

Rural Transport Services: An Overview

Arusha, 26th July 2013

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Why Transport Services ?

- Rural Transport Services has been substantially neglected by government decision makers and aid agencies.
- There has been huge concentration on roads but it has been predominantly left up to the rural population and the market to deal with providing transport.
- There is little guidance, resources, legal framework, monitoring indicators or management provided to deal with transport services.
- But we now realise that “Roads are Not Enough” and that there are many issues to deal with.

The Cycle of Poverty

- Rural transport can be thought of as a system in equilibrium with many interacting components
- For much of the developing world the system is one of a number of interacting ‘vicious circles’ holding people in poverty

The Rural Transport System & Poverty

1. The visible manifestation of poverty:

High personal effort, low long distance trip making, low goods movement, poor use of services, limited market interaction

2. The transport constraints:

Long walking distances, limited modal choice, high transport costs, poor service frequency, unsafe transport

3. The difficulties with the transport system:

Low service density, cartels and weak competition, inadequate infrastructure

4. Underlying factors causing the problem:

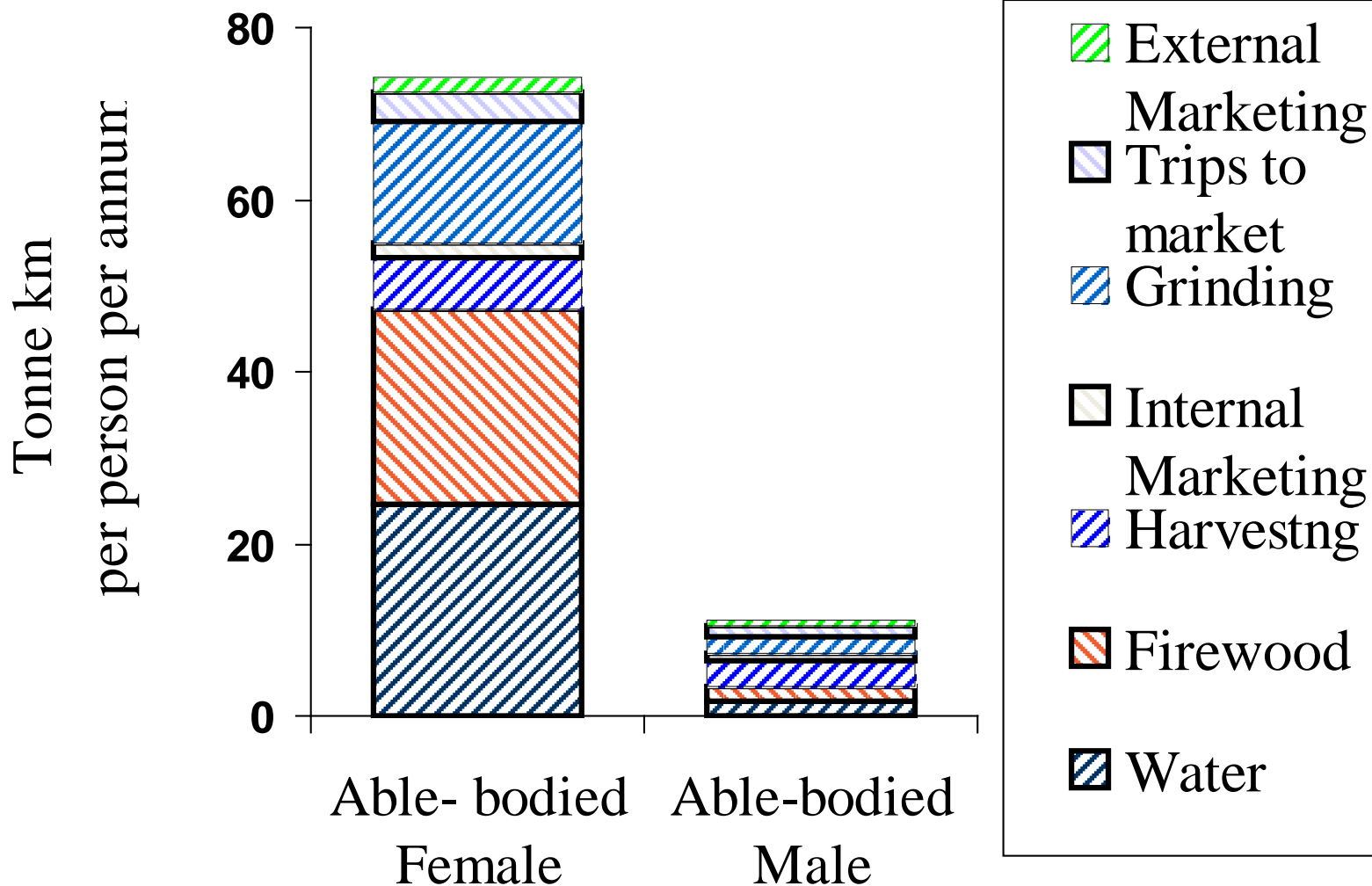
Low density of demand, weak tax base, poor infrastructure funding, weak institutional structure

1. Poor service availability
2. High fares, tariffs and underlying costs
3. Very poor safety record
4. Limited ownership of motorised vehicles in most villages and limited access to IMTs
5. Limited choice of modes
6. Particular difficulties for disadvantaged groups – old, young, infirm, women

AFCAP Rural Transport Services

the Key Issues 2.

7. Difficulty of meeting the needs of emergency transport to hospital.
8. Poor provision, funding and maintenance of infrastructure
9. Unresponsive , uncompetitive transport industry
10. Issues are “off the radar” of government
11. Weak institutional structure for dealing with services.

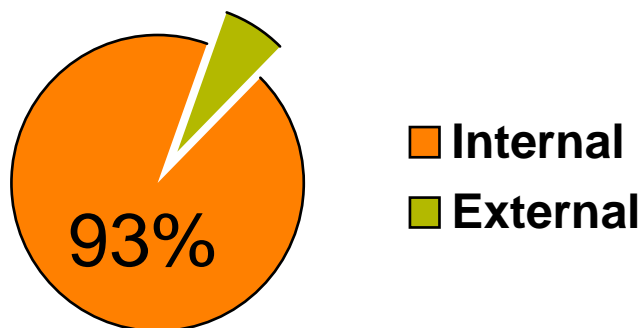




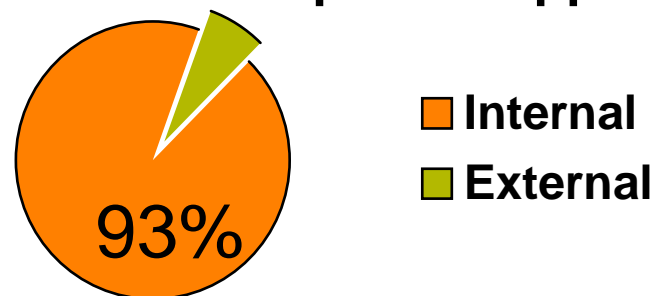


The Importance of Within-Village Transport

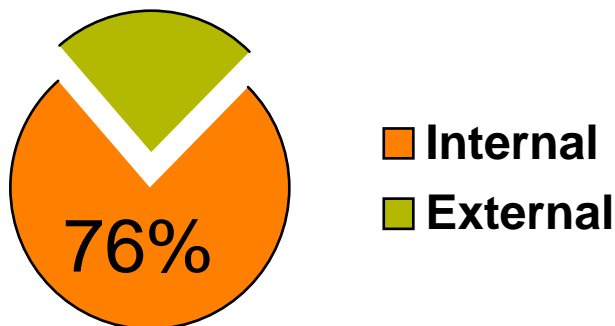
Number of trips - Ghana



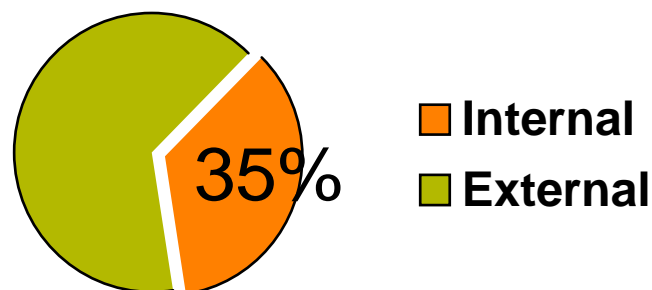
Number of trips - Philippines



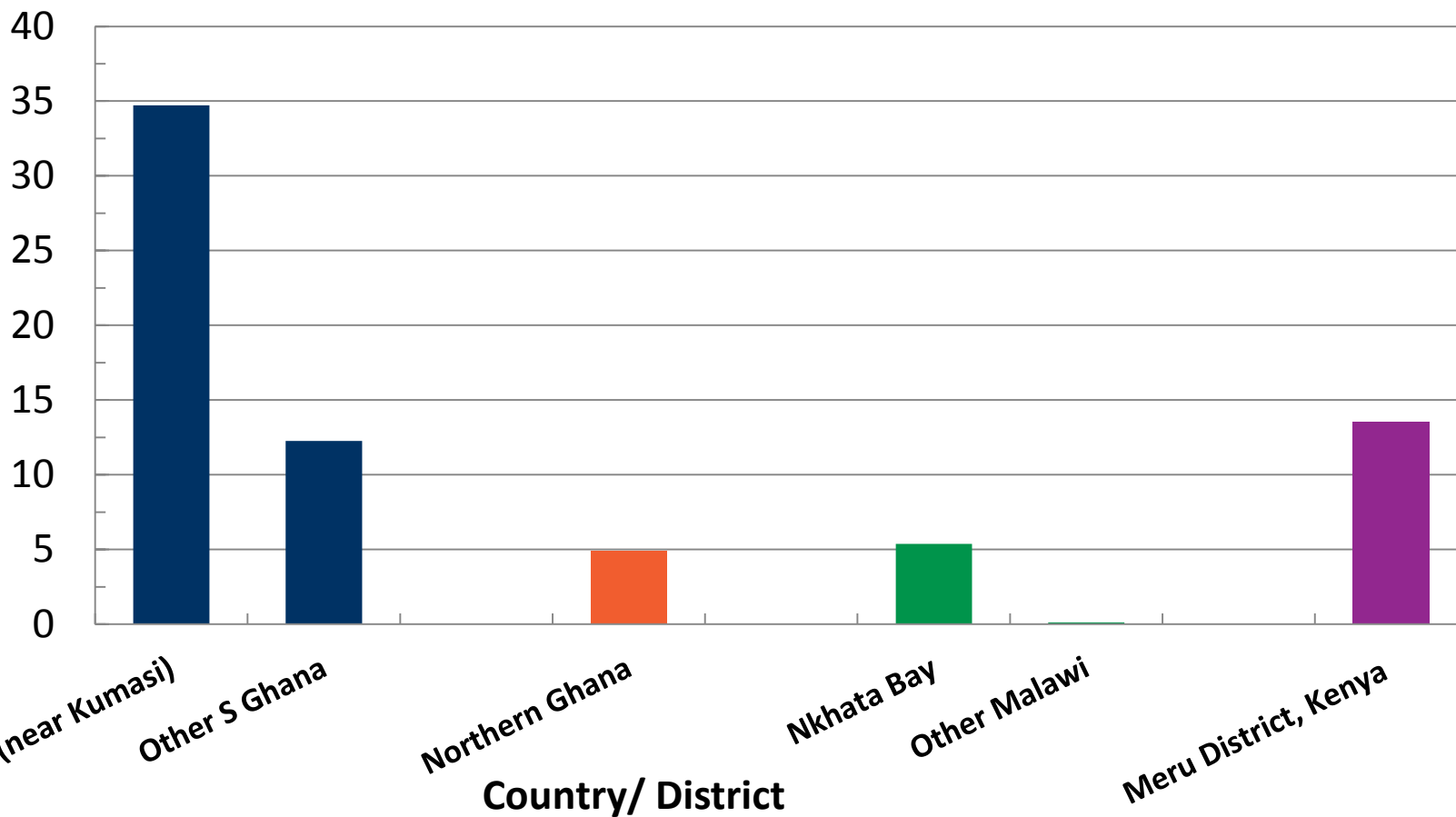
Tonne-km - Ghana



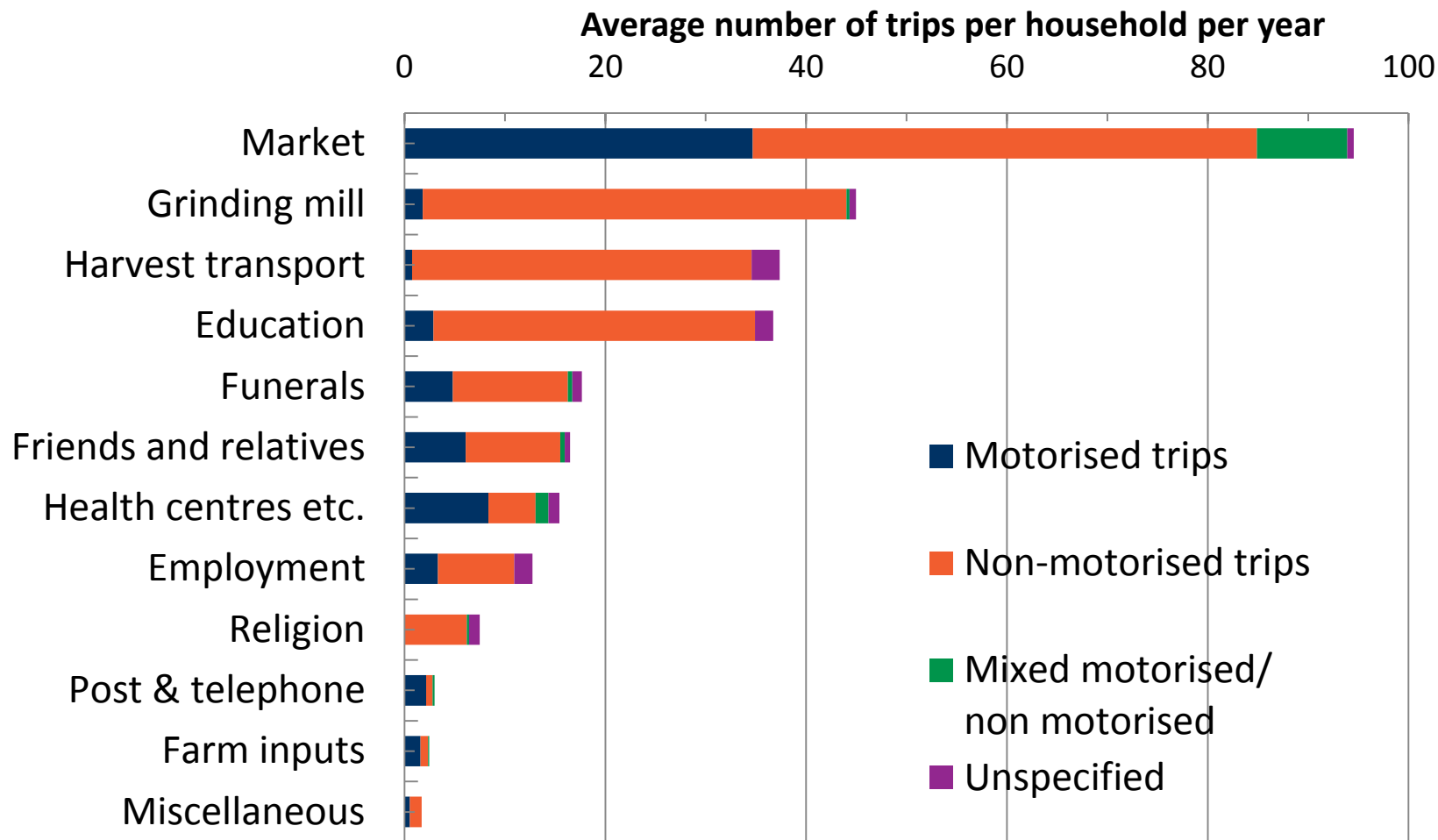
Tonne-km - Philippines



Average number of motorised (round) trips per person per year

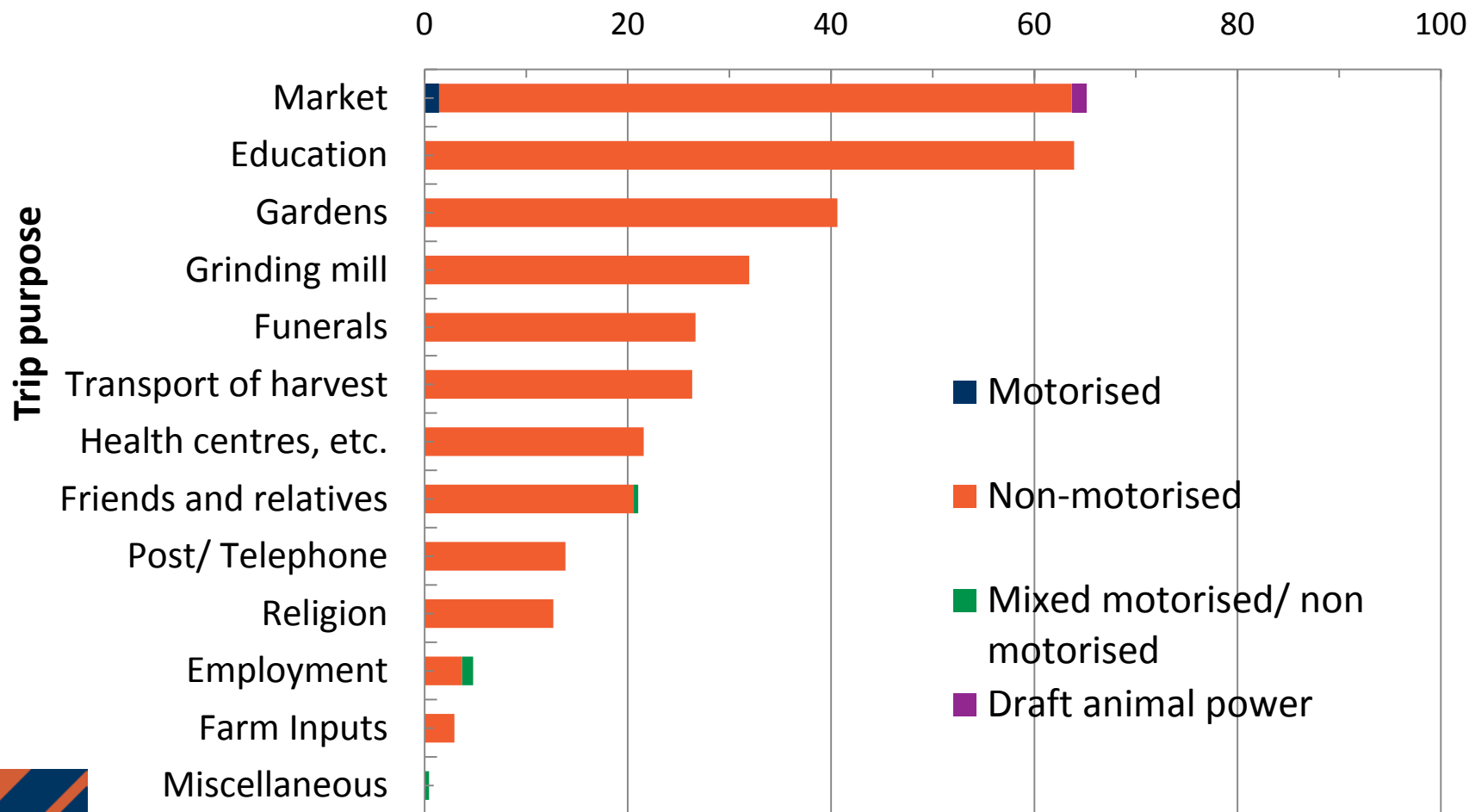


Out-of-village travel patterns by trip purpose and mode in Ghana

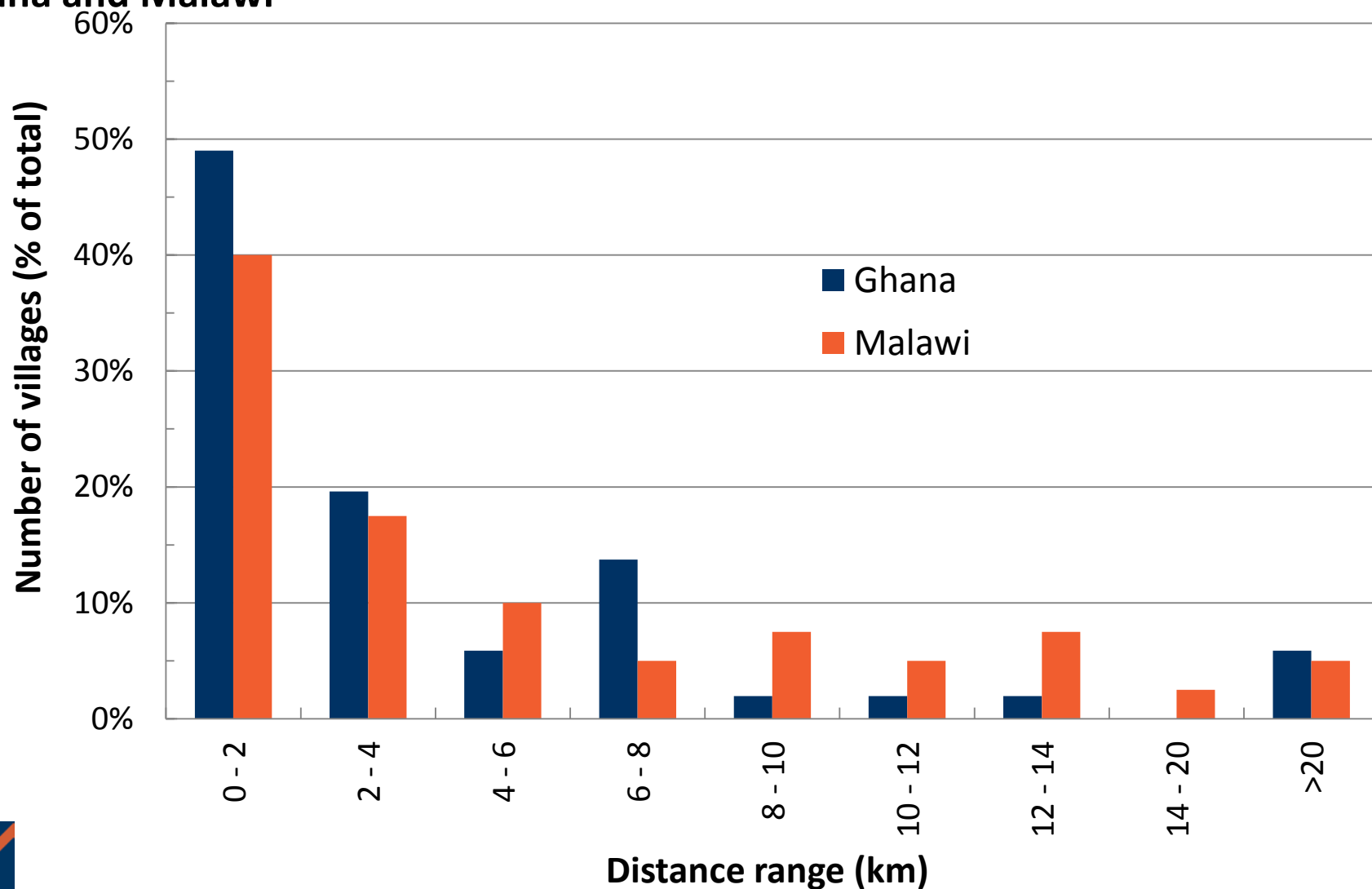


Out-of-village travel patterns by trip purpose and mode in Malawi

Average number of trips per household per year



Distance (km) of pickup point for motorised transport from village centre in Ghana and Malawi





“Transport constraints on rural livelihoods are not simply a result of poor road condition, but are a culmination of inadequate infrastructure, lack of appropriate and affordable means of transport, remoteness and physical isolation from basic services” (Dawson and Barwell, 1993)

Bicycle ambulances in Zambia

- In 2008 Transaid and World Bicycle Relief implemented a bicycle ambulance project in Zambia's Eastern Province
- 40 bicycle ambulances were built and distributed and 10 mechanics were trained in construction and maintenance skills
- 86% of trips using the bicycle ambulances were considered life saving



THE EFFECTS ON AGRICULTURE OF TEMPORARY AND SEASONAL IMPASSABILITY

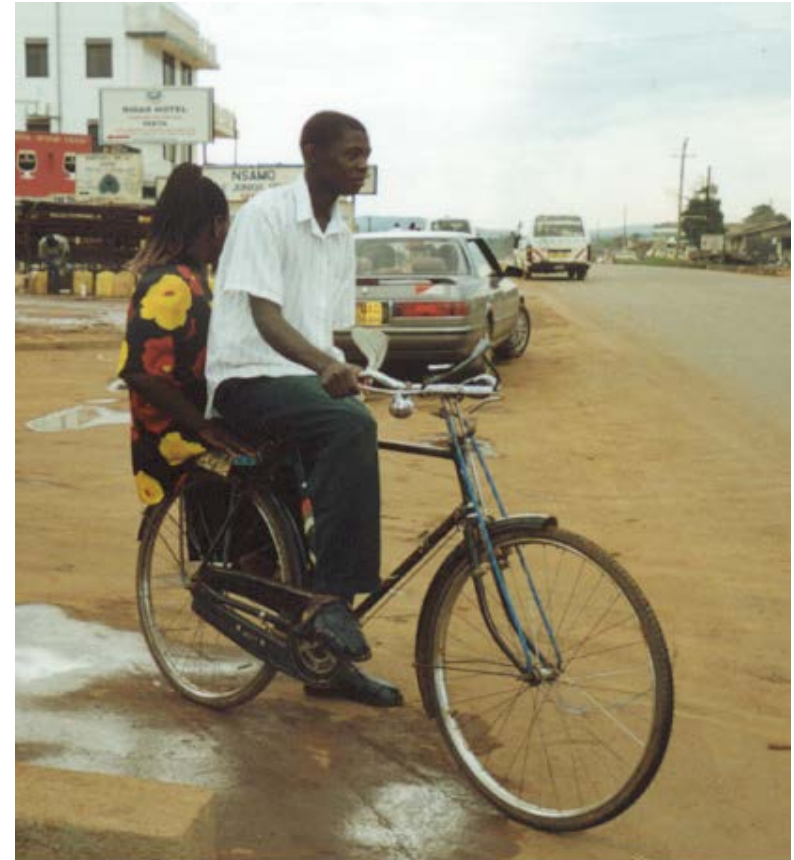
During the wet season many unpaved roads become impassable or very hard going, so transport costs rise, and this can have an effect on agriculture.

- Farm inputs – particularly the distribution of fertiliser- can be seriously affected by wet season accessibility because of the need to have them in place in time for the next growing season.
- Crops and products that are harvested through the year such as vegetables, tea and milk, and deteriorate easily once collected, can suffer serious losses if they are delayed in getting to the market or processing factory.
- Grain crops (generally harvested in the dry season) and tubers tend to be less affected by seasonal factors as they are easy to store.

THE EFFECTS OF ROUGH ROADS ON AGRICULTURE

- Many fruit crops (mangoes, bananas, tomatoes) can be seriously damaged by bruising when travelling on rough roads.
- It is possible to protect fruit by using packing materials, however these can be expensive and may transmit diseases if reused, - but packing is used in modern supply chains.
- Road quality in plantations tends to be particularly good for this reason.
- To minimise the effects of poor roads special vehicles are sometimes employed, for example to let bunches of bananas hang without rubbing against one another.

Bicycle and Motorcycle Boda Boda Operations Making Increasing of Mobile Phones



THE ADVANTAGES OF DIFFERENT MODES

Very short distances and small loads

Headloading, bicycles and hand trolleys have an advantage when moving small volumes of goods short distances. Although very expensive on ton/km basis, they can provide the lowest cost solution. Other vehicle types incur additional terminal costs and provide unused capacity so may be running nearly empty.

Intermediate distances and small to medium loads

Pack animals, animal carts, power tillers, tractors and pickups will provide the lowest cost solution

Long distance with small to medium loads

Small and medium trucks provide the lowest cost solution

Long distance transport of heavy loads

Trains, ships and heavy trucks provide the lowest long distance transport cost solution and lowest overall costs per ton/km

Vehicle operating costs for moving 500 tonnes per year over various distances, (Crossley & Ellis, 1996)

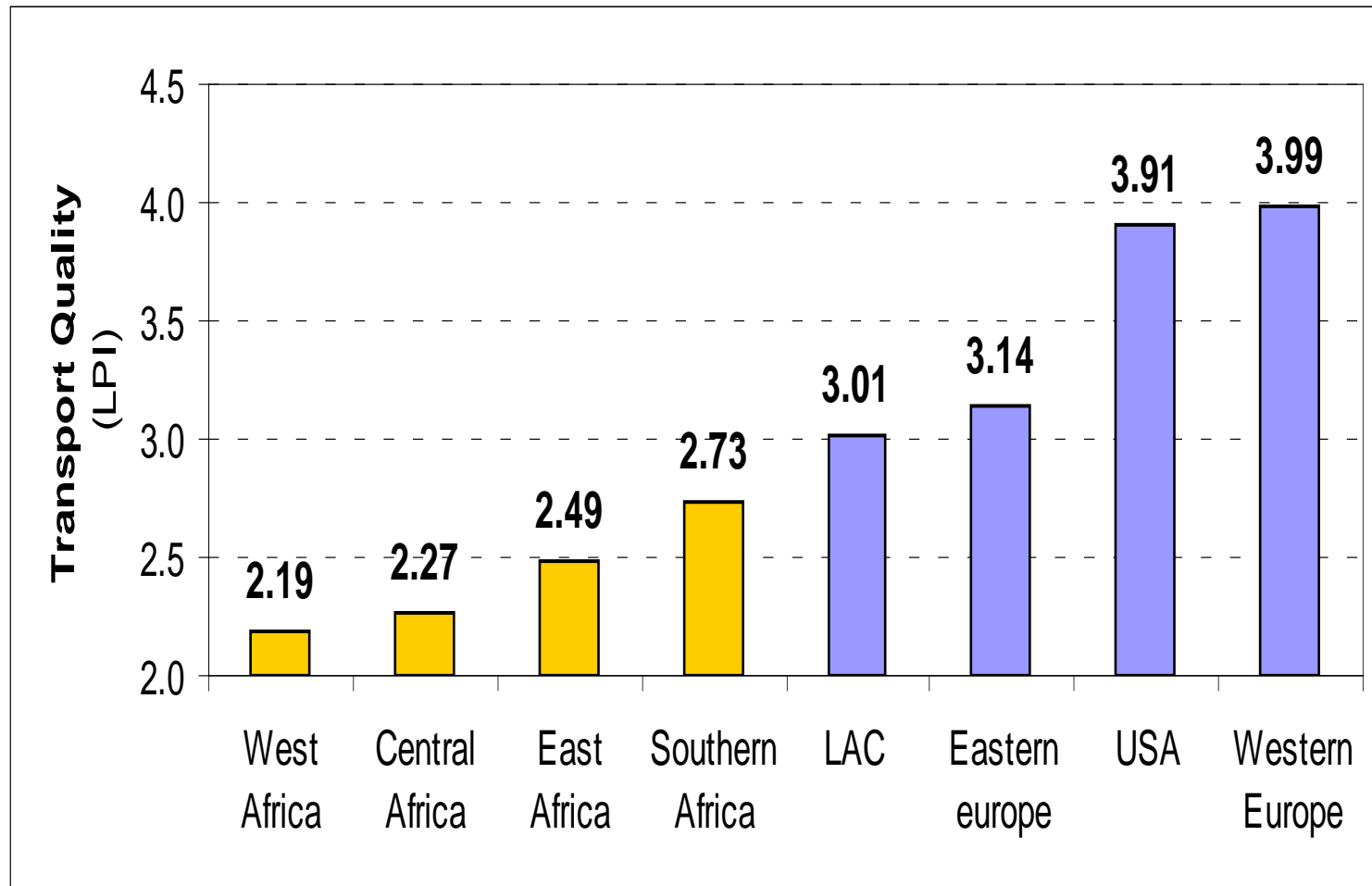
Distance (km)	5	10	20	30	40	50
Power Tiller	21.1	13.0	9.4	8.2	7.6	7.3
Tractor	42.1	22.1	12.2	8.9	7.2	6.2
Ox Cart	16.1	15.0	14.5	14.3	14.2	14.1
Motorcycle	103.9	71.7	55.6	50.2	47.5	45.9
Bicycle	58.6	54.5	53.2	52.5	51.8	51.3

DIFFERENT MODES OF TRANSPORT

- Many factories in Thailand produce the Etan farm vehicle out second hand parts. They can give low transport costs for small loads travelling short and medium distances.
- The power tiller (or single axle tractor) is now an important means of transport, particularly in rural Asia.
- Both of these vehicles may not be licensed to operate in Africa.



TRANSPORT QUALITY IS LOW IN AFRICA : LPI

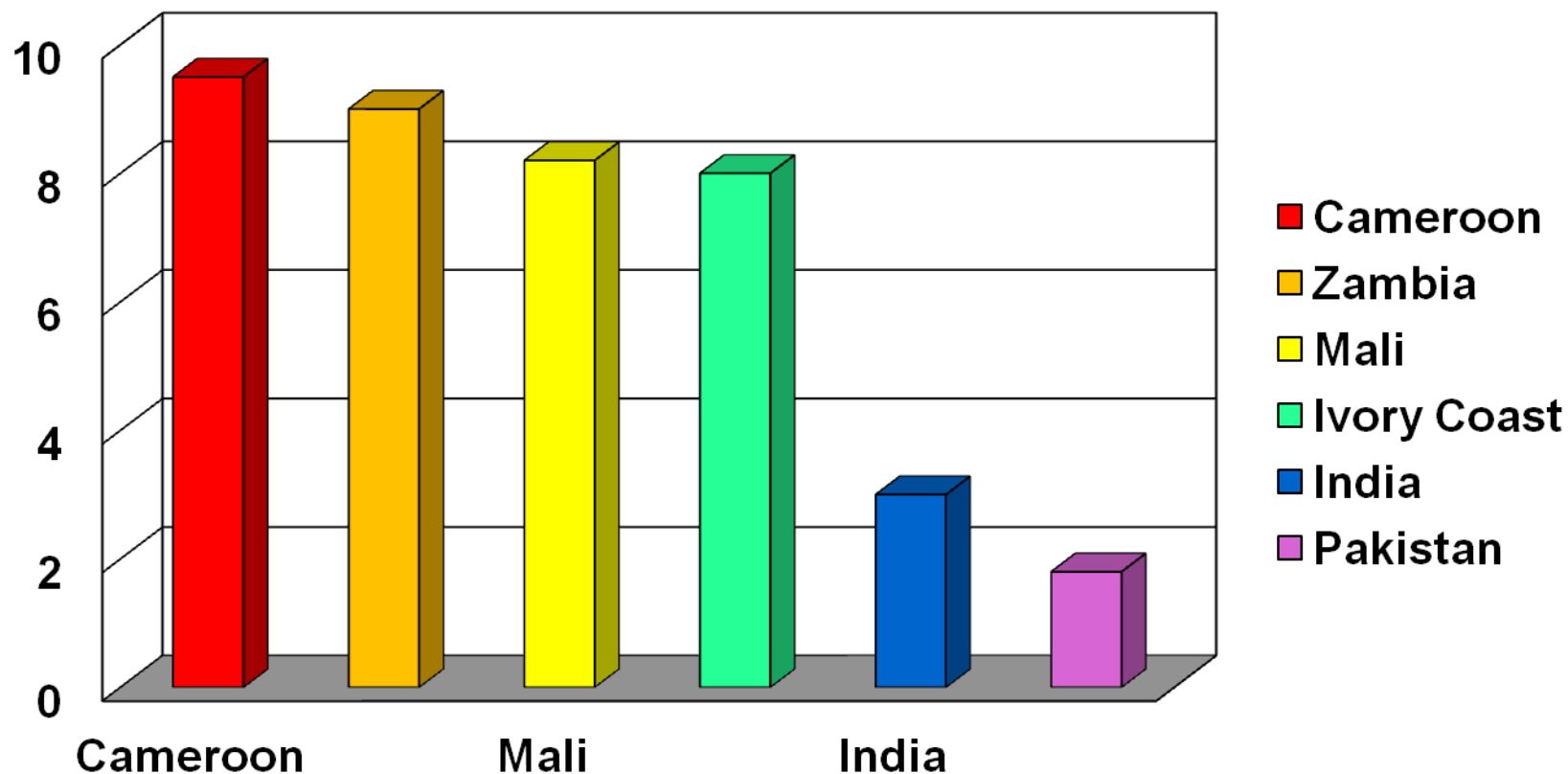


October 2007

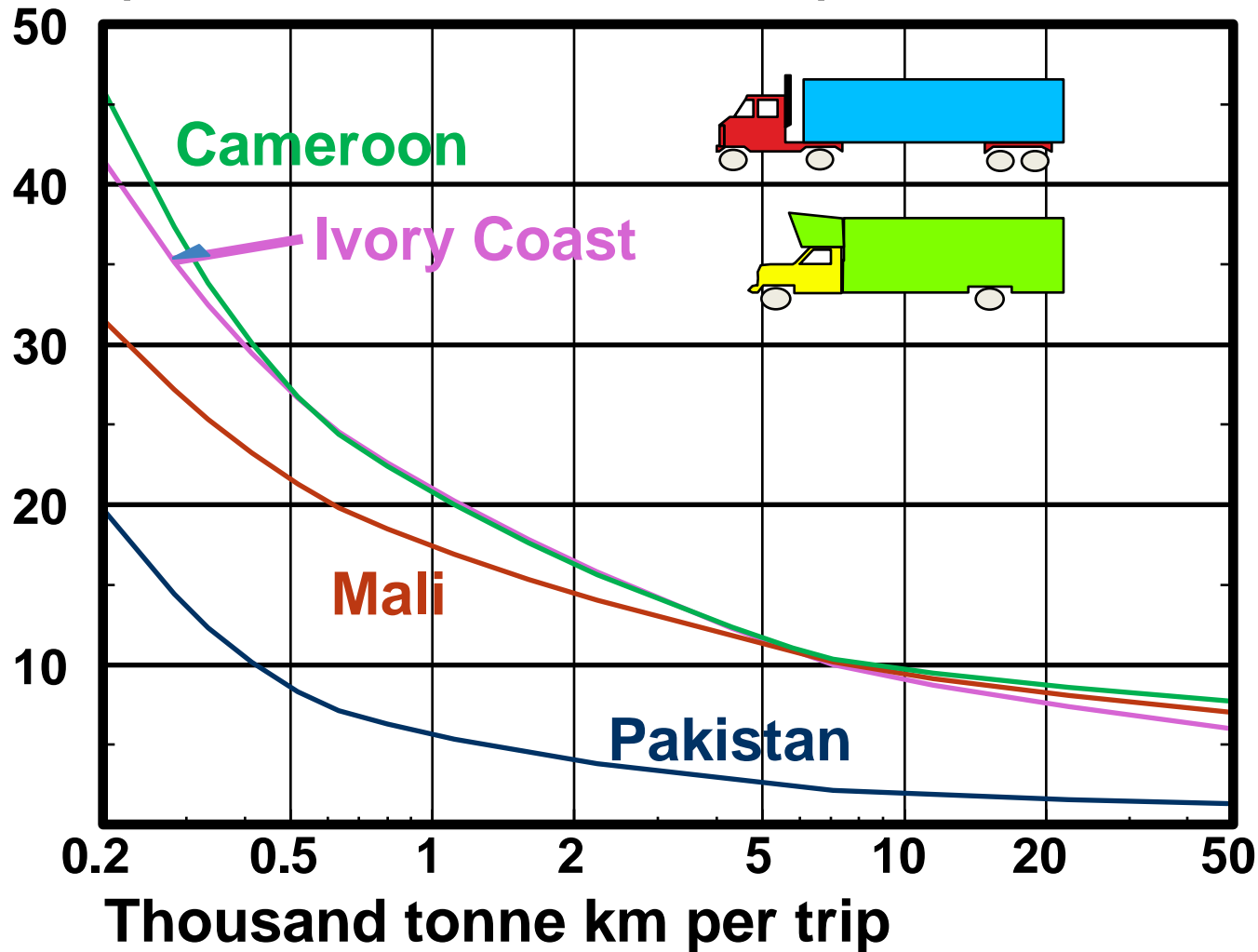
TRANSPORT COSTS IN AFRICA AND ASIA

- Over the past 25 years there have been at least five major comparative studies of transport costs in Africa and Asia
- The studies confirm that transport tariffs in Africa, for comparable journeys are many times higher than in Africa than in Asia
- However there are differences in the reasons behind the higher costs: earlier studies emphasised cost factors while the latest study by the World Bank (2009) puts more emphasis on very high profits.

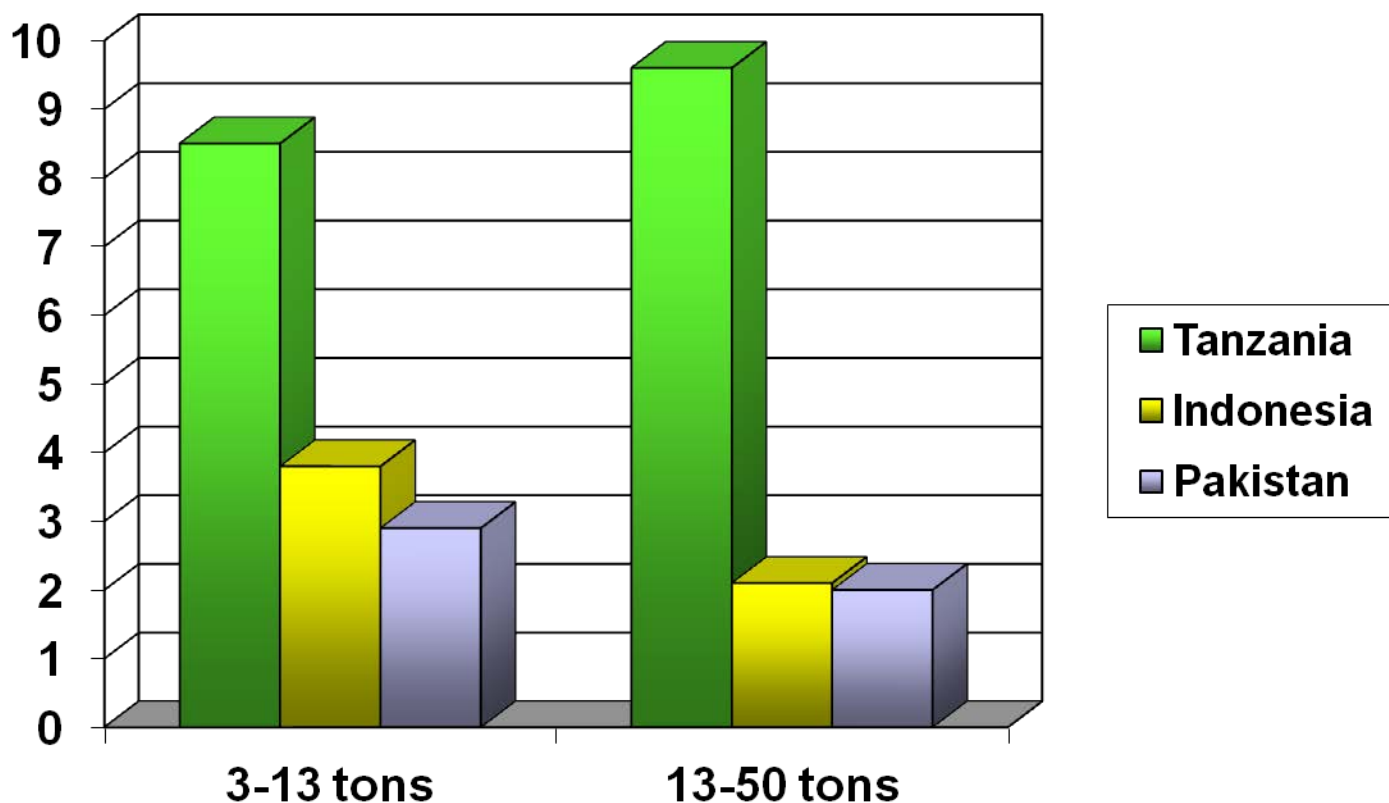
Comparison of Long Distance Tariffs: US\$ per ton km, 1988



Tariff (1988 US cents/tonne/km)



Tariffs per ton/km 1995 prices



Comparison of operating tariffs 1995 for local rural transport vehicles

	Thailand	Sri Lanka	Pakistan	Ghana	Zimbabwe
Pickup Cents /t km	8.7	-	13.7	39.0	-
Truck (8-12 t.) Cents /t km	-	-	2.1	20.6	21.4
Tractor Cents/ hr	-	320	270	1 240	740
Power Tiller Cents/ hr	123	127	-	357	-

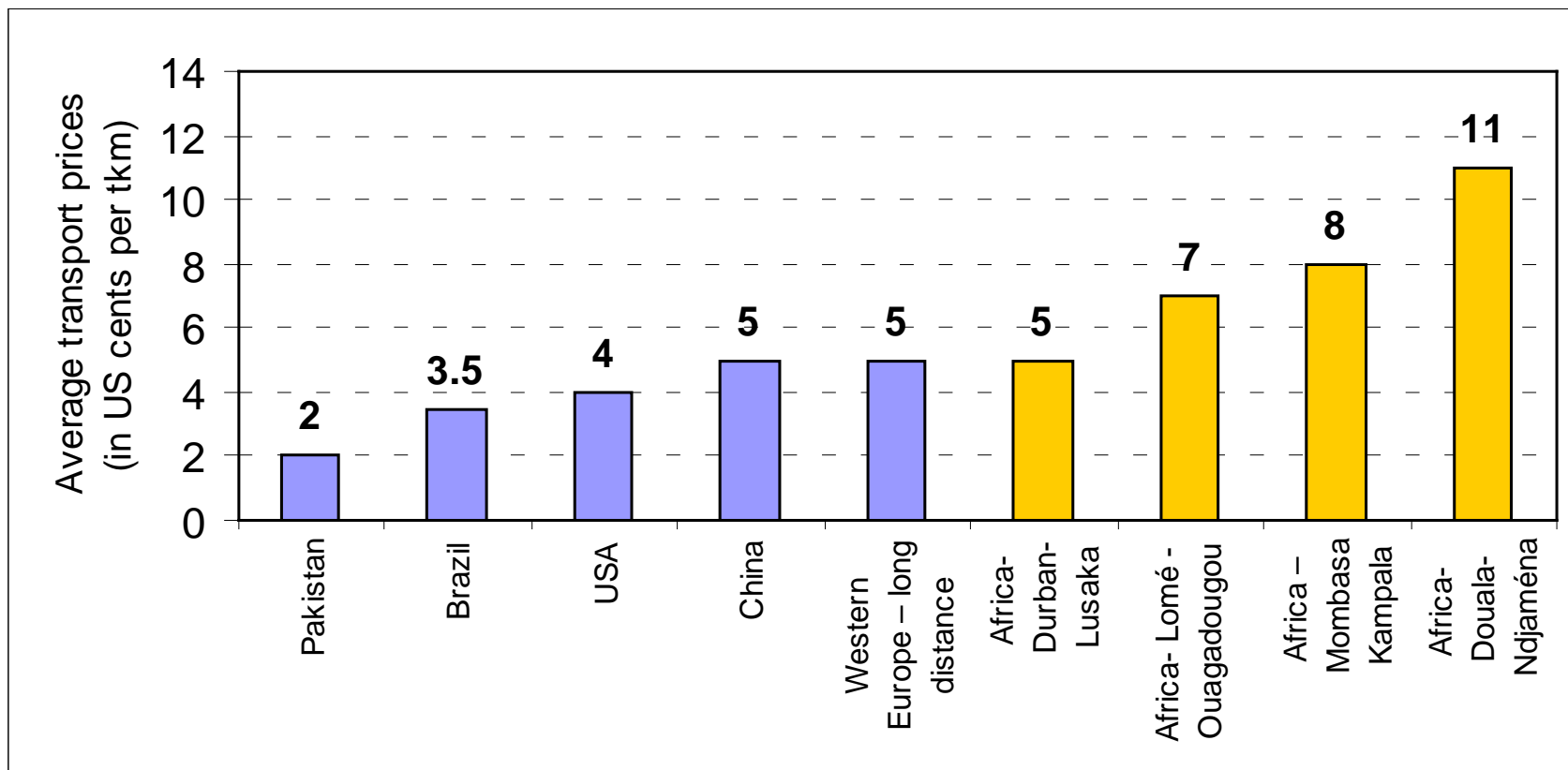
Reducing Transport Costs In Ngoundere District of Cameroon

Transport in the district was poor and costs were high because of the restrictive practises of the local transport association.

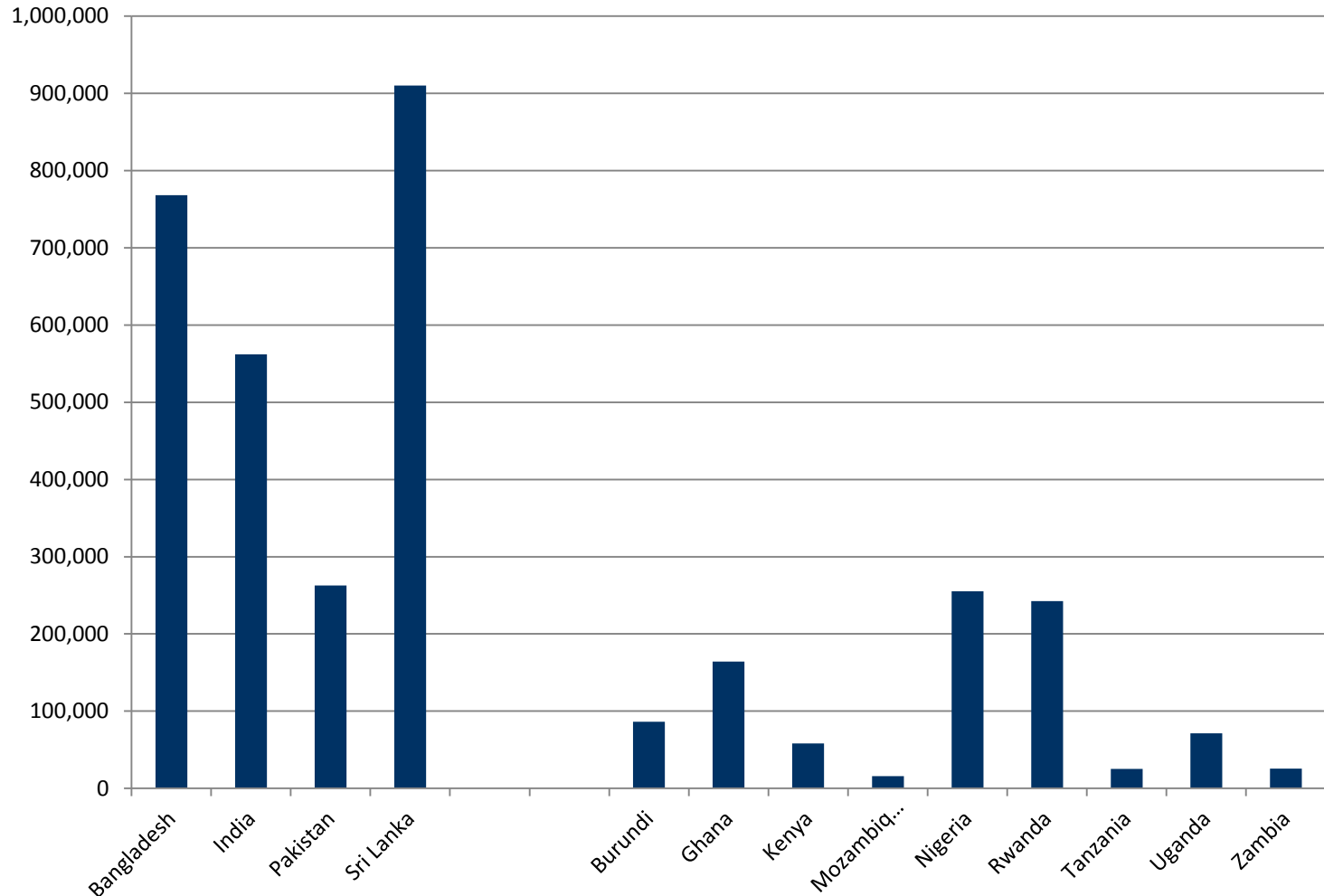
The Mayor addressed the issue by setting up rival associations operating from different bus parks.

Transport fares were dropped by 50% in 2 years and the quality of services improved

TRANSPORT TARIFFS US\$ Per Ton Km 2007 (WORLD BANK STUDY)



DENSITY OF DEMAND : GPD PER SQ KM IN 2011



HIGH TRANSPORT COSTS IN AFRICA

Earlier Studies Stressed:

- High initial input prices for vehicles, fuel, parts
- Exclusive dealerships, low demand
- Poor driver knowledge of vehicle maintenance
- Unnecessary fast driving speeds
- Poor road surfaces
- Little competition, particularly on rural routes
- Low utilisation caused by low density of demand and operation of operator cartels

HIGH TRANSPORT COSTS IN AFRICA 2

Later studies emphasised:

- Most vehicles are imported second hand
- Low utilisation of vehicles
- High barrier costs on international routes
- Super profits being made by operators
- The presence of cartels preventing competition

Infrastructure Performance and Traffic

- Appropriate solutions depend upon traffic volumes and vehicle types: pedestrians, donkeys, carts, boats, bicycles, motorbikes, cars, minibuses, trucks-
- Quality and nature of infrastructure determines what type of traffic can pass
- In general the greater the investment then the larger the vehicle types that can be accommodated and the lower variable unit operating costs –expressed per ton/km
- Performance can be improved through new investment or more intensive maintenance

PASSABILITY, TRAFFICABILITY AND ROUGHNESS

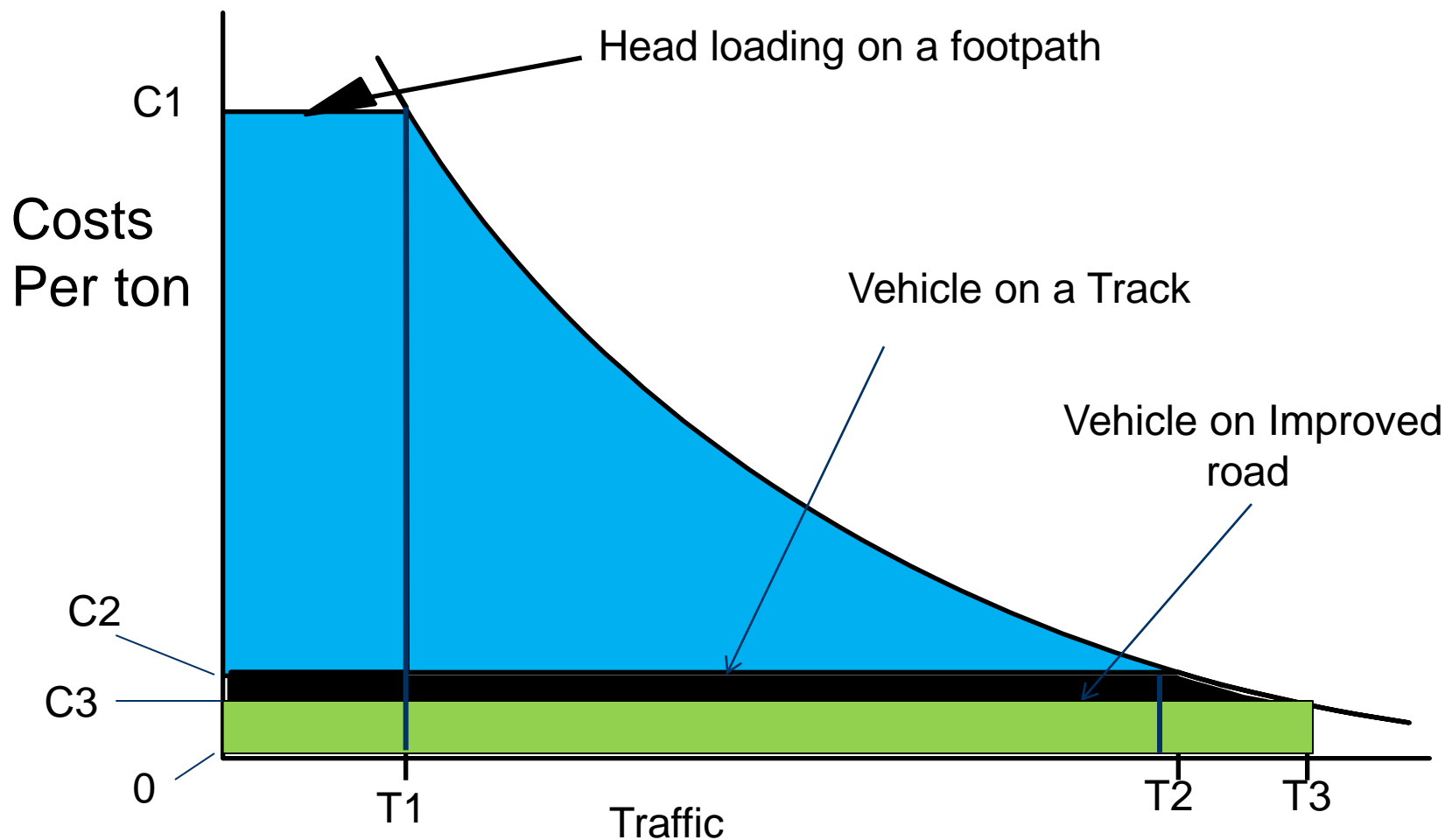
The performance of rural roads is dependent on a range of characteristics from the users perspective passability, traffickability, roughness are key.

Passability: This determines the extent to which vehicle of a given type can/ or cannot pass along the road throughout the year

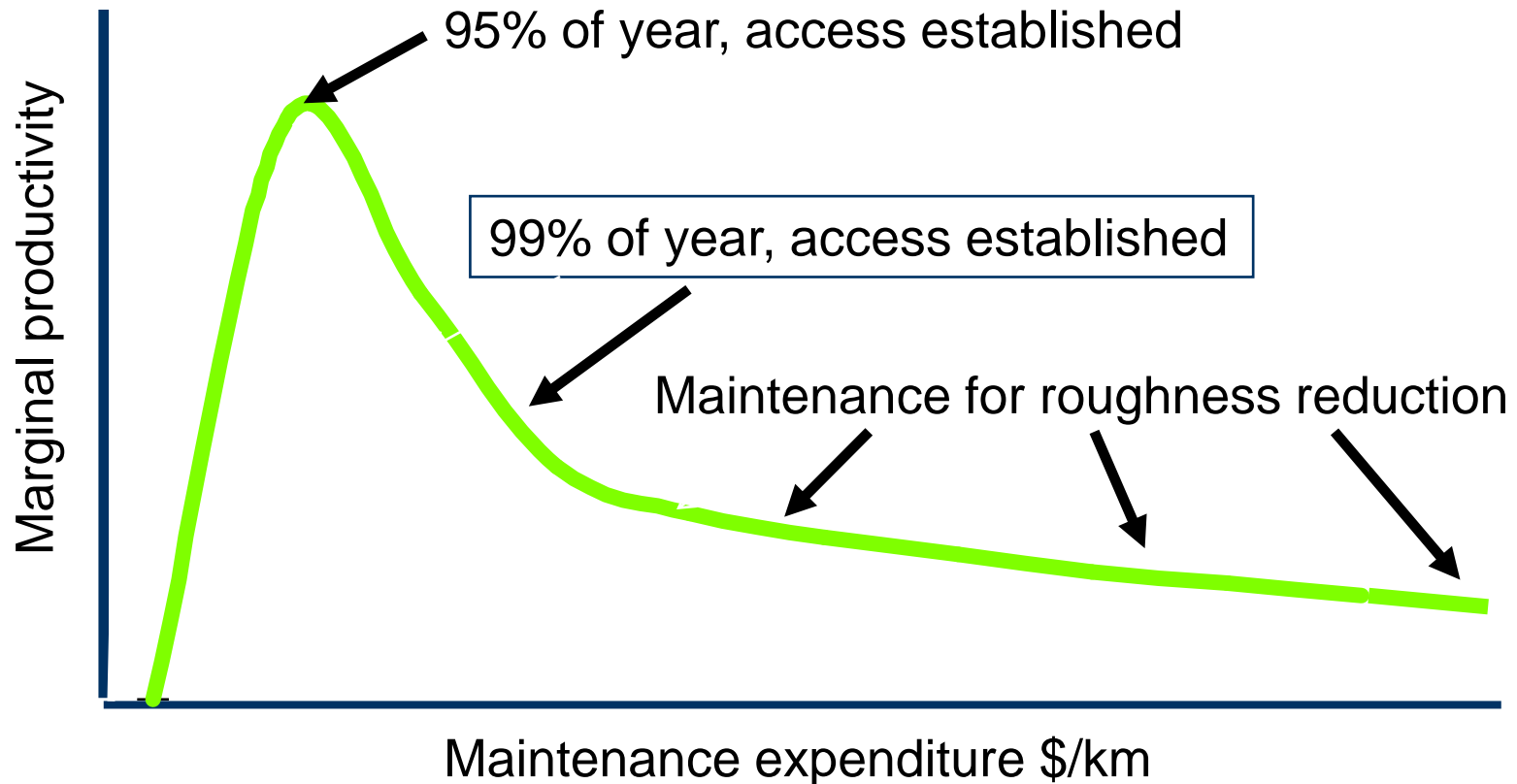
Trafficability: This characteristic indicates the ease with which a vehicle can pass. It has been found that vehicles will tend to avoid routes (even though they can physically pass) when the going is difficult. Soft mud, sand, roughness, standing water, or high vegetation can reduce trafficability

Roughness : This characteristic measures the unevenness of the road surface. A good paved road may have an IRI of 2, A very rough road will have an IRI above 20. Roughness is a key determinant of vehicle operating costs.

Illustration of Economic Benefits



The marginal productivity of maintenance expenditure



What is the Appropriate Solution for Different Traffic Levels?

- Footpath or seasonal access track- no maintenance ?
- Track with simple structures – very limited m.
- Earth road, structure, spot improvements, routine maintenance, grading ?
- Gravel road, regular grading and routine and periodic maintenance
- Bitumen surfaced road, routine and periodic maintenance

IMPROVING MOBILITY THROUGH PROMOTING IMTS

A number of initiatives have been tried to promote the adoption of Intermediate Means of Transport (IMTs) although many have not been particularly successful there are some good examples such as promotion of animal carts. Success is dependent upon making the IMT financially self sustaining, and ensuring that there are sufficient numbers to ensure that a local body of knowledge develops and repair facilities will be viable. Methods of promotion include:

- Setting up demonstration projects
- Providing loans at convenient terms
- Provide training in use and guidance for looking after animals
- Help set up repair facilities and provide training
- Ensuring that taxation levels on the import of key IMTs (bicycles, power tillers, motorcycles) is not a disincentive.
- Allowing new forms of IMT based services to be licensed for commercial hire

POSSIBLE TRANSPORT SERVICE SOLUTIONS

No Easy Solutions: Important Vested Interests will resist change

- Operator, vehicle driver licencing
- Controlling rates and fares
- Competition through rival associations (Cameroon example)
- PPP arrangements – bidding for the market
- Government owned transport services
- The village owned vehicle (Sri Lanka example)
- Monitoring prices of vehicles and parts
- Output Based Aid
- Training
- Safety Initiatives

OTHER MEASURES

- Location of services closer to household (IRAP solution)
- Improvement in child transport to schools (South African bicycle loan example) + working with schools
- Transport for Maternal Health (Nigerian Example) training taxi drivers to deal with the issue



Any
Questions?

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