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## List of Abbreviations










DANIDA	Danish Volunteer Organisation
FAO	Food and Agricultural Organisation of the United Nations
GDP	Gross Domestic Product
GNP	Gross National Product
ILO	International Labour Office (Geneva)
IMF	International Monetary Fund
IMT	Intermediate Means of Transport (Intermediate between motorised vehicles and walking; i.e. bicycles, wheelbarrows, pack animals...)
IRP	Integrated Roads Programme (World Bank Programme in Tanzania)
MIRTP	Makete Integrated Rural Transport Project
NGO	Non Government Organisation
Pkm	Passenger kilometre: One passenger transported one kilometre
SIDA	Swedish Volunteer Organisation
Tkm	Tonne kilometre: One tonne transported one kilometre
Tsh	Tanzania Shilling
UNCTADA II	Second United Nations Transport and Communications Decade
UNECA	United Nations Economic Commission for Africa
USAID	United States Volunteer Organisation
VOC	Vehicle Operating Costs
WHO	World Health Organisation
WTP	Willingness to Pay

## Unit-Conversion

Exchange Rate (May 1994)	1 US \$	518 Tsh
Area	1 Acre	0.4047 ha
Weight	1 Debe	20 kg

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## **Foreword of the Editors**

## Preface

"Le temps est un des biens les plus précieux, les plus importants de l'homme. La plus grande partie de son existence si bornée, l'homme la passe à se cultiver, à se former, à se préparer à sa destination. Le temps, où l'activité de toutes les facultés est complète, se borne à une époque bien courte et celui de la décadence des forces intellectuelles et physiques arrive promptement. C'est pourquoi tout ce qui peut hâter le développement de l'homme, augmenter son activité dans le temps de sa vigueur, diminuer les suites fâcheuses de la vieillesse est un immense bénéfice, non seulement pour les individus, mais aussi pour la société entière. ... Plus donc il sera facile à l'homme de se transporter d'un lieu à l'autre, plus il épargnera du temps et annulera d'espace durant cette translation, plus aussi le développement et l'action des forces s'accroîtront, mieux il pourra remédier à l'insuffisance de sa nature intellectuelle et physique, plus enfin l'esprit humain possède de moyens d'utiliser pour ses fins les forces et les richesses matérielles de la nature."

Friedrich List 1837, "Le Monde Marche", Réponse à la Question de l'Académie des Sciences Morales et Politiques sur l'Influence des Forces Motrices et des Moyens de Transport qui se Propagent Actuellement dans les Deux Mondes.

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"Time is one of the most valuable and important goods of mankind. Human beings spend the biggest part of their lives to educate and form themselves for their destination in life. The time when their capabilities are complete is limited to a short period and the phases when man's intellectual and physical forces are diminishing follows on swiftly. Therefore everything, which can speed up human development and increase his activities during his time of virility and reduce the consequences of his ageing, is a huge benefit not only for the individual but also for the whole society. ... The easier a human being can move from one location to the other, the more he is saving time and reducing space, the more the development and the impacts of his powers will grow, the more he will be able to overcome the insufficiencies of his intellectual and physical nature and the more his human spirit will possess the means to use the natural resources for his purposes."

Friedrich List 1837, The World is Moving, Answer to the Question of the Académie des Sciences Morales et Politiques on the Influence of the Steam Engine and the Means of Transport which Spread out in the Old and New World.

# 1 Introduction

During the last decade per capita incomes and food production of most Sub-Saharan African Countries declined. The FAO estimates that chronic undernutrition and hunger currently affects 180 million people world-wide and anticipates that this amount will probably increase to 300 million by the year 2010. Because  $\frac{2}{3}$  of the African population live in rural areas, a solution to the crisis must be found in the countryside. "Such development as there is for most Sub-Saharan African economies, for at least the next decade, is therefore likely to be 'agriculture led'."<sup>1</sup>

Poor transport conditions are generally regarded as one of the main constraints against rural development. Therefore since 1940 the World Bank spent more than \$ 62 billion world-wide in over 1000 transport projects. Since 1970 transport investments comprised 13-16 % of total expenditure. The presidency of Robert McNamara directed the bank's bias towards the construction of rural roads.

The exclusive focus of donors on roads and cars has been criticised since the 1980s, because the transport needs of rural households are neglected. In his famous World Bank Paper "Rural Poverty Unperceived" Robert CHAMBERS (1980) linked rural indigence firmly to lack of mobility. Four years later another World Bank Paper by EDMONDS and RELF concludes that 'plans, projects and existing policies in the transport sector do nothing or little for the rural poor'. This group of 'transport disenfranchised' can be conservatively estimated at world-wide to the order of 700 million people. A number of recent studies show that the rural population of many Developing Countries moves mainly by walking on paths and trails away from the rural road network and undertakes very few motorised trips. The majority of time and effort is spent for transport purposes which secure the household's subsistence needs. These transport constraints can significantly hamper rural development. The understanding that "Roads Are Not Enough"<sup>2</sup> to stimulate economic development in rural areas was grasped by the World Bank, thus launching the Rural Travel and Transport Project for Sub-Saharan Africa.

A variety of appropriate measures are available to improve the rural transport system: construction of low cost roads, tracks and paths, the introduction of Intermediate Means of Transport<sup>3</sup>, installation of rural transport services and transport avoiding measures. The questions arise which of these transport interventions have the strongest effects and which the highest

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<sup>1</sup> HELLEINER (1992 p.58); compare as well TIMMER (1988).

<sup>2</sup> Title of the book by BARWELL and DAWSON (1993)

<sup>3</sup> Intermediate Means of Transport are appropriate technologies which are intermediate between motorised vehicles and walking; i.e. bicycles, wheelbarrows, pack animals...

efficiency? Which transport interventions are most appropriate for which phase in development? How can rural transport investments be financed and the maintenance secured regarding the poor financial situation of governments and rural households? Which assessment methodologies can be used to estimate future effects of appropriate transport interventions?

This thesis tries to find answers to these questions with an empirical study and an econometric model. In the following Chapter 2 an overview of the state of research on rural transport in Sub-Saharan Africa is given. Chapters 3 and 4 present the results of a field study, which was carried out in the Makete District in the South West of Tanzania. The study observes the effects of a pilot project which was conducted by the International Labour Office (ILO) in order to improve the transport of rural households. Before the project started a household survey was undertaken, which was repeated at its end. The data base gives rise to a number of conclusions concerning the effects of the appropriate transport interventions. Chapter 5 contains an econometric model, which simulates the regional economic effects of rural transport interventions and especially their impacts on agricultural market production. A system dynamics approach is applied and the model is calibrated using the data observed during the field study. The new approach towards rural transport necessitates different assessment methodologies for transport investments, which are roughly described in chapter 6.