

STUDY ON PROMOTION OF BICYCLES FOR SCHOOL CHILDREN IN EASTERN PROVINCE

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A Project Report Submitted in Partial Fulfillment of the Requirement for the Degree of

Master of Science in Transportation

University of Moratuwa, Sri Lanka.

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March 2010

DECLARATION

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Finally, I thank the members of the National Transport Commission and its Chairman for providing me this valuable opportunity to equip ourselves with much needed professional development, essential in our career.



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ABSTRACT

Various organizations belonging to governmental as well as non governmental sectors are presently engaged in promoting the use of push bicycles. Every such organization involved in this endeavor is of the view that bicycle has the potential to face the challenges posed by the motorized modes of transport. In the Sri Lankan context, promotion of the use of bicycle is a long felt need and has reached the proportion of needing the priority basis for its handling.

This thesis is just a small step of a longer journey in that direction. It has collected and analyzed every fact and figure that counts to establish a solid factual basis to start a program of distributing bicycles among the needy school children in the Eastern Province as an initial step. The study also has the scope of extending it to other provinces, too.

The purpose of the thesis also carries an institutional requirement of the National Transport Commission (NTC) of facing the problem of providing transport for school children. The NTC which was setup for the sole purpose of handling transport by omnibus has now realized the usefulness of the bicycle in discharging its responsibilities.

The thesis, therefore, will provide the NTC with a factual basis to venture in to a program of donating bicycles to school children and at the same time to encourage the use of bicycles in the whole country.

The reasoning based on scientific analysis of data adopted here is applicable to other parts of the island, too, because, the sample area taken for the study is reflective of common conditions prevailing in the country.

Beyond the immediate need the study has well established the importance of the bicycle as a way of life in tomorrow's world. Things such as, special lanes for cyclist, wayside protective shelters and repair shops should not be in the area of wishful thinking in the future.

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LIST OF ABBREVIATIONS

Abbreviation	Description
NTC	National Transport Commission
SLTB	Sri Lanka Transport Board
LFRTD	Lanka Forum of Rural Transport Development
RDA	Road Development Authority
NGOs	Non Governmental Organizations
NMV	Non Motorized Vehicles
BRTS	Bus rapid transit Systems
SLPI	Prosperity Index of Sri Lanka
Govt	Government
Km	Kilometer
SDS	School Development Society
SK	Sri Koneshwaram Hindu College, Trincomalee
AB	Agra Bodhi Maha Vidyalaya, Kantalei
RV	Royal Vidyaloka National School, Trincomalee
VV	Vivekananda Maha Vidyalaya, Pulmude, Kuchchaweli
KG	Kurunchankani girls MV, Kurunchankani, Kinniya
AM	Araffath Maha Vidyalaya, Kurunchankani, Kinniya
MV	Madawachchiya Vidyalaya, Madawachchiya, Gomarankadawela.
KV	Kiulekada Vidyalaya, Kiulekada



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CHAPTER 01

INTRODUCTION

1.1 Objectives of the project

The main objective of the project is to draw a scheme to grant bicycles to the school children in the Eastern Province for their schooling. This is partly related to the strategy of taking measures to relieve the institutional burden of the National Transport Commission of its bounden responsibility to provide buses for school children.

This objective has been based on a number of considerations, which need to be urgently addressed in the context of schooling of children in the Eastern Province. Among the considerations that have been accounted for attention are;



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- Increase the mobility of student population in a way affordable to their parents www.lib.mrt.ac.lk
- Reduce the dependence of bus transportation of the school children
- Reduce the inconvenience faced by the school children due to the formation of their villages in a scattered manner; which are with a few houses here and there with no proper accessible roads
- Introduction of an environmental friendly mode of transportation

The research study, in this regard has been carried out with the aim of eliciting the necessary information enabling to arrive at desired conclusion.

1.2 Background

Providing, safe, reliable and low cost transport for schooling for the children in rural areas remain as an important policy of the country. In the discharge of this responsibility, Governmental Transport Agencies such as the Sri Lanka Transport

Board (SLTB) and National Transport Commission (NTC), which are primarily engaged in the provision of transport by omnibus, have been deploying their bus fleets in these areas. However it has now been felt that application of a non motorized transport mode as an alternative system will be more helpful in serving this purpose. Introducing bicycles to school children in rural areas has been accepted as a meaningful step towards achieving this purpose.

In this context, the National Transport Commission which formulates and implements the National Transport Policy of the country has now embarked on a project in promoting bicycles for school children as a part of its contribution to the Eastern Province Development Program, which draws the top priority of the Government at this hour.

For the Eastern Province, where the accelerated development program called as the 'Eastern Revival' or 'Re-awakening' is in rapid progress; non-motorized transport mode for its rural transportation will be an ideal proposition to be seriously considered upon. This will appear more important when one looks upon the post-war scenario of the Eastern Province.

Following the liberation of the Eastern Province the Authorities are facing more strenuous task than the war. It is the rebuilding the war ravaged areas. The province which had not seen the rays of development even before the war has become shattered with the war over a period of nearly 30 years.

Of all the aspects of development, transport remains to be the most important one in this particular Province. The purpose of this project is to deal with the aspect of providing transport for school children. That is to increase the mobility of the school children, taking into account the dearth of infrastructural facilities such as Roads, Bridges etc in this province. Upon this situation, the ideal solution appears to be the introduction of bicycles on mass scale for the Eastern Province, especially for School children.

1.3 Eastern Province

Eastern Province is bordering the Eastern coast to one side, and land borders from other three sides. 14.9 % (9,361 km²) of Sri Lanka's land area is covered by this province. It consists of three administrative districts, Trincomalee, Batticaloa and Ampara which are home to nearly 1.5million people, which is about 7.5% of Sri Lanka's total population. Mean number of individuals in a household is 4.61.

Characterized by agricultural as well as fishing economy, the main needs for transportation in this province is to meet the basic needs of these two industries. Traveling from home to farm, farm to close by markets to sell the produce, fetching drinking water or fuel wood for cooking, commuting to work, transporting the catch of fish and necessary equipment are some basic and common needs of transportation. Among these needs, improving the mobility and facilitating the accessibility of the mode of transport for schooling for children can be ranked as an immensely vital task. High cost of motorized modes of transport and inaccessibility to main roads due to poor road conditions in the rural areas will make the bicycle an obvious choice for rural folk, especially for children in this province.

1.4 Area to be covered by the study

When selecting the sample area to be covered by the study, following factors came in for consideration.

- An area that reflects geographical, demographical, economic and social conditions commonly prevailing in the Eastern Province.
- Less population density
- Spreaded household pattern within a large area.
- Low average income level and poor living condition
- Land area with forests and inland waters resulting lesser stretch of roads for motorized transport modes

All these factors were present in the Trincomalee District than any other district in the Eastern province, thus making the Trincomalee District an ideal sample area for the study.

1.5 Trincomalee District

Table 1.1: Population, Land Area and Population Density by District in Eastern Province

Province / District	Population (2008)	Total Area (Sq. Km.)	Inland Waters (Sq. Km.)	Forests (Sq. Km.)	Land Area (Sq. Km.)	Population Density (Persons per Sq. Km.)
Baticoloa	530	2854	244	517	2610	203
Ampara	624	4415	193	1696	4222	148
Trincomalee	361	2727	198	817	2529	143
Eastern Province	1515	9996	635	3030	9361	162

Source: Economic and social statistics of Sri Lanka, Central Bank of Sri Lanka

The Trincomalee District is in consistence with the indicators shown in 1.5 than the other two districts in the Eastern Province.

1.5.1 According to the figures of the Census and Statistic Department the population in 2008 stands at 0.36 million, which directly points to a less student population and lesser number of schools, which is the lowest in the province when compared to other two districts.

1.5.2 Total land area covers only 2529 sqkm, which also is the lowest of that category. Fairly large area of scattered forests and inland waters limit the stretch of roads.

Due to these reasons the Trincomalee district has been selected as the sample study area of the Eastern Province for the purpose of this project.

1.6 Public Transport in the Eastern Province

People have virtually no choice over the mode of public transport for traveling. They have to contend with what is available, even though the availability is on a very low frequency.

Due to this reason they are compelled to carry heavy head-loads for longer distances. Carts and hand carts are frequently used. Agricultural vehicles such as tractors and hand tractors have become multi purpose as they are often used not only for agricultural activities and goods transportation, but also, for passenger transportation. Other modes of transport such as three wheelers and motor bicycles are also being used, but to a lesser degree due to un-affordability factor.

1.7 Bicycle Usage in Eastern Province

Most popular and heavily used mode of transport in the province is the 'bicycle'. Mothers dropping their children at schools and picking them up is a common sight in the province. This shows the extent to which the bicycle has become as a useful mode of transport.

This is apart from the common use of bicycles to reach their paddy fields, market places, fishing harbors and transporting farm products and fish catches.

In short, bicycle has become a part of their lives and living. However, other two low cost modes, motor cycles and three wheelers are also being used, but not to the extent that push bicycle is being used in this province. It is an extension of the traditional bicycle usage by postman, midwife and vender in other provinces.

1.8 Challenges for students in schooling

The scattered nature of the villages and settlements and their situation in locations away from bussable main roads have compelled the children to walk longer distances even to board a bus. Since the buses are very scarce and are being run on a very low frequency the children have to wait a longer time for one. Very often they have to turn back without being able to catch a bus and become absentees in the school.

These transport problems are reflecting on their education, too, sometimes, becoming school dropouts prematurely.

Table 1.2: Literacy Rates and Educational Attainment by Province

Province	Western	Central	Southern	Northern	Eastern	North Western	North Central	Uva	Sabaragamuwa	All Island
Literacy Rate										
Male	97.5	92.7	94.3	93.5	90.0	95.3	94.5	91.4	94.3	94.5
Literacy Rate										
Female	94.5	86.1	91.4	91.8	83.5	91.8	90.8	85.5	88.9	90.6
Educational Attainment %										
No Schooling	3.9	11.1	7.7	7.6	13.8	6.7	7.6	11.9	9.0	7.9
Primary Only	23.6	31.6	61.6	32.1	37.9	30.4	30.7	35.6	30.6	29.9
Secondary Only	45.5	39.6	38.3	31.8	31.3	42.4	44.4	38.7	43.1	41.0
Tertiary	27.0	17.7	22.4	28.5	17.0	20.6	17.3	13.8	17.2	21.2

Source: Economic and Social Statistics of Sri Lanka - 2009 Report, Central Bank of Sri Lanka

1.8.1 Female and male literacy rate by province

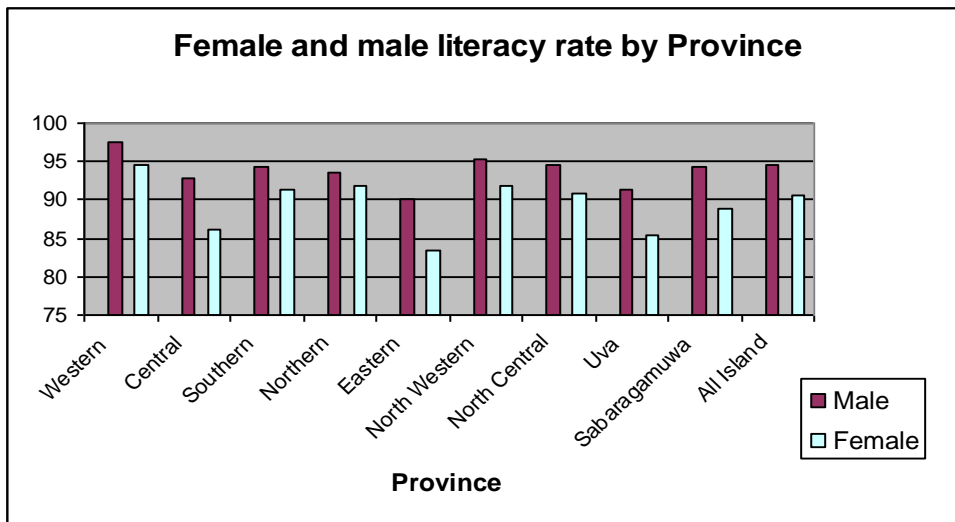


Figure 1.1: Value of Literacy Rate of Male and Female by Province 2003/2004

Source: Economic and Social Statistics of Sri Lanka - 2009 Report

The above chart (Figure 1.1) shows the variation of Female and Male Literacy Rate by province. The lowest Male and Female Literacy Rate is recorded in the Eastern Province.



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1.8.2 Educational attainment by province

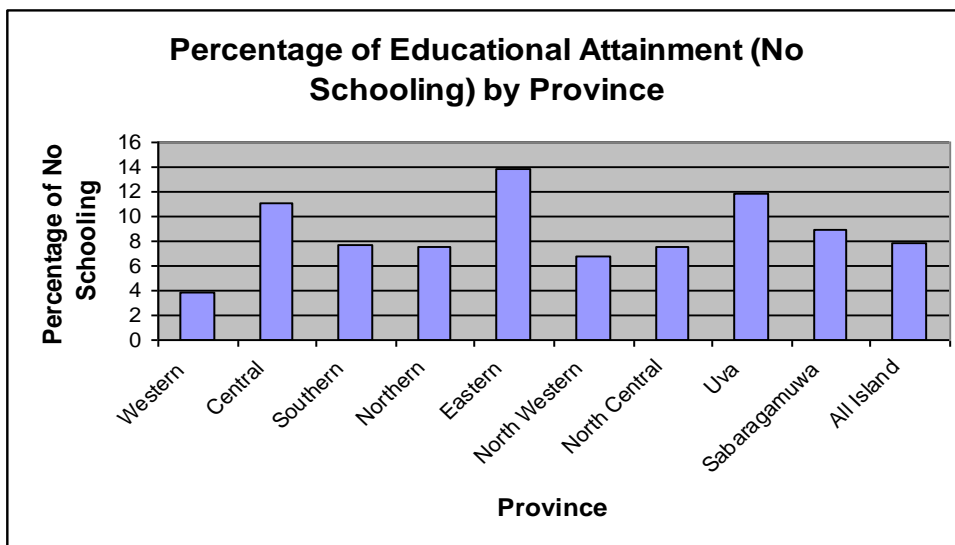


Figure 1.2: Percentage of Educational Attainment (No Schooling Rate) by Province 2003/2004

Source: Economic and Social Statistics of Sri Lanka - 2009 Report

The Graph in Figure 1.2 shows the variation of percentage of Educational Attainment by province. The lowest “No Schooling” rate, too, is recorded in the Eastern Province.

1.9 Challenges to bicycle users

What could be observed as challenges to the bicycle users were as follows;

- Environmental factors such as dust, rain, heat and wind
- Bad condition of roads
- Not having safe places for bicycle parking
- Religious and social restrictions for women.



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CHAPTER 02

METHODOLOGY

2.1 Methodology adopted for the project

With a view to achieve the objectives of the project, numbers of investigative methods were adopted throughout the project for the necessary feed backs as well as for the preparation of the relevant questionnaires.

Among the adopted investigative methods were formal opinion surveys, questionnaire surveys, expert advocacy and discussions with resource personals.

As an initial step, the Researcher and her team made a field tour in the Eastern Province. This tour enabled them to have a perception of the ground situation of the would be target area. The main aim of the tour was to identify a certain geographical area which could represent the relevant issues and problems that existed in the whole province.

As stated in section 1.3 it was decided to select Trincomalee District as the sample area for data collection after a careful consideration.

Accordingly, eight schools of this district were selected for data collection based on the following considerations.

- Representing all three major communities (Sinhalese, Tamils, Muslims) in the province
- Size of the school; with large number of student population as well as with less student population.
- Representing the urban, moderate and rural population
- Tsunami effected schools

2.2 Structure of the Methodology

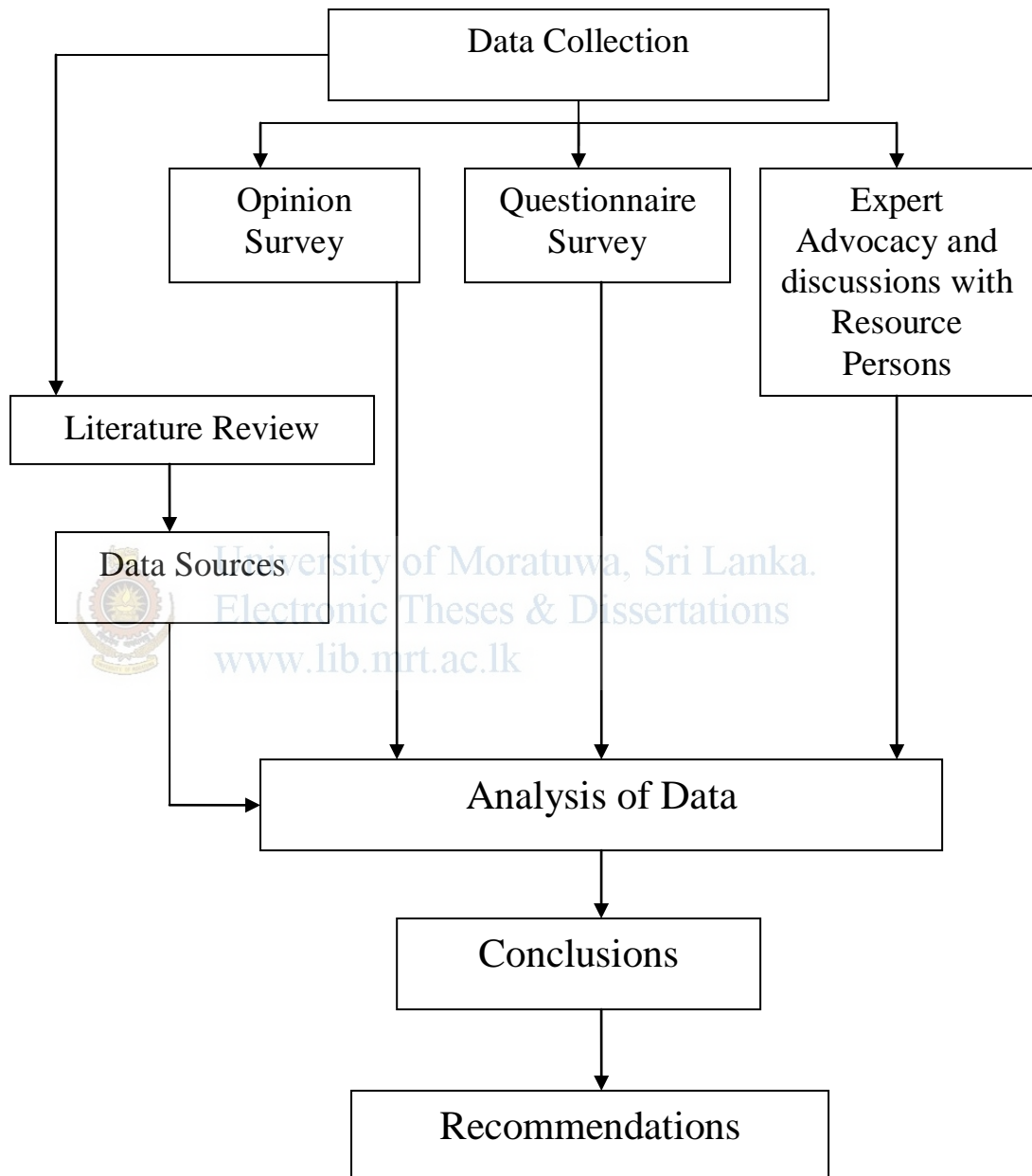


Figure 2.1: Methodology

2.3 Data Collection

This Survey was conducted during November 2009, on four normal school days. Four Enumerators were engaged to visit the eight schools of different categories for four continuous days. Researcher, too, participated in the survey and met the resource personals such as principals, teachers in-charge of the Transport Committees of the selected schools. The discussions and facts finding were centered on the existing situation of bicycle usage, common problems faced by the students to access the school, respective policies and procedures of the school etc. Structured Questionnaire was used to obtain required data from the students.

2.4 Literature Survey

International and Local literature on the usage of bicycles in general and for the school children in particular have been referred in the study. Central Bank reports, reports of the Department of Census and Statistics, relevant news paper articles, research papers compiled by professionals of the field, studies conducted by the Civil Society Associations on the subject were among the literature that were taken into account in the relevant Chapter (Chapter 03) on this matter. Websites dealing with the subject too have been extensively browsed and information retrieved.

2.5 Questionnaire Survey

A structured Questionnaire was prepared for the survey after considering the ground condition in relation to the Bicycle usage in the area through a thorough investigation of the matter. The criteria adopted in the compilation of the questionnaire were as follows:

- Easy to refer outlook for the student
- Using all three major languages in the area
- Expecting direct answers in a short and simple manner
- Generating enthusiasm for the voluntary participation in furnishing the required particulars
- Reducing the time consumption for the questionnaire to less than 15 minutes

2.6 Opinion Survey

In dealing with this aspect of the survey, the opinion of the relevant groups, Principals of the selected schools, Grama Niladaris of the area, Bicycle Vendors, Owners of the bicycle repair shops, Prominent and knowledgeable persons in the area such as Doctors, Post Masters, Station Masters etc. were obtained

2.7 Expert Advocacy and Discussions with Resource Persons

Among those who were consulted for expert advocacy were the following:

- Prominent members of Lanka Forum of Rural Transport Development (LFRTD) who had dealt with the non motorized transportation methodology in Sri Lanka extensively.
- Resource persons of the Road Development Authority (RDA) who were with specialized knowledge on the Road condition of the area
- Non Governmental Organizations (NGOs) which were engaged in Post Tsunami Activities such as providing bicycles, boats etc .in rehabilitating the area.
- Depot Managers and Area Managers of the Sri Lanka Transport Board (SLTB) who were engaged in bus operation in the area.

2.8 Data Analysis

The selected samples of subset of the student population of Eastern Province were the segments that were actively observed. Inputs of the selected samples were fed on to an Excel Sheet so as to indicate actuals and emerging scenarios by using number of statistical methods.

- Bar charts and pie charts ; To determine the properties of single variable
- Venn Diagrams ; To determine the combination of factors emerging from the collected data

- Line Graphs ; To compare variation and Growth and Drop indicators

Also used were the Statistical Methods for projections to predict the trend by using samples.

Accuracy of the data is maintained through sufficient number of data, correct recordings, proper handling of data and careful feedings of data entries.



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CHAPTER 03

LITERATURE REVIEW

3.1 Review of previous Research

Although the bicycle is a very commonly used vehicle and a mode of transport so closer to the Sri Lankan life of all walk of people, very little has been written about it so far in the form of a thorough study paper. Due to this minus point finding literature on it, is not an easy task. However, it is not without the attention of a few researchers, though the availability of such work is very rare.

3.2 Bicycles in Sri Lanka

Namiz, Musafar. 2005. Bicycles in Sri Lanka is one such study paper which has been prepared for the “Lanka Forum of Rural Transport Development (LFRTD)”. It extensively deals with all levels of bicycles use in Sri Lanka with the support of the relevant data. It is the only such study which has covered so many aspects on bicycle in a single entity so far. Among the aspects he deals with, following are the most important.

3.2.1 General Background

General Background giving geographic, demographic and other relevant areas to explain why the bicycle has come to stay in the Sri Lankan life.

3.2.2 Foot Bicycle Ownership

Namiz has cited the figure in relation to the population from the year 1978 to 2005 on giving the particulars of bicycle ownership.

Table 3.1: Bicycle ownership- 2005

Year	Population (millions)	Size of a household (Persons /household)	No. of households (millions)	% of households owning a bicycle %	Min. No of bicycles owned (millions)
1978/79	14.3	5.46	2.6	21.5	.5
2003/04	19.4	4.31	4.5	46.6	2.1

3.2.3 Service providers to the bicycle sector and employment generation due to bicycling sector.

This is really a very rare piece of study which has dealt with particulars of the bicycle repair shops, particularly called as ‘wincles’ by the general public and the bicycle sales shops. Figures relating to employment engagements on them, are also given in his paper.

Table 3.2: Bicycle Repair Shops – 2005

Year	No. of bicycle repair shops	Employment
2005	3500	10000

By 2005, it was estimated that there were 3500 bicycle repair shops and 10,000 employment engagements in this sector. Although there are over 300 vocational training institutes and technical colleges in the country, none of them offer any technical courses to bicycle technicians. According to him there are only 04 main local manufacturers of bicycles in Sri Lanka.

3.2.4 Imports, Exports, Production and sales

Market developments with regard to imports and sales of bicycles are shown here. Reproduced here is the relevant section of the Namiz Report “The local bicycle industry, therefore, competes with totally imported products and used bicycles whereas the local industry is engaged with assembling of imported components with a local value addition of about up to 60%. According to Sam Hingis [Bike Europe, 2005 (www.bike-europe.com)], Asia bike industrial (Pvt) Ltd, exported 125,000 bikes to UK in fiscal year 2004. Firefox Lanka (Pvt) Ltd was then manufacturing between 120,000-144,000 bicycles per year for export to the UK. The City Cycle Industries has more or less a free run with 100,000 bikes per year in the local market. The Company also owns an alloy rim plant with a capacity of 200,000 rims per year. About 150,000 - 200,000 bicycles are locally demanded per year.

3.2.5 Types of bicycles

A few areas covering this aspect in the paper are cited below;

According to the report, “there is no study report available on the types of bicycles used in Sri Lanka. In general, in market mix for bicycles, the gents’ 22’ standard bicycle is on the forefront. In addition to the standard bicycles for males and females, the other types of bicycles available in common are

- Mountain bike (MIB)
- All terrain bike (ATB)
- BMX
- Racing/ Sports bike
- Toddler / Kiddies bike

3.2.6 Extended Bicycles

As in countries like India and Bangladesh, bicycle rickshaws are not found in Sri Lanka. In addition extended bicycle, bicycle trailer and bicycle with passenger carrier side car are available in remote areas but very rare.

3.3 Bike Pages

Browsing the web for bicycle information also is a highly successful way of finding facts about this mode of transport. One such address is <http://www.bykepages.com>. This is commonly called the bike pages. Bicycling survey information page is on different aspects of the bicycle and posting the results for the benefit of all those who are concerned about the bicycle. Whatever question a reader has on the bicycle is answered by these pages. Some of the aspects these pages have dealt with are as follows.

- The cyclist lifestyle
- Bike commuting and transportation
- Bicycle camping and touring
- Cycling health and fitness

- Bicycling advocacy
- Bicycle traffic safety
- Basic skills for cyclist
- Cycling humor and tales

3.4 World bicycle relief

“World Bicycle Relief” is a program conducted by an international organization with a mission to provide access to independence and livelihood through the Power of Bicycles.

Through their web address www.worldbicyclerelief.com, they also provide very vital information about the bicycle use in Sri Lanka, and specially the important role it has played in the post Tsunami period in the rebuilding process of Tsunami affected rural villages. I think it is nothing but appropriate to reproduce here a part of one such study conducted in this web page which gives the relevant figures with regard to donation of bicycles as a relief measure for Tsunami victims.

- Provided 18,335 adult bikes for greater access to jobs, commerce, food and medicine and independence.
- Provided 6,041 children’s bikes to commute to school, help with supporting the family, fun, play and healing.
- Bicycles were sourced locally to ensure correct specification and that recipients are familiar with bikes. It also provides access to spare parts, eliminates supply chain, shipping costs, duties, logistics and assists the local economy.
- Training and equipping selected individuals in bicycle maintenance. This creates and professionalizes jobs, and ensures a sustainable bicycle community.

As part of its commitment, World Bicycle Relief retained an independent organization to measure the impact of Project Tsunami. Two years after the project was complete, the results are outstanding:

- 88% of recipients depend on bicycles for livelihood activities
- Bicycles can save a household up to 30% of its annual income for transportation costs
- The bicycle program provided critical, appropriate transportation enabling households to resume important livelihood, education and service activities

3.5 Shova Kalula Bicycle Project in South Africa

Sri Lanka too can follow South African Example of distribution of bicycles among the school children in Northern Cape Province, South Africa. The project has involved 187 schools with 7371 students. This has been a successfully operated Government Subsidized program.

In the relevant study they have found that the children who walk long distances to and from school get to school already tired and this affects their performance in class, subsequently affecting their progress in school.

The study also adds that they were compelled to put much effort in accelerating the modes of mobility in rural areas as public transport in the rural areas of their province characterized by high costs, lack of adequate road safety programs, and an acute lack of infrastructure in terms of roads and shelters”.

All these aspects that the Shova Kalula has given attention to are very much applicable to the Sri Lankan context of such a program as it really is the situation that exists in our country, too, especially in the Eastern Province, where the current programme is engaged on.

The core focus of the study has been to promote the usage of bicycles as a means of transport in areas where people are restricted by mobility, particularly in the rural areas. The key objective of this programme is to improve accessibility and mobility and limiting walking distances for scholars in rural areas.

The study also has drawn its attention to the aspect of maintenance and sustainability of the bicycles donated. The study has observed that the maintenance of the bicycles depend on the partnership of the donors, but most importantly, it should be the responsibility of the students themselves to ensure that the bicycles are well looked after.

3.6 “Sustrans”: United Kingdom

“Sustrans” is an organization in the United Kingdom which primarily deals with the promotion of bicycles. By doing so, Suatrans cultivates enthusiasm for worldwide bicycle users. “Sustrans is the UK's leading sustainable transport charity. Their vision is a world in which people choose to travel in ways that benefit their health and the environment. According to them, every day, they are working on practical, innovative ways of dealing with the transport challenges that affect the people.

Sustrans aims to:

- Reduce the environmental and resource impacts of transport
- Enable people to choose active travel more often
- Provide car-free access to essential local services
- Create streets and public spaces into places for people to enjoy.

3.7 Sustrans “Bike It” Program

By coming to know about the above program there is a lot that Sri Lankan bike researchers, too, can introduce to the local bicycle scene.

Benefits of “Bike It” Program

Millions of children want to cycle to school in the UK, yet only 2% do. Sustrans has stepped in to sort this out with “Bike It”, a ground-breaking project that has already quadrupled the number of children cycling to its target schools. They invite people to inform by signing up for the school travel e-update

“Bike It” says that Children feel fitter and more independent - they just love being out and about on their bikes.

According to them parents know that they are offering something really positive for their child and trust them to do everything to help their child towards a healthier, happier journey to school.

“Bike It” has quoted “Teachers saying that Bike has transformed their schools, Children are energized, excited, ready to learn and travelling safely and independently”.

“Bike It” adds that the local authorities enjoy the success of “Bike It” in their areas. It has attracted the praise and attention of many Government ministers and national newspapers and TV. Everyone loves the empty car parks and full bicycle sheds!

3.8 Bicycles in urban India

“Bicycles in urban India” is a study paper appeared in IUT journal. The study has dealt extensively with the following sub topics. Bicycles in Indian cities

- Bicycle model share
- Bicycle ownerships and per capita trip rates
- Trip length frequency description
- Cyclist fatalities / injuries
- Other non motorized vehicles (NMV)
- Bicycle users
- Bicycle as a feeder mode
- Policy outlines
- Integration of bicycle with BRTS
- National road design standards

3.9 Bicycles in Tourist Industry in Sri Lanka

Bicycles can play a vital role in the Sri Lanka Tourist Industry, too. The process is already in practice with a high potential for growth. Most of the areas with tourist attraction consist of flat terrain, especially the coastal and cities with ancient ruins. In addition, the tourists who come from heavily industrialized countries have a natural

tendency to spend an eco-friendly holiday while in Sri Lanka. Even for sight seeing they have an aversion to use polluters such as carbon emitting vehicles. Due to these reasons the people who are engaged in tourism specially the hotel owners and the tourism organizers have started providing bicycles for the tourists for their short circuit tours of sight seeing.

This is being practiced in the areas with coastal beaches, such as Bentota, Beruwala, Hikkaduwa and Negombo etc. Some local entrepreneurs, too, have found it a thriving business to provide bicycles for tourist on lending basis. This is also being practiced in the cities with ancient ruins such as Polonnaruwa and Anuradhapura etc.



Figure 3.1: Tourist in sight seeing <http://www.srilanka.tourism>



Figure 3.2: Tourists in sight seeing, Costal Area <http://www.srilanka.tourism>

3.10 Prosperity Index of Sri Lanka (SLPI)

The Central Bank Report of 2008 has introduced the Prosperity Index of Sri Lanka.

According to the Central Bank of Sri Lanka the objective of constructing this index was to measure the level of Prosperity achieved by provinces on a comparative basis. Hence, it is a relative measure.

It further states that the phrase “Prosperity of a Nation” connotes the enhancement of the quality of life of people through sustainable wealth creation coupled with the inclusion of all segments of the society in enjoying the benefits of development. In this perspective, the ultimate objective of all national policies is to enrich the lives of the people thereby increasing the prosperity of the entire nation. The report also says that in the construction of the SLPI it has incorporated 20 variables, representing various facets of the lives of people chosen on the basis of availability of data timely and consistently

3.10.1 Structure of the PISL

Table 3.31: The Structure of Prosperity Index of Sri Lanka (SLPI)

Sub-Indices and their contribution to SLPI		Variable
Economy and Business Climate 30%	Economy 20%	1. Per Capita GDP 2. Employment Rate 3. Informal Sector Real Wages 4. People Above Poverty
	Business Climate 10%	5. Per Capita Business Turnover Tax 6. Industrial Density
Well-being of the People 45%	Health 20%	7. Hospital Beds per '000 8. Medical Officers per '00,000 9. Infant Survival per '000 10. Maternal Survival per'00,000
	Education 20%	11. Schools per sq.km 12. Pupil Teacher Ratio 13. Continuation of Secondary Education 14. Pass Rates of GCE O/L and A/L Exam
	Wealth 5%	15. Ownership of Vehicles
Socio- Economic Infrastructure 25%		16. Per Capita Electricity Usage 17. Telephone Density 18. Banking Density 19. Road Density 20. Law and Order

Source: Annual Report -2008, Central Bank of Sri Lanka

The SLPI rankings can be used for setting up of provincial targets to be achieved by authorities in those provinces by making comparisons among provinces. The SLPI can also be used to measure the effectiveness of socio-economics polices, in improving prosperity.

The standings of SLPI by provinces for the period 2000-2007 are given in table 3.2.

Table 3.4: Values of SLPI by Provinces 2000-2007

Province	2000	2001	2002	2003	2004	2005	2006	2007
Western	55.3	55.5	56.8	57.5	58.3	60.3	63.2	66.1
Central	42.4	44.2	46.2	46.5	47.0	47.8	50.5	52.9
Southern	41.7	42.9	45.1	45.2	44.4	47.5	48.8	51.5
Northern	35.4	37.5	38.1	39.1	39.8	41.8	43.3	43.6
Eastern	35.1	36.5	37.1	37.6	39.3	40.5	41.9	44.2
N Western	39.8	41.2	42.7	43.6	43.9	45.7	47.5	49.4
N Central	38.5	39.5	41.2	42.2	42.0	44.1	45.6	48.4
Uva	38.0	40.3	41.4	41.4	42.9	42.3	45.3	47.8
S'gamuwa	39.1	40.7	41.3	41.7	42.4	43.9	46.1	48.2
Sri Lanka	42.4	43.9	45.3	45.9	46.4	48.1	50.3	52.7

Source: Annual Report -2008, Central Bank of Sri Lanka

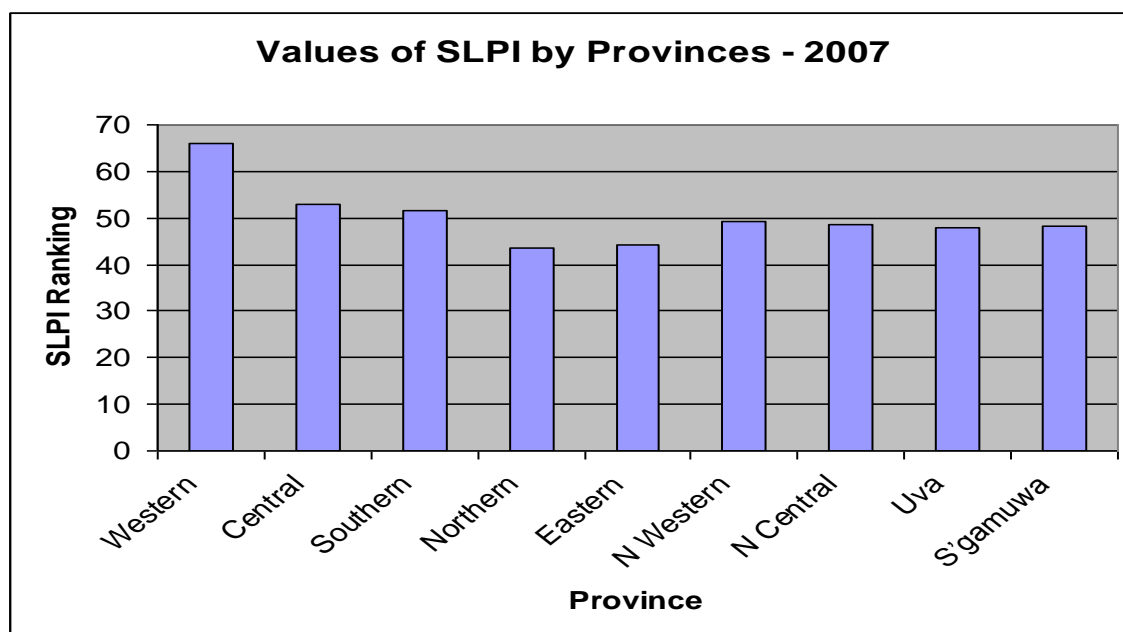


Figure 3.3: Values of SLPI by Province –Year 2007

According to this index the Eastern Province ranks as the province which is with the 2nd lowest of prosperity rate in the country. This justifies our decision to launch the bicycle project from the Eastern Province as this province appeared as the most deserving for such a scheme, mainly due to its low prosperity level.



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CHAPTER 04

DATA COLLECTION

4.1 Schools in Trincomalee District

Province / District	0-100 Students	101-500 Students	501-1,000 Students	1,001-1,500 Students	1,501-2,000 Students	2,001-2,500 Students	2,501-3,000 Students	Total
Baticoloa	83	135	67	15	11	2	1	314
Ampara	100	197	56	24	11	3	3	394
Trincomalee	47	129	48	9	4	3	-	240
Eastern Province	240	461	171	48	26	8	4	948

Table 4.1: Government school by size of student population -2007 in Eastern Province

Source: Ministry of Education

The above table indicates the figures of the student population of government schools in the Eastern Province. In Trincomalee District, there are no schools exceeding 2500 students.

4.2 Selection of Schools

The categorization of schools in the Eastern Province by their size by the Education Department was obtained. (Table: 4.1). From this categorization, the Trincomalee District was taken for further consideration and 08 schools of them which represented different scenarios were taken for the study.

4.3 Selected category of schools for the survey.

The selected category of schools were on the basis of the following criteria.

4.3.1 The size of the school

- Student population between 2000 to 2500 (02 schools were selected)
- Student population between 500 to 1000 (03 schools were selected)
- Student population with less than 500 (03 schools were selected)

Of the first category here, the 02 schools with larger student population, one had more than 600 bicycle users while the other had only 80 users.

4.3.2 Communities

The selected schools are representing all three major communities in the Eastern Province.

Among them are 02 Tamil Schools, 02 Muslim schools and 4 Sinhala schools. (Tamil and Muslim schools both have the education system in Tamil medium)

4.3.3 Area description

The schools represent the Urban, Suburban and Rural areas. The area helps to determine the degree of facilities, specially, the transport facilities the students have access to. Of the 08 schools selected 03 are urban, 02 are suburban and 03 are rural schools.

4.3.4 National and Provincial schools

Of the 08 schools 3 are National Schools and the other 5 are Provincial Schools.

4.3.5 Other factors

Special consideration was given to find out the degree of public transport facilities the students can benefit from. Students in urban and suburban areas are enjoying better public transport facilities than their counterparts in rural areas where the transport facilities are almost nil.

In the selection of schools another criteria that came into consideration was gender basis of the school. The 08 schools consisted of 05 mixed schools, 02 boys schools and 01 girls school.

4.4 Process of Data Collection

Survey was conducted on 03 consecutive school days in November 2009. The number of Enumerators engaged to visit the selected schools were 4. Students of different categories as shown in Section 4.3 were summoned to a convenient place in the school premises for the distribution of the survey forms. All survey forms were numbered and the students were explained how to fill the form. As the students were new to such surveys the Researcher explained them about the nature of the survey.

4.5 Schools selected for the survey

4.5.1 K. M. Sri Koneshwaram Hindu College (SK) - Trincomalee

Sri Koneshwaram Hindu College, which is a National School is the largest school in the district. It is situated in the heart of the Trincomalee town. It is a boys school with 2200 pupils. More than 600 students of this school are traveling to school by bicycle. Huge parking location for bicycles has been provided within the school premises itself. A security guard, too, has been posted to look after the safety of the bicycles. Large numbers of male and female teachers, too, use bicycles to come to school.

Traffic congestion in and around the city are very heavy. About 05 buses and 02 Sisu Seriya buses run under government subsidy scheme are operating during school starting time, from 6:00 am to 7:30 am. The principal of the school stated that he has allowed only the students above grade 07 to travel to school on bicycles due to safety problems. According to the school authorities, following is the approximate model share of the mode of transport of the students.

Mode	No. of students	Percentage
Bicycle	600	27%
Bus	480	22%
On foot	800	36%
Van & Others	100	4.5%
Trishaw	100	4.5%
Train	20	1 %
School Bus	100	4.5%
	2200	



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Figure 4.1

Bicycle Park in Sri Koneshwaram Hindu College – Trincomalee

4.5.2 Agra Bhodi Maha Vidyalaya (AB) – Kantale

AgraBhodi Maha Vidyalaya – Kantale is the largest mixed school in Kantale town, located about 1 ½ kilometers off the Colombo – Trincomalee main road, and ½ a kilometer from Kantale town. It is a mixed school with 2110 students, but only 80 students use bicycle for schooling. No parking facility for bicycles has been provided though there is enough space. The congestion faced by these students run on to a distance of about 01 kilometer when traveling to school. 04 normal buses and 04 Sisu Seriya buses are available for students during the school start time. According to the school authorities, following is the approximate model share;

Mode	No. of students	Percentage
Bicycle	80	3.8 %
Bus	700	33.1 %
On foot	600	28.4 %
Van & Others	400	19.0 %
Trishaw	130	6.2 %
Sch. bus	200	9.5%
	2110	



Figure 4.2: Bicycle Park in AgraBhodi Maha Vidyalaya - Kantale

4.5.3 Royal Vidyaloka National School (RV) - Trincomalee

Royal Vidyaloka National School is a medium size, mixed National school in Trincomalee district with 870 students. It is located about 01 kilometer away from Trincomalee town.

Parents with low income send their children to this school. Most of them are employed in fisheries industry. Only 10 students use bicycles for schooling. These students face a congestion of about one kilometer distance when traveling to school. 02 Sisu Seriya buses and 05 normal buses are available for students during the school start time.

Approximate modal share according to the school authorities are given below;

Mode	No. of students	Percentage
Bicycle	20	2.3 %
Bus	200	23 %
On foot	350	40.2 %
Van & others	200	23.0 %
Sch. bus	100	11.5 %
	870	



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4.5.4 Vivekananda Maha Vidyalaya (VV) - Kuchchaweli

Vivekananda Maha Vidyalaya is situated in a remote area in the Trincomalee district, 40 kilometers away from the Trincomalee town to the north along Pulmude road. It is a mixed provincial school with 850 students. Only 6 pupils use bicycles to travel to school. This is a Tsunami affected area. The Tsunami victims who were rehabilitated, too, have to walk about 1½ to 2 kilometers to access for road transport from the Tsunami Housing Scheme. No congestion when traveling to school. No buses have been deployed for this school.

02 Refugee camps with about 200 houses are located 05 kilometers away from the school. About 40 students come to this school from this camp. They have to walk about 2 or 3 kilometers to school. This is a school once completely


washed away by Tsunami in 2004. This has been re-built by the government with the help of foreign aids.

The 2 buses plying from Colombo to Pulmudai and visa vis, are the only mode of transport available for this school, too. However, most of the students come to school on foot.

Approximate model share is given bellow;

Mode	No. of students	Percentage
Bicycle	6	0.8 %
Bus	120	4.1 %
On foot	700	82.3 %
Others	24	2.8 %
	850	

4.5.5 Kuruchchnkani Girls School (KG) - Kuruchchnkani, Kinniya

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Kuruchchnkani Girls School is a medium size girls school, 2kilometers away from kinniya town. Total number of students in this school is 640 and only 90 girls are coming to school by bicycles. This is a Muslim school.

Though there is a shelter within the school premises for bicycle parking, no wash rooms and other facilities have been provided for these students. No school buses are available. Even to board a bus the students have to walk up a distance of about 1 ½ kilometers from the school. The area appeared to be with a high density of population.

Model share given by the school authorities are given bellow;

Mode	No. of students	Percentage
Bicycle	90	14.1 %
Bus	0	0 %
On foot	300	46.8 %
3 Wheelers	200	31.3 %
Vans & Others	50	7.8 %
	640	

4.5.6 Araffath Maha Vidyalaya (AV) – Kuruchchnkani, Kinniya

Araffath Maha Vidyalaya is a Muslim boys school located 2 kilometers away from Kinniya town. It has 420 students. It's a small school, but about 100 students use bicycles for schooling. Parking space with security, shelter and bicycle racks etc. are available. No bus service is provided and students have to walk up 1 ½ kilometers from the school. No school buses are deployed.

Model share shows the following figures;

Mode	No. of students	Percentage
Bicycle	100	23.8 %
Bus	0	0 %
On foot	280	66.6 %
3 Wheelers	20	4.8 %
Vans & others	20	4.8 %
	420	

4.5.7 Kiulekada Vidyalaya (KV) –Kiulekada

This is a mixed small school situated in a very remote area. It has about 420 students, but only 20 students use bicycles for schooling. No school buses are deployed, but 2 normal buses are operated from a distance of 800 meters from the school. The students who travel on bicycles do not face any traffic congestion But there are instances of where herds of buffaloes crossing the students pathway.

Model share shows the following figures;

Mode	No. of students	Percentage
Bicycle	20	4.8 %
Bus	30	7.1 %
On foot	370	88.1 %
	420	



Figure 4.3: Bicycles in Kiulekada Vidyalaya

4.5.8 Madawachchiya Vidyalaya (MV) – Madawachchiya, Gomarankadawala

Madawachchiya Vidyalaya is a small school with only 360 students. It is situated in Gomarankadawala. There are about 40 students who use bicycles for schooling. No school buses are deployed. Normal buses are operated about a distance of 200 meters from the school. Of these buses, only one bus is operated during the school starting hours. This being a remote area, no traffic congestion, at all.

Model share shows the following figures;

Mode	No. of students	Percentage
Bicycle	40	11.1 %
Bus	30	8.3 %
On foot	290	80.6 %
	360	

4.5.9 Non use of Bicycles

It can be seen that in some schools Children don't use bicycles due to availability of buses and other modes of transport, economic problems, bad road conditions etc.


4.6 Resource Personals

Following resource personnel contributed in the selection of schools as samples for data collection

- Director of Education, Trincomalee District
- Officers of Zonal Educational offices
- Regional Managers of Sri Lanka Transport Board, Eastern Region
- Depot Managers of Trincomalee District

4.7 Selection of Students

10% of the total number of students of each school was made to participate, reflecting the following categories

- 
- Different age groups from 8 years and above
 - Students who come to school by bicycles and by other modes
 - Female and male separately

4.8 Information required by the School

The following information from the Principals and Teachers in charge of the School Transport Committee / School Development Society (SDS) were obtained by the Researcher herself by direct interviews.

- Total number of students
- Number of students who use bicycles for schooling
- Space availability for parking
- Availability of wash rooms
- Availability of repair shops
- Distance with road congestion to school

- Number of Sisu Seriya buses available
- Number of other buses available
- Model share

4.9 Discussions with other Resource Personals outside the school

Details of transport facilities, bus operation frequency and availability of school buses were obtained from Depot Managers and the Regional Managers of the Sri Lanka Transport Board, Eastern Region while the road conditions of selected areas were obtained from Eastern Province Provincial Road Development Authority.

Details of availability of repair shops, availability of spare parts etc obtained from vendors & owners of bicycle repair shops (winkles) of the respective towns.



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CHAPTER 05

DATA ANALYSIS

5.1 Important Parameters

The inputs of the selected samples were fed into the Spread Sheet. Data were analyzed by using statistical methods and computer based graphical projections so as to build relationships among the important parameters. Accordingly the main variables indicating the important parameters in deciding the bicycle as the most suitable mode of transport to this particular area are as follows.

- (a) Economic condition of the society
- (b) Distance to school and distance to access a mode of transport other than the bicycle
- (c) Age of the student
- (d) Difficulties for bicycle users

5.2 Economic condition of the society

Father's Occupation, Mother's Occupation and the Status of Samurdi Allowance are taken as main indicators in measuring the economic condition of the society in the Eastern Province.

5.2.1 Father's Occupation

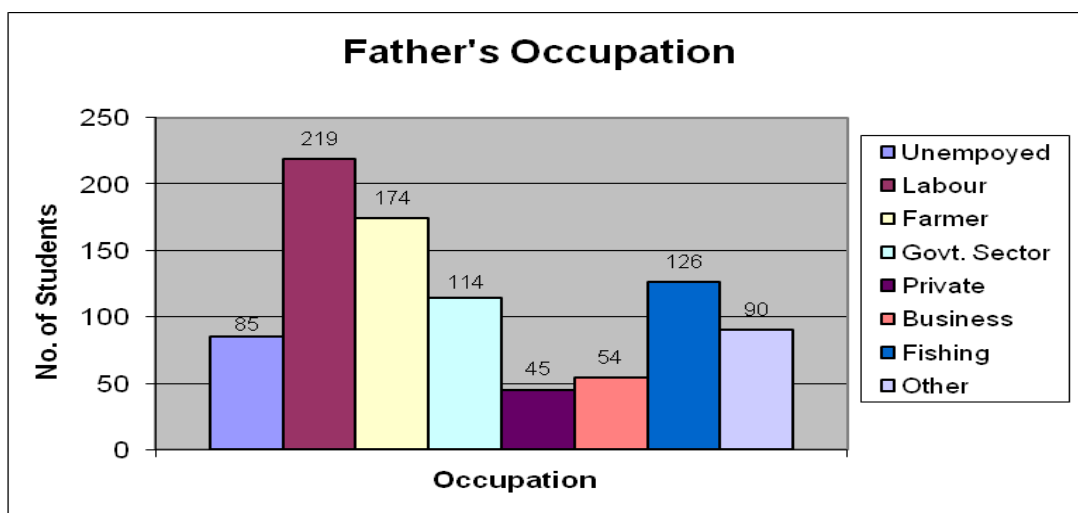


Figure 5.1: Father's Occupation

Of a total of 907 students subjected to the sample survey, 219 students have indicated that their father's were labourers, who are considered as 'poor' in the society. 174 students indicated that their fathers were farmers, while 126 indicated there fathers were in the fishing industry. These categories are considered as 'poor' in the society, because, the income they get from by engaging in such professions are very low. The above figures, when added up, come to a subtotal of 519 out of the total of 907.

Further 85 students have indicated their fathers were unemployed. This figure, too, when added up to 519 raises the sub total to 604 which is 67% of the total.

We can therefore conveniently conclude that 67% of the population is below the poverty line that needs the benefit of subsidy schemes

5.2.2 Mother's Occupation

In the chart "Unemployment" bar is the most visible.

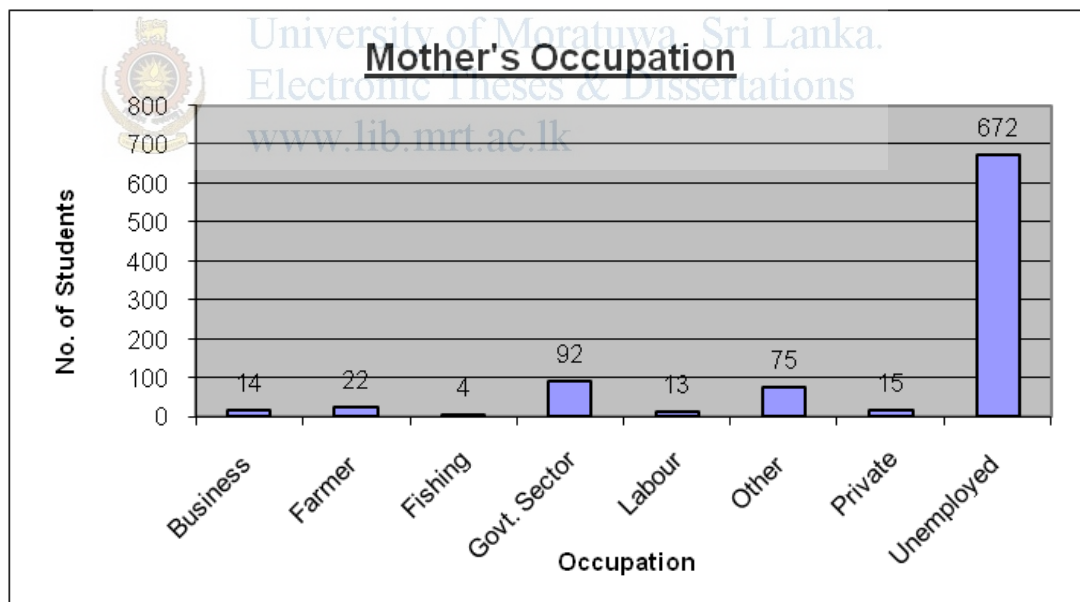


Figure 5.2: Mother's Occupation

Out of 907 sample subjects, Mother's Occupation of 672 students were in the unemployed category. The percentage is 74. This, too, showed that 74% of the students were with a very low household income families.

5.2.3 'Samurdi Allowance'

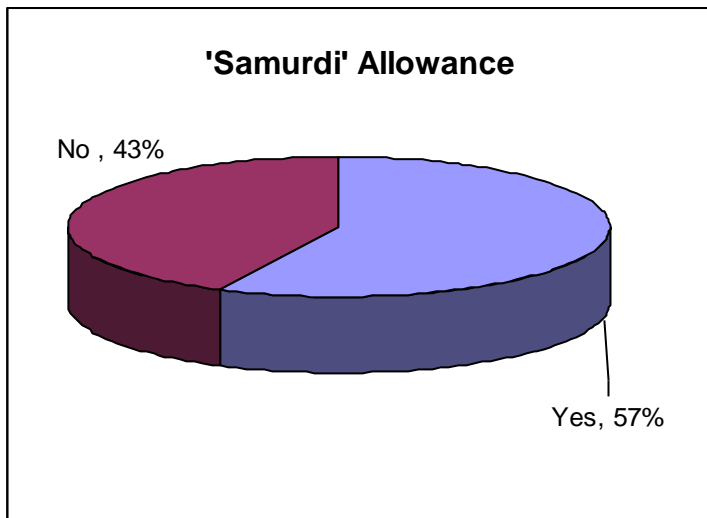


Figure 5.3: Samurdi Allowance

57% of the population in this area is Samurdhi allowance recipient. Samurdhi is a kind of dole given by the government for no income families.

It is an indication that higher number of population in this area is poor.



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The above sections 5.2.1, 5.2.2 and 5.2.3 establish the fact that people in this area are mostly poor, hence the other modes of transportation are unaffordable for them.

5.3 Distance to school and distance to access a mode of transport other than the bicycle

5.3.1 Distance to School

907 students were involved for the survey from 08 selected schools. 365 out of 907 students are coming to school from a distance of 0 to 2 kilometers. Number of students of 2 to 5 kilometer distance range is 340, and 5 to 10 distance range is 136.

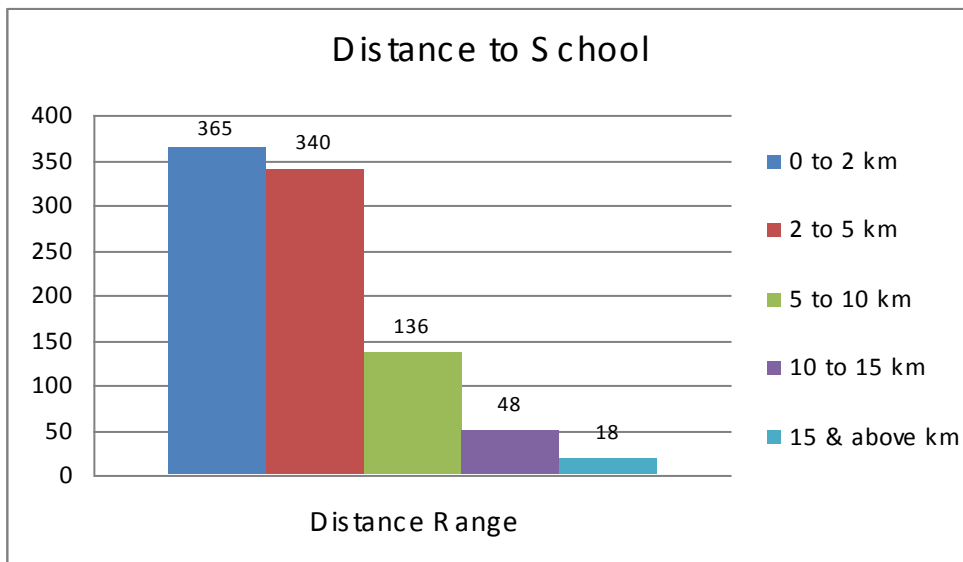


Figure 5.4: Distance to school from home

It is clear that most of the students i.e. 365 (40%) of the sample are in the range of 0 to 2 kilometers, while 340 (37%) of them are coming to school from a distance of 2 to 5 kilometers and 136 (15%) of them from a distance of 5 to 10 kilometers.

When analyzing the above graph, it is clear that 476 students (52%) are living within the range of 2 to 10 kilometer distance.

5.3.2 Distance to Board a Bus

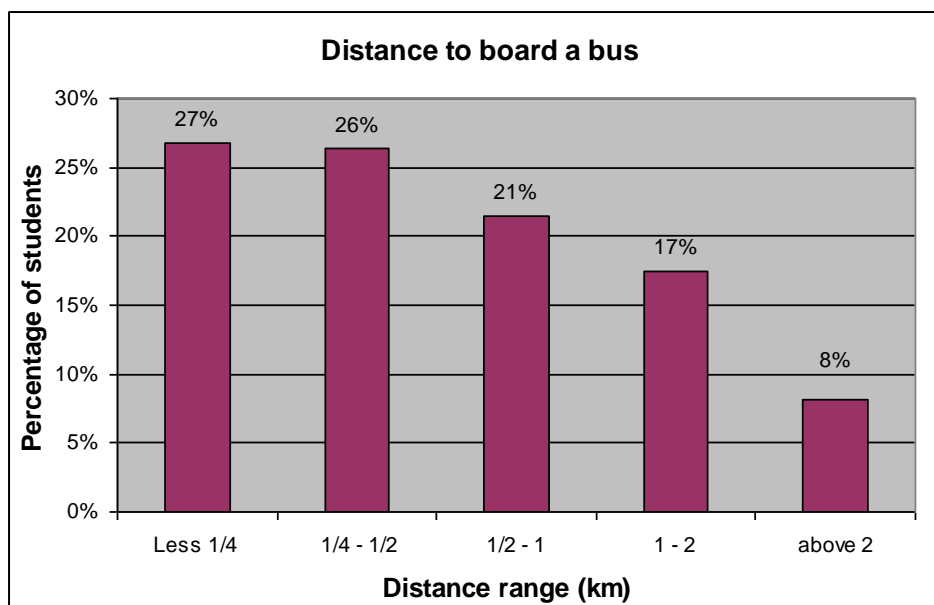


Figure 5.5: Distance to walk to board a bus

As shown in figure 5.5, 27% are within the range of $\frac{1}{4}$ km of travel distance to board a bus while 26% are within the range of $\frac{1}{4}$ to $\frac{1}{2}$ km and 21% are within $\frac{1}{2}$ to 1 km. They can be considered as conveniently placed, who can make up the distance to reach a bus by walking. Hence, no need arises for consideration of granting bicycles for such categories.

Among the students who travel by bus to school, traveling distance of 1-2 kilometer to board a bus is indicated for 17%, meaning that they are residing away from the roads and have to spend more time to reach a bus. This proves the position stated in the section 1.7 in chapter 1, i.e. the scattered nature of the situation of villages and settlements away from bussable roads.

Still, there remain 8% of students who have to walk more than 2 km to get a bus. They have to be considered as a critical category that deserves special attention.

5.3.2 Students who come to school on foot by distance

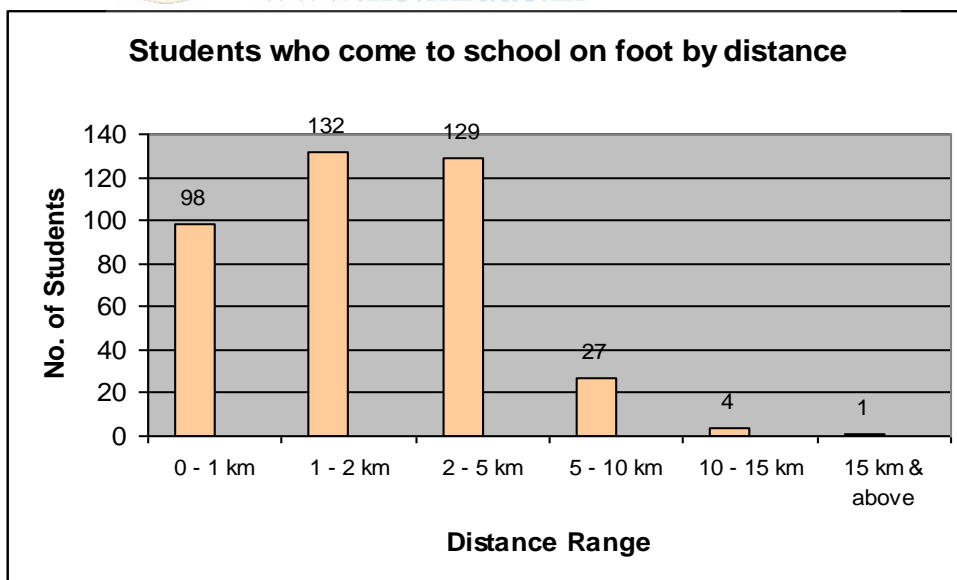


Figure 5.6: Students who come to school on foot by distance

Since the main objective of the study to grant bicycles for students consideration of distance to school remain as a vital factor. Of the total of 907 students taken for the

sample study 391 (43%) are schooling by foot. They, too, belong to different distance categories from – to school, such as 98 (25%) less than 1 km, 132 (34%) between 1-2 km, 129 (33%) between 2-5 km, 27 (7%) between 5-10km, 4 (1%) between 10-and 15 and 1(0%) above 15 km.

Of all these categories, those with the distance between 2 to 10 kilometers to school (52%) can be considered as the most deserving to receive bicycles.

5.4 Mode of Travel to School

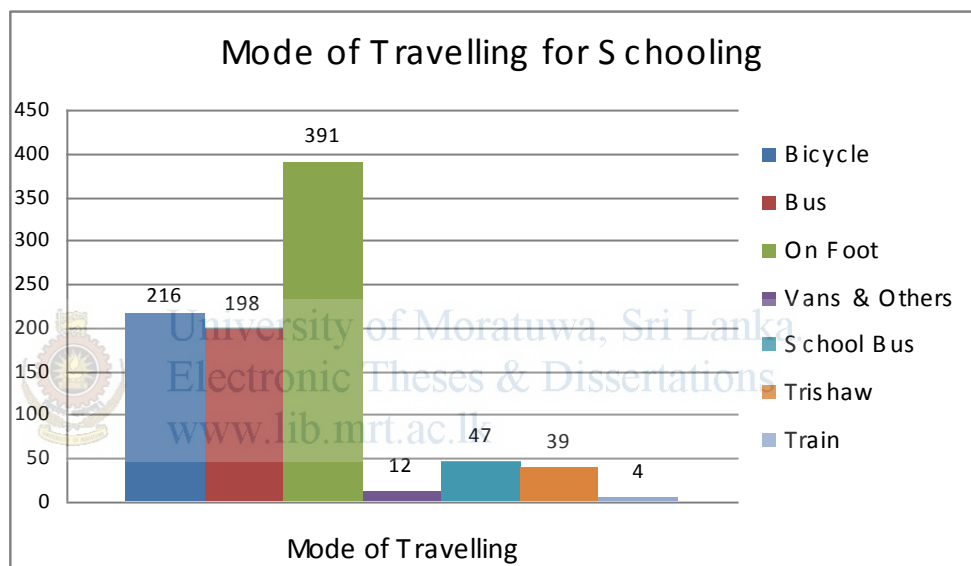


Figure 5.7: Mode of travel to school

Out of 907 sample survey participants, 391 (43%) come to school by walking. The numbers of students who come to school by bicycle were 216, i.e. 24%. Only 198 (27%) students come by bus. The students who used other modes of transport are a very few and almost negligible. The 27% of bus users again divides into two categories, 5% using school buses dedicated specially for school children and balance 22% by using normal passenger buses. Since the scenarios of 27% by bus, and 24% by bicycles, it can be concluded that Eastern Province has more students on bicycles than in other provinces.

5.5 Mode of traveling for schooling by distance

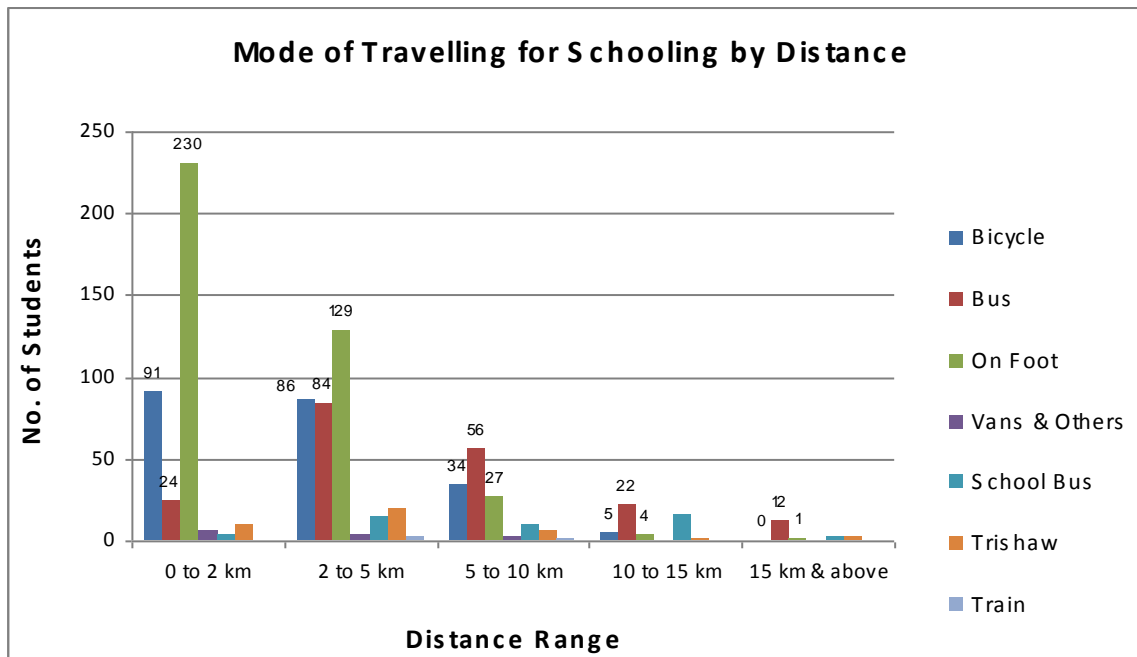


Figure 5.8: Mode of traveling for schooling by distance

The graph no.5.9 appearing here shows mode of traveling for schooling by distance. The figures therein are common to all schools which come under the study.

It was found that very large population of students (230) didn't use any mode of transport within the range of 0 to 2 km from school. Next were the students who use bicycles (91) to reach school within this range and a small proportion (24) were still there who used buses to cover this distance. Students using other modes such as 3 wheelers, trains, vans and others were relatively few and negligible.

Within the range of 2 to 5 km too the non users of transport were relatively higher (129) but the users of bicycles and buses were to a equal proportion (86, 84). A slight increase in the use of 3 wheelers and school buses could also be seen within this range. However all the schools were not served with school buses.

The range between 5 to 10 km showed an increase of bus users (56). Next were the bicycle users (34) followed by non users of transport. Beyond 10 kms there were a very few student population, they too were bus users.

- The range between 0 to 2 km was more suitable for walking than to use any mode of transport as it was health supportive and environmental friendly which could do with ease. Also it was contributory for social contacts and interactions.
- According to the above analysis the most desirable range for bicycle use appear to be the ranges between 2 to 5 km and 5 to 10 km. The bus users and bicycle users were almost same within these ranges.
- The role of train as a mode of transport for schools in this area was almost negligible as many of the schools were in areas off the rail track.

5.6 Mode of travel by school

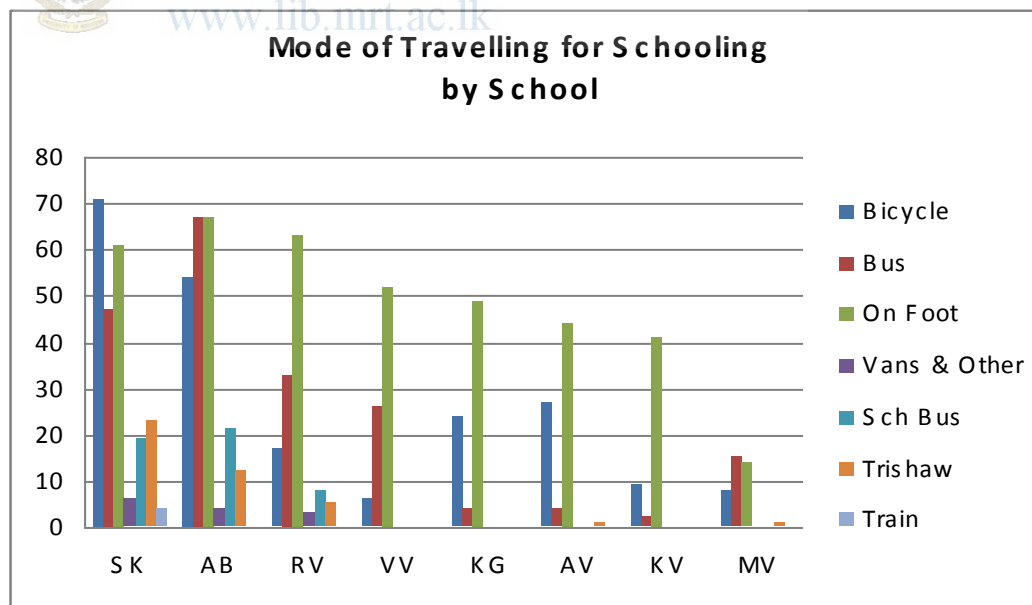


Figure 5.9: Model share by school

SK, AB and RV are schools situated in the city centers in their respective areas; hence, can be recognized as urban schools. The figure 5.7 clearly shows that the students in these schools are facilitated with high mobility, with the availability of sufficient school buses as well as normal buses and also other modes such as vans, trishaws, motor bicycles and push bicycles etc.

However the school RV is a school mainly patronized by low income group parents. Though situated in the city center the students of RV mostly do their schooling on foot. In spite of the availability of school buses only a few use them.

VV is a school situated in a remote area in the Trincomalee district. Most of the students do their schooling on foot. No school bus has been provided, but long distance road buses are plying along the nearby road, and a considerable number of students are using them for schooling. There is also a small number of students who use bicycles for schooling.

The areas where the KG and AV are situated can be regarded as suburban areas with a high density of population. But no bus routes and transport facilitates in these areas. The distance to board a bus is about 1 1/2 kilometers away from the school. As the graph 5.7 shows many students do the schooling by walking up to the school, with a fair number of students using bicycles for the purpose.

Both KV and MV are rural schools in the Trincomalee district, but the latter is facilitated with a bus service. According to the graph the students of KV do their schooling on foot and bicycles. However, since MV is facilitated with a bus service, nearly half the number of students use the bus for schooling.

When compared to the SK, AB and RV with other schools, the use of other modes of transport such as trishaws, motor bicycles, vans and others are almost nil for these schools.

5.7 Age Analysis

5.7.1 Bicycle usage for schooling by age

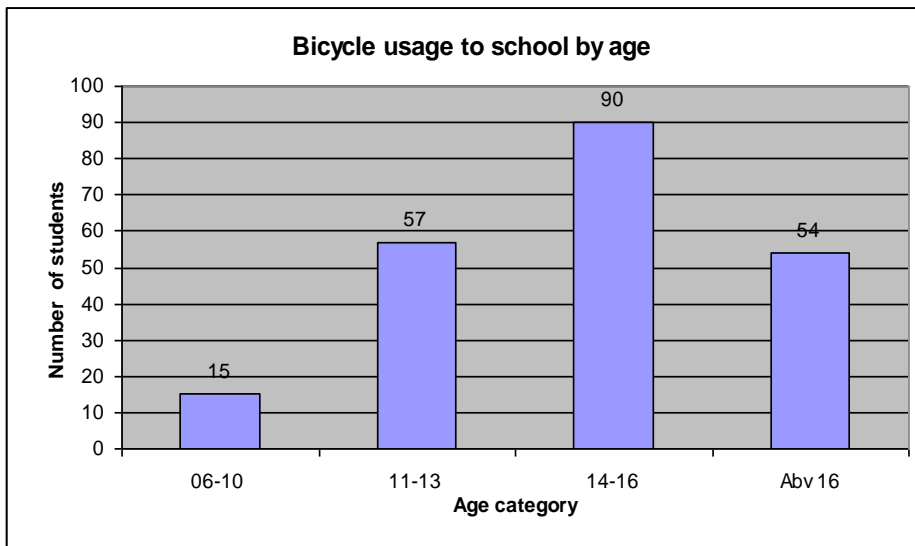


Figure 5.10: Bicycle usage for schooling by age

Out of 907 students who involved in the survey, 216 students use bicycles for schooling. According to the above graph it is clear that of the 216 bicycle users 90 students are between 14-16 age category, while 57 students are between 11-13 and 54 students are above 16 years and only 15 students fall between the age of 6-10 category. It can be regarded that the most suitable age to travel on bicycles for schooling should be above 11 years.

5.7.2 Age on which the traveling by bicycle started.

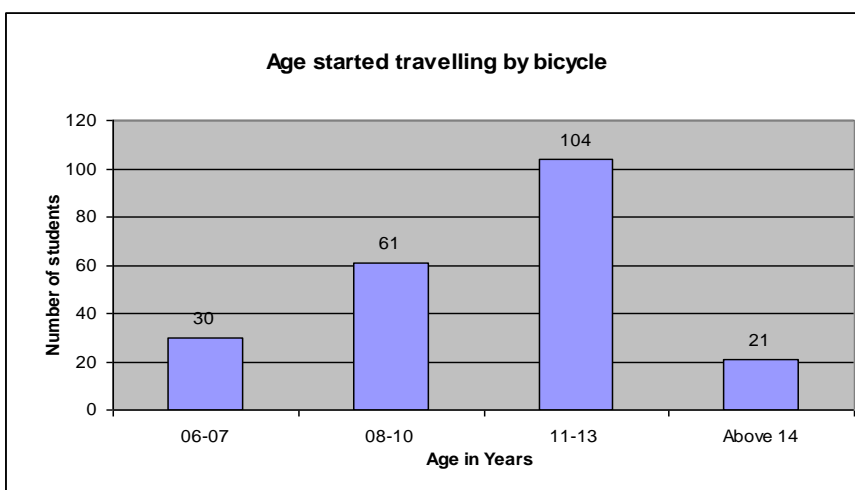


Figure 5.11: Age on which the traveling by bicycle started

When asked to indicate the age they have started cycling to the school, 48% indicated that they started between the age 11-13. The next age group was 8-10 with 28% and still there were 13% who belonged to the age of 6-7 when started cycling.

The above graph, too, shows the most suitable age to travel on bicycles is above 11 years.

5.8 Cost analysis on granting bicycles against deploying school buses under Government subsidy.

Average cost of a bicycle with a life span of 05 years at the present market rate is Rs. 8,000/=. Maintenance cost of a bicycle for 05 years is negligible. Therefore it can be assumed that the cost per student for a bicycle is only Rs.8000/= for 05 years.

If a school bus is to be deployed the cost has to be worked out on the following assumptions;

- To be a permitted bus it has to be a 40 seater or above
- Average load factor of a school bus is 1.25
- Normal school bus has 42 seats
- Therefore a school bus with 42 seats can carry 53 students ($42 * 125 / 100$)
- The present rate of subsidy per kilometer for a distance up to 45 kilometers is Rs.35/=
- The scheduled number of school days per year by the Education Department is 210
- Under the school subsidy program a student has to pay only $\frac{1}{2}$ of the normal bus fare
- Suppose a trip length is taken as 10 km per one way the bus has to make 20 km per every school day. On this basis;

(a) Institutional cost for 53 numbers of students to be carried per 05 years for the distance of 10 Km;

$$= (210 * 5) * (10 \text{ km} * 2 * \text{Rs.}35/\text{km})$$

$$= \text{Rs.}735000/=$$

$$= \text{Rs.}13868/= \text{ per student}$$

Institutional cost per student when deploying a school bus= Rs.13868/=

- (b) Calculation of cost to be incurred by the student when going by school bus;
 Distance to school = 10 km , Normal fare for 10 km length = Rs.18
 Bus fare for 2 school trips = $2 * \frac{1}{2}$ (Rs.18.00) = Rs.18.00
 Bus fare to be incurred for 05 years per student = $210 * 5 * \text{Rs.18.00}$
 = Rs.18900/=

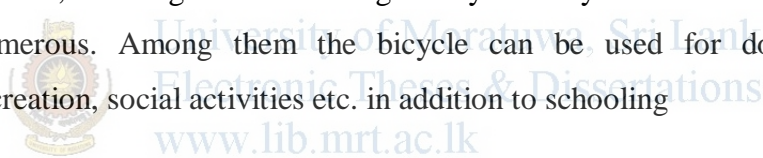
Bus fare to be incurred for 05 years by one student = Rs.18900/=

Total cost to be incurred for schooling by school bus per student = Rs 32768/=

Cost saving per student by granting a bicycle for schooling =Rs.(32768-8000)
= Rs.24768/=

It is evidently clear that granting a bicycle instead of deploying a school bus is beneficial for the institute as well as for parents of the students.

Further, the fringe benefits that gives by the bicycle to a student is far more and numerous. Among them the bicycle can be used for domestic purposes, recreation, social activities etc. in addition to schooling



5.9 Possession of a bicycle in the household

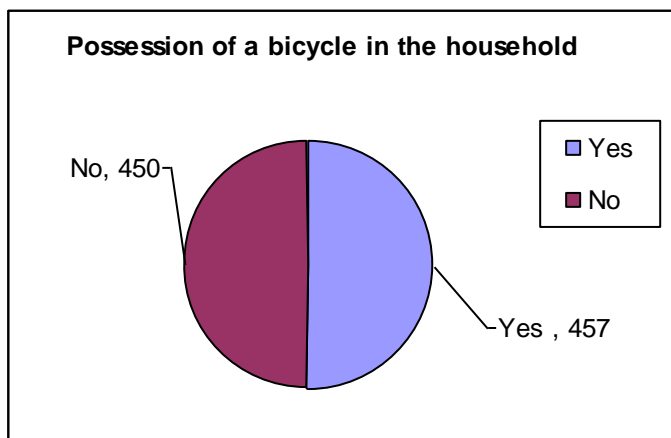


Figure 5.12: Possession of a bicycle in the household

Out of 907 students who involved in the survey, 457 students have bicycles in their homes.

5.10 Having a bicycle and usage of it

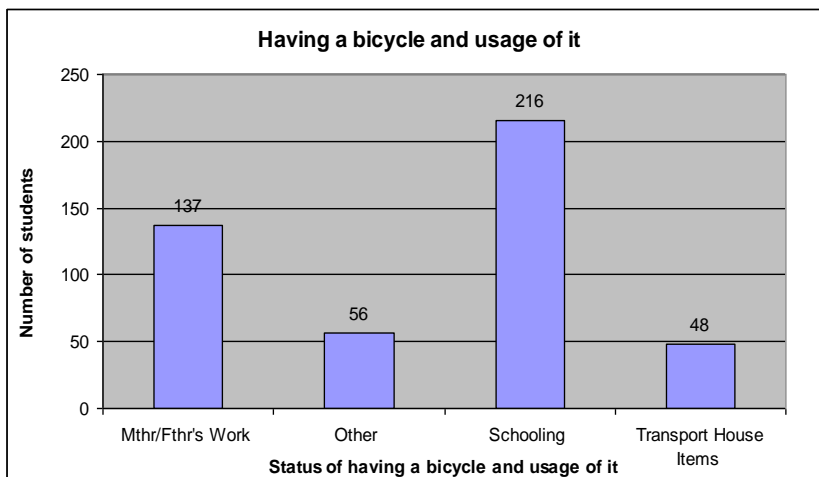


Figure 5.13: Having a bicycle and usage of it

The above chart shows that out of the 456 families with bicycles in their homes, 216 students use them for schooling, 137 students have stated that the bicycles in their household are used by their parents to go to work places.

5.11 How do they travel on bicycle?

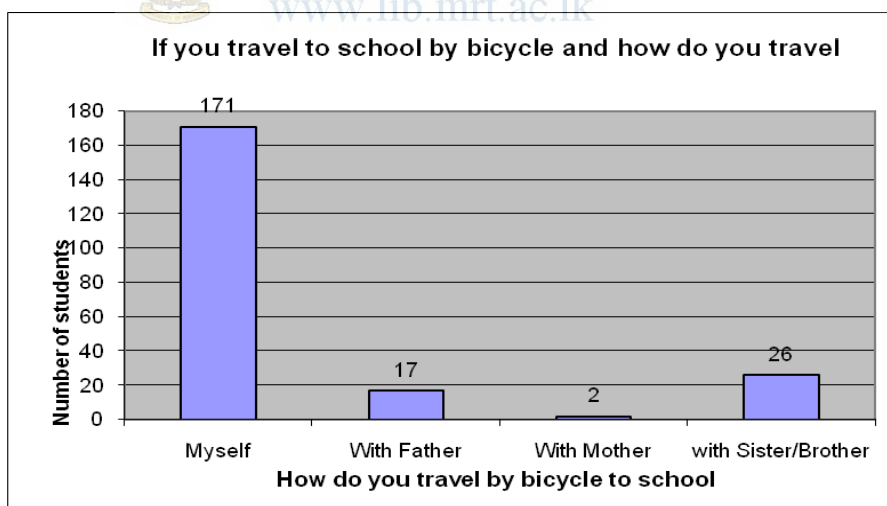


Figure 5.14: How do they travel on bicycle?

Out of 907 students 216 students are used bicycles for schooling. 171 students by themselves to go to school while 17 with their fathers, 2 students with their mothers and 26 students with their sisters and brothers respectively.

5.12 Bicycle parking facility in schools

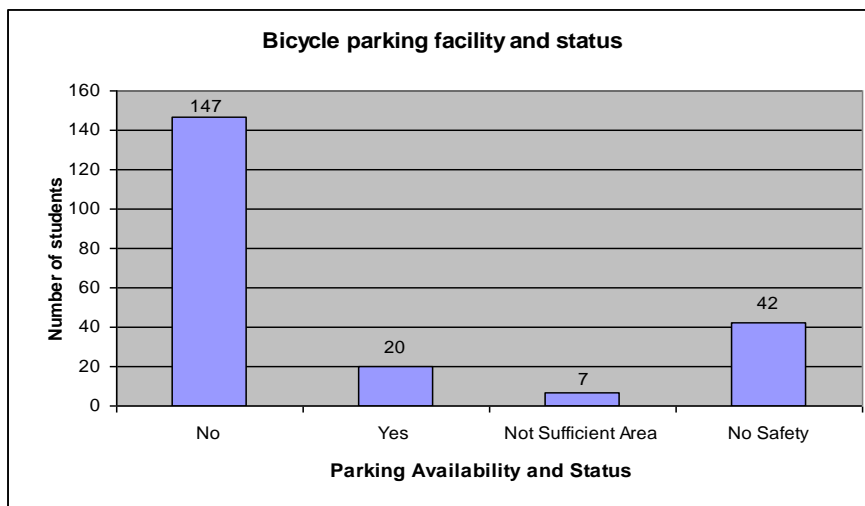
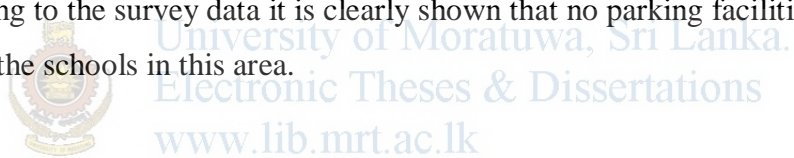


Figure 5.15: Bicycle parking facility in schools

According to the survey data it is clearly shown that no parking facilities provided in most of the schools in this area.



5.13 Status on use of bicycles for schooling and for tuition

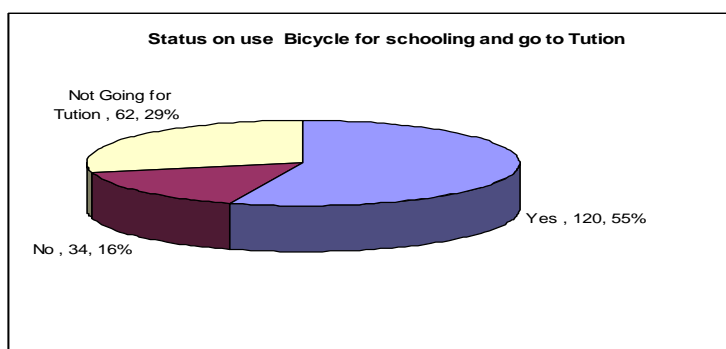


Figure 5.16: Status on use of bicycles for schooling and for tuition

Of all bicycle users, only 16% of the students are not using them for tuition. Around 55% of the students use their bicycles for tuition. Others do not go for tuition.

According to the above it is certified that most of the students use bicycles for tuition. Therefore it is believed that it can be an advantage of their high utilization.

5.14 Use of bicycles for other journeys

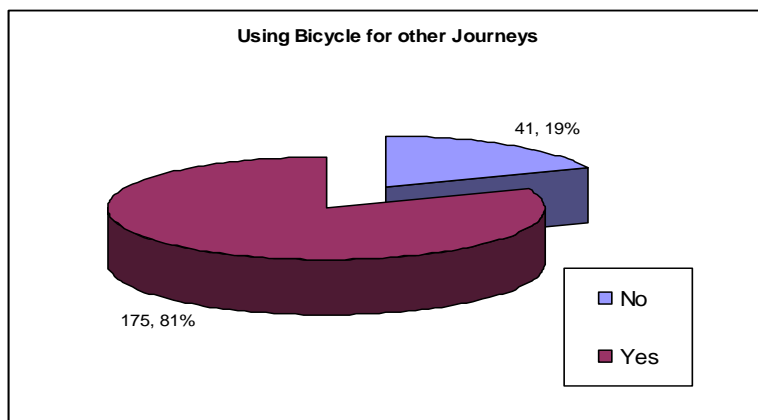


Figure 5.17: Use of bicycles for other journeys

81% of the students, who use bicycles for schooling, also use it for their private purposes such as recreational, marketing etc.

5.15 Traveling on bicycle to school; happy / unhappy

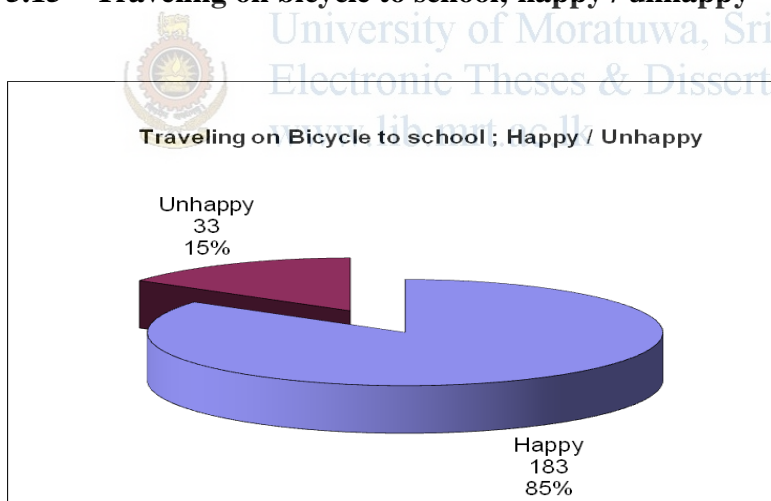


Figure 5.18: Traveling on bicycle to school; happy / unhappy

Of the bicycle users, 183 students (85%) mentioned that they were happily traveling to school, only very few students (15%) stated that they were traveling to school by bicycle unhappily.

Unhappiness may have occurred by environmental difficulties and obstructions such as bad roads, other vehicles and hilly terrain.

5.16 Travel difficulties – Environmental

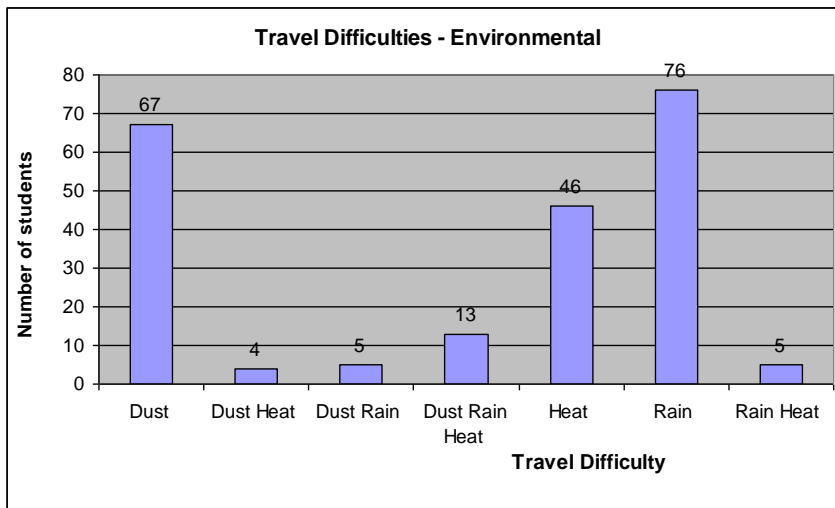


Figure 5.19: Travel difficulties – Environmental

Of the environmental difficulties the students have shown rain is the worst element than dust and heat. The combination of the above difficulties have affected for few students.



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5.17 Travel difficulties - Obstructions

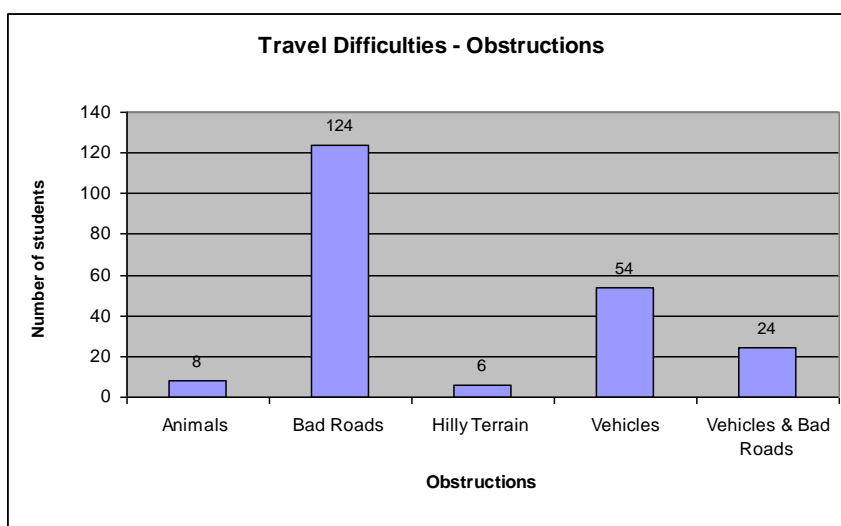


Figure 5.20: Travel difficulties - Obstructions

Of the obstructions the students pointed out, bad road condition is the most difficult than the obstruction come from other vehicles. However, the obstructions from animals and hilly terrain are also there, but to a proportion.

5.18 Availability of Repair Centers

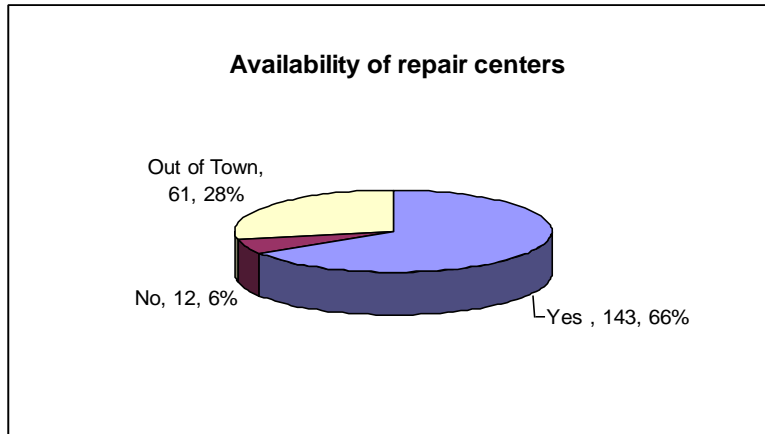


Figure 5.21: Availability of Repair Centers

66% bicycle users mentioned that the repair centers available and 28% mentioned that repair centers available, but out of town. Very few (6%) stated that repair centers were not available.

5.19 Desire to own a bicycle for schooling

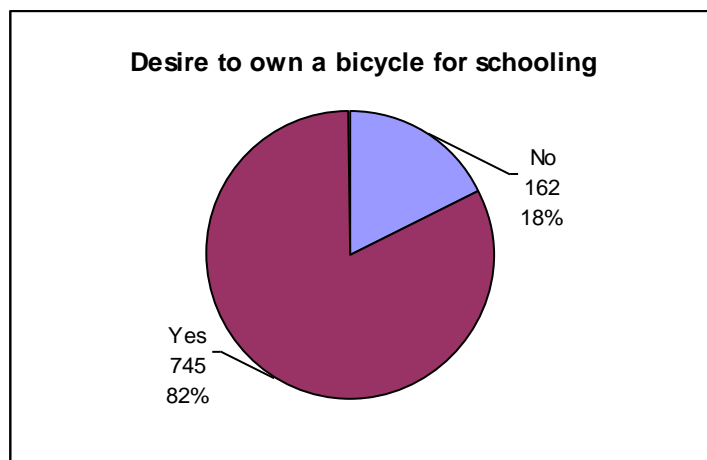


Figure 5.22: Desire to own a bicycle for schooling

907 students who participated in the survey were questioned about their desire of schooling by bicycles. 745 (82%) stated that they were interested while 162 (18%) refused the schooling by bicycle.

5.20 Reason for refusing a bicycle for schooling

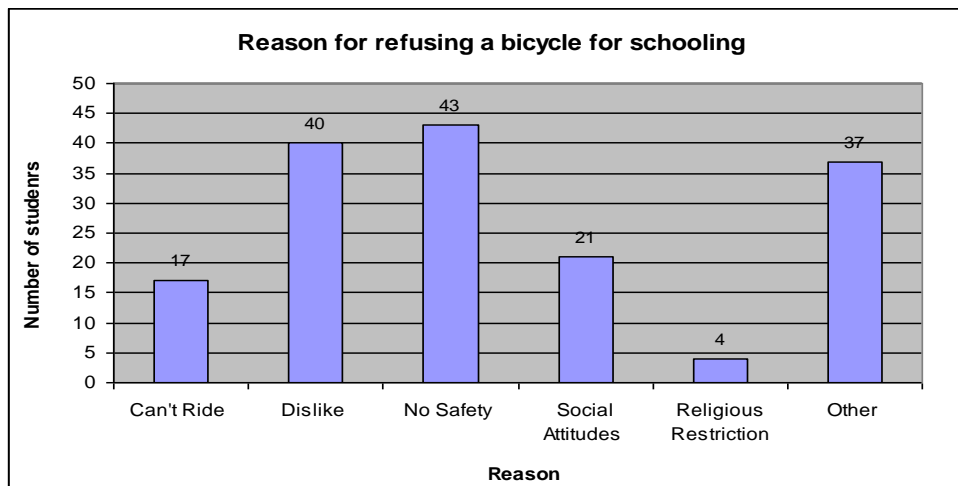


Figure 5.23: Reason for refusing a bicycle for schooling

Of the total of 162 students who refused a bicycle for schooling, safety problem was mentioned by 43 students, disliked by 40 students, other reasons by 37 students, social attitudes by 21 students, can't ride by 17 and finally religious restriction were the reasons given.

CAPTER 06

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This Project is based on an actually felt need and is extensively researched on a project approach applicable to all levels, and can be managed even by the grassroots level of the country.

When all factors that came under the study are analyzed properly, following conclusions can be reached at;

- Widespread poverty, coupled with less prosperity rate
- Dearth of infrastructure, Less bussable roads due to bad road conditions
- Scattered nature of villages and settlements
- Inaccessibility to buses, due to long travel distances to board a bus, even when available, it takes a longer time to reach the school
- Geographical situation of low-lying area, ideally suitable for cycling
- Eco Friendliness of the bicycle by being a non motorized mode of transport
- Cost effectiveness of almost zero operational and maintenance cost.

As stated at the outset, in the study, the National Transport Commission has to shoulder the responsibility of providing, safe, reliable and low cost transport for the children for their schooling. It has hitherto been discharging this responsibility by deploying buses and encouraging Sri Lanka Transport Board as well as private operators through governmental subsidy schemes to provide relief to the children. These measures are still inadequate to address the problem in its larger scope. The

study, self evidently has brought to the light the necessity of finding new measures, in this regard. As envisaged earlier, the study has finally pointed at the conclusion that providing bicycles to school children, especially to the children in the Eastern Province is the most viable solution in this regard.

Selection of Trincomalee District in the Eastern Province as the sample area for the study has served the main objective of the study as it has all the facets of the problem, that prevails in the entire island. In one hand, this area has provided the study with all the necessary data and background to achieve objectives. At the same time, it has provided the opportunity to the National Transport Commission to be a partner in the ongoing Eastern Province “Re-awakening” program.

The data collected on father’s occupation, mother’s occupation and whether on the dole of “Samurdi” in chapter 5 takes us to the conclusion that a very high percentage of parents in the province are poor and needing a helping hand for the schooling of their children.

In chapter 5, the study has focused its attention on the distance that the students have to cover when walking to school on foot and to board a bus. The conclusion in relation to these aspects has to be that

- (a) 34% of students who come on foot between 2 to 10 kilometer, and
- (b) 8% of students who have to walk 2 to 10 kilometer to board a bus should be provided with some relief.

According to the age analysis done in section 5.6 the most suitable age to be recommended to use bicycles for schooling is the age above 11 years.

The conclusions we can arrive on the data in relation to following different aspects are as follows;

- (a) Parking facility dealt in section 5.11 revealed that 68% of cycling students did not have parking facilities, hence the conclusion is to consider providing parking facilities.
- (b) Section 5.12 and 5.13 indicated that a good percentage of those who owned bicycles use it for traveling to tuition class and for other purposes. We, too, have to accommodate such practices in the future too.
- (c) Section 5.17 dealt with the aspect of repair centers and found that this facility is adequately available. The conclusion in this regard has to be that no attention is needed on this matter at present.



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RECOMMONDATIONS

6.2 Recommendations

As the study has been well researched by giving careful consideration to each and every aspect of the subject, the researcher is equipped with a factually supportive background to make the necessary recommendations, as follows.

- (a) The researcher recommends that in keeping with the institutional responsibility of providing transport to children for schooling, the National Transport Commission should launch a program of providing bicycles to school children, free of charge, initiating the process from the Eastern Province with plans to extend the program to small towns in other provinces, too, in the future.

(b) The researcher also recommends that the program should include the following measures and guide lines which are meant for sustainability of the program.

Selection Criteria

- Priority to be given to the poor children, especially to Tsunami effected and those who live in refugee camps
- School children of above 12 years of age in rural areas and above the age of 13 years in urban areas to be considered.
- The children who walk a distance of 2-10 kilometers to the school should be considered first.
- Those who walk more than 2 kilometers to access a bus, too, should come under the program.
- Children whose schools are situated in locations which are not served by regular bus service to be considered.

Safety Measures

- Parking facilities to be provided by the government by erecting shelters in the school premises
- Provide locks
- Erect cycle racks with identification numbers
- Donating cycles to be painted with a special colour scheme. The cycle should be fixed with a book basket in front.
- To form cycle societies consisting of 2 teachers, 2 parents, 2 cyclists and 2 members of the transport committee.
- Awareness programs on safety and maintenance should be conducted.
- Cycle lanes to be laid in towns and cities.

Procurement

- The proper procurement measures adhering to the government tender procedure should be applied when purchasing the bicycles.

School Access Roads

- Road Development Authority (RDA) to be advised to give priority for improvement of school access roads in its rural road improvement programmes.
- Cycle Lanes to be demarcated in school access roads in future in rural areas as well as in urban areas.



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Details of the Schools Selected for the survey

S/N	Name of the School	code	Type of School	Area Description	Medium	Community	Total of Students	Size of the School	No. of Student Using Bicycles	DS-Divition	Space Availability for Parking	Availability of Wash Rooms	Availability of Rapair Shops	Distance with road Congestion	No.of Sisu Seariya Buses	No.of Other Buses	No.of Students Selected for the survey	
1	T/R .K.M.Sri Koneshwaram Hindu College	SK	Boys	Urban	Tamil	T	2200	L	600	Trinco-Town	Yes	No	Yes	3km	2	7	233	
2	KNT/Agra Bodhi Maha Vidyalaya, Kantalei	AB	Mixed	Urban	Sinhala	S	2110	L	80	Kanthale	Yes	Yes	Yes	1km	4	2	237	
3	T/Royal Vidyaloka National School, Trincomalee	RV	Mixed	Urban	Sinhala	S	870	M	10	Trinco-Town	Yes	No	Yes	1km	2	7	130	
4	T/ Vivekananda Maha Vidyalaya, Pulmude,Kuchchaweli	VV	Mixed	Rural	Tamil	T	850	M	6	Kuchchaveli	Yes	No	Yes	No Triffic	No	2	83	
5	Kurunchankani girls MV,Kurunchankani, Kinniya	KG	Girls	Sub-Urban	Tamil	M	640	M	90	Kinniya	Yes	No	Yes	No Triffic	No	No	69	
6	T/araffath Maha Vidyalaya, Kurunchankani,Kinniya	AV	Boys	Sub-Urban	Tamil	M	420	S	100	Kinniya	Yes	No	Yes	No Triffic	No	No	71	
7	T/Madawachchiya Vidyalaya, Madawachchiya,Gomarankadawela.	MV	Mixed	Rural	Sinhala	S	360	S	40	Gomaran-kadawala	Yes	No	Yes	No Triffic	No	1	33	
8	T/Kiulekada Vidyalaya, Kiulekada	KV	Mixed	Rural	Sinhala	S	420	S	20	Kulekada	Yes	No	Yes	No Triffic	No	*2	51	
Total							7870											907

community :- T - Tamil

Size of School : - L - Large

* 150m away from the School

S -Sinhala
M- Muslim

M -Medium
S- Small



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National Transport Commission

A questionnaire on survey for the promotion of foot bicycles for school children in remote areas

Trincomalee District of Eastern Province

1. D.S. Division : _____
2. G.S. Division : _____
3. School : _____
4. Class :
4-5 6-7 8-10 11-13
5. Age :
9-10 11-13 14-16 Above 16
6. Sex : Female Male
7. Father's Occupation : Unemployed Labour Farmer Fishery
Government Sector Private Sector Business
8. Mother's Occupation : Unemployed Labour Farmer Fishery
Government Sector Private Sector Business
9. Do you have electricity? : Yes No
10. Do you have "Samurdhi" allowances? : Yes No
11. Distance to your School from home (km.) : (1-2) (2-5) (5-10) (10-15) Above 15
12. How many members are Schooling in your family (Including you)? :
1 2 3 4 or above
13. How do you come to school? : On foot Bicycle School bus Bus Van
Trisho Train Tractor Others
14. If you are coming to school by bus walking distance to the bus halt from residence (km.) :
Less than $\frac{1}{4}$ $\frac{1}{4} - \frac{1}{2}$ $\frac{1}{2} - 1$ 1 - 2 Above 2
15. Do you have a bicycle? : Yes No

16. If having using for : Mother or Father to go to work
To transport domestic items
Other transport needs
Go to school

17. If you are going to school on

foot bicycle hoe do you travel : My self with Father with Mother with Sister/Brother

If you are coming to school on foot bicycle fill in the following numbers from 18 to 23

18. At what age you started coming to school on a bicycle (years)
6-7 8-10 11-13 Above14

19. Do you have a parking area No Yes Not sufficient area No safety

20. Do you go for tution on bicycle: Yes No Not going for tution

21. Do you use bicycle for other

journeys : Yes No

22. Your feeling when you

travel to school on bicycle : Happy Unhappy

23. The difficulties when travelling to school on bicycle :

(i) Environmental reasons : Dust Rain Heat

(II) Obstructions : From other vehicles From animals

Bad conditions of roads Hilly terrain

(III) Are there repair centers

for bicycles : Yes No Out of towr

24. If you have a bicycle do you use it

for schooling : Yes No

25. If not using give reason

: Can't ride Dislike No safely

Social attitudes Religious Restriction Others

தேசிய போக்குவரத்து ஆணைக்குழு

பாடசாலை மாணவர்களுக்கான துவிச்சக்கர வண்டி பாவணையை மேம்படுத்துவதற்கான
தகவல் சேகரிப்பு

கிழக்கு மாகாணம் - திருகோணமலை

1. பிரதேச செயலாளர் பிரிவு :
2. கிராம சேவகர் பிரிவு :
3. பாடசாலை :
4. வகுப்பு : 4-5 6-7 8-10 11-13
5. வயது : 6-10 11-13 14-16 16 மேல்
6. பால் : பெண் ஆண்
7. தந்தையின் தொழில் : தொழில் அற்றவர் தொழிலாளி கமத்தொழில்
அரசதுறை தனியார் துறை வியாபாரம்
8. தாயின் தொழில் :  தொழில் அற்றவர் தொழிலாளி கமத்தொழில்
அரசதுறை தனியார் துறை வியாபாரம்
9. மின்சார பாவணை உண்டா? : ஆம் இல்லை
10. சமுர்த்தி கொடுப்பணவு உண்டா? : ஆம் இல்லை
11. பாடசாலைக்கும் உமது வீட்டிற்கான தூரம் (கி.மீ.) : (1-2) (2-5) (5-10) (10-15) 15 மேல்
12. பாடசாலை செல்லும் குடும்ப அங்கத்தினர் எண்ணிக்கை : 1 2 3 4
13. பாடசாலை வரும் விதம்? : நடந்து துவிச்சக்கரவண்டி பாடசாலை பேருந்து பேருந்து
முற்சக்கர வண்டி புகையிரதம் ட்ரக்டர் ஏனையவை
14. பாடசாலை வரும் விதம் நடந்தேயானால் வீட்டிற்கும் பாடசாலைக்குள்ள தூரம் : $\frac{1}{4}$ ம் குறைவு $\frac{1}{4} - \frac{1}{2}$ $\frac{1}{2} - 1$ 1 - 2 2 மேல்
15. உம்மிடம் துவிச்சக்கர வண்டி உள்ளதா? : ஆம் இல்லை

16. அதை பயன்படுத்துவது : பெற்றோர் வேலை செல்ல
- கம பொருட்களை கொண்டு செல்ல
- நகரத்திற்கு செல்ல
- பாடசாலை செல்ல

17. நீங்கள் பாடசாலைக்கு துவிச்சக்கர வண்டியில் வரும் போது அதை செலுத்துபவர்:

நீங்கள் தந்தை தாய் சகோதரர் / சகோதரி

நீங்கள் பாடசாலைக்கு வருவது துவிச்சக்கர வண்டியால் எனின் 19 முதல் 25 வரை உள்ள வினாவிற்கு பதில் அளிக்கவும்

18. நீங்கள் பாடசாலைக்கு துவிச்சக்கர வண்டியில் வர ஆரம்பித்த வயது :

6-7 8-10 11-13 14 மேல்

19. உமது துவிச்சக்கர வண்டியை நிருத்த பாடசாலையில் தரிப்பிடம் உள்ளதா?

ஆ இல்லை போதுமான இட வசதி இல்லை பாதுகாப்ப இல்லை

20. துவிச்சக்கர வண்டியில் பகுதி நேர வகுப்பிற்கு செல்வீரா? ஆம் இல்லை நேர வகுப்பிற்கு செல்வதில்லை

21. துவிச்சக்கர வண்டியை வேறு பிரயாணங்களுக்கு பயன் படுத்துவீரா? ஆம் இல்லை

22. துவிச்சக்கர வண்டியில் பிரயாணிக்கும் போது உமது உணர்வு : சந்தோசம் சந்தோசமின்மை

23. துவிச்சக்கர வண்டியில் பாடசாலை வரும் போது ஏற்படும் தடைகள் :

(i) சூழல் காரணங்கள் : தூசி மழை வெயில்

(ii) ஏனையவை : மற்ற வாகனங்களின் மூலம் மிருகங்களின் மூலம் சீரற்ற பாதை
மேடான சுற்றுப்புற சூழல்

(iii) துவிச்சக்கர வண்டியை திருத்துமிட வசதிகள் உண்டா? ஆம் இல்லை நகரத்தில் இல்லை

24. உம்மிடம் துவிச்சக்கர வண்டி இருந்தால் அதை பாடசாலை செல்ல பயன் படுத்துவீரா?

ஆம் இல்லை


25. பயன் படுத்துத்த முடியாதற்கான காரணம் : செலுத்த முடியாது விருப்பமின்மை

பாதுகாப்பின்மை சமூக காரணங்கள் சமய கட்டுப்பாடு ஏனையவை

ජාතික ගමනා ගමන කොමිෂන් සභාව

පාසැල් ලමුන් සඳහා පාපැදි භාවිතය ව්‍යාප්ත කිරීම සඳහා වූ සමීක්ෂණයේ ප්‍රශ්නාවලිය

නැගෙනහිර පළාත - ත්‍රිකුණාමලය දිස්ත්‍රික්කය

1. ප්‍රාදේශීය ලේකම් කොට්ඨාශය : _____
2. ග්‍රාමසේවා වසම : _____
3. පාසැල : _____
4. පන්තිය :
4-5 6-8 9-10 11-13
5. වයස (අවුරුදු)
9-10 11-13 14-16 16ට වැඩි
6. ස්ත්‍රී පුරුෂ භාවය : ස්ත්‍රී පුරුෂ
7. පියාගේ රැකියාව  : රැකියාවක් නැත කම්කරු ගොවි ධීවර
රජයේ රැකියාව පුද්ගලික අංශය ව්‍යාපාර
8. මව රැකියාවක් කරන්නේද? : රැකියාවක් නැත කම්කරු ගොවි ධීවර
රජයේ රැකියාව පුද්ගලික අංශය ව්‍යාපාර
9. ඔබගේ නිවසට විදුලිය තිබේද? : ඔව් නැත
10. ඔබ පවුලට සමෘද්ධි ප්‍රතිලාභ ලැබෙන්නේද? ඔව් නැත
11. නිවසේ සිට පාසැලට ඇති දුර කි.මී :
(1-2) (2-5) (5-10) (10-15) (15ට වැඩි)

12. ඔබ පවුලේ පාසැල් යන සහෝදර සහෝදරියන් කීයක් සිටීද?

(ඔබ ඇතුළුව)

1 2 3 4 හෝ ඊට වැඩි

13. ඔබ පාසැලට පැමිණෙන්නේ :

පයින් බයිසිකලයෙන් පාසැල් බස් බස් රථයෙන් වෑන්රථයෙන්
රථයෙන්

ත්‍රිරෝද රථයෙන් දුම්රියෙන් ට්‍රැක්ටරයෙන් වෙනත්

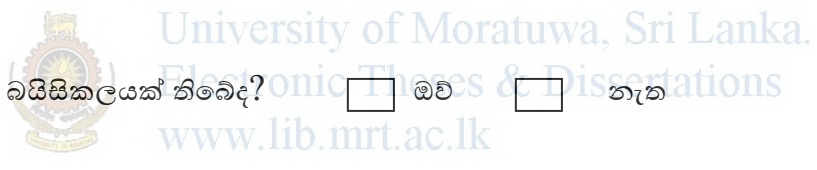
14. ඔබ පාසැලට පැමිණෙන්නේ බස් රථයෙන් නම්

බස් රථයට ගොඩවීමට පැමිණිය යුතු දුර :

(කිලෝ මීටර) 1/4 ට අඩු 1/4 - 1/2 1/2-1 1-2 2 ට වැඩි

15. ඔබගේ නිවසේ බයිසිකලයක් තිබේද?

ඔව් නැත



16. තිබේ නම් බයිසිකලය පාවිච්චි කරන්නේ කුමක් සඳහාද?

මව හෝ පියා කෘෂි නිශ්පාදන

රැකියාවට යාමට ප්‍රවාහනයට

අනෙකුත් ප්‍රවාහන පාසැල් යාමට

අවශ්‍යතා

17. ඔබ පාසැලට පැමිණෙන විට බයිසිකලය පදවන්නේ :

මා විසින් පියා විසින්

මව විසින් සහෝදරියක් හෝ

සහෝදරයෙක් විසින්

ඔබ පාසැලට පැමිණෙන්නේ බයිසිකලයෙන් නම් , 18 සිට 23 දක්වා සම්පූර්ණ කරන්න.

18. ඔබ විසින් බයිසිකලය පදවාගෙන ඒමට පටන්ගත් වයස :
 (අවුරුදු) 6-7 8-10 11-13 14 ට වැඩි

19. ඔබගේ බයිසිකලය නැවැත්වීමට ස්ථානයක් පාසැලේ තිබේද?

ඇත නැත ඇත නමුත් ප්‍රමාණවත් ආවේ නැත.

20. ඔබ උපකාරක පන්ති යාමට බයිසිකලය පාවිච්චි කරනවාද?

පන්ති යන්නේ නොකරමි බයිසිකලයක් පාවිච්චි විවිධ

21. පාසැල් වෙලාවෙන් පසු වෙනත් ගමන් යාම සඳහා බයිසිකලය පාවිච්චි කරන්නේද? ඔව් නැත

22. ඔබ පාසැලට බයිසිකලයෙන් පැමිණෙන්නේ : සතුවින් අසතුවින්

23. බයිසිකලයෙන් පාසැල් යාමේදී ඇතිවන දුෂ්කරතා :

(i) පරිසර හේතු : දූවිලි වර්ෂාව හිරු රශ්මිය

(ii) ඇතිවන බාධා : අනිකුත් වාහන වලින් සතුන්ගෙන්

මාර්ග තත්වය අබලන් වීම කඳු පල්ලම් සහිත වීම

(iii) බයිසිකලය අලුත් වැඩියා කර ගැනීමට ස්ථාන තිබේද? ඇත නැත ඇතින් පිහිටා ඇත.

24. ඔබට බයිසිකලයක් තිබේ නම් පාසැල් යාමට එය පාවිච්චි කරන්නේද? ඔව් නැත

25. නැතිනම් එයට හේතුව,

පැමිණීමට නොහැක කැමැත්තක් නැත ආරක්ෂාව නැතිකම

දෙමව්පිය සහ සමාජීය ආකල්ප ආගමික සීමාවන් වෙනත්