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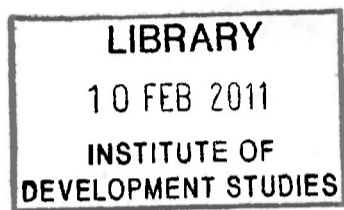
(832)

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Working papers

LIMITATIONS IN APPLICATION OF TRANSPORTATION PLAN-
NING METHODS IN TROPICAL AFRICA: ACASE STUDY OF
RURAL TRAVEL IN KIRINYAGA DISTRICT, KENYA.

By

Charles K. Kaira
Working Paper No. 363



The paper discusses the limitations of transportation planning methods in tropical Africa. It is suggested that a more realistic approach should be adopted, one that takes into account the local conditions and the needs of the rural population. The paper also discusses the importance of the government's role in the development of the transport sector and the need for a more integrated approach to transport planning. The paper is intended to provide a basis for the development of a more realistic approach to transport planning in tropical Africa.

February, 1980

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RN322634

IDS



095574

LIMITATIONS IN APPLICATION OF TRANSPORTATION PLAN-
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Working Paper No. 103

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ABSTRACT

The paper discusses transportation research and planning in developing countries with emphasis on tropical Africa. It is suggested that research into transport modes used in rural areas should receive the proper attention and encouragement from the international lending institutions (IBRD, IDA etc). as well as the individual governments in order to plan for better transport programmes in the rural areas. Therefore, it is proposed to conduct a case study of transport modes in Kirinyaga District with special emphasis on the potential and use of intermediate technology modes. The outcome of the proposed field survey will help in the design of a rural transport programme that is within the means of the inhabitants, that compared with the level of technological development of the country and that is adaptable to the cultural regimen.

February 1970

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1. INTRODUCTION

Transportation planning and research in the developing countries has been done mainly in the area of highway transportation with emphasis in providing better highway facilities through better construction and maintenance methods as well as opening up of rural areas to encourage development of economic activities in the less developed regions through the construction of feeder roads. Although in some countries intermediate transportation modes like cycling, cycle rickshaws, donkey carts, etc. are used, little effort has been put into research aimed at improving the existing intermediate technology transport modes through programs that encourage the use of these modes and at the same time improving the technological application of these modes to suit the conditions of the developing countries.

In recent years a series of studies conducted by the World Bank and ILO have been concentrating in the areas of construction and maintenance of rural roads using labour-intensive methods as compared to equipment-intensive ones (6,7,12). Furthermore, the Bank has embarked on a long-term program of research into the socio-economic impact of roads and other infrastructure investments as well as operational study program of simple selection and screening procedures (3,6). Therefore, the Bank is changing from its traditional 'road user benefits' evaluation method of road projects to the 'producer surplus' one.¹ While the former method favours the selection of transportation projects mainly in urban areas and inter-urban roads, the latter provides a basis for more reliable estimation of economic change, helps to show which complementary investments are most important and, above all, yields insights on how to ensure local level 'grass roots' involvement in project activities needed to achieve sustained social development.

Consideration of economic changes in the 'area of influence' of a road, especially of a feeder road, is a step towards the concentration on the Wananchi² as a beneficiary of road development projects instead of

1. For a detailed discussion of this analysis see, Carnemark, Biderman, Bovet "The Economic Analysis Of Rural Road Projects" Bank Staff Working Paper No. 241, 1976, World Bank, Washington D.C.

2. Wananchi refers to the majority of peasants.

the 'well to do' who is the focal point of the 'road user benefits' method. The 'area of influence' of a road in tropical Africa can be practically considered as the maximum distance of 16 km. from the road in any direction the person can travel by walking. Obviously, this falls short of the distance quoted in 'World Road Statistics 1976's ranging from 20km. to 100km. (Table 1.1). Therefore, it should be noted that provision of a feeder road is only a partial solution to the transport dilemma the 'Wananchi' experience.

The author would like to argue that more attention should be paid to solving the transportation problems in the deep rural areas in order to realise full benefits from the transport investments put into the provision of feeder roads. In otherworlds improvement of communication accessibility should also be made at the lower level in order to argument those at the national level.

Taking into consideration the level of income, education and technical development of the population within and around the 'area of influence' of a feeder road, the application of self-reliant strategy is advised in favour of imported technological solutions which, with advanced technology and capital intensive characteristics, reduce employment opportunities and remove decisionmaking powers from the village level. Appropriate technology covers a wide range of transport solutions such as packframes, human and animal propelled carts, bicycles and other pedal driven vehicles, motor cycles, 'basic' vehicles³ light trucks and agricultural transport implements to mention a few.

The empirical research work to be covered in this paper, will concentrate on a sub-location in the Mount Kenya Region⁴ an area that has been an object of several previous studies. While one village in the study area is a market center with easy access to transport facilities the other is an isolated community located 8km. away from the market center and has no direct access to transport facilities. The aim of the

3. These are devices other than motorised vehicles.

4. This area was chosen to enable the comparison of the present study with previous studies.

study is to compare and contrast the travel behaviour, needs and use of the different transport modes by the two villages through the study of the travel anatomy of functional groups.(e.g. traders, farmers, craftsmen, etc.) in relation to their use of available transport modes and needs for appropriate technology transport modes.

Table 1.1: Road statistics for selected tropical African countries

Country	Change in length of road network 1950-75 (per cent)*	Percent paved** 1975	Road Spacing	GNP per capita \$
Angola	110	11	34	370
Kenya	50	8	24	220
Malawi	70	14	21	130
Mozambique	40	9	40	180
Nigeria	140	17	21	340
Sierra Leone	130	17	20	200
Uganda	70	—	18	230
Upper Volta	—	9	100	110
Zambia	140	11	43	420

Source: UNIDO: International Forum On Industrial Technology: Working Group No.12, New Delhi/Anand, India,20-30 November, 1978.

* These figures must be treated with caution since some of the changes are due to alternation in the classification of what is a 'road'.

2 TRENDS IN RURAL TRANSPORT

Although numerous studies involving planning and improvements of transport at the national level and in urban areas in developing countries have been carried out, studies at the village (community) level are non-existent. This negligence which existed during the rule of the colonial masters has been continued by the indigenous leaders who tend to have the same developmental priorities as those of the former colonial masters. As a rule the transport development pattern has been dictated by the need to transport raw materials, cash crops and minerals to harbours for eventual shipment to industrial countries, and the need to govern the countries efficiently through the provision of all -weather roads for purposes of collecting taxes, conducting political campaigns, social services, and 20th century 'development' prestige.

Until recently, almost nobody has been concerned with the transport⁵ needs of the Wananchi in isolated rural areas or on the farm as such. It seems to be taken for granted that the motor vehicle is the only and best solution for rural transport development. This is evident from the projects financed by the World Bank and other lending institutions (6). Since the second world war, 45.6% of the cumulative loans of the International Bank For Reconstruction And Development (IBRD) and 52% of the cumulative loans of the International Development Association (IDA) in the transport sector in developing countries has been in the area of highways followed by 31.2% (IBRD) and 34.0% (IDA) in the area of railways (10). What is even more alarming is the fact that all the loans are for appraisal and selection of road projects as well as design, construction and maintenance of roads. No attention, whatsoever, has been given to the design of vehicles that are supposed to use these roads. Consequently, the road design standards used are, in most cases equivalent to those used in the developed countries since the vehicles are imported from there. Even the vehicles manufactured or assembled in the developing countries are replicas of those manufactured in the developed world. Thus it can be said that there is no vehicle basically designed for use in tropical African conditions.

Furthermore, in the area of transport research in developing countries, the World Bank and collaborating institutions⁶ during the fiscal year period 1971-1978 have given out funds as follows: (6)

a) Highway design and maintenance standards	31.5%
b) Rural roads	8.7%
c) Substitution of labour and equipment in civil construction	54.3%
d) Ports	1.5%
e) Railways	4.0%

5. Probably, the first such study is by the World Bank: "An Investigative Survey Of Appropriate Rural Transport For Small Farmers In Kenya", 1977.

- 6.
1. U.K. Transport and Road Research Laboratory 1971-75.
 2. Central Road Research Institute, New Delhi.
 3. Swiss Federal Services Of Technical Cooperation And The Federal Institute Of Technology (Zurich).
 4. Swedish International Development Agency and others.

Considering the fact that most civil construction⁷ mentioned in item 3 is related to highways, it can be said that 94.5% of research funds were used for highway related transport research.

Looking at the planned public sector investments in Table 2.1 and the distribution of public sector transport investments in Table 2.2, the proportion of public investments committed to the transport sector is high for all the six countries ranging from 21.3% to 40.6%. Here, again the portion allocated to roads is quite high ranging between 37.2% to 87.5% of which only 2.6% to 8.4% is allocated to minor (feeder) roads. Thus the trend is in agreement with the transport planning philosophy of the World Bank and other international lending institutions, namely, solving rural transport problems through the provision of highways and motor vehicles.

7. As works done by ILO show:

- a) Roads and Redistribution: Social Costs and Benefits of Labour-intensive Road Construction in Iran, G.W. Irvin et-al ILO.
- b) Men and Machines: Study of Labour-Capital Substitution in Road construction in the Phillipines, Deepack Lal et-al. ILO, 1974.
- c) Equipment Verses Employment: A Social-benefit Analysis of Alternative Techniques of Feeder Road Construction in Thailand, W.A. McCleary, et-al. ILO, 1976.
- d) Implementation of Appropriate Road Construction Technology in Kenya, Ministry of Works/ILO/NORAD Project, Geneva, November, 1976.

Table 2.1: Planned public sector investments
(per cent)

	Botswana* 1973-78	Kenya* 1974-78	Nigeria 1975-80	Sierra Leone 1973-78	Tanzania 1969-74	Uganda 1971-75
Agriculture	7.7	22.2	6.5	25.6	10.5	22.2
Natural Resources	4.2	1.8				
Mining			7.0	3.8	0.1	
Industry	5.6		19.0	7.2	13.4	11.1
Commerce		3.0		0.7	1.3	1.7
Tourism		2.9		0.9	4.4	1.6
TRANSPORT	26.2	40.6	27.5	21.3	28.9	28.2
Power				12.5	7.8	
Water			5.0	1.7	4.1	5.2
Housing	35.4	5.9		2.5	6.8	1.2
Construction		2.2		0.4		
Education	9.4	3.2	7.5	4.9	7.0	8.1
Health		4.9	2.0	5.4	1.5	6.0
Social Services	3.9			6.9	2.9	3.4
Public Administration	7.8	5.8	15.0	3.0	2.9	9.8
Economic Services		5.8		3.2		
Urban Development						
Rural Development						
Other		1.7	10.5		8.4	2.6

* Government Ministries only.

Sources: UNIDO: International Forum On Appropriate Industrial Technology: Working Group No. 12, New Delhi/Anand, India 20-30 November, 1978.

Table 2.2 : Distribution of public sector transport investment,
(Per Cent).

	Botswana* 1973-78	Kenya* 1974-78	Nigeria 1975-80	Sierra Leone 1973-78	Tanzania 1969-74	Uganda 1971-75
Roads:Main	60.5	21.5			29.9	20.6
Secondary	23.6	7.3			7.7	12.2
Minor	3.3	8.4			2.7	2.6
Urban					0.3	1.7
Other					6.1	0.3
Sub-Total	87.5	37.2	73.1	51.2	46.7	37.4
Road Transport Industry				3.7		
Railways		25.0	12.1			19.1
Ports		7.1	4.4	13.0		
Shipping			1.7	1.2	0.6	
Other Water Transport			1.3			
Civil Aviation	5.1	10.1	6.5	6.1	5.2	13.1
Airlines			0.7	0.2		13.8
Other Transport		6.0			4.0	4.4
Posts And Telecommunications	7.4	14.7		14.8	3.6	12.2

* Government only.

Sources: UNIDO: International Forum On Appropriate Industrial
Technology: Working Group No. 12, New Delhi/Anand,
India 20-30 November 1978.

3. MODES OF TRANSPORT USED IN RURAL AREAS.

In recent years effort has been made by different researchers to gather information on different transport modes used in rural areas in developing countries (1,2,8,9,10). Although some of the modes consist of simple vehicles which could be made cheaply and used almost anywhere their use has been limited to only a few developing countries. The obvious reason for such a limited use lies in the fact that such modes of transport are unknown in these parts of the world or have not been introduced or even encouraged by the governments concerned.

Rural transport modes are shown for a few selected countries in tropical Africa in Table 3:1 while Table 3:a, for developing countries shows the rural transport modes and their characteristics. Since the author has not personally visited all those countries cited, Table 3:1 is not exhaustive. It will be noted that some transport mode characteristics in Table 3:2 are not given due to lack of reliable data or no data at all. Therefore, it is one of the aims of this research to obtain the missing data for the transport mode characteristics. The transport modes given in Table 3:2 are briefly discussed below:

By far the transport mode most widely used in rural areas is walking, Walking can be sub-divided in two types: namely Walking without carrying or moving a load and walking when carrying or moving a load. The latter is, furthermore, sub-divided into headload, shoulder load backload and strongback load. A normal person practically walks a maximum distance ranging from 16 to 33 km for purposes of travelling depending on the terrain and weather conditions. It is difficult to put a precise figure on the range of human portage involving walking when carrying or moving a load. This depends on the importance that is attached to carrying or moving the load and the willingness of the individual to undertake the arduous work involved in addition to such factors as the terrain and the magnitude of the load. The loads are usually limited to about 40 per cent of body weight though this decreases as the distance of travel increases or if the terrain is a difficult one (10) However, normally the load carried is greater than that the carrier (person) can lift unaided onto his head.

Shoulder loading is widely used in Asia but it not common in tropical Africa. By definition strangback loading is related to shoulder loading whereby a pole is carried by two or more people with the load

Table 3.1: Prevailing Rural Transport Modes In selected African Countries.

COUNTRY	AREA CONNECTED BY Transport Mode*														
		Motor Vehicles	Tractor + Trailer	Donkey-cart	Ox-cart	Pick-Up	Lorry	Bicycle	Bicycle + trailer	Pedal-driven tricycle	Hand-Cart	Human portorage	Wheelbarrow	Animal-carts	Animal portorage
NIGERIA	On Farm		X					X	X				X		
	No Road at all		X					X	X		X				
	Fairweather Road	X	X			X	X	X							
	All Weather Road	X	X			X	X	X							
MALAWI	On Farm		X					X	X		X		X		
	No Road At All		X					X	X		X				
	Fairweather Road	X	X			X	X	X					X		
	All weather Road	X	X			X	X	X							
TANZANIA	On Farm		X					X		X	X	X	X	X	
	No Road At all		X					X			X		X		
	Fair weather Road	X	X			X	X	X					X		
	All weather Road	X	X			X	X	X							
UGANDA	On Farm		X	X	X			X	X	X	X	X			
	On Road At All		X			X	X	X			X				
	Fair Weather Road	X	X			X	X	X							
	All Weather Road	X	X			X	X	X							
KENYA	On Farm		X	X	X			X	X	X	X	X			
	No Road At All		X	X	X			X			X			X	
	Fair Weather Road	X	X	X	X	X	X	X							
	All Weather Road	X	X			X	X	X							

* The List is not Eshantive

Table 3.2 Intermediate Technology Transport Modes Used in Developing Countries

TRANSPORT MODE	W A L K I N G				Without Load	Bicycle	Hand-Cart	Wheelbarrow	Backpacks	Bicycle + Carrier	Bicycle + trailer	Tricycle	S A D D L E ANIMALS				P A C K ANIMALS				ANIMAL DRAWN CARTS		Motor Cycle	Motor Cycle 50cc + trailer	Motor Cycle 200cc + Trailer	Motorised Rickshaw
	Head Load	Shoulder Load	Back Load	Strong Back									Pony	Mule	Donkey	Camel	Pony	Mule	Donkey	Camel	Donkey	OX or Bullock				
Load (Capacity) in kg.	25-35	25-35	60-80	40-60	40-60	upto 100	600-700	upto 180	40-60	80-100	upto 150	150-200	50	50	50	50	100-150	75-120	120-680	upto 500	upto 100	100	200	550	upto 750	
Distance in km.	upto 20	5-10	5-10	5-10	5-10	upto 100	?	?	5-10	?	?	?	?	?	?	?	?	?	?	?	?	?	-	-	-	
Maximum Speed Km/hr	3-5	2-3	2-3	2-3	2-3	15-20	3-4	3-4	2-3	10-15	12	12	10-20	10-20	10-20	10-20	4	3-4	3-5	3-5	3-5	50-60	40	40	40	
Width of track in Metres.	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	2	2	1	20	2	2	
Purchase Price in US. \$	-	-	-	-	-	60-120	?	40	-	60-120	160-230	150-220	?	?	?	?	?	?	?	?	?	?	600-1500	600-1500	150*	200
Maintenance Costs in US \$	-	-	-	-	-	?	?	?	-	?	?	?	-	-	-	-	-	-	-	-	-	-	?	?	?	?
Rates Charged by KM/Tonne	X	X	X	X	X	?	?	?	-	?	?	?	-	-	-	-	-	-	-	-	-	-	?	?	?	?
Life time in hrs.	-	-	-	-	-	?	?	?	-	?	?	?	-	-	-	-	-	-	-	-	-	-	?	?	?	?

* Second hand
 ? Research is needed in order to establish some basic figures.
 X Varies depending on the importance urgency of the trip.

suspended between them. Backpack is normally used in hilly and rocky terrain and/or can be pushed or pulled on good terrain by provision of wheels.

A Wheelbarrow is a single wheeled load carrier pushed under normal circumstances by one person while a hand cart is a two-wheeled load carrier pushed and/or pulled by one or more people and normally requires a wider path than that required by the wheelbarrow. Wheelbarrows and hand-carts are not suitable for use on steep gradients since the weight of the cargo then has got to be supported by the operator and this rather than resistance to motion determines the maximum load (10). Push-carts, a form of hand-carts are operated by upto four men and can be used to move loads slowly over short distances and at great effort in urban areas. Their use is evident around Nairobi markets. In the rural areas in tropical african countries there is evidence of attempts to use wheel-barrows for rural transport.

Bicycles are commonly used in several parts of tropical Africa for both personal and goods transport in rural areas. The speed of a bicycle with only a rider ranges from 15km/to 20km/hr dropping to a range from 10km/hr to 15km/hr with rider or rload/trailer. Although the bicycle has been used for a long time in tropical Africa/bicycles with trailer combination has not been in use until recently. One interesting application of bicycle trailers which has been identified in designs evolved in Nigeria and Malawi is as rural ambulance (1). It is a case of an unknown technology rather than a case of an inappropriate technology that bicycle-trailers are not widely used in tropical Africa. The disadvantage of the conventional two wheeled trailers is that it limits the type of route over which the bicycle can be operated since the trailer is usually too wide for operation on such narrow foot-paths. Therefore, there seems to be potential for a single wheel trailer with the same two-dimensional characteristics as the bicycle.

The tricycle, modification of the bicycle is already widely used in Asian Cities as a passenger carrier commonly known as a cycle Rickshaw or trishaw. This type of vehicle is virtually unknown in tropical Africa. In Bangladesh the cycle rickshaw has become an important means of rural transport being operated on a hire basis as in the cities, for carrying passengers as well as cargo. Tricycles are only suitable for use on relatively flat terrain.

In many developing parts of the world animals are used to pull carts and sometimes used as pack or saddle animals. The load varies according to the route conditions and distance, the lower figure in Table 3.2 being indicative of that which can be carried continuously for a full day. In India the Indian Institute of Management in Bangalore has estimated that at present over 60 per cent of all goods carried from farm to market are moved by bullock-carts (10). These carts can operate on very muddy tracks though they cause damage to surfaced roads because of the high contact pressure at the rim. However, the use of animal-carts is less widely spread in tropical Africa, even in areas where animals are used for cultivation. In recent years efforts to develop improved animal-cart designs have been made in a number of tropical African Countries including Nigeria, Malawi, Tanzania and Senegal (10).

In order to be used in rural areas, the motor-cycle must be rugged, simple, easy to manufacture and maintain locally, suitable for continuous use on rough tracks and capable of being used as a cargo carrier, rather than simply as a means of personal transport. Unfortunately no motor-cycle has yet been designed specifically to meet the needs of developing countries. This is something the industries should think about if they are to increase the use of motor-cycles in developing countries. Therefore the major need, if the potential of the use of motor-cycle is to be exploited is for the development of designs suited to the requirements of and to small-scale manufacture in the developing countries. In Saigon (Asia), the Honda is used with a small two wheeled trailer which can carry both passengers and freight (five adults and 200 Kg. of produce (8)). No such vehicle has been introduced in tropical Africa and yet it is cheap to operate and its cost is not too high compared to average population income.

Field Study Strategy

After discussions with various members of IDS staff and personal visits to the Mount Kenya area Districts. Kutus and the area South of the Sagana/Embu Road has been selected as the study area. This area is quite flat and seems to have a good number of the rural transport modes which are a subject of this study. The study area will be divided into two parts: 1) area adjacent to the main road and 2) area located more than 4 km from the main road (see attached map).

A Sample households in the study area will respond to Questionnaire I. In addition, the traders and shopkeepers will respond to sub modules respectively. Table 4.1 shows the schedule of household sample for each part of the study area .

For purposes of public transport interviews, passengers embarking and, disembarking will be randomly asked to respond to Questionnaire II at Bus/Matatu Stops bordering the study area (Kagio), Kutus, Samson's Corner, Kimbimbi and Kandongu Works Camp). Furthermore, the Bus/Matatu Operators will respond to Questionnaire III regarding their operation (regularity, reliability, adaptation of the public to transport mode etc).

Although the questionnaires are written in English, the interviews will be conducted in the Local Language of the area. Therefore the interviewers will have a good command of both languages so as to interpret correctly the respondents answers.

Schedule of household (HH) sample. (Table 4.1)

Functional Group:	Number of HH in Universe.	Number of HH in sample.
1. Traders (whole sale, produce etc)	N.A.	All
2. Shopkeepers	N.A.	All
3. Street-vendor	N.A.	All
4. Craftsmen	N.A.	All
5. Fieldworkers (Agricultural extension, community health, veterinary, administration, etc.)	N.A.	All
6. Farmers	a)) b) 2;000	300
7. Employees (those not included in (5) - teachers are in this category):	a) Over 50 HH b) Under 50 HH	50 All

Questionnaire Analysis.

After the field survey, the analysis of the questionnaires will consist of three parts;

- 1) Travel anatomy of different groups with regard to transport mode, frequency, load moved/carried, distance, transport cost and conditions of route for each trip purpose. Trip purposes for each different group are given in Table 5.1

- 11) For each transport operation and maintenance costs, and average transport costs per tonne -km will be compiled.
- 111) Analysis of attitudes, aspirations and adaptation to different transport modes by the rural population.

Table 5.1 Trip Purposes For Different Groups.

Farmers and/or all Households	<ul style="list-style-type: none"> 1) Transport of cash crops to collecting points, depots or buying centers. 2) Transport of surplus food products to collection points depots, markets or cooling centers. 3) Transport of farm inputs from buying centers or stores 4) Trips to major towns for special goods or services 5) On farm transport of inputs and produce of products. 6) Gathering and Collection of fuel and water
Traders (WholeSale) Producebuyer)	<ul style="list-style-type: none"> 1) Transport connected with buying from factories, depots and selling of goods to retail shops. 2) Transport connected with buying of produce from farmers at farm-gate or produce stores and selling it to Produce Boards and Processing Plants.
Shopkeepers (Retail)	Transport connected with buying stock for the shop.
Craftsmen	Transport connected with business transactions.
Fieldworkers	Transport connected with work trips.

Rural Transport Programme.

Based on the results of the field Survey, a rural transport programme consisting of appropriate technology will be designed. The recommended modes will be those that serve the majority of the rural population, that are within the means of the inhabitants, that compare with the level of technological development of the country and that are adaptable to the cultural regimen.

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4. General Information:

(1) Are you informed about the following concerning public transport service in your home area?

	Bus schedule	Bus fare charges	Matatu fare charges
Yes			
What is it?			
No			

(2) Do you always get public transport when you want to travel?

	Yes	No	Don't know	Please explain
On day I want				
At time I want				

(3) Do you think the public transport service in your home area meets your requirements?

YES	NO	Don't know	Sub -- Location	District	Please explain

(4) What travel mode do you consider as being in your means?

Walking	Bicycle	Bus	Matatu	Private Car	M/C	Other

Please explain.....

Thank you very much indeed for the trouble you have taken in answering the questionnaire. We would like to assure you that the information you have given us will be treated with the highest secrecy and used only for research purposes. If there is any points you feel have not been covered in the questionnaire please feel free to say them in the remarks section.

Remarks

RURAL TRANSPORTATION SURVEY 1990

II Questionnaire for Passengers

Interview No.

363
 The University of Nairobi is carrying out a transport survey in rural areas with the aim of understanding transport problems the WAMACHIs are facing. With this survey it is hoped that planners could be guided in their task of solving transport problems in the rural areas. Therefore, your cooperation in furnishing the required information for this survey will be highly appreciated.

Sub-Location Nearest TC/Market Village
 Interviewer Day of Week Date Duration of Int.
 Bus stop

1. Carrier information:

Origin	Destination	Route of Operation	Make	Capacity	Yr. of Manuf.	Garaged at
Bus						
Matatu						

2. Personal data about the passenger:

Respondent Sex Age Profession Highest level of School Embarking Disembarking

.....

3. Information about the journey up to this stop:

Origin _____ Destination _____ Starting time of journey _____
 Cost of journey _____ Distance from home to nearest Bus/Taxi stop _____ Arrival time at this stop _____
 Reasons for travelling _____
 Have you travelled with luggage? () Yes () No If yes estimate weight _____ Nature _____ Charge _____
 Please describe your journey starting from home up to this point as follows:

From (Location name)	To (Location name)	Distance	Mode of transport	Travel time	Cost Fare Others*	Duration of waiting before obtaining transport mode

* Other costs include: expenses incurred related to travelling e.g. meals, hotel accommodation etc.

b) List the cash crops grown giving information as follows:

Crop	Total Quantity Produced last season	Quantity sold the Last Season	Farm Gate Price	Transport Mode to Market	Dist. in miles	Transport self	Transport Cost Crop	Transport Cost Per unit	Price per Unit

Do you have any other pieces of Land you farm on? () Yes () No
 () No
 Size

c) Does the transport mode available for your use play any role in production and marketing decisions on your farm? () Yes () No
 Please explain.....

d) Do you ever experience any difficulties in transporting inputs (e.g. seeds, fertilizers) for your farm at the time you require them? () NO () YES What are they?

e) When you have a crop/livestock ready for transporting, could you explain how you contact a transport operator or middleman?

How long does that take? Do you ever experience any difficulties in making contact? () No () Yes
 What kind of difficulties?

3) What Sort of vehicle are you likely to own in the future?

Car	M/C	Kombi	Pick-up	Lorry	HeavyLorry	Ox-cart	Donkey-Cart	Tractor	Bicycle	Hand-cart	Wheelbarrow
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What are the advantages of owning that particular vehicle you have chosen?

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.....

.....

(ONLY FOR MOTORVEHICLE OWNERS/OPERATORS)

4) If you are driving a motor vehicle and you had empty seats, would you consider transporting people? () YES/NO () What are your reasons for the answer you have given?

.....

.....

.....

.....

.....

(FOR ALL VEHICLE OWNERS/OPERATORS)

5) Information about trips made yesterday: Vehicle..... Year of manuf.....

Date..... Day of week..... Village..... Garage Location.....

Please make a record of journeys made during the whole day from the time the vehicle was out of the garage/home to the time when it was parked in the garage/home again. If you made any deliberate stops usually in connection with activities (not temporary halts for petrol, meals, refreshments and similar purposes), give your reasons or purpose for having made the journey or an intermediate stop. If the vehicle was carrying some goods, please indicate the nature of goods indicating the amount carried (e.g. $\frac{1}{2}$ full, full, empty or exact amount when known). For passenger vehicle, give number of passengers:

Origin (Sub-location)	Stop (Sub-location)	Trip Length	Purpose of Journey	Loaded capacity	Nature of goods	Hire Charges	Purpose of stop	Duration of Stop

* For more than one vehicle use supplementary sheet.

BASIC VEHICLE SECTION (Excluding motor vehicles)

Interviewer: The following questions are best answered by the owner/operator of vehicle

1) To keep a vehicle in good condition requires some spare parts please give details for the/12 months: / Last

Type of vehicle	Spare part	Cost	Quantity in 12 months	Availability	Distance from home

2) Fill in the following information regarding your vehicle:

Type of vehicle	Repairer*	Type of Repair	Charge	Frequency of repair	Distance to Workshop	Repair at Home

* Self, member of household, Repairman etc.

* Activity list include: going to work, school church, shop, collecting firewood, water, food and visiting and going to big towns, selling in markets and recreation activities etc.
 + Characteristics of routes used (e.g. rocky, muddy, sandy, hilly, slippery, all weather tarmac etc.)

Member	Father	Mother	Son	Daughter
Age (for son or daughter 10-25 years only)				
Highest level of schooling				
Profession				
Are you informed about the following concerning the public transport services?				
<input type="checkbox"/> Yes.				
<input type="checkbox"/> No.				
a) What is the bus schedule?				
b) What is the bus fare?				
c) What is the taxi fare?				
2) Do you think the public transport service meets your travel requirements?				
<input type="checkbox"/> Yes				
<input type="checkbox"/> No.				
<input type="checkbox"/> Don't know				
Why does it not meet the requirements?				

1
 2)
 1
 1

4) Do you always get public transport on the day you want to travel?

- Yes.
- No.
- Don't know.

Why not?

5) What transport mode do you consider as being within your financial means?

- Walking
- Bicycle
- Bus
- Taxis.
- Private Motor vehicle.
- Other specify.

6) Are there any societal restrictions that stop you from using a particular transport mode? () Yes. () No.

If yes,

- Bicycle.
- Bus
- Car
- Lorry.
- Train.
- Other

	Father	Mother	Son	Daughter
Yes				
No				

7) Do you feel at home when using the following transport modes?

(Cross Yes/No) Walking,

Bicycle

Car

Bus

Lorry

Taxi

Train

Father Mother Son Daughter

Yes No Yes No Yes No Yes No

8) Do you use a bicycle?

Why do you use a bicycle as a transport mode?

Can you ride a bicycle? (1) Yes (2) No-

What is the upper limit of travel time you use a bicycle for?

State in min.

Yes No Yes No Yes No Yes No

9) Apart from financial means are there any other factors that stop you from owning a bicycle?

Yes.

No

What are the factors?

10) Do you feel safe when riding/using a bicycle on roads that have a high volume of motor vehicle traffic?

- Yes
 No

11) Do you find motor vehicle drivers as sympathetic towards bicycle riders when sharing the same road?

- Yes
 No
 Don't know

12) What type of drivers give due consideration to bicycle riders sharing the same road?

- Car drivers
 Lorry drivers

13) In what circumstances would you ride a bicycle at night?

Member	Father	Mother	Son	Daughter
10)				
11)				
12)				
13)				

14. Would do you consider riding a bicycle in town?
Why not?

	Father	Mother	Son	Daughter
Yes				
No				

15. Are there any occasions/functions on which you feel the bicycle is not the right transport mode for you to use?

- Yes
- No
- Don't know

What are they?

Thank you very much indeed for the trouble you have taken in answering the questionnaire. We would like to assure you that the information you have given us will be treated with the highest secrecy and used only for research purposes. If there is any points you feel have not been covered in the questionnaire feel free to say them in the remarks section.

Remarks

TRADE SUB-MODULE

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1. What type of goods do you trade in?

2. Could you please describe the area of your business influence?

3. What transport mode is owned for business purposes?

_____	_____	_____	_____	_____
(Government)	Proprietor	Wife	Girl	Goods
			Transport	Corp
				Establishment

4. What transport mode do you use/hire for business purposes?

5. Do you receive your goods directly from agencies/farmers? Yes No

Please explain _____

6. Do you take the goods to your customers or do they come for them?

Yes No

Please explain _____

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TRADE SUB-MODULE

7. What type of vehicle do you think is suitable for your business?

Why?

SHORKEEPERS SUB-MODULE

Location of shop

1. How do you receive goods you trade in? Yes No

2. Do you ever travel for purposes of buying stock for your shop?
 Yes No

Type of good (Consignment)	Quantity	Source Location	Distance mi.	Transport cost Self	Goods	Frequency per month

SHORKEEPERS SUB-MODULE

3. How wide is the area your shop serves?

4. What type of transport mode do you think is suitable for your needs?

Why?

Mode of transport	Hours available	Transport mode	Type of services	Frequency

5. Do you have any railway connections? () Yes () No

6. What transport mode do you use?

7. Where do you obtain most of your work?

8. What kind of services do you offer your customers?

Location of premises _____

COMPLETION BY HAND

198/10/88

CRAFTSMEN SUBMODULE

ID6/WP 363

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Location of business _____

1. What kind of services do you offer your customers? _____

2. Where do you perform most of your work? _____

3. What transport mode do you use? _____

4. Do you have any regular customers? () Yes () No.

Customer	Home Address	Transport mode	Type of service	Frequency

5. Please describe the area of your business influence? _____

6. What type of transport mode do you think is appropriate for your needs?

Why?

RURAL TRANSPORTATION SURVEY 1980
 III Questionnaire for Bus/Matatu Operators

The University of Nairobi is carrying out a transport survey in rural areas with the aim of understanding transport problems the WAKACHU are facing. With this survey it is hoped that planners could be guided in their task of solving transport problems in the rural areas. Therefore, your cooperation in furnishing the required information for this survey will be highly appreciated.

Name of Interviewer Interview No. _____

Sub-Location TC/Market Duration of interview.....

Date..... Day of week.....

1. Carrier Information:

	Origin	Destination	Route	Make	Capacity	Yr. of Manuf.	Garaged at
Bus							
Matatu							

Respondent: () owner () operator () conductor

2. Personal data about the respondent:

Respondent	Sex	Age	Highest level of School

(1)

Do you have a time schedule on the routes you operate on?

Yes No

If yes do you keep the time schedules? Yes No

If no what are your reasons for operating out of the scheduled time?

(2)

When do you carry most passengers?

Why is it at this time?

(3)

When your vehicle breaks down, what alternative transport is given to the passengers to make sure that they get to their destinations without too much delay?

I call for another vehicle of the same company

Put them on the next available vehicle with no extra charge

Passengers who want to use other available means do so at their own expense.

Passengers have got to wait until the vehicle is repaired.

Passengers get their money back after a specified period from the time of the breakdown. Specify the period _____

Other specify _____

(4) Do you think there is a demand for more public transport on the route you operate on? () Yes. () No.

If YES, estimate the demand _____
If NO, give your reasons _____

() Information about passengers: _____

(1) When is the fare agreed with passengers before or after reaching the destination? _____

Are there extra charges for deviations from the route taken? _____

() Yes. () No. _____
What are they? _____

(2) Which group of passengers do you find are not informed about the fares charged? _____

(3) Do you have regular customers? () Yes. () No.
Please explain (type of passengers, trip purpose, trip length etc.) _____

Thank you very much indeed for the trouble you have taken in answering the questionnaire. We would like to assure you that the information you have given us will be treated with the highest secrecy and used only for research purposes. If there is any points you feel have not been covered in the questionnaire feel free to say them.

() Yes () No
Do you have a firm schedule on this route for _____