



**ESTIMATING THE IMPACT OF RURAL ROAD
INVESTMENTS ON SOCIO-ECONOMIC
DEVELOPMENT**

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OUTLINE

- INTRODUCTION
- ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH
- ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT
- CONCLUSION

INTRODUCTION

- Inadequate transport infrastructure in rural Africa limits economic growth and socio-economic development
- Transport infrastructure pre-requisite development, MDGs
- African rural roads infrastructure neglected
- Increased interest in impact of rural roads investment

INTRODUCTION

- Estimation of rural road investment benefits complex to quantify
- Impact important indicator for justification of costs involved in investment
- This paper reviews methodologies for estimating impact of rural road investment



ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

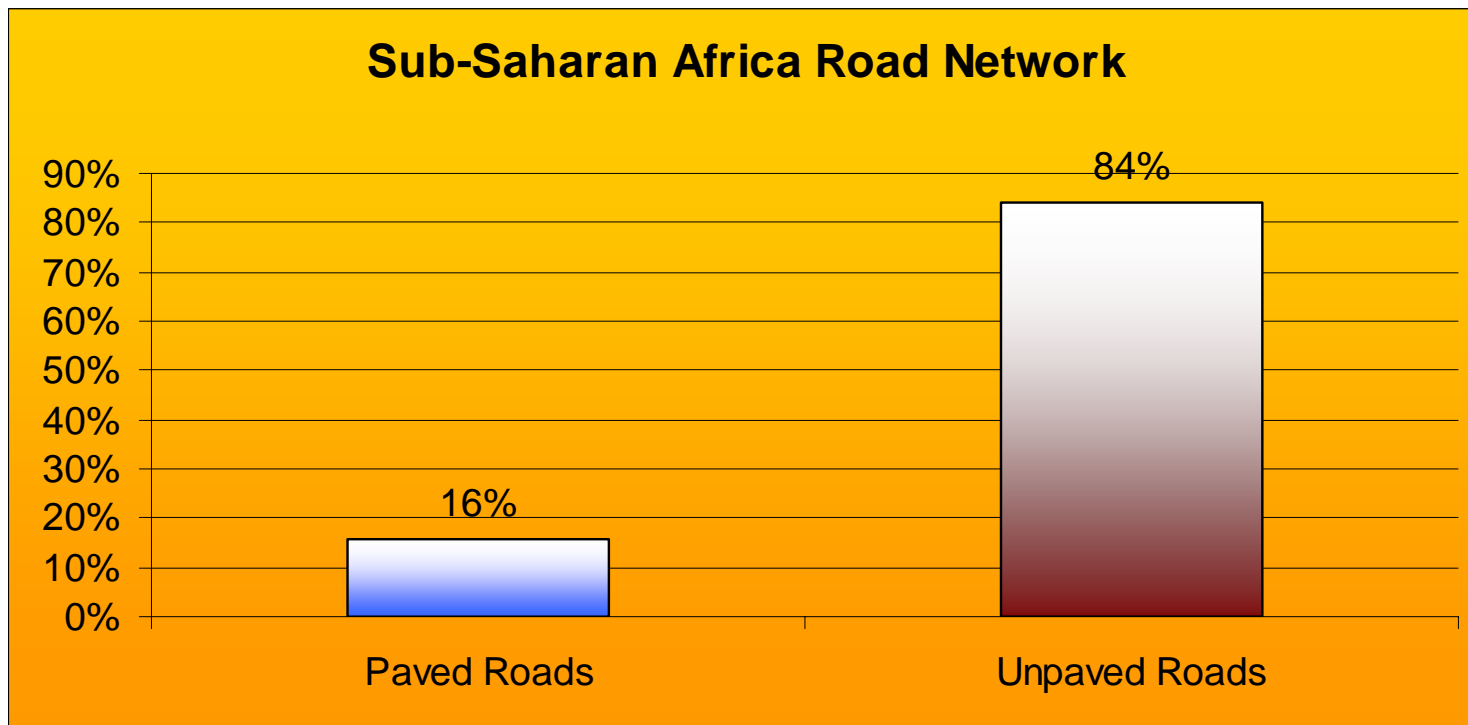
- Many studies indicate link between inaccessibility & poverty
- Transport infrastructure essential component of sustained poverty alleviation
- Inadequate roads infrastructure limits:
 - Accessibility & mobility
 - Educational access
 - Health access
 - Social activity
 - Trade opportunities – local and regional

ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

- Roads primary mode of transport in Africa
- SADC : 80 % of goods & services by road
- Africa's rural road infrastructure inadequate & underdeveloped
- Lowest density of paved roads when compared to rest of world
- Limits economic growth & development

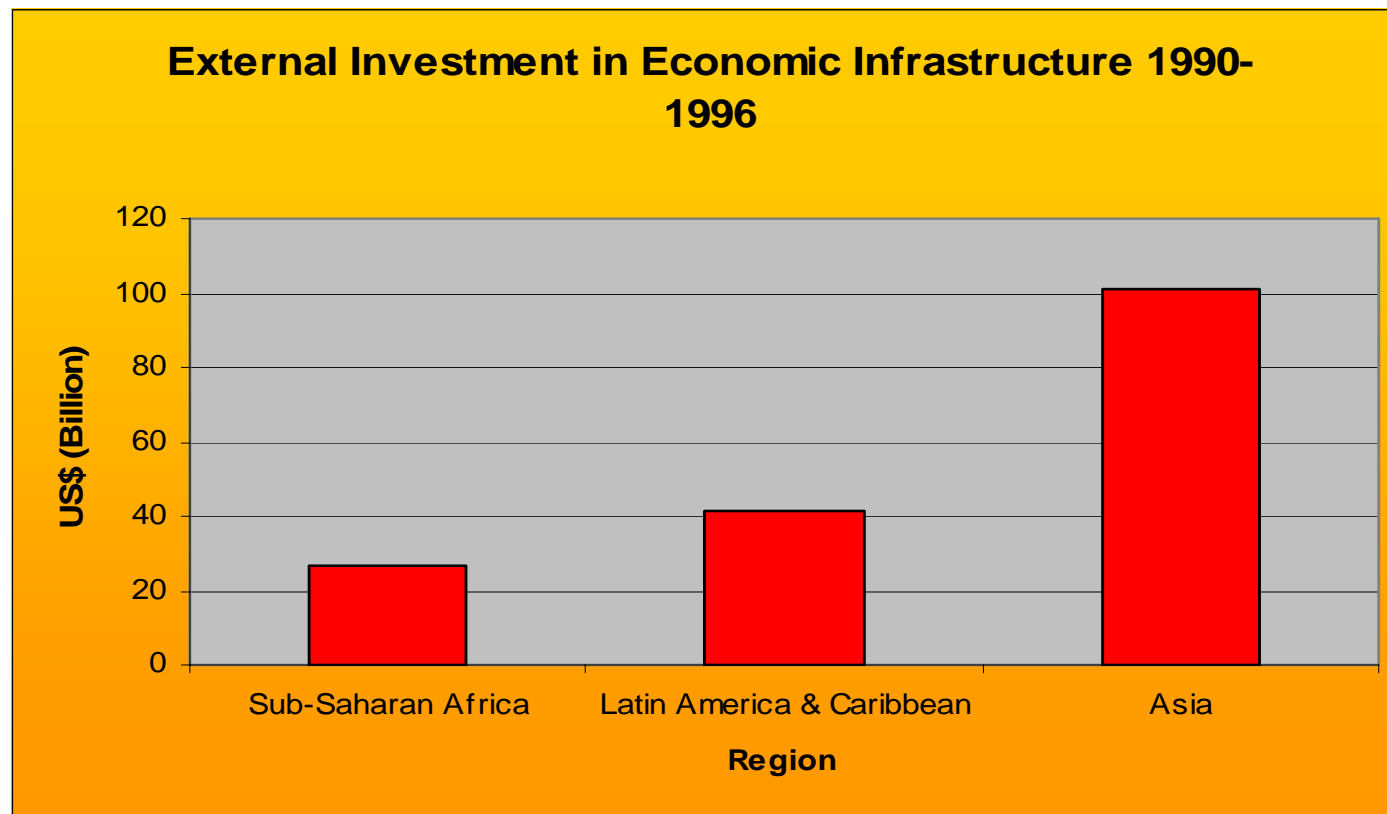
ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

Estimated 1.8 mill km of roads in Sub-Saharan Africa – only 284000 km (16 %) paved



ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

- Lack of sufficient funds for:
 - development / expansion of road network
 - routine / periodic maintenance of existing roads



Source: United Nations Food & Agriculture Organization (FAO) 2002

ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

- Financing needs for road network development in Africa substantial
- Challenges:
 - Determination of road financing needs
 - Accurate assessment of nature & extent of Africa countries road network
 - Identification of financing sources
 - Attract sound & sustainable road investment

ROAD INVESTMENT, RURAL TRANSPORT, POVERTY ALLEVIATION & ECONOMIC GROWTH

- Road investment focuses on strategic components - primary roads & roads in urban centers
- Increasing awareness of rural roads – poverty alleviation link
- Rural transport infrastructure consists mainly of:
 - Rural roads
 - Tracks
 - Trails
 - Footpaths



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Why quantify impacts?

- Limited, competing resources
- Choose between
 - Various options on same road
 - Different projects
 - Programme prioritisation



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Review of methodologies to estimate impact of rural roads investment :

- Benefits of road investments
- Appraisal techniques
- Alternative impact assessment techniques
- Impact of rural roads investment on socio-economic development



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

- Benefits of road investments
 - Direct benefits
 - Savings in Vehicle Operating Costs (VOCs)
 - Travel time savings
 - Reduced accident costs
 - Possible savings in road maintenance costs
 - Indirect benefits
 - Induced benefits



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

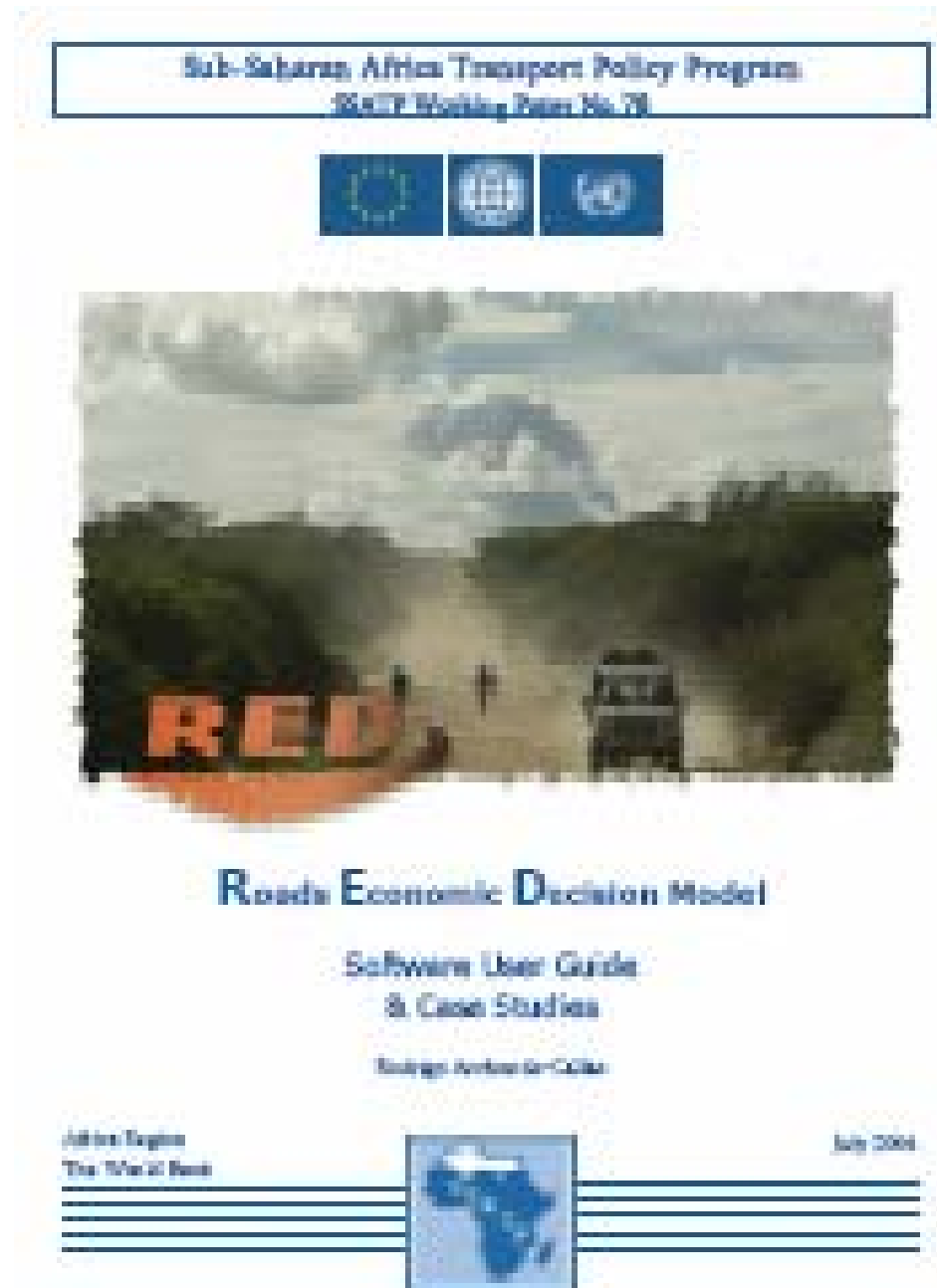
- Appraisal techniques:
 - Most frequent-used mechanisms → historical CB appraisal: impact of proposed investment: comparison of costs x benefits
 - Software tool: World Bank Highway Development & Management Model (HDM-4)
 - HDM-4:
 - Support decision-making on road management & expansion of traffic capacity
 - Designed to appraise projects
 - Develop road programmes
 - Evaluate long-term road system investment alternatives

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

- Traditional CBA methods not always suitable for low volume roads appraisal
- Rural roads most often have low traffic volumes
- Tool developed for low volume roads: Roads Economic Decision (RED) Model – developed by World Bank 2003
- RED:
 - Aimed at improving decision-making process for development & maintenance of low-volume roads
 - Perform economic evaluation of road investment options
 - Benefits calculated for respective traffic components
 - Benefits expressed into VOCs, travel time & accident costs



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

COMPARISON: HDM-4 vs RED

HDM-4	RED
High volume roads (VPD > 200)	Low volume roads (VPD < 200)
Detailed economic evaluation	Simplified economic evaluation
More complex input data required	Low input data requirements
Complex to apply to economic evaluation of low-volume roads	Easier to apply to economic evaluation of low-volume roads
Limited allowance for incorporation of induced / development traffic	Allow incorporation of induced / development traffic
Exclude NMT benefits	Include NMT benefits
Feasibility indicators: B/C Ratio, NPV & IRR	Feasibility indicators: B/C Ratio, NPV, IRR & MIRR

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

- Other techniques to support HDM & RED:
 - Multi-Criteria Analysis (MCA)
 - Ranking of Rural Transport Infrastructure (RTI) investments
 - Cost-Effective Analysis (CEA)
 - Compares cost of interventions with their intended impacts
 - Appraisal of investments in social sector
 - Rarely been applied in transport sector – however: now receive more attention with increased focus of African countries on poverty alleviation

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Alternative Impact Assessment Techniques

- Focus on estimation of indirect- and induced benefits
- Supported by additional data collection methods
- Frequently used method : socio-economic household surveys
- Main benefit : questionnaires structured to obtain perceived benefits

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

SE HH surveys typically collect following data:

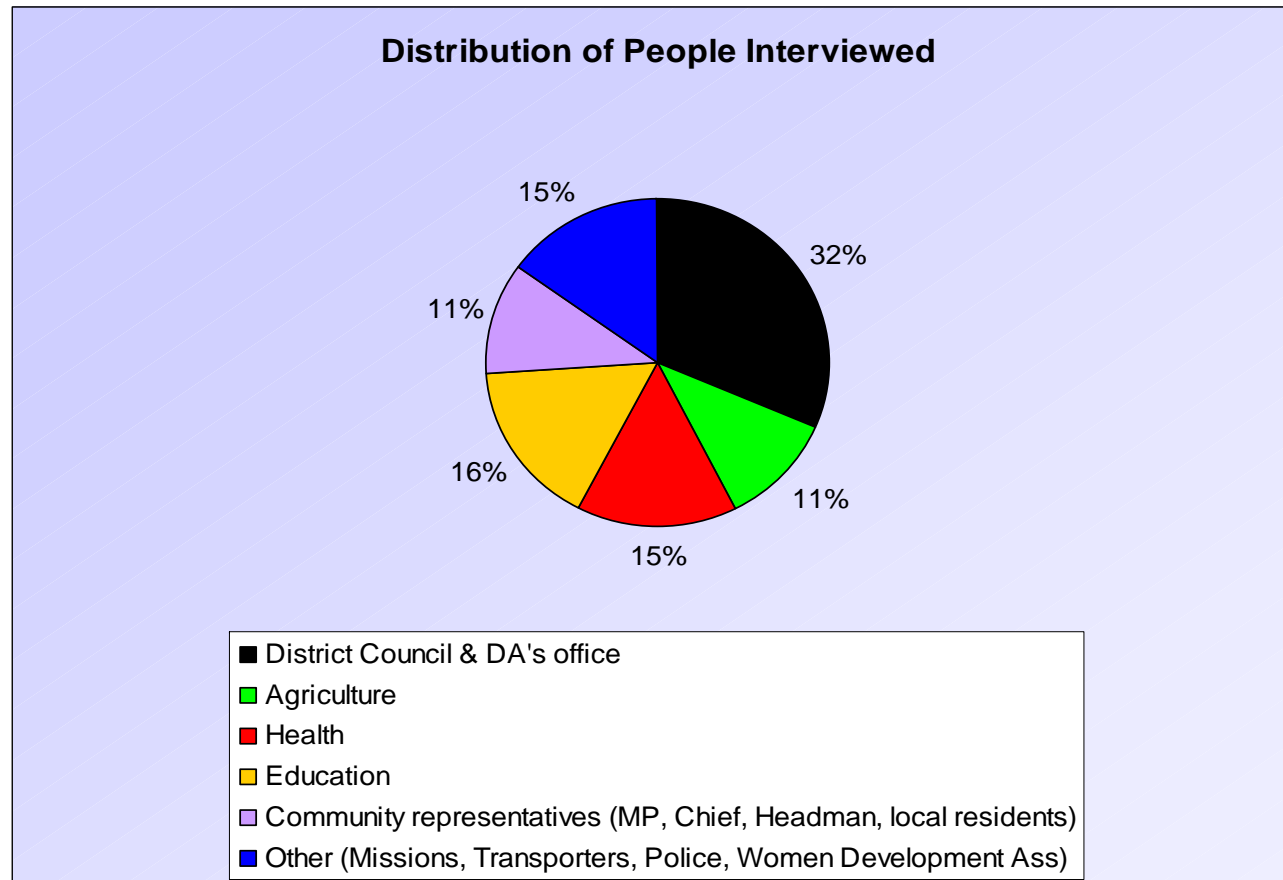
- Perceived impact on community activity
- Existing transport constraints experienced due to insufficient road investment
- How investment will solve transport constraints
- Impact of investment on daily activities / living conditions
- Link between proper rural roads infrastructure & poverty, accessibility & mobility
- Whether accessibility to facilities vary by income & location
- Gender impact of rural road investment

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Zambia case study



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT Zambia case study



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Study results indicated:

- Self-employment among men & women
- Range of economic activities: trading, logging, carpentry etc
- Individual farmers organize own transport to market place
- Subsistence farmers transport produce on bicycles



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Zambia case study



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT




Zambia case study



ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT

Zambia case study

Province	Sectors / aspects affected by feeder road improvement works								
	Agriculture sector	Health sector	Education sector	Security aspects	Gender equality	Traffic / Transport	Consultation with District Councils *	Overall rating **	Level of satisfaction ***
Northern	↑	↑	↔	↔	↑	↑	↑	↑	Fair to good
Luapula	↑	↑	↑	↔	↑	↑	↑	↑	Fair to good
Western	↔	↔	↔	↔	↑	↔	↑	↔	Poor to fair
TOTAL	↑	↑	↔	↔	↑	↑	↑	↑	Fair to good

-  Definite signs of improvements compared to pre-ROADSIP conditions
 Impact of road improvement not evident or difficult to establish
 Definite signs of deterioration compared to pre-ROADSIP conditions

* Consultation during the process of selecting roads for theROADSIP programme

** Based on comparison with pre-ROADSIP conditions

*** Based on amount of reasonable complaints received from stakeholders

ESTIMATION OF IMPACT OF RURAL ROAD INVESTMENT ON SOCIO-ECONOMIC DEVELOPMENT

Typical conclusions:

- Significant socio-economic / indirect benefits
- Creation of short-term employment opportunities through road construction
- Long-term employment opportunities through continuous road maintenance
- Improved accessibility / mobility
- Correlation between poverty & low accessibility
- Correlation between inadequate all-weather road network & limited accessibility to other facilities
- HH income & location impact on accessibility

SUMMARY AND CONCLUSIONS

- Paper reviewed mechanisms to estimate impact of rural road investment
- Rural roads infrastructure essential source of economic growth
- Several appraisal techniques exist
- Qualitative methods can be used for impact determination