

COMPARISON STUDY OF RURAL BUS TRANSPORT SUBSIDY SCHEMES

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University of Moratuwa

Sri Lanka

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S.D.Athukorala

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Thesis submitted in partial fulfillment of the requirement for the degree Master of
Transportation



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DECLARATION OF THE CANDIDATE

I declare that this is my own work and this thesis 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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DECLARATION OF THE SUPERVISOR

I have supervised and accepted this thesis for the submission of the degree

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ABSTRACT

Sri Lanka has a public transport system that dates back to the 1860s. Buses entered the service in 1907 and have become the most widely used mode of transport. The penetration level of buses is 1 bus per 1000 population. The per capita bus travel is approximately 12 km per day. These services cover urban, inter-urban as well as rural services. Rural services however 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 subsidise 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. This study is evaluated the rural route subsidy scheme initiated in 2005 and identify the short comes of existing system. And study subsidy schemes practice in other countries to provide sustainable transport service to the rural people. By studying that, it is going to identified what are the improvements we can do for the "Gamiseriya" scheme for provide better service to Sri Lankan rural communities.

TABLE OF CONTENTS

DECLARATION OF THE CANDIDATE	i
DECLARATION OF THE SUPERVISOR	ii
ACKNOWLEDGEMENTS	iii
ABSTRACT	iv
TABLE OF CONTENT	v
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBRIVATION	ix
CHAPTER 1:	
 INTRODUCTION	01
1.1 Background of the Study	01
1.2 Rural Transport History in Sri Lanka	03
1.3 Objective of the Study	05
1.4 Methodology of the Study	05
CHAPTER 2:	
“GAMISERIYA” RURAL TRANSPORT PROJECT	06
2.1 Introduction	06
2.2 Rural Transport History in Sri Lanka	06
2.3 “Gamiseriya” Rural Transport Project	10
2.4 Short comes of “Gamiseriya” Project	16
CHAPTER 3:	
RURAL TRANSPORT MODELSIN SELECTED COUNTRIES	19
3.1 Introduction	19

3.2	Rural Transport Project in United State	19
3.2.1	Special Features of the System	20
3.3	Rural Bus Subsidy Grant Project in United Kingdom	21
3.3.1	Special Features of the System	24
3.4	“Kick start” Rural bus funding project in United Kingdom	24
3.4.1	Special Features of the System	26
3.5	Rural Transport Project in Republic of China	26
3.5.1	Special Features of the System	28
3.6	Rural Transport Project in Kuxabusnarna Ockelbo Sweden	29
3.6.1	Special Features of the System	30
CHAPTER 4:		
ANALYZING FRAMEWORK & COMPARION STUDY		
4.1	Introduction	32
4.2	Selection of the Service	32
4.3	Funding Method	34
4.4	Scheduling	39
4.5	Fare	42
4.6	Vehicle Specifications	44
4.7	Concession Period	47
4.8	Monitoring System	48
CHAPTER 5:		
CONCLUSION AND RECOMMENDATIONS		
		52
	References	54

LIST OF TABLES

Table 2.1	Subsidy Allocation for Rural routes in 1995	8
Table 2.2	Subsidy Allocation for Rural routes in 2000	9
Table 2.3	Subsidy Allocation for Rural routes in 2007	16
Table 4.1	Comparison of Selection of the Service	33
Table 4.2	Comparison of Funding Method	35
Table 4.3	Comparison of Method of Scheduling	40
Table 4.4	Comparison of Fare Schemes	43
Table 4.5	Comparison of the Vehicle Specifications	46
Table 4.6	Comparison of the Concession period	48
Table 4.7	Comparison of the Monitoring System	49
Table 4.8	Comparison Matrix	51



LIST OF FIGURES

Figure 2.1	Subsidy granting Procedure in year 2000	10
Figure 2.2	“Gamiseriya”SubsidyPayments2005-2009	14
Figure 3.1	Rural Bus Grant in United Kingdom Weekly Schedules	23
Figure 3.2	China rural route planning	27
Figure 3.3	Santana Saloon Cars Used on the Kuqa-Dunkuotan Route	29



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LIST OF ABBRIVATION

NTC	National Transport Commission
CTB	Central Transport Board
RTBB	Regional Transport Board Buses
SLTB	Sri Lanka Transport Board
ITD	Idaho Transportation Department
FTA	Federal Transits Administration
U K	United Kingdom
US	United state
PHV	Private Hire Vehicle
CFIT	Commission of Integrated Transport
BSOG	Bus services Operators Grant
DfT	Department for Transport
ULSD	Ultra Low Sulphur Diesel
IFRTD	International forum for rural Transport and development



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CHAPTER 01

INTRODUCTION

1.1 Background of the Study

Transport is central to the development process, directly providing physical access to jobs, health services, education and other amenities. Especially improving the access and mobility of the isolated rural poor paves the way for access to markets, services and opportunities, making rural land more productive by lowering agricultural input prices, in marketing farm produce, in facilitating the exploitation of minerals and forests, in helping to develop new export and import industries, in improving leisure and access to public services and facilitating the individual's utility function, in facilitating technological diffusion, in lowering consumer prices, in reducing seasonal price fluctuation, in raising prices for real estate and in keeping abreast of social, economic and political developments. The transport linkage between rural areas and urban areas is an important aspect of national development. The mobility of rural produce to reach different urban markets provides better prices for rural goods and services and this in turn will encourage the development of agricultural production, handicrafts and other product of a rural economy. Similarly, strong urban-rural links will also provide mobility of rural labour for employment in industrial and commercial activities in urban centers. Therefore government has the main responsibility to provide transport facilities to these areas, because of various reasons described as follows. (IFTTD, 2004)

Inadequate private and social assets

Inadequate transport facilities are a common symptom of the inadequacy of the access to social assets. Geographical isolation and difficulty of access by national roads, rail or other infrastructure can limit communities participation in labour and product markets and constrain their economic opportunities. Lack of affordable transport services or means of transport can mean that provision of transport facilities alone the may not alleviate this constrain. Inadequate transport facilities can thus contribute to inability to accumulate private and social assets.

Weakening of human capabilities

Lack of transport services in rural areas may constrain access to facilities and resources such as schools and health centers. Reliable access to schools and health services for the poor contributes directly to their accumulation of human capital.

Time and energy intensive productions

Rural people's lack of access to assets and technology means that the production for the market and for the households is time and energy intensive. They have to carry heavy loads (agriculture inputs and outputs, fuel and other home needs) on their backs and heads over long distances. The greatest proportion of the lowest productivity, and the most time consuming work is done by the women. They rely on head portage to carry their produce to the market. Reducing the transport burdens of rural women would release their time and energy for more productive and socially beneficial activities.

Inadequate social participation

The voice of the poor in the political process is often relatively weak. The poor are not given significant expression because poverty is often associated not only with geographical isolation, but also cultural and political isolation. Lack of transport services can be a contributory factor in creating an environment characterized by voicelessness and lack links with the broader society.

Vulnerability to natural, economic and social shocks

Unavailability of proper access increases vulnerability to shocks and may increase costs. Eg:- without a good transport system food cannot be brought to food deficit areas or famine areas and people cannot be protected from civil conflicts. If there is poor transport services to health services people will remain unhealthy; children will die and any epidemic is likely to have catastrophic results. Provision of basic transport services can greatly reduce vulnerability and the severity of the impact on household level risks such as medical emergencies.

1.2 History of Rural Transport in Sri Lanka

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, a tank 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. However with the global industrialization which took place when Sri Lanka was under British rule, many urban centers were created. Bullock Carts were the dominant mode of transport at this time.

Even though railways have been in operation in Sri Lanka since 1867, 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 World War I. These buses operated by private individuals carried both passengers and goods.

The commercial, industrial and educational activities of the urban nodes grew as the bus services between urban centers increased in number. Therefore, more rural communities were attracted to neighboring urban centers in their search for employment, trading opportunities and educational facilities. Even though passenger transportation between urban centers steadily improved, it did not extend to rural routes which were only served by bullock cart.

In 1958, bus services were nationalized and placed under a single state organization - the newly formed Ceylon Transport Board (CTB). By the end of 1970s, the per-capita bus usage, supported by a policy of low fares and an efficient bus transport system, was among one of the highest in the world. An important element in this was the mobility.

The state controlled bus service provided to rural areas, contributed immensely to the relatively low urbanization in Sri Lanka. This was also driven politically since the new mobility was sought after by the rural population in much earnest. 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.

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 in the rural areas.

In 1978, with the intention of overcoming these deficiencies in public transport, the government gave the opportunity to the private sector to invest again in passenger transportation while at the same time re-establishing the CTB with 9 regional Transport Boards. However this led to both private and state sectors vying for the profitable routes and thus all loss making routes and services were neglected. Therefore rural bus passenger transport deteriorated completely along with other services such as school and night services.

In 1989, the government intervened and provided a lump sum subsidy to the state operator to provide routes identified as uneconomic rural routes. However, more and more routes were added to this list without an increase in the subsidy thus making the level of subsidy too small to motivate an operator. Since it was more viable even for the cash strapped state operator to deploy buses on more lucrative routes, these routes were maintained only with skeleton services just in order to qualify for subsidy payments. The services were unreliable and rural communities had to resort to private or Para-transit modes of transport in order to attend to even basic travel requirements. There was no audit or regulatory function in the delivery of these services as it was a direct subsidy from the Treasury to the Operator.

Considering these issues encountered in the rural transport sector, when establishing the National Transport Commission (NTC) under Act. 37 of 1991, it was stated that the National Transport Commission 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 a “Gami Saeriya” project in 2005 to address problems encountered in rural transportation in Sri Lanka. (Prof. Amal S. Kumarage, 2000)

1.3 Objective of the study

The main objective of this study is to evaluate this “Gami Seriya” project and identify the shortcomings of the system. By studying rural bus subsidy schemes of other countries it may be possible to identify further improvements to the existing “Gami Seriya” programme. This is the ultimate objective of this study.

1.4 Methodology of the study

This study is going to evaluate the existing “Gami Seriya” scheme by using secondary data. Literature survey will be carried out to identify similar subsidy schemes practiced in other countries. In this stage it is hoped to evaluate the identified schemes and select common features in them.

In the next step the analyzing framework is built up by using the above common features. And critically compare each feature within the selected subsidy schemes. Arising from the comparison the strengths that can be applied to the “Gamsi Seriya” programme for better operation will be identified.

CHAPTER 02

”GAMI SERIYA” RURAL TRANSPORT PROJECT

2.1 Introduction

The regulation of road passenger services and the carriage of goods by motor vehicles within a province is a subject devolved to the Provincial Councils in terms of the 13th amendment to the constitution of this country. Administratively there are four levels of collaboration in the provision and development of rural transportation

- Central Government
- Provincial Governments
- Divisional Secretariat
- Pradeshiya Saba

Central Government releases funds to relevant ministries and regulatory Authorities to fulfill the rural transport needs in rural areas. According to the Act No. 37 of 1991 of National Transport Commission providing subsidies for uneconomical services is described as follows,

“To ensure the provision of omnibus services on un-remunerative routes, by entering after consideration of competing bids, into contracts with persons for the provision of those services and where necessary, providing financial support to persons providing such services and to specify the fares that may be charged by such persons having regard to the nature of the services provided.”

2.2 History of the Rural Transport Subsidy schemes in Sri Lanka

There were 2183 routes identified as uneconomic routes in late 1990. During this period, the government decided to grant subsidies for these routes for better operation. This subsidy was paid only to the Sri Lanka Transport Board Buses. The criteria adopted in making subsidy payments in that period can be described as follows;

Subsidy for Y Route = (cost per km operated X Operated km) – Total Revenue of Y route

Y Route = Selected Rural Route

Example

Total no. of kms operated by a depot in a given month	=	433,800 km
Total cost according to Profit & Loss statement (Rs)	= Rs.	5,799,800
Cost per km	=	$\frac{\text{Total cost}}{\text{Total km operated}}$
	=	$\frac{5,799,800}{433,800}$
	=	Rs. 13.37
Other revenue of the given month (season, post, army)	=	17,8240Rs
Revenue per km	=	$\frac{\text{Total cost}-\text{other revenue}}{\text{No. of km operated}}$
	=	$\frac{5,799,800-178,240}{433,800}$
	=	Rs. 12.96
Operated kms of Y route in given month	=	960km
Total revenue of given month	=	Rs.8, 190
Cost per km	=	Rs.12.96
Total cost of the Y route	=	12.96 x 960km
	= Rs.	12,441.60
Loss of the Y route in Rupees	= Rs.	12,441 - 8,190
	= Rs.	4,251.00

According to this method 2178 rural routes were subsidized by using 200million rupees in 1995. There were some routes in urban areas operated at loss due to competition from private buses. Not only the rural routes, but other routes also benefited under this payment criteria. This is the main weakness of this payment criterion.

On the other hand, the route sometimes received very low amount per Km. because the operator was not much concerned to provide services in those routes. Following table describes the subsidy payment amount in the year 1995.

Table 2.1: Subsidy allocation for rural routes in 1995

Region	No. of uneconomic routes	Operated km in 1995 (Mn)	Subsidy amount paid (Mn) in 1995	Subsidy amount per km (Rs)
Western	292	22.4	50.8	2.27
Central	430	18.7	33.2	1.77
North western	284	11.4	21.8	1.91
Sabaragamuwa	319	11.4	16.8	1.47
Southern	182	14.0	24.3	1.73
Uva	384	10.4	18.7	1.80
North central	152	6.4	22.4	3.50
Eastern	115	3.8	10.6	2.80
Northern	20	0.6	1.4	2.30
Total	2178	99.1	149.2	1.50

Source: National Transport Commission

In the year 2000 the Ministry of Transport revised the above method and added some specifications to this rural routes subsidy scheme. This criterion can be explained as follows.

Cost Variable

Take average cost of all cluster companies or average cost of a particular cluster company, whichever is less and compare it with the average cost of the depot and take whichever is higher.

Revenue

Waybill revenue per Km for a given month + Season ticket revenue per Km for a given month + Season ticket subsidy per Km for a given month + Revenue from army pass per Km for a given month + Salary subsidy per km for a given month

Payment = (Cost X Operated km of a given month) – (Revenue- Operated km of a given month)

According to this method it was decided to pay an incentive to routes, which serve more than 85% of the time table requirement. These incentive payments are the savings of routes, which had served less than 40% of the time table requirements. In the year 2000 the subsidy allocation amounts are summarized as follows;

Table 2.2: Subsidy allocation for rural routes in 2000

Region	No. of uneconomic routes	Operated km in 2000 (Mn)	Subsidy amount paid (Mn) in 2000	subsidy amount per km (Rs)
Western	236	15.8	36.5	2.30
Central	416	19.8	26.1	1.30
North western	268	13.2	25.0	1.80
Sabaragamuwa	369	14.4	19.0	1.30
Southern	202	13.4	23.0	1.70
Uva	372	6.4	11.8	1.80
North central	186	9.4	17.5	1.85
Eastern	114	5.0	11.1	2.20
Northern	106	0.6	1.5	2.50
Total	2183	98	171.5	1.75

Source- National Transport Commission

According to the above tables it is clear that the subsidy amount per km is much less. This lump sum subsidy discouraged the operators. Due to this reason these services were not operated continuously.

Meanwhile there was a system to grant subsidies to uneconomic routes through the tendering procedure. The tenders offered to private operators as well as CTB. There were 15 routes subsidized under this system. This system can be shown as follows.

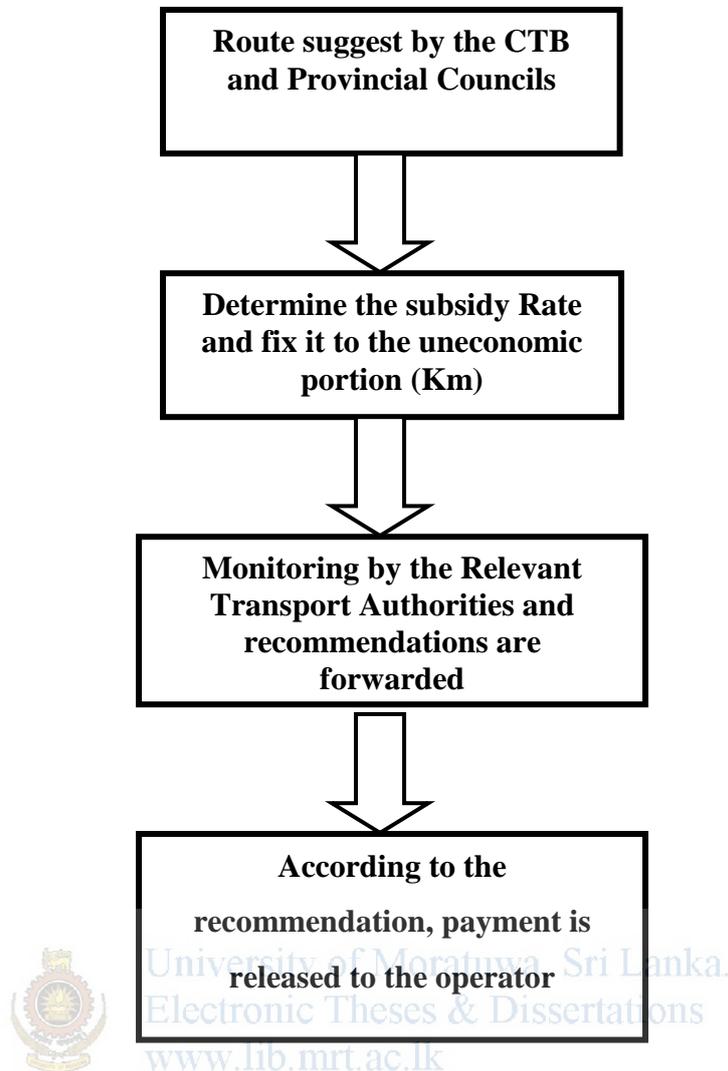


Figure 2.1: Subsidy granting procedure in year 2000

The CTB subsidy funds were used to implement this project. But the CTB was not willing to provide their funds. Due to the objections of the CTB the scheme was suspended. In the year 2005 “Gami Seriya” rural bus transport project was initiated to provide a more effective bus service to the rural people.

2.3 “Gamiseriya” Rural Bus Transport Project

The government in recognition of the wider socio-economic policy of promoting rural socio-economic wellbeing and equity based growth has agreed in its policy statement to provide special consideration with respect to transport needs of rural and under developed or developing areas.

Moreover the proposed National Transport Policy sets out that bus fares will be equitable for all people. The interpretation of this statement is that rural people should

not be required to pay more for basic transport services than other citizens elsewhere in the country. Such a policy however has implementation problems and becomes unviable since providing bus services in areas which are so sparsely populated that filling a bus for most trips of the day is unlikely. However, not providing such services leads to stagnation of socio-economic development of such rural areas and causes migration of people to cities. Hence in an effort to keep such communities economically and socially active and developing, bus services need to be continued.

Based on this policy, the National Transport Commission has initiated a compensation scheme for subsidizing nonremunerative rural bus transport services under a project called “Gami Saeriya”. Such compensatory payments are paid on actual delivery of services as stipulated through a contract with the NTC and monitored by a committee of leading citizens of the community to which such services are provided. Both the State and private operators are offered such contracts for a period of three years. It is expected that communities together with the operator will promote and develop the service sufficiently in order to ensure continuity of services after this period by achieving financial viability without the compensatory payment. There are over 200 such concessions that have been awarded and operating successfully to date. (Prof. Amal S. Kumarage)

The procedure of the “Gami Seriya” project can be described as follows.

Stage I: Selection of Services

Community groups, transport sector officials and elected representatives, make requests for new service or for inclusion of existing services, under the “GamiSeriya” program. The National Transport Commission thereafter conducts a preliminary inquiry to determine if such as route has a demand that justifies a subsidy. The request is denied if near full load factors are found or if households in the community are too few to justify a bus service. Moreover, if even a single operating bus exists on that route, then the route is rejected at the preliminary level of assessment. Another pre-requisite is that the length of the unremunerated route which should be greater than 5 km and more than 50% of the total route length being be in a rural area. Moreover there should be an adequate demand for at least 3 trips (morning, mid-day, evening) per day for a bus having a minimum seating capacity of over 25 seats. At present the “Gami Seriya” program funds only single bus operations.

At this stage, NTC officials conduct survey and determine,

- Number of villages in project impact area
- Population of the served area
- No. of schools, health centers, AGA offices. markets in project impact area
- Beneficiary groups
- Total route length and uneconomic route length
- Condition of the road

Based on the above data the following is determined the

- Suitable bus type
- No. of trips required per day (at least 3 trips)
- Trip schedule
- Bus Fare
- Operating cost
- Bus stops schedule

These determinations are made at the preliminary stage.

Stage II:

Selection of the Service Provider

After the determination of the above factors, the second stage is the selection of the service provider. At this stage the NTC offers the route list to the Sri Lanka Transport Board (SLTB) and ask them the possibility of providing bus services on selected routes. If they agree those routes are offered to the CTB at a pre determined subsidy rate. If the CTB is unable to provide a service, then a competitive bidding procedure is followed to select a private operator. Private operators also have to provide 90% of the operation level on these routes. Otherwise they are not qualified to receive subsidies. The concessionary rate for private sector operators is decided based on bided operational cost per Km. In case the lowest bided price is higher compared to the estimated, the NTC negotiates with the lowest bidder for further lowering the concessionary rate. Subsidy is only provided for the nonremunerative Kms of the route at the rate agreed in the contract. Excessive operations over those scheduled are

not considered for payment. Simultaneously the NTC conducts a technical evaluation of a bus to check its fitness for operation, minimum seating capacity and other specifications related to omnibuses.

Stage III:

Service Condition

Service provider signs the agreement with the NTC for a three year period. In this period they agree to provide bus service on selected bus routes according to the conditions of agreement. The NTC has powers to cancel that agreement, if they are unable to fulfill the requirements of the agreement. This agreement consists of the following conditions.

- Operator has to charge fares according to the fare tables which are provided by the NTC.
- Operator must follow the time table in the agreement
- School children are carried at half rate
- Operators have to fulfill 90% operation level
- Payment related documents (Log sheets) have to be submitted before 15th of each month.
- If they are unable to reach the agreed operation level they have to pay penalty charges.

Stage IV: Service Monitoring and subsidy payments

This is an important part of this project. Monitoring Committees are established at village level with the participation of communities of the village. It consists of six or seven persons. The reason for selecting these persons is that some of them use this service regularly and others are respectable persons in the village. Therefore they are the best assessors of this service. Such person are often the

- School Principal
- Gramaniladari (He is a person appointed by the government to solve problems in the village)
- Priest
- Retired senior citizen of the village

- School child
- A person who uses this service regularly

This committee has to monitor the bus service. The Committee chairman and another member have to certify the log sheet. Monthly subsidy is paid only under the recommendation of this Committee.

NTC has a separate flying squad that conducts ad-hoc service supervision using them. They check the quantity and quality of the bus service and a report is forwarded to the management for information and decision making.

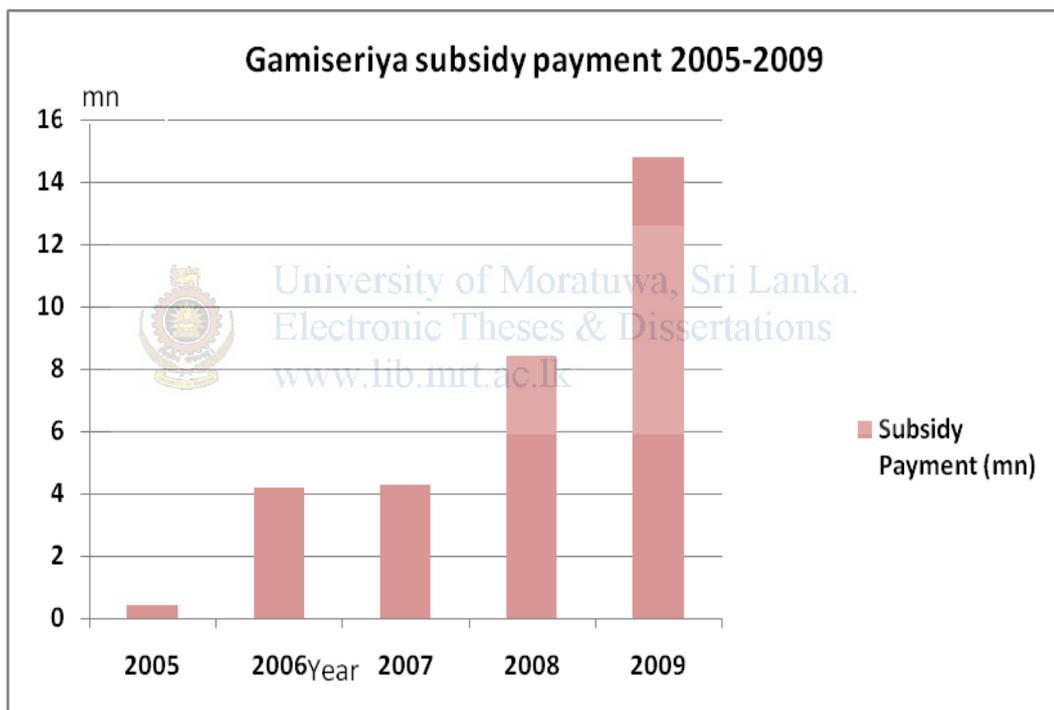


Figure 2.2: “Gamiseriya” Subsidy Payments 2005-2009

Source: National Transport Commission

Figure 2.2 shows how the subsidy payment increased from 2005-2009. At present there are 32 bus services (private operators) operated under this project.

In 2007 this project expanded to Central Transport Buses under the same procedure, except the tendering system. The routes were selected at the request of the Sri Lanka Transport Board. The subsidy rate per km was determined by using the following formula.

Determination of subsidy payment rate

Step1: Determine the potential earning capacity

Earning capacity of the operator was assumed as higher than the average waybill revenue per Km of depot and all island average waybill revenue per km (say X)

Step 2: Determination of the actual revenue

Actual revenue of the route is determined using the available data (say Y)

Step 3: Determination of the subsidy payable

Calculate the difference between the above two values (say X-Y) and assume it as the rate payable per Km. subsidy payment rate: Rs(X-Y) per Operated Km

Step 4:

Determine the subsidy for kms actually operated on the uneconomic portion multiplied by the determined payment in step 3 and the quantum payable is calculated. This rate is fixed for one year or until the time of annual fare revision which ever occurs first and the revision will be based purely on the annual fare increase.

Example

Average waybill revenue of the depot	=	Rs.45.00
Rural route Revenue	=	Rs.25.00
(Consider 50% of actual route revenue for calculation)	=	Rs.12.50
	=	Rs.45.00-Rs.12.50
	=	Rs.32.50
Operated Km in uneconomic portion in a given month	=	1,500
Monthly subsidy payment	=	1,500XRs.32.50
	=	Rs.48, 750.00

Table 2.3: Subsidy allocation for rural routes in 2007

Region	No. of uneconomic routes	Operated km in 2007(Mn)	subsidy amount paid (Mn) in 2007	subsidy amount per km (Rs)
Western	77	1..39	33.7	24.30
Central	85	2.0	53.0	26.00
North western	66	2.0	42.3	20.40
Sabaragamuwa	81	2.8	73.5	25.80
Southern	24	0.52	13.2	25.40
Uva	58	0.7	17.5	25.00
North central	70	2.4	59.4	24.75
Eastern	51	1.5	38.3	25.30
Northern	3	0.07	1.6	22.85
Total	515	13.38	332.5	24.85

Source: National Transport Commission

This payment criterion was revised in 2009 due to the request of the SLTB. New criteria were calculated based on the cost factor. It was calculated based on the cost per Km. At that time the cost per km was Rs.72.00 for the private buses. Quarter of this cost is based on the subsidy calculation. It was considered as Rs.17.50 per Km. Earlier payment was limited to uneconomic portion. But this revised system was paid for the total route length. Due to this change the operator can receive much more than earlier.

2.4 Shortcomings of the “Gami Seriya” Project

There are no provisions in the agreement on service delivery after the concession period. This allows the operator to stop the service after the concessionary period. The operator can stop the service after 3 years without giving any reason to the transport regulators even when the service is profitable. Such kind of service termination becomes unfair to the regional community since then a particular route is considered as nonremunerative and thereby it is not reconsidered for subsidy under the “Gami Seriya”.

Subsidy payment does not pay attention to the operator's revenue drop after the concession period. During the concession period the operator receives an equal monthly payment as a subsidy. Even though revenue increase is expected with the service operation in progress, monthly payment is not adjusted accordingly. This project did not pay attention to this issue.

The operator must operate the buses according to a fixed timetable. Flexible schedules were not allowed under this project.

Most of the rural roads are not in good condition to operate a bus service though the community demanded such services. These communities did not benefit from "Gami Seriya" because the project did not pay attention to provide the infrastructure facilities, such as bus shelters, and bus stops signs which are needed for a proper service.

The Subsidy grant was given to an individual operator who was given permission to provide transport on a particular road. An individual operator is unable to provide a continuous service every day. For example if the bus breaks down there is no option to the rural passenger. Due to this reason services become unreliable. This project did not take into consideration this situation.

The operators, who benefited under this project, are single bus operators. "Gami Seriya" permits are issued for a single route and a particular bus. In the rural areas we cannot expect the same demand every day of the week as in urban areas. Operators were not permitted to operate different bus types to suit the demand. On the other hand, majority of the operators had a single bus. Therefore vehicle utilization is very low under this project.

There is a service condition that; the vehicle must be a 25 capacity bus. The vehicles below this capacity were not permitted to provide rural services. In most bus operations, requirements vary widely between one route and another in rural areas. . Small vehicles are needed for routes where demand is low, or if there are physical restrictions such as weak or narrow bridges. Thus the people in remote rural areas did not benefit from this project.

Freight transport is totally neglected in this project. Sri Lanka's economy is largely based on agriculture. Rural people face difficulties in transporting their products to the market. Conventional buses are the most appropriate service for the rural areas. But the project overlooked this condition.

The shortcomings of this project can be identified as above. However by obtaining private sector participation in providing rural services, the National Transport Commission has been able to deploy rural services all over the country. It is observed that private sector now is keen to operate rural services under this project and also their efficiency in operation is outstanding when compared to SLTB. The success of subsidized bus services in operation under "Gami Seriya" project shows the efficiency and the effectiveness of this scheme over the concessionary models tried in the past. But still there are several modifications to be made to obtain its ultimate goals. Following chapters will discuss this matter in detail.



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CHAPTER 03

RURAL SUBSIDY MODELS IN SELECTED COUNTRIES

3.1 Introduction

This chapter is focused on various subsidy methods used in other countries to promote rural transport. Most developing countries have implemented Rural Road Subsidy projects but there are no Rural Bus projects to provide transport facilities to the rural people based on the subsidies. Republic of China is the only Asian country that this study found to do so. But most developed countries have implemented such rural bus subsidy projects for various objectives. Some objectives are different from ours. But by studying those projects we can identify some improvements for the “Gami Seriya” project.

Therefore five subsidy projects from four different countries have been selected. They are:

- Rural Bus Transportation Programme in United States FY 2006
- Rural Bus Subsidy Grant Project in the United Kingdom
- “Kickstart” Rural Bus Funding Project in the United Kingdom
- Rural Transport Project in the Republic of China
- Rural Transport Project in the Kuxabussarna, Ockelbo, Sweden

3.2 FY 2006 Subsidy Project

This is the main rural transport project in USA to develop transport facilities in rural areas. Division of Public Transportation together with Idaho Transportation department conducts this project. (Source: Division of Public Transportation, Idaho Transportation, United State)

The project provides the funds to improve rural bus transport in the United States. The funding level is subject to change based on the final federal allocation. The time limit for expending the granted amount is limited to no more than three (3) years from the

date of award of grants as long as the applicant remains compliant with the grant agreement. Funds are available to rural areas with less than 50,000 people. Funds are to be allocated to each district based on the percentage of persons living in the rural area of each district. The Division annually obtains the most recent census estimates data from the Idaho Department of Commerce to determine current numbers for each district. The goals of the program are: to enhance the access of people in rural areas of Idaho to health care, shopping, education, employment, public services and recreation; to assist in the maintenance, development, improvement, and use of public transportation systems in rural and small urban areas; and to encourage and facilitate the most efficient use of all federal funds used to provide passenger transportation in rural areas through the coordination of programs and services. As in many other largely rural states, rural bus service in Idaho is a vital link between otherwise isolated rural and nearby small urban communities.

Operating assistance may be given to a public or private nonprofit organization for the direct operation of intercity service after appropriate consideration of participation by private, for profit service providers. Capital assistance may be provided to purchase vehicles or vehicle-related equipment such as wheelchair lifts for use in intercity service. Charter and tour services are generally not eligible for FTA assistance.

Funds for the program are available for allowable costs incurred under the categories of administration, operating, and planning, marketing and capital expenses to support the provision of rural transportation services.

3.2.1 Special features of this system

- This project provides funding for 50% of the operating deficit of rural public transit services, and 80% of the capital costs for equipment (such as buses). Program is administered by individual state departments of transportation.
- This project mainly focuses on elderly and disabled people living in remote areas
- Each districts is selected for funding based on population size (more than 50000)
- Each vehicle has to have wheel chair accessibility

- Funds are released to operator as a operating subsidy and funds are also released to purchase vehicles and related equipment as capital subsidy
- General fare system is applied
- Fixed time schedules as well as demand response services are provided
- Operator has to report condition of the vehicle. Staff will make periodic on-site inspections of vehicle(s), driver logs, and project records. Operators are required to submit Monthly Vehicle Reports, proof of insurance at each renewal.

3.3 Rural Bus Subsidy Grant Project (RBSG)

United Kingdom has conducted several rural transport projects to develop their rural transport facilities. Rural Bus Subsidy Grant project (RBSG) was initiated in the year 2002. The project is conducted by the Department for Transport in UK. (The Rural Thoroughbred, Buses in the Countryside report, (2000), Department for Transport, UK)

The Bus Services Operators Grant (BSOG) is a payment made to bus operators by the Department for Transport (DfT) that offsets a high proportion of the fuel duty paid on fuel consumed. Currently BSOG is paid at a rate of 43.21 pence per liter (ppl) for Ultra Low Sulphur Diesel (ULSD), the fuel predominantly used by bus operators.

BSOG represents the largest proportion of direct funding (outside concessionary fares) and was equal to around £437 million in 2008/09. Its effect is to allow bus operators to run a wider network of services than would otherwise be the case, and so arguably does provide incentives for patronage increases. However, it is directly based upon fuel consumption, and so is poorly linked to environmental objectives, particularly climate change. Excluding concessionary travel, the Bus Service Operators Grant (BSOG) is the main source of bus support funded by the Department for Transport (DfT). The rationale for BSOG rests with the positive external benefits of lower congestion and improved environmental outcomes from reduced car travel as well as the accessibility benefits to bus passengers. The main objective of the project is promoting greater equality of opportunity and to improve the quality of life for transport users. The Department is keen that buses play their full part in helping to

meet these goals. There are several policy options they considered on this subject as follows,

Option 1

A move to an incentive per passenger payment

Option 2

Exploring more radical options for linking BSOG and concessionary fares reimbursement, with no change in BSOG system

Option 3

An operator specific distance based payment

Option 4

The preferred option is policy option 2 as this has the potential to maximize value for money. By making bus operators face the full cost of fuel, it will also greatly enhance the incentive to conserve fuel and invest in more efficient buses.



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Scheduling the services

A sample of a thousand timetables was analyzed to examine the times of first and last buses, the length of operation, the number of days per week the service runs, and the provision of Sunday services. Following graph shows the number of operating days of RSBG services.

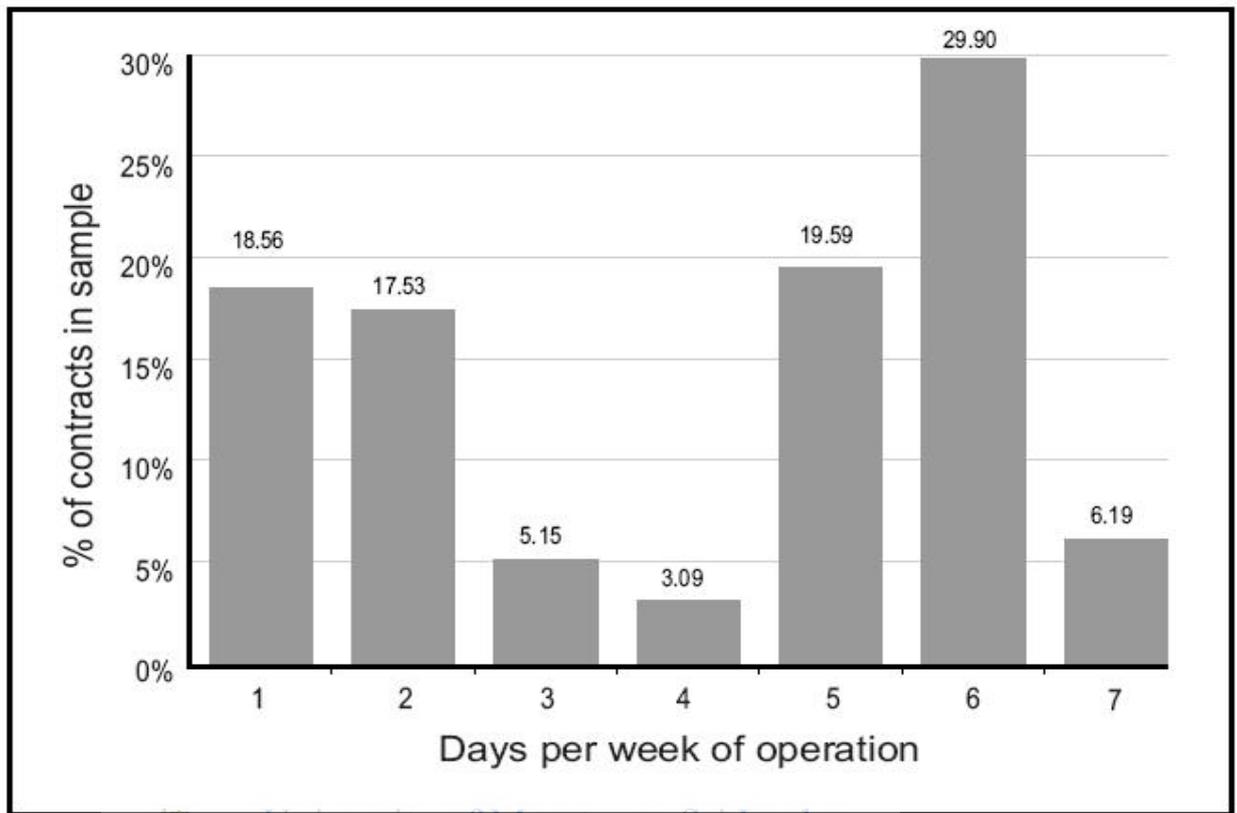


Figure 3.1: Rural Bus Grant in United Kingdom Weekly Schedules

Source: *The Rural Thoroughbred-Buses in the countryside summary report*

By definition, devolution of funding would not require DfT enforcement it would be open to local authorities of how best these funds are spent. For a Quality Contract, these take the form of one or more contracts between local authorities and bus operators, and would be enforced contractually by the local authorities concerned. The traffic commissioners' role in registering services and monitoring compliance is not applied in relation to services provided under a quality contracts scheme, other than in specified circumstances. However, the traffic commissioners' will (as under existing legislation) have the power to impose sanctions against persons who operate unauthorized local services in the area of a quality contracts scheme.

3.3.1 Special features of the project

- Selection of route based on the size of the population.
- Funding is provided to cover 80% of fuel consumption
- Scheme provides for more flexible use of vehicles such as taxi buses, social services and voluntary sector vehicles. Minibuses, and taxi buses are used to provide services
- Rail, Bus, Taxi integrated services are provided under this scheme
- Service provider is selected through tender procedure
- General fare policy applied. Concession fares for school children, disabled and elderly people (over 60) was available
- Concession period is limited to three years.
- Service monitoring committee is appointed by the Department for Transport

3.4 “Kickstart” Rural Bus Funding Project

Kickstart funding for projects involving bus service improvements was first introduced by the Department for Transport (DfT) on a pilot basis as part of the Urban and Rural Bus Challenge competitions in 2003. In the light of initial results from that pilot, a competition for the award of further Kickstart funding was held in 2005. A total of £20million was awarded to 43 projects as part of that competition.

Kickstart provides pump-priming funding to new bus services, or bus service enhancements. It is targeted at schemes that have the potential to become successful but which initially might be marginal in commercial terms and require some financial help to start them off, or which are currently marginal schemes that with some extra support could be made more successful.

Kickstart is aimed at bus services which will contribute to the Department's overall objectives of increasing bus patronage, and in particular developing bus services as an alternative to car use, bringing with it a reduction in congestion and benefits to the environment. It is also about improving accessibility and social inclusion.

The criteria for Kickstart 2009 can be divided into two areas – those that are essential (which will be expected of all schemes to aim to achieve) and those that are desirable (which, although not deemed essential to a successful bid, will be treated positively during scheme assessment).

Essential criteria are those where the scheme will:

- Attract new passengers, particularly where this involves modal shift from the car and delivers benefits in terms of congestion and the environment;
- Represent good value for money in terms of the costs and benefits of the proposed project
- Involve close partnership between local authorities and bus operators;
- Be sustainable beyond the Kickstart three year funding stream. Ideally the schemes would be commercially viable after the Kickstart funding finishes (or viable on a not-for-profit basis where the local authority's partner is a community transport operator), or at the very least be supported with guaranteed local authority subsidy;
- Deliver outcomes that help to meet local policy objectives, particularly any transport targets but also wider local authority objectives;
- Contribute towards Department for Transport objectives
- Comply with disabled access requirements

Kickstart funds are normally used to provide ongoing financial support for the service operation. New or upgraded vehicles should be funded by the operator partners. However, there could be circumstances (particularly where smaller operators are involved, or for some rural or community transport services) where support is needed to help provide new vehicles. Authorities should consider carefully the issue of the future use and residual value of any vehicle that has been purchased with the help of Kickstart funding. It is important that such vehicles are not transferred to operate other services without suitable recompense.

Supporting capital works could perhaps be taken from Local Transport Plan funding. Developers and other partners should be encouraged to contribute to funding where appropriate. Bids may include the revenue costs associated with any new

infrastructure provided under the proposal. (Source- Kickstarting Growth in Bus patronage: targeting support at the margin (2003) Transport studies group, Loughborough University)

3.4.1 Special features of the project

- Service selection based on the population
- Funds are divided into two groups, ongoing financial support and capital subsidy for purchase of vehicles.
- Ensure that vehicles purchased through this scheme are not transferred to operate other services.
- Operator has the responsibility to increase his patronage during the funding period.
- Operator has to submit his marketing plan with the tendering application (How to increase the passenger patronage)
- General fare applied. concession travel same as in previous scheme
- Concession period limited to three years.
- Fixed and flexible schedules are used. Minimum hourly service is required.
- Vehicle types vary according to the demand on such routes.

3.5 Rural Transport Project in Republic of China

According to the scheme the main objectives of this project can be identified as follows, (Source- People Republic of China: Sustainable Rural Transport, (July 2007) Asian Development Bank.)

- Sustainable growth.
- More harmonious society.
- Reducing income inequalities.
- Cushioning the social impacts of development.
- Protecting the environment

3.5.1 Special Features of this Project

- Flexible schedules are encouraged on village bus routes to cater for demand fluctuations.
- Not granting direct subsidies to the operator. Granting route licenses free of charge and provide infrastructure facilities.
- Fares set by price committees would be maximum levels. Owners are permitted to charge any fare below the maximum.
- The operator of a village bus route is free to choose appropriate vehicles, provided the vehicles have a village bus license.
- Operators, owners and drivers are responsible for the safe operation of their vehicles. Safety inspections would be through random checks by road administration and public security officials at terminals.
- The manager of the village bus operator, if it is a cooperative, is appointed by its members. An assistant is employed for accounts and administration and a dispatcher to record the journeys made by each bus.
- Each bus owner is responsible for his own maintenance and running cost. Passenger fares are collected by the drivers and paid to the manager's assistant daily. Fare revenues are divided weekly between members according to their seat-kms operated after deducting for overheads, manager's assistant's and dispatcher's salaries.
- Two standard types of bus are in common use on rural routes, 7-seater and 19-seater
- Other types might be more suitable depending on circumstances (demand and Road conditions)
- Subcontractors (who own the buses) usually have no say in the choice of bus type/size
- Operators should have more flexibility in selecting the most appropriate types e.g. 11-seaters might be ideal on many routes
- Sometimes much larger buses may also be appropriate



Figure 3.3: Santana Saloon Cars Used on the Kuqa-Dunkuotan Route, Xinjiang

Source: Sustainable Rural Transport Service –China

This is the smallest public transport vehicles used in china. This type of vehicle is used in deep rural areas to provide transport facilities to rural Chinese people under the government licenses.

- Road transport authorities tend not to issue route licenses on poor quality or unclassified roads.
- Route license should not be issued unless there is a terminal at one end. Otherwise licensed services must wait for the construction of a suitable terminal.
- Operators, owners and drivers are responsible for the safe operation of their vehicles. Safety inspections would be through random checks by road administration and public security officials at terminals.

3.6 Rural transport project Kuxabussarna, Ockelbo, Sweden

Kuxabussarna operates in the municipality of Ockelbo, 220 kilometres north of Stockholm. The population of Ockelbo is 6,400, with half living in rural areas. The population density of the region as a whole is 16 per km². The scheme was initiated by the municipality of Ockelbo in 1995 to demonstrate the potential for improving public transport in a rural area, particularly to increase both public transport use by motorists and the area served by buses. The plan was to combine existing (mainly public funded)

Services in the area (including school services, medical patient services, and services for elderly and disabled people), and to make them accessible to the general public. It

was anticipated that using appropriately-sized vehicles and the savings thereby would deliver a completely free, fully scheduled bus service, which is well integrated with other public transport services. Careful planning and the use of appropriate vehicles have enabled passenger numbers to be increased at no extra cost. Vehicles also carry freight.

3.6.1 Special features of this Project

- Buses run between 06:00 to 17:00 Monday to Friday, on eight different routes designed so that 70% of local inhabitants live within 300 metres of a bus stop.
- Frequencies vary across the day, with a maximum hourly service. The routes are designed to connect with regional services to larger towns, so that they can be used by commuters.
- Passengers typically travel between 10 and 40 km. Kuxabussarna is a regular, scheduled service, so there is no booking system.
- The vehicles are not wheelchair accessible; an accessible taxi service is retained for more disabled travelers. One exception to the scheduled services' fixed route is that buses will extend their run beyond the end of the normal route to collect or deliver disabled people living nearby. This does not affect the timetable, or the other passengers.
- Bookings are made through the contractors, and the system is integrated into a nation-wide system called Bussgods.
- The service is contracted out to three separate companies.
- Six vehicles are used, mostly medium sized, although the largest seat 60. Eleven staff provides an average 34 hours daily service between them.
- Timetables are distributed twice a year to the households in the municipality to keep the inhabitants informed. Changes to published routes and timetables are displayed on the Ockelbo website. There are frequent references to the scheme in the local media.
- The service uses standard bus service licenses. Four-year contracts are awarded to contractors after competitive bidding.
- Commuters use the service to get to work in some of the larger villages. 40% of services go to schools, so use among school pupils is high (some schools have

adjusted their timetables to fit in with Kuxabussarna). Despite the fact that it is not wheelchair accessible the service is used by significant numbers of disabled and elderly people. Since the introduction of Kuxabussarna, use of special accessible taxis has decreased.

- The buses also carry freight. The freight system is used by the municipal administration for their internal post, by pharmacies, the postal service, local bakeries and other companies.
- Since the service is free to passengers, all the annual €375,000 costs are met by the local municipality. This represents a minor saving to the authority compared with the cost of pre-existing services. It was calculated that the cost of collecting fares would exceed their value. (www.irishrurallink.ie)



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CHAPTER 04

ANALYZING FRAMEWORK AND COMPARISON STUDY

4.1 Introduction

The study identified short comings of the existing “Game Seriya” project in chapter two. In the literature survey five subsidy schemes identified the practice in four different countries. When studying the literature survey there are several factors that are most common to the five subsidy schemes. Therefore those factors are used to build up this analyzing framework. . These are the more critical factors in any rural subsidy project. Each scheme determines these criteria in different ways. This chapter discusses these factors in detail and comparison between subsidy schemes will be carried out according to selected features. Furthermore the study would be comparing each factor of different schemes and identifying the strengths to apply to the “Gami Seriya” scheme.

These seven factors can be categorized as follows.

- Selection of the service
- Funding method (Rate)
- Scheduling
- Fare
- Vehicle Specifications
- Concession Period
- Monitoring System

4.2 Selection of the service

“Route” means a line of travel which specifies the high way which may be traversed by a motor vehicle between one terminus and another. Further it can be defined as “the road section between the two terminal points of a regular service in operation” (Sudarsanam, 1979)

In rural transport, the determination of the subsidy route is very critical. In different subsidy schemes, there are various methods of selection of routes to be subsidized. Population, Gross National Product, per capita income can be shown as examples.

Table 4.1 Comparison of Selection of the Service

Model	Selection criteria
<p>China Modal</p> 	<p>The village bus operators are permitted to plan their own bus routes, based on their knowledge of local requirements</p> <p>They would then be required to apply for a Village Bus Route License for each proposed route</p> <p>The Village Bus Division would have the authority to make changes to the proposed routes if it feels this to be necessary, although it must have genuine reasons for doing so.</p> <p>There should be an appeal procedure for operators who disagree with such changes, or have other grievances, such as the refusal by the VBD to grant a license for a route.</p> <p>If the VBD considers some routes to be necessary, but no operator has proposed them it should draw up its own plans for these routes, and seek potential operators to apply for licenses; these may be local groups or, if none are available, a larger company.</p>
<p>FY 2006 Model</p>	<p>Selection of route from each district based on population. Less than 50,000 populations.</p>
<p>Kickstart project</p>	<p>The route must be outside of London.</p> <p>Routes are expected for the services that come in to greater London area if the service predominantly serves areas outside London, and the lead authority is from outside London.</p> <p>Operator can suggest the route with full route detail report through a survey.</p>
<p>RBSG project</p>	<p>Funding service is selected based on the population. Less than 3000 people.</p> <p>Operator can suggest the route with full route detail report through a survey.</p> <p>This project funds poorly used routes, while established services</p>

	decline because of a lack of investment.
Sweden project	Based on the population. Less than 3000 people Routes are designed to connect with regional services to larger towns

When selection of route, three of the above discussed schemes base their selection on the size of the population in the particular district or area. China model was based on operator details. “Gami Seriya” project was based on the request made by the communities and transport authorities. This is not a much effective method. Some authorities were not concerned to apply for this scheme. On the other hand people who are living in remote rural areas are not aware of this project. As a result “Gami Seriya” project benefits are not widely spread all over the country.

Therefore, “Gami Sariya” project needs a more rationalized policy to select the route. A policy based on the socio economic condition in the region would be more beneficial to the rural people. Population density is one of the good indicators of this. Further the per capita income would be the best indicator to identify the need for the service.



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4.3 Funding Method (determination of subsidy rate)

Transport providers are not willing to operate commercially non-viable routes due to high operational 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 uneconomical, but significant from the point of view of a community service or as part of development infrastructure is justified by the resulting net improvement from increased social benefits and decreased social cost. Therefore any government has the responsibility of providing transport services to isolated people to fulfill their transport requirements, by providing subsidies to operators. These funds are allocated using various methods as follows.

- Tendering procedures
- Fuel subsidies
- Pre-determined rates for only uneconomic portions of the route

- Provide infrastructure services to the operators
- Capital subsidies

Table 4.2 Comparison of Funding Methods

Model	Funding method
China Modal	No subsidies to the operators. Route licenses and Bus licenses are issued free. Only the infrastructure facilities are provided such as terminals, roads, vehicle repairing and safety testing depots.
FY 2006 Model	Three kinds of grants are offered. capital grants for purchase of vehicles or vehicle related equipment, bus shelters and bus depots. Operating grants for the purchase of service agreements, user side subsidies.
Kickstart project 	Pump-primary funding to new bus services, or provide for bus service enhancement and for providing ongoing financial support for the service operations Provide capital subsidies for purchasing vehicles. Operating subsidy is based on the patronage percentage.
RBSG project	Fuel Duty Rebate is paid directly to bus operators according to how much fuel they use in providing local bus services. 80% of the duty is refunded. Rest 20% have to be borne by bus operators
Sweden project	Total operating cost is granted to the operator as a subsidy. The cost of the system is borne by the relevant Municipality.

There are different funding methods in the above subsidy schemes.

As a developing country it would be very difficult to apply the Swedish method, because it is a complete free scheme, where all the expenses are borne by the Local Authorities or relevant Municipalities.

Under the “Gami Seriya” project the operator receives an equal monthly payment as a subsidy. As result the operator is not concerned in improving the demand from his

side. At the end of the concession period, he faces difficulties at once. This is the main shortcoming of this scheme.

The kick start subsidy scheme, funding method is suitable for us to avoid this situation.

Kick-start funds a percentage of the net cost of approved new services and initiatives to increase patronage including for example, marketing and capital expenditure to a ceiling as well as bus service provision:

- 80% of costs incurred in year 1;
- 60% of costs incurred in year 2;
- 40% of costs incurred in year 3.

The decreasing rate of support was intended to provide incentives to operators to improve patronage. In this method the operator would continuously try to enlarge his patronage and after the concession period, the operator could survive individually without subsidies. In this method not only the institution but also the operator has the responsibility of improving the passenger demand.



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Kickstart requires local authorities and operators to consider jointly which route, or network, enhancements will contribute most to the transport objectives, offer the strongest potential for patronage growth, and be sustainable with assured funding and viability over the longer term; and Kickstart involves both partners contributing to the investment required; bids should forecast patronage numbers for each year of Kickstart support and for at least the first year after the Kickstart period. It should describe the project's strategy for achieving growth and the analysis which underpins the forecast. Where the project is for the enhancement of an existing service, patronage data should be given for at least the most recent year. An indication of the proportion of passenger types would be useful where this is available, particularly the number of concessionary passengers. In particular any forecasts of passengers changing from car use to bus and the methods used to determine this would be interesting. The operator might also want to indicate in the operators bid what the underlying patronage trends are for the area in question. Each operator submits the document to the authority by describing their marketing plan, and how they improved

the patronage. Otherwise the authority would not accept the proposals. This system protects the operator as well as the service.

In the “Gami Seriya” project the grant suddenly stopped after three years. There is no further protection to the operator. If we can follow a method like the above it would be more beneficial to the operators.

On the other hand, the China model does not introduce the operator subsidy. They provide infrastructure facilities for better operation such as terminal developments, bus shelters, road constructions and maintenances and establish inspection depots. Furthermore, the administrative and permit charges are less than others in urban transport.

In many developing countries government resources are limited and those available for rural transport (if any) must be prioritized between developments of infrastructure, enforcement of traffic regulations, and other funding needs. Subsidies for rural bus services would reduce funds available for other purposes, and it is necessary to decide whether funds would be better spent on infrastructure and enforcement, which would encourage operators to enter the market on a commercial basis, than on direct subsidy to operators.



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According to the China experience, two of the four provinces of China have introduced measures to reduce the cost of providing rural services: Guangxi discounts selected fees and charges levied on rural transport operators and Gansu compensates rural operators for increased fuel costs between CNY 2,000 and 6,000 per annum for each vehicle, depending on the number of seats. Guangxi’s policy reduces selected fees and taxes for buses and minibuses that have at least 20 percent of their route on roads of Class IV or lower. They receive a 30-50% reduction (depending on the size of vehicle and the proportion of the route on rural roads) in the Road Maintenance Fee, Passenger Surcharge, Transport Management Fee and Flood Control and Security Fee, and a 50%t reduction in City Construction Tax, Transport Facilities Maintenance Fee and Vehicle Safety Inspection Fee. The effect of these as benchmark a 19-seat bus operating four round trips per day over a 39 km route with 50 %load factor is an 11 percent reduction in average monthly costs from CNY 8,214.6 to 7,302.95. The impact of Gansu’s fuel subsidy is much lower.(source- People Republic of China: Sustainable Rural Transport, (July 2007) Asian Development Bank.)

Furthermore in the China scheme, rather than providing subsidies, which provide no incentive to improve efficiency, the transport authorities should consider focusing on ways to reduce the overheads imposed by the administrative fees and terminal charges levied by the larger companies and to encourage more efficient utilization of vehicles by granting fewer bus licenses and discouraging long layovers at terminals. With fares controlled, however, the cost savings made by operators cannot be passed on to users. It may be appropriate, therefore, for regulators to allow variations in fares below a specified limit.

The China model always tries to develop infrastructures and reduce the transport cost of the rural bus operators through providing facilities which were discussed above. “Gami Seriya’ project provides subsidies for the individual bus operators. This project is not concerned about improving the rural transport infrastructure such as bus terminals, shelters and road maintenance. There are some routes operated under “Gami Seriya” project where the road condition is very unsatisfactory. (Source-National Transport Commission – Gami Seriya Project)

E.g. Kabitigollewa-Kapugollewa (25Km)
Embilipitiya-Middeniya (Via Kilawelpotewa)(20Km)
Puttalam-Saliyawewa(Via Neelabemma)(44Km)

Therefore operating costs are also very high. If we can integrate with Provincial Authorities or Pradeshiya Sabas we can support the improvement of the road conditions. If we can follow the China model we can provide wider benefits for the operators than now.

The US model the FY 2006 subsidy scheme and kickstart project (UK), provide subsidy grants for the purchase of vehicles.. They define the vehicle specifications and those vehicles should be used only for the purpose. This is the capital subsidy. Rural Bus Granting Project provides direct subsidy for the operator to cover his operating cost. It is similar to our “Gami Seriya” project funding method.

According to the above comparison, there are some modifications that can be introduced to “Gami Seriya” project for better operation. According to the China

model, the provision of the infrastructure facilities is more beneficial. For example when we construct or repair a road section it is beneficial to all the people. On the other hand, if we can introduce a capital subsidy under the “Gami Seriya” project more operators can be attracted to the service. The majority of “Gami Seriya” bus operators are village people. Most of them face financial difficulties when they invest in a bus. For this reason, although they are selected through a tender system, some services are implemented only after taking a long period. If we can provide a capital subsidy, it would benefit the rural people in remote areas also. At present we subsidize only bus services. But in the countryside there are people without proper access. If we have a capital subsidy we can provide such as bicycles, taxies to those people.

4.4 Scheduling

Scheduling is the most important single factor in transport operations. In order to cater to the transport needs of the public, an effective bus scheduling system is essential. Bus scheduling, by definition, is a trip or trips assigned to be performed by a bus during a day. Scheduling by its meanings, cannot be final or rigid. It is a continuous process of adjusting to the changing environment. Today’s best schedule will not necessarily be the tomorrow’s best. In order to be effective, scheduling should be dynamic.

There are many factors to be considered in scheduling. They are.

- Number of villages and towns in the area and their population
- Number of villages not connected by road but within the “catchments” area.
- Importance of the villages in the area under study such as location of schools, primary health centers, courts, markets etc.
- Agriculture and industrial importance of the villages
- Rail heads enroute requiring connections to feed and pickup train traffic
- Density of traffic, frequency of service and number of buses required at various timing in the day, first and last timings are considered necessary for the terminals, special times required for train connections schools etc.

- Locating and determining the “parent town” which attracts traffic in the morning and disperse it in the evening in various directions.

When compared with other transport operation schedules, rural transport schedules are very different. It varies due to a number of reasons, therefore it is difficult to establish fixed schedule time table for every rural route. For example, there are some routes which have a demand only in the morning and evening trips and there are some routes which have a demand on specific days. (Market day/special festival days).

Therefore, these factors have to be considered when scheduling the services for rural routes. It has to consider passenger convenience and minimize the operator cost incurred.

Table 4.3: Comparison of Method of Scheduling

Model	Scheduling method
<p>China model</p> 	<p>Flexible schedules to encourage village bus routes to cater for demand fluctuations.</p> <p>The village bus route licenses do not specify schedules, but require a minimum service level.</p> <p>The 7-seater vehicles normally depart 20 minutes after arrival, or as soon as they are full, whichever is sooner.</p> <p>The waiting time for the larger buses varies from 15 minutes at busy times to 40 minutes at quiet times unless they fill up sooner.</p>
<p>US Model</p>	<p>There are fixed time schedules as well as demand responsive services.</p>
<p>Kickstart project in UK</p>	<p>Time schedules have to be proposed by bus operators.</p> <p>Minimum hourly service is required</p>
<p>RBSG project in UK</p>	<p>The length of operation, the number of days per week services, Sunday recruitments is considered.</p>
<p>Kuxabussarna, Ockelbo, Sweden</p>	<p>Frequencies vary across the day, with maximum hourly service.</p> <p>One exception to the schedule services' on a fixed route is that buses will extend their run beyond the end of the normal route to collect or deliver disabled people living nearby.</p>

	This does not affect the time table or passengers' demand A parallel taxi service operates with this scheme
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The demand response transport is very popular among the rural people in developed countries. FY 2006 scheme is an example of that. These are usually operated with small buses of up to 15 seats, often equipped to carry passengers in wheelchairs in order to cater for elderly and disabled passengers, who now constitute a significant proportion of non-car users. They do not operate on fixed routes or timetables, and will call at any point within a specified area on demand. Typically a bus will be scheduled to depart from its starting point at specific times, so that users know approximately when a service will be available. They may join the bus at its starting point, and inform the driver where they wish to be dropped, or they may telephone (either the bus driver if he has a mobile phone or a control center), requesting to be picked up at a particular point. Few, if any, such services operate on a commercial basis and most of them are heavily subsidized.

At present it is difficult to apply the demand response transport service to our rural areas. Demand response services are for low demand areas such as when population is less than 3000. The Swedish scheme implements this demand response service because when they are selecting the routes they would consider population that is less than 3000. In our country the population density is high. Therefore demand response services are not suitable for our services.

“Gami Seriya” project often depends on the fixed schedules. But the overseas schemes discussed above depend on the flexible schedules. Flexible schedules minimize the operator cost. Service provider of “Gami Seriya” project operates on given fixed time table by NTC. Number of trips is limited to four round trips. Maximum is six trips. Payments are limited to pre agreed trips in the agreement. When studying the other schemes it is clearly noticed that the flexible schedules are more effective than fixed time schedules. Most villages have special festival days limited to their surrounding villages. In such cases the village bus operator can provide a number of services to the village. On the other hand, on days on which there is less demand, time schedules can be adjusted according to situation. Therefore “Gami Seriya” project will be more successful by using flexible schedules.

4.5 Fare

This is another important factor in bus transport. Operator revenue basically depends on this criterion. Fare depends on the service quality. Bus fares have to be regulated by the legal authority in any country otherwise operators tend to charge excessive fares. Fare systems can be identified as follows,

Flat fare: Most develop countries used flat fares.

Zonal fare: Zonal fare is limited to a specified metropolitan area. It determines the fixed fare within the zone. This method is also used in many developed countries.

Graduated fares: It is based on the distance of passengers. Most developing countries apply this method to determine the fares.

Different pricing policies can be identified as follows,

Equity: This policy option considers the relationship between fare and user ability to pay and the relationship between fare and trip length. Most developing countries use this method to determine the fares.

Peak/Off peak differentials: Cost per passenger may be higher for peak than off peak.

Government/private sector support or disruptions: Fare determination depends according to the policies of the government. Some governments decide to transport passengers free of charge. And in some cases lowest fares are charged to attract passengers to public transport from private vehicles. By this method, the bus fare can be also used to fulfill government objectives in various ways.

Discount for pre payments: Discounts of the pre payment means, season tickets, special passes to specified passengers like elders, and the disabled.

Different subsidy schemes determine the fare of the route by using various methods. The following chapters discuss it clearly.

Table 4.4: Comparison of Fare Schemes

Model	Fare scheme
China Modal	Fares set by price committees would be the maximum levels. Owners are permitted to charge any fare below the maximum The operator cannot change the fares within three months of being displayed
FY 2006 Model	General fares apply. Concessionary fares for elderly (over60), the disabled and school children
Kickstart project	General fares apply Concessionary fares for elderly (over60), disabled and school children
RBSG project	General fares apply Concessionary fares for elderly (over60), disabled and school children
Sweden project	Free of charge

The fare determination is similar in three subsidy schemes. US model, Kickstart project and the RBSG scheme set the general fares. In the China model, bus fares are regulated by the pricing bureau and bus operators have little flexibility in this matter. Since it is recommended that village bus operators should be given a monopoly of services in their areas, it is recognized that there must be measures to prevent them from abusing this privilege by charging excessive fares. However, fare variations which will benefit passengers, such as reductions in fares to reflect reduced operating costs as a result of improved vehicle utilization or improved road conditions, should be permitted. It is therefore recommended that pricing bureau should set a ceiling on rural bus fares, in terms of a maximum rate per km, but that operators should be permitted to charge fares below this level if they wish.

The Swedish scheme follows a completely different method, they do not charge from passengers. The total bus operation cost is reimbursed to the operator by relevant

authority or municipality. It was calculated that the cost of collecting fares would exceed their value.

“Gami Seriya” project follows the general fare system. School children are transported at half rate. This fare structure is based on equity. Both urban and rural passengers pay an equal fare per Km. Due to the poor condition of rural routes operating cost is very high. This is the common situation in any country. Operators are not willing to provide rural services due to low demand. There are two options to avoid this problem. One is charging a higher fare from the passengers to cover the cost of the operator. The other is granting a subsidy to the operator. But in reality rural people cannot afford higher fares because majority of them are living below the poverty line. Therefore the Government has the responsibility of providing transport to the rural passengers by using subsidies.

“Gami Seriya” project protects the passengers, by following the general fare structure. On the other hand, it protects the operator by giving subsidies. Therefore the fare structure of this project can be justified.

4.6 Vehicle Specifications

Almost all countries are decided that suitable vehicles should be used in rural areas by considering the geographical situation. Technical standards are most critical in these buses. The standards should recognize that rural passengers often carry goods, therefore they have to be provided more space and binding for hand luggage and brackets for items like bicycles.

Existing vehicles produced by manufacturers are not generally suitable for mixed passenger and freight loads in rural areas, and are unsafe when they carry mixed loads. There are other potential benefits to be gained from standardization in larger fleets, including reduced requirement for spares stockholding, and therefore reduced inventory costs, and savings from purchasing in larger volumes. Mechanics’ familiarity with a particular model can result in improved maintenance standards, while the requirement for special tools is reduced. A standardized fleet can also present a more professional image to the public. There are, however, several

disadvantages, particularly if standardization is taken to extremes. A standard vehicle might not be suitable for every task, and in a highly standardized fleet it may be necessary to compromise with vehicles specified for all types of services operated without being ideally suited to any of them. Too rigid application of a standardization policy also discourages innovation. In most bus operations, requirements vary widely between one route and another. Small vehicles are needed for routes where demand is low, or if there are physical restrictions such as weak or narrow bridges. Larger vehicles are needed for busier routes on better roads. To maximize efficiency and minimize costs each route should be operated with the type of vehicle best suited to it. Some operators, such as those in a city where conditions are fairly consistent throughout the route network, might require relatively few types; others, such as one operating a mix of rural and inter-urban services, might require a highly diversified fleet.

Planners are poor judges of the factors that determine the ideal type of vehicle in the range of circumstances in rural areas: the vehicle's capital and operating costs, its reliability, the availability of spare parts, the resale value, the preferences of passengers, their willingness to pay for better quality, and the characteristics of the loads they carry. Efforts to dictate a standard bus are usually unsuccessful and wasteful. Far better at judging these things are the operators who use the vehicles and the passengers who pay to be carried in them.

Table 4.5: Comparison of the Vehicle Specifications

Model	Vehicle specifications
China Modal	Medium buses with 19-22 seats and minibuses with 7seats Generous luggage accommodations essential for rural transport vehicles.
FY 2006 Model	Every vehicle has to have wheelchair accessibility.
Kickstart project	Subsidy grants only for new vehicles.
RBSG project	Medium size 30-60 seat buses are used. Provide Wheelchair accessibility. Facilities for freight.
Sweden project	Mostly medium sized vehicles, although the largest has seats 60

The above table clearly indicates that the vehicles used in the rural areas, are especially chosen. In most bus operations, requirements vary widely between one route and another. Small vehicles are needed for routes where demand is low, or if there are physical restrictions such as weak or narrow bridges. Larger vehicles are needed for busier routes on better roads. To maximize efficiency and minimize costs each route should be operated with the type of vehicle best suited to it. We have to consider the about the geographical situation of the service area. In the China model they use even 7 seater super saloon cars for the very remote rural areas to provide transport facilities. Furthermore for the agricultural rural areas, they provide vehicles with facility for freight also. They have designed vehicles for this purpose.

In “Gami Sariya” project we are not much concerned with this problem. So far we have provided rural transport facilities only to the areas which have access roads. But there are a considerable number of persons living distant rural areas without proper access. They use bicycles and three wheelers as transport modes by paying higher fares.

We have not paid attention to the small capacity vehicles. We have encouraged only buses under this project. But if we can promote small capacity vehicles for

appropriate routes it would be more beneficial, such as taxis and less capacity van services. In the China model they practice this successfully.

The China model, grants route licenses to the Bus Company selected through competitive bidding. The license is issued for the particular route. After obtaining route license, the bus company can decide the suitable vehicles for the route. It is determined based on the demand of the particular route. Every bus company has different capacity of vehicles. Therefore they operate those vehicles based on the demand of the route. Eg- for the market days they operate large capacity vehicles. On the days which have low demand, they can use less capacity vehicles. Therefore vehicle utilization is very high in this model.

The “Gami Seriya” subsidy project does not consider the vehicle capacity at all. It provides subsidies only for buses. This is a main weakness of this project. Moreover, the project does not pay attention to the freight transported. But still we have to take into consideration the village based agriculture products. Therefore it is necessary to promote passenger cum freight transport services to the rural areas. The NTC provides assistance to several established Bus Companies. (Badula Co, Matara Bus Company, Giriulla Bus Co.) If we can offer the “Gami Seriya” permit to these Companies, they can be operating the services by using the appropriate vehicles as discussed in the previous paragraph.

4.7 Concession Period

Concession period of any subsidy scheme is limited to a pre-agreed time period. Local authorities, central government or private organizations provide subsidies within this concession period, and thereafter the operators have to be responsible for providing the services without grants. In this case operators should have a sound promotion system to attract passengers to their services and increase the passenger demand.

Table 4.6: Comparison of the Concession period

Model	Concession period
China Modal	Village bus route licenses are issued for five years.
FY 2006 Model	Only for three years.
Kickstart project	This scheme provides support for up to three years.
RBSG project	Concession Period is three years.
Sweden project	This scheme provides financial assistance for four years.

According to the above comparison it can be clearly noticed that the concession period of selected schemes vary between three and four years. Only the China model issues the route license for five years.

The concession period of “Gami Seriya” project is also three years. After the concession period the operator has to provide the service without grant. The operator has to be responsible to increase his demand in this period. He can attract the passengers by providing a reliable transport service to them within this period. After the concession period of one route, the subsidy grant can be converted to other new routes. Therefore when compared with other schemes, the “Gami Seriya” concession period can be justified.

4.8 Monitoring System

Monitoring system is to help for the better operation. Various subsidy projects monitor their system by using various methods. It has helped them to make decisions to improve the service quality and identify the weak points.

The following checking system is applied to monitor the subsidy systems

- Documents based checking
- Public hearing
- Vehicle safety standards

- Road side checking

The above systems are applied to monitor the subsidy systems in developed and developing countries.

Table 4.7: Comparison of the Monitoring System

Model	Monitoring system
China Modal	Strictly monitoring of safety standards. Inspection of vehicles at the terminals. Statutory periodic inspection at authorized inspection stations.
FY 2006 Model	Operators report monthly on use and condition of the vehicle. Staff will make periodic on-site inspections of vehicle(s), driver logs, and project records
Kickstart project	The team selected from the department of transport, monitor the whole system. Complaints centre for the general public.
RBSG project	Local authorities establish a committee; consisting of government officials.
Sweden project	Strictly monitors the system. Pays great attention to the quality of the service. Monthly operation reports are carefully monitored before the payments.

Compared to the above schemes “Gami Seriya” project has a strong monitoring committee than the other schemes. The China model is only worried about the safety standards of rural vehicles and does not monitor the operation standards. The other four schemes monitor the system based on the operator reports. But “Gami Seriya” project has a strong monitoring committee at village level. Village communities are better assessors of the service.”Gami Seriya” Committee consists of School Principal, Gramaniladari, Priest, retired senior citizen of the village and a school child. Two of the members have to certify the monthly log sheets. Otherwise subsidy payments are not released to the operator. Every passenger complaints regarding the service is seriously considered and quick action is taken. Therefore the monitoring system of the “Gami Seriya” project is more effective than that of the other projects.

Using the above comparison it is possible to build up the matrix to compare each criterion as in table 4.8.



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Table 4.8 Comparison Matrix

Model	Service selection			Funding method				Scheduling		Fare			Vehicle		Concession period		Monitoring system			
	Based on population	Based on Operator Request	request of RPTAS & social groups	Capital Subsidy	Free licenses	Operating Subsidy	Infrastructure Facilities	Fixed & Flexible time	Fixed times	General fare	Any fare below maximum	Free of charge system	Different Capacity	Fixed capacity	3 year	3<years	Safety	Based document	Quality of service	Village Committees
China Model		√		√		√		√		√		√			√		√	√		
Kickstart	√			√		√		√		√		√		√				√		
RSBG	√					√		√		√		√		√				√		
FY 2006	√			√		√		√		√		√		√				√		
Sweden Model	√							√			√	√			√				√	
Gami Sariya			√			√			√	√			√	√						√

CHAPTER 05

CONCLUSION

This research study mainly focused on comparing the “Gami Seriya” rural transport project with similar rural transport projects in selected countries. The study identified five different subsidy schemes practiced in four different countries. This research has been focused to study five schemes and identified the most common features of each scheme. In chapter four an analyzing framework and comparison matrix based on those features have been built and critically compared with each other.

According to this comparison the “Gami Seriya” fare determination can be justified since the above three models have followed the same method based on equity.

User friendly village based Monitoring Committees are more effective for better monitoring than document based monitoring systems. But the “Gami Seriya” project was not much concerned about safety standards as the China model and the service quality as the Swedish model. It is recommended the safety and quality aspects also should be included in the “Gami Seriya” project for better operation and to gain more social and economic benefits specially to the users and to the country in general..

As far as the selection of service route is concerned it is better to base it on socio economic factors of the region. This is practiced in all four models except the China model. Every model used appropriate vehicle types depending on the demand of the particular route. If “Gami Seriya” project can follow this system it would help to minimize operating costs of the operators and the service can be expanded.

The subsidy payment scheme should be revised to avoid the operator’s considerable revenue drop at the end of the concession period. During the concession period the operator receives an equal monthly payment as a subsidy. Even though revenue increase is expected with the service operation in progress, monthly payment is not adjusted accordingly. A payment scheme which deducts a certain part of monthly payment of second and third years is proposed as being more suitable since it allows operators to adjust to the situation after the concession period. Kickstart funding

method is a good example which was discussed in chapter four. This scheme encourages operators to increase his patronage level by reducing percentage of subsidy amount in each year. Therefore, the operator could adjust to the situation after the concession period.

To ensure that this project benefits the people living in distant rural areas without proper modes of transport to the town centers or the common facilities, Capital subsidies such as bicycles and taxis for them can be introduced.

Most of the rural roads are not in good condition to operate a bus service though the community demands such services. Therefore, it would be useful to come into mutual agreements with local authorities to rectify the road surface condition, improvement to sharp bends, widening of narrow road sections and road structures such as culverts and bridges prior to the commencement of such services. Then these local agencies would prioritize these roads under their fund allocations or plan some other mechanism to get adequate funds. On the other hand road transport infrastructure such as bus stop signs and shelters need to be established with the introduction of such services. This would help to regulate the operation avoiding stopping at each passenger door step. The China model is an example of this.

By adopting the strengths identified in the each models discussed in chapter four, “Gami Seriya” project can be transformed as the most effective rural transport project in Sri Lanka.

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