	increased	62.5%s	increased	-	increased	87.5 %
decreased	12.5%	decreased	-	decreased	75%	decreased	-
No impact	37.5%	No impact	37.5%	No impact	25%	No impact	12.5 %

Following are the items transported by families using G.R.B.S in Saliyawewa-Putlam route;

- Vegetables (onions)
- Fruits
- Grains
- Carpentry items

Three wheels, Lorries, Bicycles and Tractors were the transport modes before starting the project.

But, after starting the project 12% of families have started to transport their product items using this service. Among those families following details were found.

Table 4.9: Impact of G.R.B.S to Product items in Saliyawewa-Putlam Route

Travel Time Using G.R.B.S % of families		Production quantity % of families Due to G.R.B.S % of families		Cost of transport using G.R.B.S % of families		Profit level Due to G.R.B.S % of families	
increased	-	increased	66.6%	increased	-	increased	88.8%
decreased	66.6%	decreased	-	decreased	77.7%	decreased	-
No impact	33.3%	No impact	33.3%	No impact	22.2%	No impact	11.1%

Families of the area covered by Gepallawa-Kurunegal route are not using this service to transport their production in considerable manner.

4.4.7 Details on usage of G.R.B.S for other trips

Other than the above described trips, the villagers of the route in Mirigama-Giriulla are using this Gamisariya Rural Bus Service to go to Banks, Post office, D.S.office in Divulapitiya and Attanagalla, Dispensaries etc.

People in Saliyawewa-Putlam are using this Gamisariya Rural Bus Service to go to Police Station, Banks, and Post office etc.

Families who are living in the area covered by Gepallawa-Kurunegala are using this service to visit banks, Dispensary, tuition classes etc.

Therefore, Gamisariya Rural Bus Service Project offers very higher value of benefits to the society and this is very important project to improve the social and economical values within rural villagers.

4.4.8 Subsidy benefit analysis

For this analysis 05 families were selected from each routes.

Calculating subsidy amount per family per day:

Route	Number of families in un-served area	Percentage of families use GRBS	Number of families use GRBS	Allocated subsidy amount per year (Rs)	Subsidy amount per family per day (Rs)	Subsidy amount per five families per day (Rs)
Mirigama-Giriulla	319	81	258	210000	2.70	13.50
Saliyawewa-Putlam	700	92	644	1277412	6.60	33
Gepallawa-Kurunegala	300	64	192	315960	5.48	27.40

Total subsidy amount for 05 families per day (Rs) = 73.90

Total Benefit of the project per day[6]

(1) Travel Time Savings per day (Rs) = 601.25
(2) Travel Cost Savings per day (Rs) = 666.00
(3) Vehicle Emission Cost Savings per day (Rs) = 46.1

Total benefits per day (Rs) =110.85
Net benefit per day (Rs) = 36.85 (Total benefits- total Subsidy amount per day)

[6]Benefits calculation see pages 63-65

Calculating Benefits of the G.R.B.S Project

1) Travel time savings per day

Route	Mode	Number of members shifted to GRBS	Average travel time before the project per person (minute)	Average travel time after the project per person	Travel time difference (minute)	Total Travel time difference (minute)	Total time savings (hour)	Value of time per hour Rs[7]	Value of time Rs.
Mirigama-Giriulla	Walk	11	60	15	45	495	8.3	34.48	284.46
	Motor Cycle	2	35	100	-65	-130	-2.2	108	-234.00
	Three wheel	2	30	90	-60	-120	-2.0	120	-240.00
	Car	1	25	90	-65	-65	-1.1	314.48	-340.69
	Van	-	-	-	-	-	-	-	-
	Lorry	-	-	-	-	-	-	-	-
	other	-	-	-	-	-	-	-	-
Saliyawewa-Putlam	Walk	12	100	20	80	960	16.0	34.48	551.68
	Motor Cycle	3	135	180	-45	-135	-2.3	108	-243.00
	Three wheel	2	140	210	-70	-140	-2.3	120	-280.00
	Car	-	-	-	-				
	Van								
	Lorry								
	other	-							
Gepallawa-Kurunegala	Walk	5	60	15	45	225	3.8	34.48	129.30
	Motor Cycle	1	30	80	-50	-50	-0.8	108	-90.00
	Three wheel	2	25	80	-55	-110	-1.8	120	-220.00
	Car	-	-	-	-				
	Van								
	Lorry								

Total travel time savings (Rs) = -682.25

[7] Value of Time was calculated according to "Assessing Public Investment in the Transport Sector" published by Department of National Planning, Ministry of Finance and Planning- Colombo.

(2) Travel Cost Savings

Route	Mode	Number of vehicles stopped operation due to people shifted to GRBS	Average fuel liters per day per one vehicle	Average fuel liters per day	Fuel cost saving per day (1 ltr = Rs 80)	Bus Fare per person per day	Total Bus Fare per day	Travel Cost saving (Rs)
Mirigama-Giriulla	Motor Cycle	2	0.8	1.6	128	52	104	24
	Three wheel	1	1.1	1.1	88	52	104	-16
	Car	1	2.5	2.5	200	52	52	148
	Van	-	-	-				
	Lorry	-	-	-				
	other	-	-	-				
Saliyawewa-Putlam	Motor Cycle	2	3	6	480	80	160	320
	Three wheel	1	4.7	4.7	376	80	240	136
	Car	-						
	Van	-	-	-				
	Lorry	-	-	-				
	other	-	-	-				
Gepallawa-Kurunegala	Motor Cycle	1	0.8	0.8	64	30	30	34
	Three wheel	1	1	1	80	30	60	20
	Car	-	-					
	Van		-	-				
	Lorry	-	-	-				
	other	-	-	-				
Total								666

Total Travel Cost savings (Rs) = 666

(3) Vehicle Emission Cost savings

Route	Mode	Number of vehicles shifted to GRBS	Average fuel liters per day per one vehicle	Average fuel liters per day	Emission Cost savings-Rs. per liter[8]	Total Emission cost savings Rs.
Mirigama-Giriulla	Motor Cycle	2	0.8	1.6	2.24	3.6
	Three wheel	1	1.1	1.1	2.48	2.7
	Car	1	2.5	2.5	2.28	5.7
	Van	-	-	-		
	Lorry	-	-	-		
	other	-	-	-		
Saliyawewa-Putlam	Motor Cycle	2	3	6	2.24	13.4
	Three wheel	1	4.7	4.7	2.48	11.7
	Car	-	-	-		
	Van	-	-	-		
	Lorry	-	-	-		
	other	-	-	-		
Gepallawa-Kurunegala	Motor Cycle	1	1.6	1.6	2.24	3.6
	Three wheel	1	1.1	2.2	2.48	5.5
	Car	-	-	-	-	
	Van	-	-	-		
	Lorry	-	-	-		
	other	-	-	-		
Total						46.1

Total Emission Cost Savings (Rs) = 46.1

[8] Emission cost was calculated according to " Assessing Public Investment in the Transport Sector" published by Department of National Planning, Ministry of Finance and Planning- Colombo.

4.5 Summary of the Analysis

Gamisariya Rural Bus Service has successfully contributed to different trips of rural people. 81% of People who live in un -served area in Mirigama –Giriulla use this bus service while in Gepallawa –Kurunegala it is 64% and in Saliyawewa-Putlam it is 92%.

Bus operators in Mirigama –Giriulla and Saliyawewa-Putlam routes get enough subsidies to cover their operating cost and operator in Gepallawa – Kurunegala does not get enough subsidy level to cover the operating cost.

G.R.B.S has a significant impact on school trips of the children in selected villages. School children in 79% of families in Mirigama-Giriulla route, School children in 90% of families in Saliyawewa-Putlam and School children in 54% of families in Gepallawa-Kurunegala route use this service. School children in 51% families who walked before starting the bus service have shifted to use GRBS due to comfort, time saving and safety. School trips of 33% of families have increased due to this service.

When talking about trips to visit relations/entertainment activities and religious and cultural activities, G.R.B.S has less impact for these kinds of trips of the villagers. Due to the service only 7% families who walked before starting the service have shifted to the bus service and 9% families who used three wheels and 5% families who used bicycles have shifted to use the bus service. Only 1% families who used car/vans for the same trips have select G.R.B.S for these trips.

After starting this service the employment trips of the villagers have increased and a considerable number of people have started to go to employment beyond (out of) the village. Members in 12% of families in selected villages who walked for the employment before the project have shifted to use GRBS. Further 7% families who use three wheels for their employment trips have started to use this bus service. Further 19% of families the who walked for employment trips before starting project in saliyawewa-Putlam, 11 % of three wheel users in Mirigama-Giriulla, 39% of bicycle users in Gepallwa-kurunegala route have shifted to use this service due to

comfort, time saving ,cost saving and safety. Saving of vehicle parking cost is another advantage people consume due to the GRBS service. Further due to this service the numbers of employment trips have increased in each village.

Small scale cultivations to grow fruits and vegetables, grocery shops, hardware stores, carpentry industries, bricks manufacturing industries, Bristol products are some new industries /businesses started after implementation of GRBS.

Families who use walk and bicycles to go to groceries/markets/weekly market before starting GRBS are the people who mostly shifted to use this service for market trips. 21% of families in Gepallawa-Kurunegala who walked to groceries/markets/weekly market before the project and 15% families in Saliyawewa-Putlam route who walked for the same trips have shifted to use this bus service. Further these kinds of trips have increased in considerable number due to the service.

Farmers especially in Saliyawewa-Putlam and Mirigama-Giriulla route have started to transport their harvest to the market, bring fertilizer to their farms using the service. Therefore, now farmers have ability to earn extra profit because they can provide their harvest directly to the market without giving intermediate sellers who are coming to the villages. Further production quantity and the profit level of the production have increased. Further they are using this bus service to bring inputs (seeds, fertilizers, and other agricultural-instruments) for their cultivation. These facts have affected to have higher production quantity and encourage farmers to produce more quantities.

When review all kinds of trips as a whole the majority of the people who used walked, bicycles and three wheels have changed their mode of transport to GRBS and very little percentage of people who used cars, vans, and lorries have selected the service. Further, most of villagers who walked before the project have selected this service due to comfort, time saving and safety. The main reason for three wheel users to select this service is cost saving & most of bicycle users have selected the service due to safety.

Road development and increasing land value are other indirect benefits villagers get due to GRBS and the project has positive impact to travel cost and emission cost savings of the villagers.

CHAPTER 05

CONCLUSION & RECOMMENDATIONS

5.1 Conclusion and Recommendations

Rural Travel and transport is about rural people's mobility and their access to goods and services.

According to the literature review, it can be said that lack of income and insufficient private consumption, weak human capabilities, poor health, poor nutrition, inadequate leisure and inadequate social participation are some problems faced by Sri Lankan villagers.

Further, it is revealed that without sufficient rural transport facilities rural people face a number of difficulties like lack of reasonable prices for their production, higher cost of inputs used in the production, difficulties to find new market places, lack of necessary services and facilities, impact on education and emergencies and migration from the village.

Therefore, encourage to provide private and government transport services to rural communities is very important for the commercial, industrial, social and educational activities in rural communities and such services can provide several social and commercial benefits to the rural societies.

Although number of benefits granted through rural bus transport services, rural bus services have always been loss making due to the fact that such areas have lower household income and therefore unable to generate high volume of travels.

To maintain a sufficient transport service level in uneconomic rural routes, different governments in different countries follow various subsidizing methods.

With establishment of SLTB in 1958, Sri Lanka government took steps to provide subsidies to operate bus service in several uneconomic rural routes.

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In year 2005, the National Transport Commission initiated a compensation scheme for subsidizing unremunerated rural bus transport services and the project was called "Gamisariya" and from that year both state and private operators are provided subsidies under the project.

There were 496 GRBS routes which were provided subsidies by NTC in 2010 and for this analysis 03 routes of Mirigama-Giriulla , Saliyawewa-Putlam and Gepallawa-Kurunegala were selected and social and economic benefits received by families who live in un-served areas of selected routes were discussed.

81% of families in Mirigama-Giriulla , 92% of families in Saliyawewa-Putlam and 64% of families in Gepallawa-Kurunegala use the G.R.B.S.

Bus Operators in Mirigama-Giriulla and Saliyawewa-Putlam routes are provided enough subsidy level to cover their bus operating cost. But the subsidy amount is not sufficient for the operator in Gepallawa-Kurunegala route to cover his operating cost. Therefore G.R.B.S operators need a effective subsidy payment method to maintain the service regularly.

G.R.B.S shows a significant impact for the different trips of the villagers in selected 03 routes. The service has a keen impact for the school trips in Saliyawewa – Putlam route and also considerable impact for the school trips in Mirigama –Giriulla and Gepallawa-Kurunegala route. School children who walked before starting the project and who used bicycles to go to schools in selected 03 routes have mostly shifted to use G.R.B.S due to comfort, time saving and safety. Further, due to this bus service the numbers of school trips in all 03 routes have increased to a considerable level.

When consider trips of visit to relations, entertainment activities, religious and cultural places, GRBS has less impact on these kinds of trips of the villagers due to unavailability of the bus service in most of holidays and poya days.

After the project a considerable number of ladies especially in Gepallawa-Kurunegala route and Saliyawe-Putlam route have stared to go to employment out of the village due to the G.R.B.S. Therefore this bus service has an impact to strengthen the economy level of these villagers and reduce unemployment rate of the villagers. Further a considerable number of people who walked , used bicycle and three wheels for employment trips have shifted to use this service and villagers who used car/van and lorry have very little shifting rate to the Gamisariya Bus Service.

To provide effective service Mirigama-Giriulla and Gepallawa-Kurunegala G.R.B.S time tables needed to be coordinated/synchronized with train time tables which have higher demand especially in peak hours. Further due to G.R.B.S, employment trips in all selected villages have increased.

People in Mirigama-Giriulla and Saliyawewa-Putlam routes use G.R.B.S not only for passenger transportation but also to transport their product items to the market. Therefore, now people have ability to earn higher income level. Some families especially mentioned in above two routes have started some small scale industries also.

Other than the mentioned trips, families in selected routes use G.R.B.S to go to banks, post office, D.S. office, Police station, hospitals, etc.

When consider the selected 3 routes route as a whole, car/van and lorry users have reluctance to use G.R.B.S for their trips and a considerable number of walkers, bicycle users and three wheel users have shifted to the G.R.B.S. due to comfort, time saving, cost saving and safety.

Gamisariya Rural Bus Service project has granted higher benefit rate to the selected villagers by saving of travel and vehicle emission cost. Further it has created several indirect benefits to them.

Therefore, G.R.B.S has granted a number of social and economical benefits to the families who live in un-served areas belongs to Mirigama-Giriulla, Saliyawewa-Putlam and Gepallawa-Kurunegala G.R.B.S routes.

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APPENDICES –A Sample Questionnaire for the villagers (to get family details)

Household information

(1) Years of settlement in the village?…….
(2) Number of members in your
family ? …….

(3) In your family, number of Males ( ) , Females ( ) , School Children ( ) , Employees ( ) , Unemployed ( )

(4) Do your family has a vehicle? No …….. , Yes ……then type of vehicle?.....

(1) Do you have school children in your family ? Yes …… No …….. If Yes
(2) Details of mode of transport to attend to school .

Before Starting Gamisariya Project		After Starting Gamisariya Project		Using of Gamisariya Bus Service for this trip		If use Gamisariya the number of trips		If use Gamisariya bus service why use the service? Because of	
walk		walk		Use Gamisariya Bus Service		Increase		Comfort	
Three wheel		Three wheel						Safety	
Bicycle		Bicycle						Cost Saving	
Lorry		Lorry		Not Use Gamisariya Bus Service		Decrease		Time Saving	
Car/Van		Car/Van						Other … ……	
Other		Other				No Impact			

(3) Details of Mode of transport you and your family members use to go to see relations/Entertainment activities

Before Starting Gamisariya Project		After Starting Gamisariya Project		Using of Gamisariya Bus Service for this trip		If use Gamisariya the number of trips		If use Gamisariya bus service why use the service? Because of	
walk		walk		Use Gamisariya Bus Service		Increase		Comfort	
Three wheel		Three wheel						Safety	
Bicycle		Bicycle						Cost Saving	
Lorry		Lorry		Not Use Gamisariya Bus Service		Decrease		Time Saving	
Car/Van		Car/Van						Other … …….	
Other		Other				No Impact			

(4) Details of mode of transport you and your family use to visit religious/cultural events

Before Starting Gamisariya Project		After Starting Gamisariya Project		Using of Gamisariya Bus Service for this trip		If use Gamisariya the number of trips		If use Gamisariya bus service why use the service? Because of	
walk		walk		Use Gamisariya Bus Service		Increase		Comfort	
Three wheel		Three wheel						Safety	
Bicycle		Bicycle						Cost Saving	
Lorry		Lorry		Not Use Gamisariya Bus Service		Decrease		Time Saving	
Car/Van		Car/Van						Other … …….	
Other		Other				No Impact			

(5) After G.S service are there any member in your family who joined outside employment?

yes ☐ No ☐

if "yes"

Number of Males jointed outside employment ☐

Number of Females jointed outside employment ☐

(6) Details of mode of transport to go to employment?

Before Starting Gamisariya Project		After Starting Gamisariya Project		Using of Gamisariya Bus Service for this trip		If use Gamisariya the number of trips		If use Gamisariya bus service why use the service? Because of	
walk		walk		Use Gamisariya Bus Service		Increase		Comfort	
Three wheel		Three wheel						Safety	
Bicycle		Bicycle						Cost Saving	
Lorry		Lorry		Not Use Gamisariya Bus Service		Decrease		Time Saving	
Car/Van		Car/Van						Other …	
Other		Other				No Impact		…….	

(7) Have you or your family member started an industry / business after implementing Gamisariya Bus Service to the village?

yes	No

if yes , what type of industry / business have started?

……

……

(8) Details of mode of transport to go to groceries/Market/weekly Market?

Before Starting Gamisariya Project		After Starting Gamisariya Project		Using of Gamisariya Bus Service for this trip		If use Gamisariya the number of trips		If use Gamisariya bus service why use the service? Because of	
walk		walk		Use Gamisariya Bus Service		Increase		Comfort	
Three wheel		Three wheel						Safety	
Bicycle		Bicycle				Decrease		Cost Saving	
Lorry		Lorry		Not Use Gamisariya Bus Service				Time Saving	
Car/Van		Car/Van				No Impact		Other … …….	
Other		Other							

9) Details of Using Gamisariya Bus Service for other trips? ……

……

(10) Do you use Gamisariya Bus Service to transport production items? yes [ ] No [ ]

If "Yes"

Details of products for which Gamisariya Bus Service is used for transportation (vegitables/Fruits/Spices/others)

Production Items	Mode of transport before start G.S	Travel Time after implement G.S		Production quantity after G.S		Cost of transport after G.S		Profit level after G.S	
		increased		increased		increased		increased	
		Decreased		decreased		decreased		decreased	
		No impact		No impact		No impact		No impact	

APPENDICES –B Sample Questionnaire for the operators

1 Route No. ☐

2 Service ☐

3 Covering villagers ☐

4 Covering DS Divisions ☐

5 Route length ☐

6 Un served portion ☐

7 Full Bus Fare Rs. ☐

8 No.of trips per day ☐

9 Avg.No.of persons per trip ☐

10 Avg. revenue per day ☐

11 Number of not operating dates per month ☐

12 Do you transport goods? yes/No

if yes

What type of goods you transport? ……

13 Your ideas/suggestions to improve this service

…….....

APPENDICES –C Calculating of Bus Operating Cost for Rural Areas

Rural Routes Bus Operating Cost per KM - 2010

	Operational Cost	Rs
1	Fuel Cost (Diesel)	20.00
2	Crew Cost	13.50
3	Service and Lubricants	3.11
4	Tires and Tubes	7.00
5	Repairs	5.20
6	Daily Overheads	0.50
7	Monthly Overheads	3.20
8	Annual Overheads	0.40
9	Depreciation of Bus	4.30
10	Financing of Bus	0.80
11	Provision for risk	0.40
	Total operating Cost per Km	58.41