

3 Framework of the Field Study

The Makete Integrated Rural Transport Project (MIRTP) was carried out by the International Labour Office in Makete District in the south-west of Tanzania. Its principal aim was to reduce the transport burden of rural households. This was to be achieved by improving footpaths, tracks and roads with labour-based technologies, by making donkeys available for the local population and by reducing trip lengths by repairing local grinding mills. Before the project started a survey concerning the transport patterns of rural households was conducted in 1986 and 1987. In 1994 a second survey was carried out (by the author) using a methodology comparable to the previous research. This chapter will show the outcomes of the field studies which were designed in order to estimate some of the effects of the different transport interventions.

During the period under consideration, from 1986 to 1994 Tanzania has experienced severe political and macroeconomic changes, which probably have had considerable impacts on the development of the Makete District. Therefore a brief review of Tanzanian history since independence will first be given.

3.1 Tanzania: General Framework

After independence in 1961 Tanzania registered a moderate per capita growth of the economy. Six years later President Nyerere declared a Pan African Socialism (Ujamaa): private enterprises were nationalised, prices, wages, interest and exchange rates controlled, marketing and trade were organised by parastatal enterprises and all economic activities were planned in Five-Year-Plans¹. The government invested in human capital formation and improvement of the health system and succeeded in meeting the subsistence tasks², which brought strong sympathy from western donors. In the 1970s economic performance weakened and by the beginning of the 1980s the economic crisis had reached unprecedented proportions: the per capita GDP and the real income had declined since 1977, inflation reached annual rates of 30 %, the public finance deficit rose to 20 % of the GDP, the external balance of payments deficit proliferated rapidly (BAGACHWA/MALIYAMKONO 1990, pp 1), and the population could not be nourished by the national agricultural crop production. BRYCESON (1990, p 229) states: "Had it not been for the large increase in per capita food imports, some parts of the population, notably those in urban areas would have experienced life threatening shortages of food". The government

¹ These plans were elaborated by western consultants, not by the national planning commission.

² The country's literacy rate rose from 10 % to 60 % between 1961 and 1977, while the life expectancy increased from 43 to 52 years.

claimed mainly external reasons for the crisis: the soaring terms of trade, the oil price shocks³, the military spending for the war against Idi Amin's Uganda, the break up of the East African Community and severe droughts. But many internal factors contributed substantially to the economic crisis:

- Neglect of the agricultural sector, i.e. low producer prices, little investment in infrastructure, poor marketing arrangements and bad input distribution.
- The Villagisation Programme, which forced most farmers to move to communal centres causing an immense disruption of agricultural production.
- Emphasis on large scale and import intensive industries.
- Excessive growth of public administration and bad management of public enterprises, thus producing severe deficits in government budgets.
- Strong government interventions regulating all economic activities as mentioned above.

The rural households reacted by retreating from the official economy, production was decreased to almost subsistence level and the small surplus was often marketed through illegal channels; the second economy proliferated. The steady economic decline forced the government to announce a Structural Adjustment Programme (SAP 1983-1985), in order to receive new international credits. Because the SAP was not actually a revision of the socialist economic policy, an agreement with the IMF could not be achieved and the international donors retreated. The volume of external aid declined from 1980 to 1985 by 30 %, while foreign debt continued to grow. The lack of foreign currency was becoming the main bottleneck in the Tanzanian economy, as essential raw materials and spare parts could not be imported any more. Finally the retreat of president Nyerere in November 1985 gave way to an agreement with the IMF, which financed the Economic Recovery Programme (ERP I 1986 to 1989) followed by the Economic and Social Action Programme (EASP 1989-1992). The programmes contained the usual IMF market reforms: devaluation of the Tanzanian Shilling, deregulation of the internal market and external trade, privatisation of parastatal companies, reduction of government budget deficits, rise of real interest rates and the abatement of inflation. Some measures like the currency devaluation were introduced in a "shock manner", others were implemented gradually. The economic transformation process was still underway in 1994.

The economic reforms first showed macroeconomic effects, when the real growth rates of the GDP reached positive values in 1984 and overtook the

³ "In 1978-1982, the loss of income purely on account of terms of trade movements amounted to 12 % of GDP. Furthermore, the oil import bill, as a proportion of total export earnings, rose sharply from 26 % in 1978 to 56 % in 1982, with quantities remaining fairly constant" (BAGACHWA/MALIYAMKONO 1990, p.3)

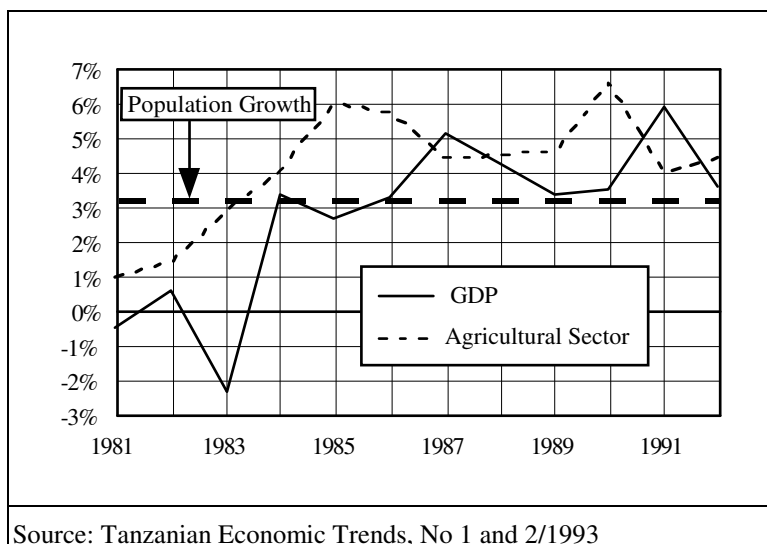


Fig. 3.1-1 Real growth rates in Tanzania

stem mainly from the sale of agricultural produce, did not rise partly due to the stagnation of production and partly due to the deterioration of the terms of trade. Only one third of imports were covered by exports. The resulting balance of payment deficits could only be compensated for by the growing transfers from national and international donors. In 1990 the foreign debt reached 260 % of the GNP. Economic growth in Tanzania was only partly due to internal reforms; a big share was externally financed.

Special emphasis in the economic recovery programmes, was laid on the promotion of the agricultural sector, in which 82 % of the active population is engaged. Before the reform the Primary Co-operative Societies⁵ had a legal monopoly on crop purchasing at the farm level. Unions assembled the commodities from the primary societies and then processed and handed them over to the state owned marketing boards. "This system was grossly inefficient and resulted in lower producer prices, untimely delivery of inputs, poor quality of exports due to processing problems and shipping delays" (BAGACHWA 1992 p.35). Although the government set up the agricultural producer prices, they only rose in nominal terms and not in real terms, due to inflation and the growing margins of the national marketing boards. Therefore the government abrogated the marketing monopolies of its parastatals. In 1989 private traders were allowed to buy grain from primary societies and in 1991 farmers were given the freedom to sell to any buyer⁶. By 1992 producer prices were almost completely liberalised; only the prices for maize, wheat and paddy were still under govern-

population growth in 1986, which is estimated at 3,2 % p.a.⁴. The agricultural sector was growing stronger than the rest of the economy. Similarly, real per capita incomes increased and real interest rates were adjusted to almost positive levels. The inflation rate, which reached 36 % in 1984, stayed at an unsatisfactory high level of 23 % in 1994.

The export earnings, which

⁴ 1978-1988: new surveys estimate the population growth at 3.8 % (HOFMEIER, 1993, p 178).

⁵ Parastatal marketing boards

⁶ The 1986/87 survey in Makete (Barwell/Malmberg 1989) shows that many farmers sold their produce to private traders, which were operating illegally.

ment control. Private traders could also participate in the distribution of agricultural inputs.

According to AMANI (1992, p 51) the market reform entailed mainly positive effects, causing both an increase in food production and urban supply. BAGACHWA gives a more detailed picture: the production of food crops rose from 1986 to 1988 for maize and wheat (34 %), beans and cassava (16 %) but the growth slowed down until 1992 in such a way that the overall increase could not keep up with the population growth. The production of traditional food crops like cassava stagnated and that of sorghum and millet declined. Rising imports of food crops were necessary to secure the food supply of the population. The production of most export crops with the exception of sisal increased from 1985 onwards, often exceeding 1981 levels before 1992. However, the soaring terms of trade⁷ did not entail a growth in the export earnings. The prices for inputs, which were rising sharply in the last years due to cutbacks in government subsidies, had negative repercussions on the agricultural production.

The cutback in government expenditures⁸ had far reaching consequences for the provision of social services. During the socialist period external observers admired the high standard and the free access to public services like schooling and health services. During the crisis in the 1980s it became clear, that this standard could not be maintained without giving up the principle of free charge services. Today schooling fees are a significant hurdle for school enrolment.

A critical study on behalf of SIDA of the social, economic and cultural changes resulting from the structural adjustment process in Tanzania, in which 600 people in 12 villages were interviewed, concludes with the remark: „We think that there are good grounds for reporting, that import and domestic trade liberalisation has been good for rural people, including those locally regarded as relatively poor and perhaps especially poor women as well as the better off and those living in towns.“ (BOOTH et al 1993, p. 118). According to the villagers the availability of goods more than compensated for their higher prices. Agricultural production was improved by the better transport situation, but higher prices for agricultural inputs gave rise to new restrictions on traditional food and export crop production. However, new production activities like brewing local alcohol, quarrying, collecting sand and supplying local urban markets with food crops became possible. On the other hand the social services built up since independence seem to be in jeopardy due to insufficient public funds.

⁷ Especially the price of coffee, which in 1981 comprised 33 % of the total Tanzanian export earnings, fell rapidly in the beginning of the 1990s. Sisal prices showed a steady decline since 1981.

⁸ Not all of the cutbacks had negative social consequences. For example 16,000 "ghost workers" were removed from the public payrolls.

During the 1980s and 1990s the transport situation has deteriorated rapidly in Tanzania; in 1990 only 15 % of the trunk roads and 10 % of the regional roads were in a good condition, while two thirds were impassable or not maintainable. This resulted in high road vehicle operating costs, thus entailing low producer prices, delayed evacuation and damage to crops. The national railways and ports could not meet the transport demand, causing significant stockpiles of crops and diverting bulk transport to roads. The potential transit traffic from Zambia, Zaïre, Rwanda and Burundi could not be handled and the transport parastatals made losses or generated low returns. The World Bank estimates (1990, pp 3) the total losses produced by the inefficient transport sector at annually more than \$ 300 million.

In 1990 the World Bank started the Integrated Roads Project (IRP I) with a budget of \$ 871 million for the coming five years, 91 % of which was financed by foreign capital. The project planned the rehabilitation and upgrading of the trunk and regional road network, the institutional strengthening of road management capacity, the enhancement of the road maintenance capacity and management assistance to public transport services (WORLD BANK 1990). Up to 1994, the proportion of trunk and regional roads in good condition has at least doubled. In 1992 and 1993 the traffic volumes on the rehabilitated road sections doubled or tripled (WORLD BANK 1994, pp 2). The Kilimanjaro Region experienced an increase of average daily road traffic by a factor of five, of passenger traffic by a factor of 20 and a reduction in vehicle operating costs by about 31 % in real terms. An impact survey stated that the access to markets, agricultural inputs and to public services like health facilities and schools has improved substantially.

The government created a road fund⁹, in order to finance maintenance and upgrading activities, using the revenues from a road toll which was introduced in 1991. The percentage of transport sector expenditure on development and recurrent budget increased from 13 % to 39 %. Until 1995 road maintenance will be financed completely by the road fund. The institutional settings were changed in favour of better management and the funds are distributed to the institutions concerned: national roads are under the supervision of the Ministry of Works, regional roads are managed by the Regional Engineer and district roads are maintained by the District Councils. In 1992/93 the flow of budgeted funds to the Regional Engineer were considerably delayed and many regional roads were not maintained adequately. On the district level the maintenance of roads is often conducted by the local population with self-help labour due to the shortage of funds. From 1996 to 2001 the World Bank plans a Second Integrated Roads Project (ERP II) with \$ 650 million including 75 % foreign

⁹ Compare Box 2-1.

participation. Less than 1 % of the financial means will be used for a Village Travel and Transport Programme, which would promote inter alia low cost means of transport and path construction.

The economic liberalisation brought very strong impacts for the transport sector: during the socialist period, practically no private ownership of motorised vehicles was allowed and the importation of bicycles was highly taxed. After the liberalisation the ownership of motor vehicles was permitted and the taxation for imported bicycles eliminated. As a result, the yearly imports of motor vehicles nearly tripled between 1984 and 1990, while the total value of vehicles and parts¹⁰ increased by 470 %. Compared to the importation of motor vehicles, the number of bicycles showed an explosive development between 1988 and 1989, with the number of imported bicycles¹¹ rising from 100 to 73,000. The imports for transport equipment comprised 24 % of the total Tanzanian imports in 1992. These imports were only possible with the support of the international donors, who covered the external debt by making fresh money available.

3.2 Description of the Makete District

3.2.1 Geographic and Economic Basis

The Makete district is located in the south west of Tanzania close to the lake Nyassa, 900 km away from the biggest town Dar-Es-Salaam and 400 km from the regional centre Iringa. The district stretches over a mountainous plateau with an altitude of 1,500 to 2,400 m containing mountains, hills, ridges, valleys and steep escarpments. Makete has a moderate tropical climate with annual rainfalls of 1,300 to 2,000 mm mainly in the rainy season from November to May. In the

1988	Makete District	Iringa Region	Tanzania
Population	102,617	1,193,074	23,174,000
Population density	18 P/km ²	21 P/km ²	27,5 P/km ²
Female/male ratio	1.26	1.18	1.04
Population growth	1.3 %	2.7 %	2.8- 3.3 %
Households within 400 m from water supply	26 %	42 %	
Households with electric supply	0.13 %	2.38 %	
Literacy rate (>5 years)	68.4 %	57.5 %	85 % (>15)

Tab. 3.2-1 Characterisation of Makete District

¹⁰ The biggest growth is registered in imported chassis with engines and bodies, which are assembled in Tanzania.

¹¹ The government reduced the import tax for bicycles and the Netherlands conducted a programme to import bicycles from India.

central and southern part of the Makete district, live the Wakinga people, while in the north dwell the Wawanji, who speak a different language. In 1988 the official census reported that the number of inhabitants in the Makete district was 100,000. Assuming an annual growth rate of 1.3 %, the population can be estimated at 111,000 inhabitants¹². The population growth is much lower than the regional and national growth rates as well as the ratio of female to male inhabitants. These are two indicators of the high outward migration from the area. Local experts estimate that 60 % of the working age population and 80 % of the active males leave Makete to find income outside the district. The people from Makete are generally well known as hard labourers and skilful in the art of pit-sawing. Some businessmen are very successful outside the district.

The population density figure for 1994 is reported at 18 persons/km², which is less than the regional and national average. The population lives in villages with an average of 1,100 inhabitants, often in scattered settlements. Makete, the administrative centre of the district, has more of a village than a town of the character. In the 1970s the Tanzanian government undertook a large re-settlement scheme, in order to concentrate the scattered population in more densely populated villages¹³, where the endowment of infrastructure and services would be better. In Makete 85 of the 96 villages were required to resettle. Despite the Villagisation many of the villages are still very scattered today. This makes the provision with piped drinking water and electricity costly and could be one reason besides poverty, for the low endowment-ratio in Makete.

The macroeconomic changes already mentioned in Chapter 3.1 also had their impacts in Makete: general economic growth, (temporary) increasing producer prices, changes in the marketing system, private ownership of cars and cutback in public expenditure, brought with them a lot of changes. On top of this, a steady development took place due to the opening up of the district, and the increasing activities of international donors.

A MIRTTP document of July 1985 states: "There is nowhere locally to obtain equipment, spare parts and administrative material. Private sector facilities are minimal. There are few shops or other services and only the most basic commodities can be bought ..." Today, Makete village where the district headquarters are located gives the picture of a slowly but steadily developing area. A regular market takes place twice a week. A number of shops have been established, a wider range of commodities is available, a telephone link was estab-

¹² Other reports estimate the total population in 1993 at 117,000 assuming a growth rate of 2.7 %.

¹³ In many cases the Villagisation Programme was not planned carefully; more often than not farmers did not receive proper compensation for their lost plots and were forced to move. Consequently some of them returned later to their homes. In addition the resettled farmers often had to walk much further to reach their fields.

lished, the postal services have been improved, a bank opened a branch, and the infrastructure for the district authorities has been expanded.

Changes at the household level can be assessed by comparing a survey conducted in 1986 and 1987 by BARWELL and MALMBERG with a similar survey¹⁴ from 1994. The latter survey was undertaken in two study areas¹⁵: the study area **Bulongwa** is located in a peripheral part of Makete; situated close to the escarpment, which forms the western border of the district and which can only be crossed on foot. Here the terrain is very steep and the agricultural activities are restricted. The second study area, **Matamba**, is located in the north western part of the district. It is the region with the best external access, because 24 km of road leads down the northern escarpment, where a tarmac road leads to the capital, Dar Es Salaam and Mbeya, a nearby and major regional centre. The northern area is very active in agricultural production, because of its favourable agroecological conditions and the traditional market orientation.

		Bulongwa	Matamba	Total * Survey area
Monthly Expenditure (May, June) [\$/Household]	1994	\$ 37	\$ 20	\$ 28
	1986/87	\$ 20	\$ 11	\$ 14
Households possessing Radio	1994	44 %	28 %	38 %
	1986/87	34 %	26 %	29 %
Households possessing Tin Roof	1994	36 %	27 %	33 %
	1986/87	29 %	22 %	24 %
* Including Ihela, which does not belong to Matamba or Bulongwa Region				

Tab. 3.2-1 Indicators for living standard

The average household in Makete has 4.9 members of which 2.3 are children and 0.7 persons older than 45 years. 46 % of the inhabitants have primary and 2 % secondary education. In Matamba the situation is better than in Bulongwa. Official statistics, as listed in Tab. 3.2-1, give a more optimistic picture about the educational situation; Makete's literacy rate is higher than the average of the whole Iringa Region. Two indicators show a decreasing tendency for out-migration; while in 1986/87 19 % of the households were headed by women, the percentage decreased in 1994 to 13 %. In the same period the ratio of female to male adults changed from 1.35 to 1.13.

The household income was estimated by assessing the household cash expenditure¹⁶, which amounts in May and June 1994 to 28 \$/month. The

¹⁴ A description of the conduct of both surveys is given in Chapter 3.4

¹⁵ The location of the study areas is given in the map in Fig. 3.3-1.

¹⁶ This methodology was chosen, because a direct question about income might give false results. Still the income might be underestimated, because expenditures like agricultural inputs and savings are not included.

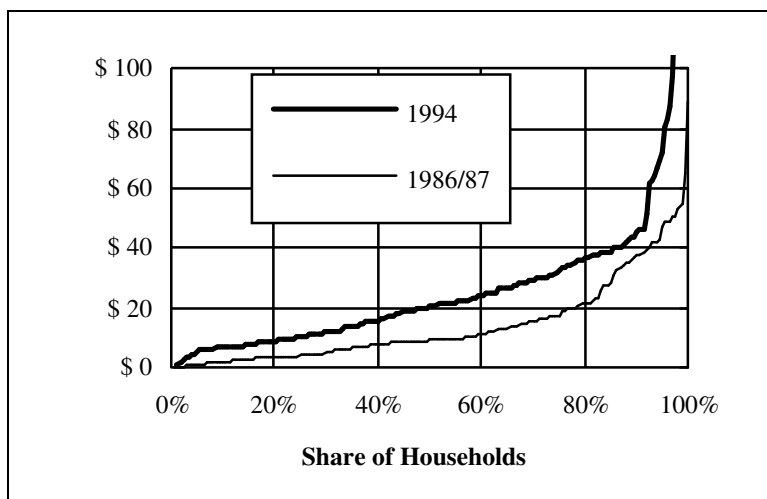


Fig. 3.2-1 Income distribution in the survey villages

monthly expenditure rises by \$ 1 if barter trade is included¹⁷. Since 1986/87 the average household expenditure¹⁸ doubled. This is an indication of the rapid changes in Makete. The household endowment is another indicator that the standard of living has generally risen. The possession of radios and tin roofs was in particular more common in 1994.

Household expenditure, income and endowment show significant regional disparities. In general, households in the Matamba Region are worse endowed and have a smaller expenditure¹⁹. There is a gap between expenditure and marketing revenues, which seems to indicate that many households have other sources of cash income, e.g. cash remitted by relatives²⁰.

Fig. 3.2-1 shows the distribution of the monthly expenditures in Makete during the two surveys. The changes were favourable for all income groups of the society; no household was worse off in 1994 compared with 1986/87. While the mean value increased from \$ 14 to \$ 28, the median rose from \$ 9 to \$ 21. The analysis of the personal expenditure distribution shows that the inequalities were reduced; the Gini-Coefficient decreased from 0.51 in 1986/87 to 0.47 in 1994. This seems to indicate that the strong developments taking place in the survey area are not based on growing inequalities; quite the reverse happened.

If households are asked about main source of cash income, most of the households (77 %) indicate sale of agricultural produce, 8 % are craftsmen, 7 % receive cash from relatives and 4 % are in regular employment. Other sources of

¹⁷ Some authors describe the economy of Makete as predominantly relying on barter trade. In the survey villages only 3 % of the monthly expenditure was bartered.

¹⁸ In general all values given in Tanzania Shilling are converted into US\$ with the May 1994 exchange-rate. The 1994 value of the 1986 Shilling is calculated by multiplication with the national consumer price index. A rural price index was not available and the national index including price changes for urban households was used. Because urban inflation is assumed to be higher than rural price variations, the above mentioned changes in the expenditure are most probably an underestimation.

¹⁹ This seems to completely contradict the observations of marketing activities and the income derived from them. On top of this more households in Matamba receive cash remitted by relatives.

²⁰ Because only the main source of cash income was asked, no indication about the magnitude of the other sources can be made.

income are sale of livestock, trading and brewing beer. The situation did not change significantly during the observed period, with the exception of an increase in artisan and timber activities. In Bulongwa more households receive their main income from agricultural activities than in Matamba, where more cash is received from relatives. An exception is the village Ihela in the centre of the Makete District, which is not listed separately in the tables. The village has always been a source of migrant labour. Therefore only 38 % of the households receive their main income from farming, 29 % from artisan or timber work and 28 % receive cash remitted by relatives or from salaries.

If households were asked about their main occupation the picture is comparable: 87 % of the heads of household state that their main occupation is farming, 6 % are craftsmen and 5 % employees with regular salaries. Since 1986/87 the number of craftsmen increased, while the share of farmers decreased.

3.2.2 *Agriculture*

The economy of Makete basically relies on agriculture. The agroecological conditions are in general favourable for the rainfed cultivation of crops. Problems occur at the slopes of steep hills where erosion can often be noticed. The agricultural potential is seen in two contradictory ways: while some experts state that problems "cannot be attributed to the low inherent capability of the natural resources or the unavoidable pressure of population" (Howe 1987, p.13) others see limitations because of population pressure and thin soil layers (ibid. p.27). The Regional Agricultural Development Plan (1986) states that nowhere in Makete is the population pressure very high, but 27 % of the population live in wards with high pressure and 60 % with medium pressure. Especially in the vicinity of the villages the pressure on arable land forces the farmers to shorten fallow periods, which are necessary for the natural regeneration of the soils²¹. Because of the relatively low pressure on land there is no "landless class" in Makete. Since livestock is not very important, there is no competition between pastoralism and farming.

Smallholder farms dominate the farming-system and the farm sizes within a village do not differ significantly. The average agricultural area per household is 5.2 acres and consists of 6.9 plots. Between the two surveys 1986/87 and 1994 the agricultural production was extensified: the average land under cultivation nearly doubled, while the use of fertiliser decreased. A reason might be the strong rise in fertiliser prices after the state gave up its subsidies. Only 4 % of the farmers in Bulongwa purchase fertiliser compared to 80 % in Matamba, where the relative small size of the plots is compensated for by the

²¹ This situation will change in future with the rising population density, but the use of agricultural inputs could increase the productivity and reduce the pressure on land.

use of fertiliser. Another reason might be the better road access to Matamba and the possession of IMT.

The average household harvests 2 t of crops per year, which is 38 % more than in 1986/87. This shift is due to the change from light to heavy crops and to

		Bulongwa	Matamba	Total Survey area*
Land under cultivation/household	1994	6.6	3.9	5.2
[acres]	1986/87	2.9	2.7	2.7
Households purchasing fertiliser	1994	4 %	80 %	50 %
[%]	1986/87	16 %	85 %	56 %
Fertiliser/household purchasing fertiliser	1994	18	135	125
[kg]	1986/87	no data	155	-
Harvesting of crops	1994	1.9	2.3	2.0
[t]	1986/87	1.1	1.6	1.45
Marketing of crops	1994	0.42	1.24	0.77
[t]	1986/87	0.16	0.47	0.31
Marketing of ulanzi	1994	50	450	250
[l]	1986/87	no data	195	-
Revenues from marketing	1994	48	121	79
[\$]	1986/87 **	28	87	55
* Including Ihela, which does not belong to Matamba or Bulongwa Region				
** Estimate				

Tab. 3.2-2 Basic agricultural data per household

a general increase in agricultural production. The crop production must be distinguished between Bulongwa Region, where subsistence is dominating and 1.9 t are harvested annually and Matamba, where the harvest reaches 2.3 t and bigger quantities are marketed. In Bulongwa the cool climate allows the production of cereals such as wheat and maize, which comprise two thirds of the weight harvested and Irish potatoes and vegetables (each 10 %). In Matamba wheat accounts for only 1 % of the harvest, while maize and potatoes each claim 40 % of the production. Other products are sweet potatoes, beans, peas and fruits. Due to the diversity of crops grown, harvesting and marketing occurs throughout the whole year.

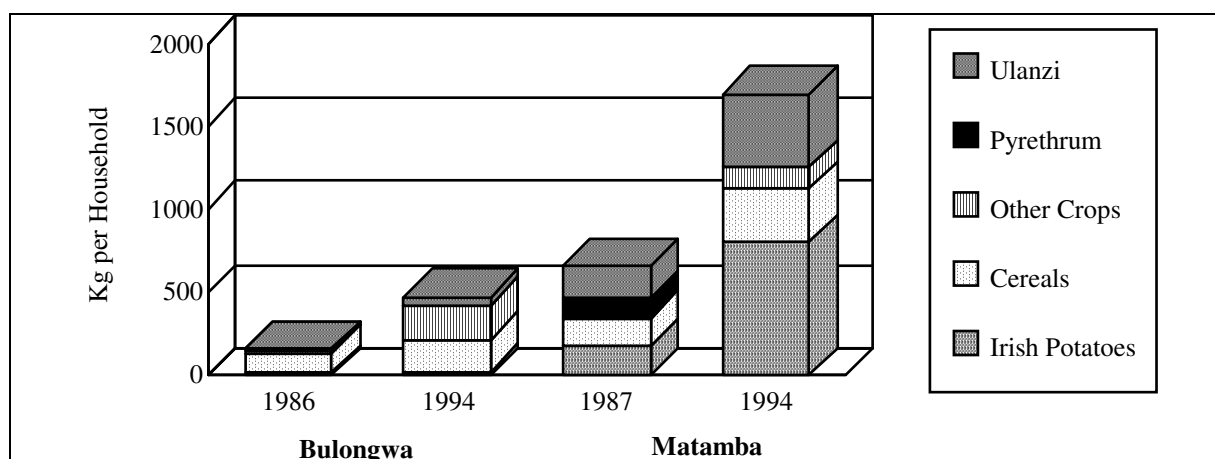


Fig. 3.2-2 Marketing of agricultural products in Makete 1986/87 and 1994

Agricultural products grown in the moderate climate of Makete are traded with the tropical lowlands. During the observed period the marketing increased substantially; while in 1986/87 only 21% of the crops harvested were marketed, this amount rose to 39 % in 1994. The quantity marketed in Bulongwa is much lower than in Matamba. DIERKS (1995) found out that the increased marketing did not cause a reduced subsistence food production measured in calories per capita. In 1994 the average household in Bulongwa received revenues of \$ 48 and in Matamba \$ 121 by the marketing of agricultural products. The increase in marketing and the changing prices caused a rise in revenues in Bulongwa of \$ 20 and in Matamba of \$ 34 per household²². Even though the absolute growth in Matamba is much higher, the percentage increase was stronger in Bulongwa. The marketing increase did not change the distribution of the revenues among the Makete households as represented in Fig. 3.2-3.

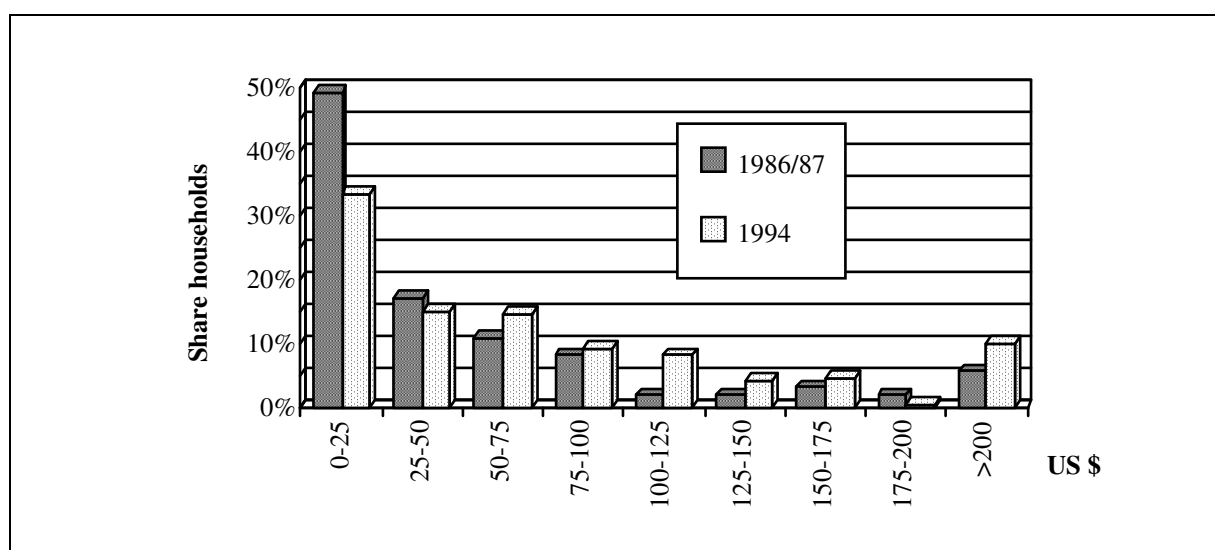


Fig. 3.2-3 Revenues from marketing of agricultural products in the Makete District

²² The revenues for 1986/87 had to be estimated, because the data were incomplete.

In 1987 the Matamba Region produced 85 % of the pyrethrum²³ exported from the Iringa Region. Due to the falling prices of pyrethrum the production declined by 50 % between 1976 and 1986 and stopped completely in 1994, after the state owned pyrethrum boards did not pay for the collected harvest²⁴. Pyrethrum was replaced in Matamba by cereals and potatoes, whereas in Bulongwa other crops like vegetables became more important. Many farmers sell other agricultural products such as the alcoholic bamboo juice ulanzi, which is marketed in considerable quantities in the Matamba Region, where annually 450 l per household are sold to traders, at local markets or to other members of the village²⁵. Quite often the ulanzi is transported with four-wheel drive-vehicles to the big towns of Mbeya and Iringa.

	Bulongwa 1986-1994		Matamba 1987-1994	
	Prices (Njombe) [Tsh]	Marketing [t]	Prices (Mbeya) [Tsh]	Marketing [t]
Beans	+81 %	+256 %	+154 %	+294 %
Irish Potatoes	-30 %	+136 %	-15 %	+381 %
Wheat	-22 %	+94 %	-20 %	+186 %
Maize	+135 %	+50 %	+55 %	+122 %

Source: Dierks (1995) p. 30

Tab. 3.2-3 Change in real agricultural producer prices in Makete

The increase in marketing was partly due to the changing producer prices, which was a result of the liberalisation of the agricultural markets. While the real prices for beans and maize were submitted to large increases, the producer prices for wheat and Irish potatoes decreased moderately. The decrease might have been smaller if a rural consumer price index could have been used²⁶. Even

²³ Pyrethrum is harvested from flowers and used for the production of biological insecticides.

²⁴ The director of the Matamba Pyrethrum Board left the country with a couple of million Tanzanian Shillings after collecting the harvest from the farmers and not paying them.

²⁵ A considerable amount (45 %) of the ulanzi harvested is consumed by the households themselves. Nearly 300 l are annually drunken by adult household members from their own harvest, not including the ulanzi bought in the local shops. Excessive consumption of alcohol seems to be a serious problem in Makete.

²⁶ The 1986/87 producer prices were adjusted with the national price index. Distortions might occur, because the index is dominated by the patterns of urban consumption. An index of rural consumer prices does not exist in Tanzania. The devaluation of the Tanzanian Shilling was one of the major reasons for the consumer price increase, because imported goods became more expensive. Assuming that the urban consumption has a higher share of imported goods, the devaluation of the Tanzanian Shilling has increased the price of the urban basket of commodities considerably more than the rural consumer prices. Therefore the (moderate) reduction of producer prices for Irish potatoes and wheat might not have

though the prices of some products were decreasing the market production increased. This augmentation cannot only be explained by price incentives. Other factors must have influenced the agricultural production: the permission of private traders and private ownership of vehicles, the changes in the transport system and the general opening of the district.

	Bulongwa	Matamba	Total Survey
1994	22 %	69 %	57 %
1986/87	56 %	89 %	71 %

Tab. 3.2-4 Share of crops marketed in the village

As previously mentioned, the marketing monopoly of the parastatal marketing boards was broken and private traders were permitted. This had severe impacts on the marketing of crops in Makete, which changed from primarily marketing in the village to external marketing. Farmers from the Bulongwa Region, where motorised access to the villages is difficult, market $\frac{4}{5}$ of their crops outside the village while in Matamba, which has good external access, only $\frac{1}{3}$ of the products are sold externally. The latter region has to be analysed more carefully, because the village Mpangala dominates the results with the marketing of heavy crops. Here 70 % of the crops (mainly potatoes) are sold on the fields or on the street to private traders, because the heavy crops cannot be transported to the lowland markets. In the remaining two villages the weight of the products marketed (maize, sorghum) is lower and some farmers prefer to walk to the lowland markets where the prices are higher than in the village. In these villages 75 % of the crops are sold externally.

One of the main restrictions for agricultural production is not only marketing, but also the transport of the products from the fields. While the amount of products harvested varies between 1.6 t and 4 t per household, the amount transported from the field only alternates between 1.4 t and 2.6 t. The remaining amounts are either sold directly on the field or consumed right away. Although the Matamba Region registers bigger harvests, the amount transported home is not significantly higher than in Bulongwa. In Matamba a good road passes by the fields of two villages and allows the marketing of products directly from the fields²⁷. Even though the amount harvested is much higher in Matamba, less tkm are transported from the field to the farm than in Bulongwa. In general the transport burden caused by the evacuation of products from the fields is higher than from marketing activities. The former imposes restrictions

occurred if a rural consumer price index could have been used to calculate the price changes.

²⁷ These products are mainly potatoes which are transported from the fields directly to the street. A considerable amount of ulanzi is harvested from the bamboo bushes in or beside the village and transported directly to the street, where it is collected.

on the agricultural production, which cannot be solved by motorised transport, because the fields are often not accessible by roads.

3.2.3 Transport Activities

Transport in Makete is restricted by the steep terrain and poor road conditions. The dominant mode is walking. The average household uses 45 hours per week for transport activities which comprise a transport volume of 83 tkm per annum. The main features of the rural transport system as described in Chapter 2 remain untouched. Half of the time is used for the collection of water and firewood and 18 % for trips to the fields. 21 % of the transport time is devoted to trips to external markets of which less than 2 % is used to market one's own produce. The marketing of agricultural produce amounts to less than 5 % of the total tkm of an average household, while the collection of firewood and water comprises 80 %. A detailed listing of the transport patterns is given in Tab. 3.2-6, Fig. 3.2-4 and in the appendix.

Tons per household	Bulongw a	Matamba	Survey Villages
Products Harvested	2.08	3.17	2.57
Transported home	2.03	2.22	2.10
Not transported home	0.05	0.95	0.47
Tkm (Field-Home)	8.2	6.7	7.5
Tkm (Marketing)	3.5	6.8	4.7

Tab. 3.2-5 Transport of Crops

	Trips/Annum	Trip Distance [km]	Hours/Annum	Tons /Annum	Tkm/Annum
Water	1,055	2	811	18.2	28.2
Firewood	276	5	370	6.9	37.3
Village Centre	206	2	138	-	-
Grinding Mill	36	4	71	0.7	5.6
Fields	235	4	429	2.1	7.5
Health Facilities	25	6	72	-	-
Internal Crop Marketing	11	-	4	0.2	0.3
External Crop Marketing	20	0	55	0.4	4.4
External Markets	91	9	450	-	-
Other External Trips	34	-	(93)*	-	-
Total	1,970	-	2,345	28.5	83.3
The following data was obtained from the household survey: number of trips, trip duration, mode of transport. The following assumptions were made: walking speed = 4 km/h, average headload = 20 kg * Estimate, not included in total time					

Tab. 3.2-6 Transport pattern of an average household in the survey villages 1994

During the survey period 1986/87 to 1994 the total transport burden expressed in time and tkm stayed relatively constant. The biggest change was an increase in the number of trips by 22 %, especially for water and firewood collection. In

the same period the average distance decreased, which resulted in a compensating effect thus leaving the time and tkm unchanged. The reduction of distances might be partly a result of the donor activities, which were designed with the target of reducing the transport burden of women. The repair of grinding mills, installation of woodlots and piped water supply, might result in a reduction of the walking distance. The changes in the number of trips can be partly explained by the reduction of the trip distances, which made more short trips possible²⁸. Other explanations are the different frame conditions like f. ex. the marketing system, which affected crop marketing; crops are marketed nowadays more on external markets. In general an increase of external trips²⁹ by 14 % (16 trips/annum) can be observed. The number of trips, the time used and the distance walked to the locations of health services remain unchanged. Some differences in the transport patterns might occur because the evaluation methods in both surveys were slightly different³⁰. This holds true for the trips to the village centre and to the fields which were evaluated differently.

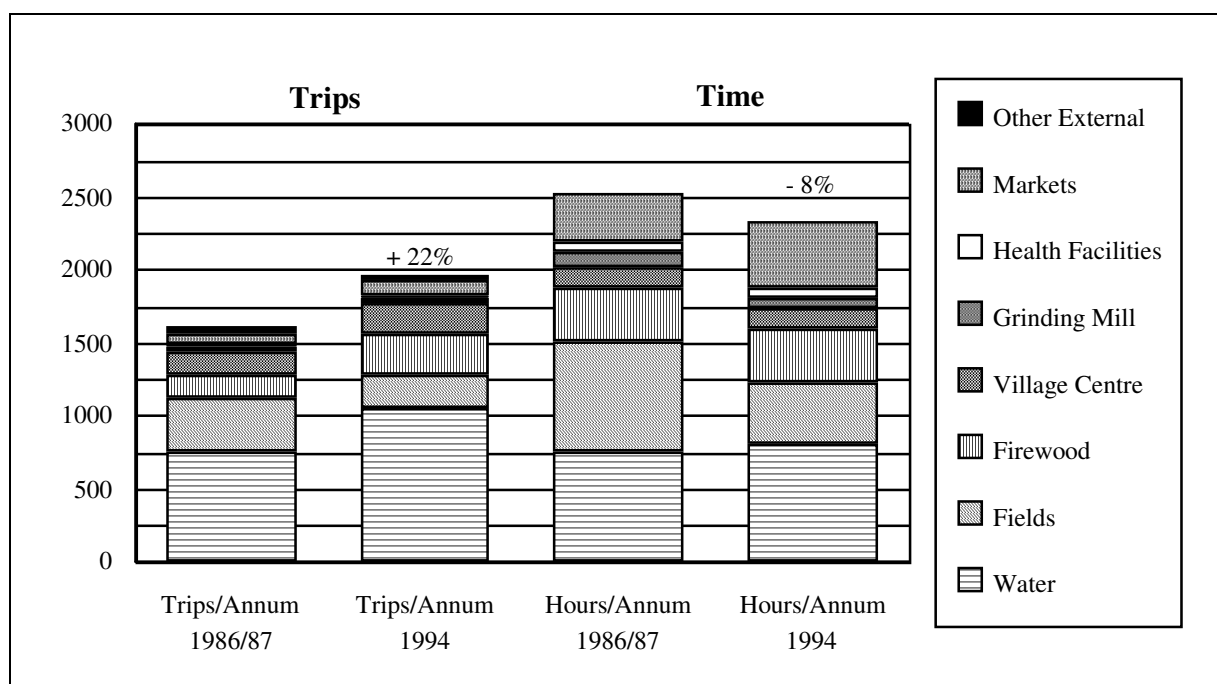


Fig. 3.2-4 Transport activities per household in Makete 1986/87 and 1994

²⁸ The village Kidope is a good example, where after the installation of piped water supply the distance decreased by 43 % but the number of trips nearly doubled.

²⁹ Trips to markets and other external trips.

³⁰ Indeed three surveys (1986, 1987 and 1994) have to be compared, which were conducted and analysed by different persons. For each survey a (slightly) different questionnaire was used and sometimes different statistical methods (definition and extinction of extreme values) were used.

Almost every village has some kind of road access but the poor conditions of the roads, especially during the rainy season and the lack of motorised vehicles makes motorised transport a seldom event. On average one motorised trip is annually undertaken per household. 65 % of the households did not travel at all with motor vehicles; 3 % travelled once per month or more. The relatively high transport costs compared to the low income is the main reason; households undertaking motorised trips spend 13 % of their total expenditure on transport. In addition they have a 60 % higher total expenditure than households which are not undertaking motorised trips.

About half of the villages in Makete have their main access via footpaths and another quarter can hardly be reached during the rains. A network of footpaths and tracks that cross the district is the main transport infrastructure. It provides the most direct routes between places, often over difficult terrain but offering shorter walking distances than following the roads. Sometimes shortcuts are so efficient, that driving is only $\frac{1}{3}$ faster than walking. Paths down the escarpment are the only possibility to reach the lowlands in the western direction. The road network consists of 850 km of motorable roads, with 160 km of regional roads, 190 km of district roads and about 500 km of feeder roads. While the first two road categories are under the supervision of the regional and the district engineer, the feeder roads are maintained through the villages. In 1994 the regional and district budgets received central government allocations from the road fund. The money was often used for emergency repairs. In general the condition of the regional and district roads was worse than that of many feeder roads, which were maintained with Self Help labour. It seems obvious, that the population is willing to invest working time to improve the access of their village. In Matamba Ward the villagers preferred to pay a local tax to pay labourers to improve the feeder road instead of working themselves³¹.

	Motor vehicles		Donkeys		Bicycles		Wheelbarrows	
	1994	1986/87	1994	1986/87	1994	1986/87	1994	1986/87
Bulongwa	4	2	0	0	16	7	10	1
Matamba	0	2	56	12	47	57	3	1
Survey Area*	4	4	56	12	73	61	16	3
In Working Order	2		-	-	59			
* Including Ihela								

Tab. 3.2-7 Means of transport in survey villages

In 1987 only 65 motor-vehicles in working order were counted in Makete, which implies a ratio of 0.6 vehicles/1000 inhabitants. 85 % belonged to missions, to development projects, to the government or to the District Council.

³¹ A detailed description of the Self Help activities in Matamba is given in Box 5-1.

The number of motorised vehicles in working order in the surveyed villages decreased. In 1987 two buses were each operating three times a week carrying 25,000 passengers per year. The improvement of the Njombe-Makete-Bulongwa road had effects on public transport in Makete. In 1993 buses were also operating during the rainy season and the service was extended to Bulongwa. During the next rainy season the condition of the improved road deteriorated fast after preceding unprofessional upgrading. In 1994 the road was in such bad repair that the bus stopped the service to Bulongwa.

In 1994 only 3 % of the survey households owned a bicycle in working order and 2 % a donkey. The number of IMT increased significantly: in 1981, when the first surveys were conducted no bicycles or donkeys were found in the district. Since 1987 the number of bicycles has increased by 20 %, but in 1994 many of the bicycles were not in working order. A reason for this growth might be the reduction in import taxes. Most of the bicycles are used in Matamba, where the terrain is flat. The MIRT Project enhanced the ownership of donkeys, which more than tripled during the observed period. All of the donkeys can be found in two survey villages of Matamba. The number of wheelbarrows in the survey area increased by a factor of five. However, very few households actually possess a wheelbarrow, as most of them are in the ownership of NGOs or other institutions.

3.3 Transport Interventions in the Makete District

The Makete Integrated Rural Transport Project (MIRTP) was conducted by the International Labour Office (ILO) from 1986 to 1995. The MIRTP was a pilot-project in the field of rural transport and had the following objectives:

- the introduction/development of low cost means of transport,
- the improvement of feeder roads and tracks by self-help labour,
- the development of existing tracks and trails,
- the improvement of existing bus and truck services,
- transport avoiding measures such as the repair of grinding mills and the planting of woodlots and
- the establishment of capacity within the District Council to plan, organise and implement rural transport interventions.

Numerous activities were conducted in the district and the follow up phase was still going on in 1994. In 1992 a Tripartite Evaluation (CHIWANGA et al 1992) assessed the output

	Bulongwa	Matamba	Survey Area
Donkeys	0.0%	3.5%	2.0%
Wheelbarrows	0.1%	0.4%	0.3%
Bicycles	1.3%	4.2%	3.3%

Tab. 3.2-8 Households possessing IMT in working order

from the Project as listed in Tab. 3.3-1. A more detailed synopsis of the MIRTTP Activities is given in the appendix.

Objective	Main results
Technical support for improvement of paths on a self-help basis	27.3 km of local paths improved
Capability established in District to improve and maintain feeder roads	40.5 km of feeder roads and tracks improved
Donkeys and donkey panniers made available	144 donkeys and 120 panniers sold
Capacity to produce wheelbarrows established	181 wheelbarrows in use
Hand operated grinding mills made available and motorised grinding mills repaired	25 motorised grinding mills repaired, 3 hand operated Grinding Mills made available
Road Maintenance Unit of District established	Capacity partly established
District Mechanical Workshop improved	Performance not improved
Capacity established in district to provide managerial support to District Council Bus and Village Truck Service	Objective not fulfilled
Capacity developed within the district Council to analyse, plan, promote and support rural transport improvements.	Training of Counterpart conducted

Tab. 3.3-1 Objectives and Main Results of the MIRT Project

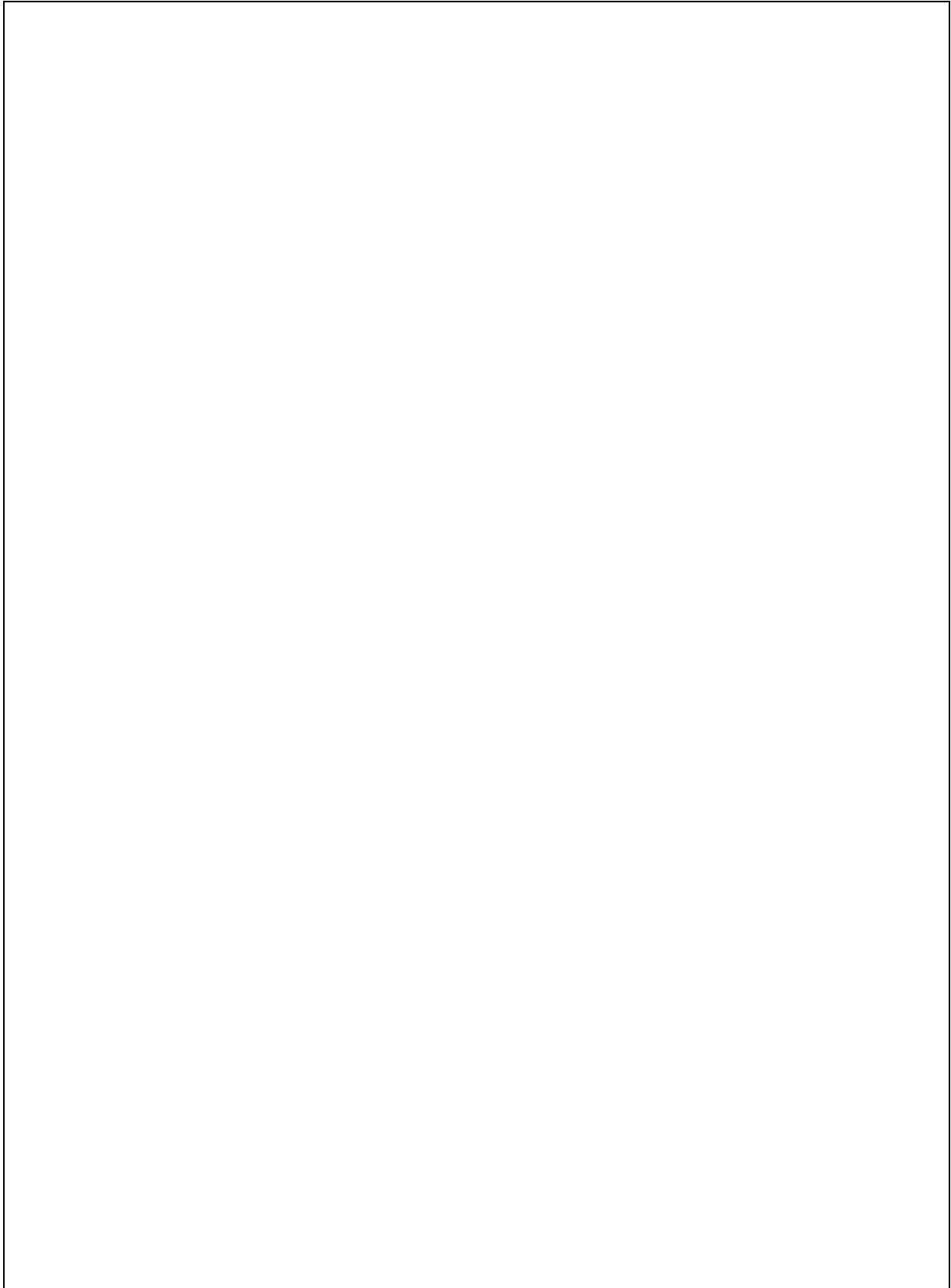


Fig. 3.3-1 Transport infrastructure and improvements in the Makete District

3.4 Methodology of the Field Study

Several pre-evaluation-studies³² had been undertaken in the region before the MIRT Project started. "While projects are usually criticised in evaluations for gathering insufficient planning data, the MIRTTP is one of the few cases where the opposite holds true." (CHIWANGA et al 1992, p.35). In 1986 and 1987 a survey conducted by BARWELL and MALMBERG questioned 431 rural households in 19 villages in the Makete District about their household endowment, expenditure, transport behaviour, agricultural production and marketing. In 1994 this survey was conducted in a similar way in order to appraise the socio-economic changes by comparing the evaluated data with the previous studies. This time 248 households in 8 villages were interviewed: 171 households belonged to a 10 % random choice of households in the villages and 77 households were interviewed, because they possessed a donkey, bicycle or wheelbarrow.

Interviews with the village leaderships were conducted to obtain qualitative assessments of the changes due to the MIRT Project. In addition, the traffic was counted on improved and not improved footpaths and on an improved road.

Village	Area	Households Interviewed		Changes in Transportation
		Random	IMT-HH	
Unenamwa	Bulongwa	21	2	Improvement of internal access Improvement of footpath
Utengule		15	4	Improvement of footpath Breakdown of grinding mill
Madihani		15	2	
Kidope		22	1	Installation of piped water supply Installation of grinding mill
Ihela	Central Region	21	6	Improved of external access Installation of woodlots Installation of dispensary
Mpangala	Matamba	30	29	Improvement of external access
Ngoje		16	22	Improvement of external access Installation of grinding mill
Ng'onde		31	11	Installation of grinding mill deterioration of external access
Total		171	77	Total: 248

Tab. 3.4-1 Survey villages 1994

The map overleaf shows the survey villages and the main MIRTTP improvements. The study area Bulongwa is located in a peripheral part of Makete; the

³² BARWELL / MALMBERG CALVO (1989), DIXON-FYLE / FRIELING (1990), JENNINGS (1992) and many others more.

villages of Utengule and Madihani are situated close to the escarpment, which forms the western border of the district and which can only be crossed by foot. Motorised external access is possible via the regional road from Makete to Bulongwa, which had been partly improved, but had deteriorated at that time to a very bad condition. The track to Unenamwa and the footpath to Utengule were improved. The terrain is often very steep so bicycles are rarely used.

The second study area Matamba is located in the north western part of the district. It is the region with the best external access, because a 24 km long road drives down the northern escarpment, where a tarmac road leads to the capital Dar Es Salaam and to the next big town Mbeya which counts 100,000 inhabitants. The villages of Mpangala and Ngoje are directly adjacent to this improved road. Ng'onde is located besides the regional road, which is no longer passable. The terrain is relatively flat and the use of bicycles is much more common than in Bulongwa. The whole area is very active in agricultural production, because of its favourable agroecological conditions and its good external access.

The Village of Ihela is located beside the regional road Njombe-Makete and also has a good external access. During the dry season a regular bus passes through every day. The agricultural potential is mediocre.

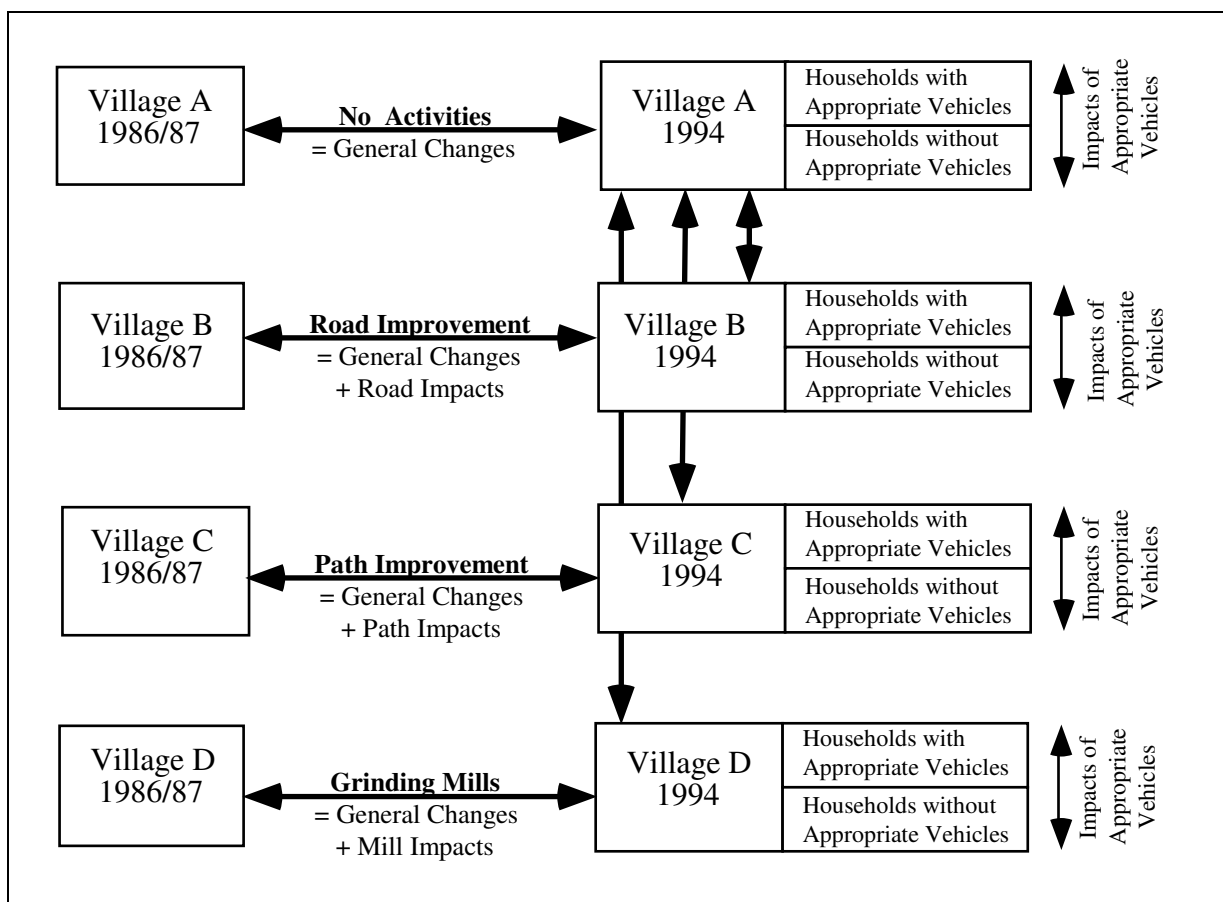


Fig. 3.4-1 General methodology of impact assessment

Only the objectives 1 to 5 on Tab. 3.3-1 will show measurable effects upon the household level and are therefore part of this study. Furthermore the Danish development aid organisation DANIDA installed a piped water supply in one village.

In general, a distinction has to be made between short term effects and long term impacts. The effects comprise the immediate benefits after or during the improvement such as revenues generated by the construction and maintenance activities, reductions of transport time and Vehicle Operating Costs. The impacts try to assess the long term benefits like increased production- and marketing activities induced by the transport improvements. Impacts presume that the maintenance will henceforth be carried out properly in order to guarantee a long duration of the benefits. Due to the short observation period of seven years and to the fact that the last phase of the MIRTP was still going on no clear judgement of the sustainability can be given.

In general, three methodologies for the assessment of the impacts are used in this study: Methodology I can be applied for the assessment of road and footpath improvements. The changes occurring between 1986/87 and 1994 in a village with improvements are compared with the changes of a control group i.e. villages without improvements of the transport system. It can be assumed that the difference of the changes represent the impacts of the transport intervention.

	Village A	Village B
1986/87	\bar{X}_{A86}	\bar{X}_{B86}
1994	\bar{X}_{A94}	\bar{X}_{B94}
Change	$\Delta \bar{X}_A = \bar{X}_{A94} - \bar{X}_{A86}$	$\Delta \bar{X}_B = \bar{X}_{B94} - \bar{X}_{B86}$
Impact	$I = \Delta \bar{X}_B - \Delta \bar{X}_A$	

Tab. 3.4-2 Methodology I for impact assessment

Methodology II can be applied for the assessment of grinding mills and piped water supply; a simple comparison of 1994 villages (B, C, D, ...) with improvement and 1994 villages A without improvements gives an indication of the impacts. The results can be compared with the outcomes of the application of Methodology I, which can also be sensibly applied in this case. In many cases only the mean values of the 1986/87 survey were available. Therefore a comparison of median and standard deviation was not always possible.

Methodology III tries to assess the impacts of the purchase of IMT. Because the household survey 1986/87 was conducted anonymously no data exist about the performance of households before the purchase of an IMT. Therefore the impacts have to be assessed by comparing households of the same villages with a similar household structure; i.e. size of household, profession, source of cash income etc.

Often assumptions have to be made for the estimation of the impacts. In order to reduce misjudgements due to wrong assumptions two approaches were chosen: the 'optimistic approach' chooses those assumptions, which are most favourable for the impacts of the concerning transport intervention, while the 'pessimistic approach' takes into account the unfavourable assumptions. The comparison of mean values (for the estimation of impacts on marketing) might give a too optimistic picture of the changes, because extreme values may influence the average. Therefore a more pessimistic approach is also calculated by comparing the median values, which give a clearer impression for the majority of households.

A couple of methodological problems occur due to missing or non comparable data. The revenues from marketing activities is one of the salient features of the impact assessment. As mentioned above the agricultural producer prices changed during the observation period. Because a rural price index has not yet been calculated for Tanzania, the estimation of the real price changes is problematic. Furthermore the nominal prices only of the next big towns Mbeya and Njombe can be obtained but not the prices in Makete. Therefore all the revenue changes were calculated by multiplying the amounts (in tons) marketed in 1986/87 with the 1994 producer prices. This methodology does not reflect the actual income situation in 1987, but rather gives an indication of the comparable changes in marketing.

All values are transformed into Dollars using the June 1994 exchange rate of 518 Tsh per US \$. Monetary values of previous years are first adjusted to the local 1994 price level before the exchange rate is applied.