

# Rural Transport Training Materials

## Module 4:

### Rural Mobility

# Promoting the use of IMTS: Case Study Sri Lanka

## Session 4.2

## Part 2

Presentation 4.2a



# 1. Introduction

## Learning Objectives

This session enables participants to:

- ③ Explore the current use of IMTs in Sri Lanka
- ③ Examine the factors affecting the provision of IMTs in a given context
- ③ Reflect on the lessons learnt from the Sri Lanka experience and consider how they may be applied to other countries

# Session Overview

- ③ Overview of transport in Sri Lanka
- ③ Case study areas
- ③ Vehicle use and economic aspects
- ③ Factors affecting provision on rural transport services

## 2. Transport in Sri Lanka

### © 94,800 kilometres of road

- third are paved
- network per inhabitant - larger than any other South Asian country
- 2x the average in East Asia

### © Problems

- maintenance and congestion on major routes
- freight & passenger services are deregulated and competitive

### © Transport at the rural level

- dominated by the bicycle for personal travel and marketing functions
- ox carts, and 2 and 4 wheel tractors transport the bulk of agricultural produce

# 3. Case study areas

## Malagala village

- ⊙ Accessible along a **single track paved road**
  - 5 km from Parduka the main service centre
- ⊙ Bulk of production is for **subsistence**
  - excess bought by traders to sell in Parduka
  - small amounts of cash crops would make individual trips to market unprofitable
- ⊙ **Goods transport** in the village is used for
  - building materials
  - firewood
  - small amount of agricultural produce

## ⊙ Regular **bus** service

- provides travel for most activities outside of the immediate vicinity of the village

## ⊙ **Bicycles** predominate - used for

- personal transport - to get to alternative sources of income
- satisfies nearly all peoples needs - travel to markets, friends and relations, employment, grinding mills, fields and for the harvest from the rubber plantations

© Richer people use **motorcycles** for similar tasks as bicycles

© **Power tiller**

- agricultural preparation
- village level transport including the transport of fertiliser, harvest, firewood, building materials and to local markets

# Madiyawa village

- ◎ Nearest service centre to is Maho
  - 10km from the village along an earth road
  - impassable during the rainy season
- ◎ **Lack of a bus service** leaves the villagers feeling very isolated
  - unable to visit anyone outside the village
  - restricted in the work they can accept because of their limited travelling range
  - **result** ... the more dynamic members of the community leave altogether
- ◎ Most common form of transport is by **bicycle or foot**



◎ **Bicycle** - predominant transport mode

◎ Role of the bicycle

- more **important** in this village because of the lack of a bus service

◎ **Power tiller** becoming increasingly important

◎ **Ox carts** services are falling

◎ **Motorcycles** are used by

- traders (dried fish is a popular product)
- shop keepers
- richer people for personal travel
- motorcycle owners are often asked to transport the sick to hospital

## Oxen

- agricultural preparation
  - but their use for transport is nearly finished due to competition from the power tiller

## Tractors

- mainly for transport
  - ... because the paddy fields are so wet that they cannot hold the weight of a tractor

The Aluwathugirigama GSN area: consists of 4 villages - Melagal Gammadda, Deniya Gammadda, Mada Gammadda, Peterkanda Colony

- ⊙ **Lack** of easily cultivable land
- ⊙ Physical infrastructure is **inadequate** - roads, tracks and paths
- ⊙ Travel within the villages - almost entirely by **footpaths**
  - unsuitable for anything other than humans
- ⊙ **Rainy season** it becomes difficult even for them
  - roads or permanent paths are washed away by heavy rains
  - ... can turn roads into rivers in a matter of minutes

© As a result of the poor village level infrastructure **vehicle ownership is very low**

- goods are transported to the roadside 2 km away by **headloading**

© **Traders rarely operate** in this area because of the difficulties of getting into the village

© Village level **scheme**

- to build appropriate roads to the village using local contractors
- but the **suitability of the road design** for heavy rains was unclear

# Venivallara

## ⊙ Government sponsored **resettlement scheme**

- landless people have been allotted two acre plots to develop as agricultural land

## ⊙ Supposed to be connected to a maintained **road network** and irrigation system - but is not complete

## ⊙ **Results**

- only an earth road - difficult to pass during the rainy season
- small traders have to cease trading during rainy season
- bus service - which stops three km away during the dry season - suspends stops altogether during the rains

## ⊙ Intensified the role of the **power tiller**

- passenger transport to nearest service centre
- large agricultural plots increased their viability

## ⊙ **Bicycles and motorcycles**

- personal transport and trading

## ⊙ Demand for **ox carts** is falling

- but some people prefer ox carts to transport of bananas - less damage

## Use of IMTs in Sri Lanka



### Case Study Activity

- A. *What key issues need to be examined when promoting the use of IMTs in the villages?*
- B. *What are the advantages and disadvantages of different types of IMT for each village?*
- C. *Which IMTs would you recommend for the villages, and why?*

# 4. Vehicle use & economic aspects

## © In Sri Lanka:

- all motorised modes are imported
- non-motorised modes are constructed locally

Bicycle

Hand cart

Motorcycle

Power tiller &  
trailer

Ox carts

Tractor &  
trailer



# Bicycle

- ◎ Most **widely used** vehicle in rural Sri Lanka
  - 446,000 in use
- ◎ Primarily used by **men**
  - acceptance of women riding bicycles has started
  - many of the household tasks conducted by women head-loading water and firewood
- ◎ **Travel uses**
  - to external sources of income
  - to markets to buy or sell produce
  - personal reasons
  - to health or educational facilities
  - to and from fields during the crop production season

## Hand cart

© **Hilly areas**

© Transport firewood, **agricultural produce** etc.

© **Locally manufactured**

- wooden box mounted on 2 axles with 4 small wooden wheels

© Only be found on **paved roads**

- inappropriate for use on rough roads because of the primitive nature of the wheels

© The carts **vary in size**

- require 1 to 4 people to push them.

# Motorcycle

- ◎ Similar functions as the bicycle
  - next step up as a vehicle for personal mobility
- ◎ 325,000 motorcycles in operation
- ◎ Motorcycle uses
  - wealthier people for their own mobility
  - commercial
    - marketing, milk, dried fish, village shop supplies and other high value perishable commodities
- ◎ Ideal for use on rough rural roads
  - except wet months (3 months/year) due to muddy roads.

## Power tiller & trailer

- ◎ First introduced into Sri Lanka in **1956**
  - 11,000 units imported up until 1975
  - currently 2,000+ imported/year
- ◎ **Rapidly becoming the most important multi-purpose agricultural and transport vehicle**
- ◎ **Ideal for**
  - small field sizes and short distances
- ◎ **Uses**
  - ploughing, threshing, pumping water, and the transport of harvest, firewood, produce to market, for marketing and passenger movement
- ◎ **Multi-purpose**
  - utilised all the year round
  - good alternative income source to farming.

## Ox carts

- ◎ **Oldest** form of animal draught power in Sri Lanka.
- ◎ **Uses**
  - ploughing: wet zone areas - soil is too wet and deep to be able to support a power tiller
  - transport of firewood, paddy, agricultural produce
  - transport of very delicate perishable goods e.g. eggs, bananas
- ◎ **Used less** intensively now
  - increased power tillers
  - only required at times of peak activity
- ◎ 1½ million Buffalo and 1 million bullocks are an important source of **draught power**

## Tractor & trailer

- ◎ Initially imported into Sri Lanka to increase **agricultural production**
- ◎ 1952 over 400 tractors were imported from UK and Australia
  - tripled the countries fleet of tractors
- ◎ Tractors entered into **co-operative pools**
  - but due to poor management and lack of spares they were under utilised and became inoperative
- ◎ Tractors
  - a competitive alternative to lorries for road haulage
  - dominated the market, particularly for short haul movements
- ◎ Total number of tractors in operation estimated 16,000 - 38,000

# Vehicle operating costs

## ◎ Ox cart

- cheapest vehicle up to about **8km** and load of **500 tonnes**

## ◎ Bicycle

- cheapest at very small levels of demand - **10 tonnes**
- only at household level and for very small business

## ◎ **Competition** between power tillers and draught animal power

- perform the same tasks but draught animal power is more labour intensive
- decline in the use of draught animal power

## ◎ **Power tillers** have better productivity

- agriculture more intensive
- costs of animal power have risen due to reduction in area to keep animals on, & feed and labour costs have also risen
- demand for agricultural and transport services increased

- ◎ **Power tiller** cheapest option up to 1000 tonnes at 10km or at 40km with a load of 500 tonnes
  - then tractor is more cost effective
- ◎ Tractor affected by **competition** from power tillers
  - fields are too small to make tractors practical
  - power tiller more suited to small, often water-logged fields
- ◎ **Tractor**
  - transport produce
  - road works for the haulage of materials



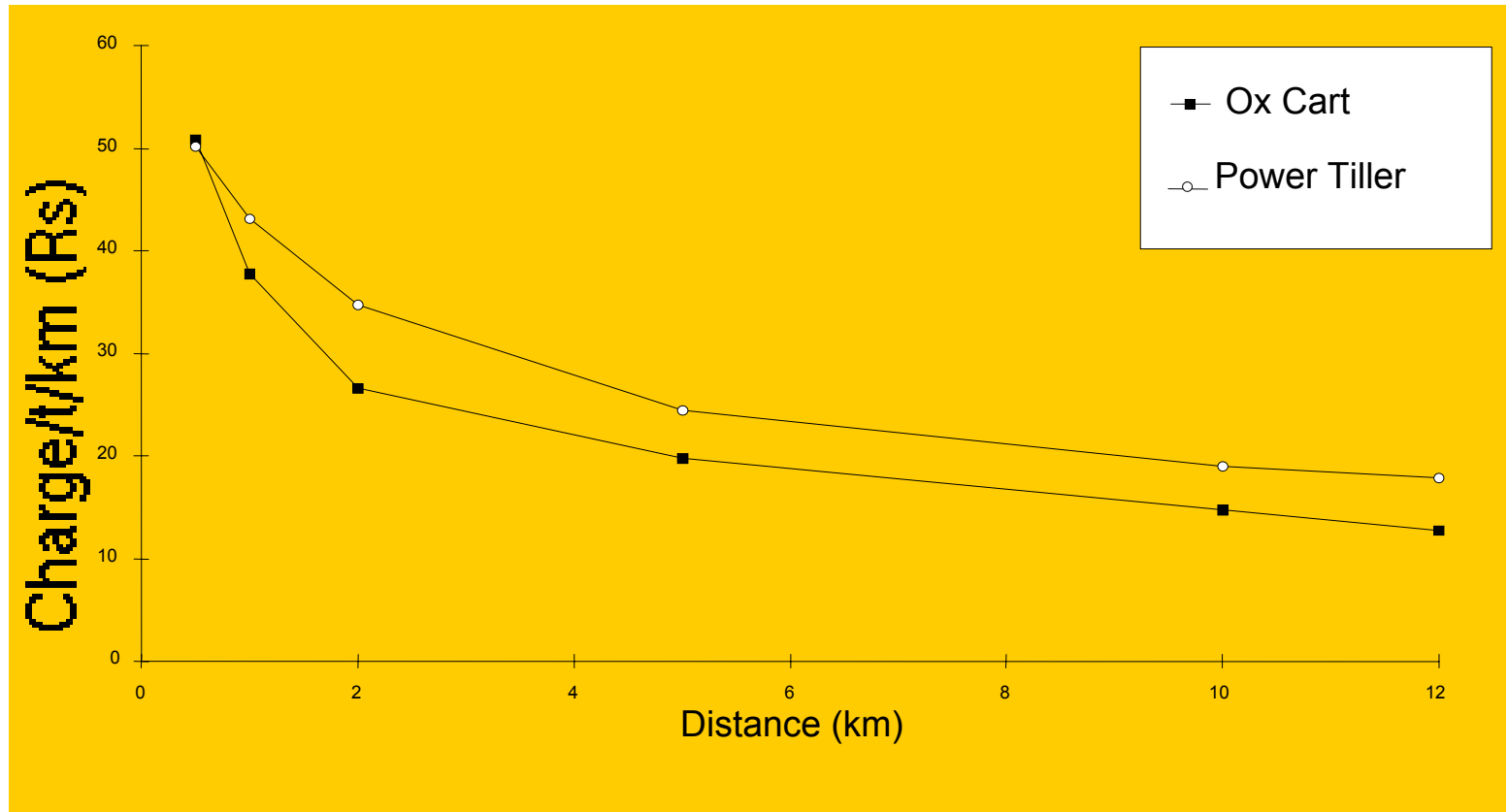
# Vehicle operating costs for a density of demand of **500 tonnes & various distances**

<b>Distance (km)</b>	<b>5</b>	<b>10</b>	<b>20</b>	<b>30</b>	<b>40</b>	<b>50</b>
<b>Power Tiller</b>	21.1	13.0	9.4	8.2	7.6	7.3
<b>Tractor</b>	42.1	22.1	12.2	8.9	7.2	6.2
<b>Ox Cart</b>	16.1	15.0	14.5	14.3	14.2	14.1
<b>Motorcycle</b>	103.9	71.7	55.6	50.2	47.5	45.9
<b>Bicycle</b>	58.6	54.5	53.2	52.5	51.8	51.3

# Vehicle operating costs for a trip distance of **10 km** and **various levels of demand**

<b>Demand (tonnes)</b>	<b>50</b>	<b>100</b>	<b>200</b>	<b>500</b>	<b>750</b>	<b>1000</b>
<b>Power Tiller</b>	60.8	37.9	20.5	13.0	13.0	13.0
<b>Tractor</b>	190.1	96.8	50.1	22.1	15.9	12.8
<b>Ox Cart</b>	22.0	17.2	15.0	15.0	15.0	15.0
<b>Motorcycle</b>	74.8	71.7	71.7	71.7	71.7	71.7
<b>Bicycle</b>	54.5	54.5	54.5	54.5	54.5	54.5

# Transport charges in Sri Lanka



# 5. Factors affecting provision of rural transport services

## Infrastructure

- ◎ Rural feeder road network in Sri Lanka is generally good
  - most rural communities have good access to these roads
- ◎ Resettlement programmes
  - remote face problems - lack of maintenance and poor design of roads
  - seasonal inaccessibility - bus services and traders stop

# Credit

## ◎ Many sources of credit available

- but for the poorest - very expensive or unavailable

## ◎ Commercial banks - reasonable rates of interest

- large percentage of the **richer farmers** use bank loans to buy agricultural machinery
- **4.5% of farmers have access to formal short term credit**
- small-scale farmers are unable to get loans because they require collateral

## ◎ Informal sources

- traders and village money lenders
- **rates very high** - 12% per month
- provide an invaluable source of credit

# Vehicle back up services

## 🌀 Repair facilities

- available in larger villages (Malagala) - motorised and non-motorised vehicles
- other villages in their nearest service centres 10-15kms away

## 🌀 Spare parts

- easily available and often manufactured within the country
- but spare part suppliers were increasing the price of spares very rapidly