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INDICATIVE PROGRAMME FOR THE  
INTEGRATED DEVELOPMENT OF THE METAL AND ENGINEERING  
INDUSTRIES FOR THE PRODUCTION OF AGRICULTURAL MACHINERY  
AND EQUIPMENT IN

T A N Z A N I A

Programme Development Support Unit  
July 1990

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INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN  
TANZANIA

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**INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA**

**1. INTRODUCTION**

1.1 UNIDO has established a Program Development Support Unit (PDSU) in Vienna with the task of creating integrated programs of support for industrial development in Africa as part of the international effort behind the second Industrial Development Decade for Africa (IDDA II). Several sectors contributing to industrial inputs for agriculture are under study, including the agricultural machinery industry (AMI).

1.2 The PDSU has adopted a systems approach to these studies. Thus, all components of an industrial system, from the environment in which it operates, through inputs and production to the product list and distribution to the whole spectrum of market sectors are analysed in relation to one another to identify weaknesses within components and in the linkages between them. Indicative programs are then designed to alleviate constraints and strengthen weak points to improve both the contribution the AMI can make to agricultural development and its own prosperity and development as an industrial sector.

1.3 To rationalise the task of compiling programs for some fifty countries and in the expectation that some countries might be grouped as having similar needs, the PDSU has developed a typological grouping system. Analysis of common variables applicable to the agricultural machinery industry system (AMIS) has indicated that the fifty countries can be divided into six groups. The character of each group is distinct. Group I countries are largely self sufficient. Groups II to V are increasingly less self sufficient with increasingly smaller markets and weaker industrial sectors. Group VI countries, while not strong industrially, are prosperous for other reasons and not in great need of assistance.

1.4 One or more sample countries have been selected from each group for field study and for the elaboration of an integrated program of projects which, at this stage, is to be indicative of the assistance needed and indicative, also, of the type of program which might be replicated for use in other countries of the same typological group.

1.5 This report covers an indicative, integrated program of development for the agricultural machinery industry in Tanzania. It was compiled after desk studies in Vienna and a three-week field trip to Tanzania in January 1990. Government officials in the ministries concerned, officials of the various institutions involved in AMIS in Tanzania and manufacturers of agricultural tools and equipment were all invited to contribute to discussion of the problems and opportunities for AMIS in Tanzania.

1.6 Tanzania is in Typological Group II, with Zambia, Mozambique, Malawi, Cameroon, Senegal and Cote d'Ivoire : all countries with agricultural systems based on peasant farming using mostly hand tool and animal draught cultivation and with some development of tractor power on plantations and estates. In all of these countries there is relatively weak industrial development but AMIS is represented on both artisanal and industrial levels. This existing base coupled with the potential market for farm tools and implements suggests that development assistance could produce a good response in terms of industrial expansion in these countries.

1.7 The Tanzanian economy is characterised by massive investment in industry, including AMIS, but without parallel development of markets for industrial products,

particularly in the case of AMIS. Rapid population growth and industrial demand for agricultural raw materials provide a good base for agricultural growth and an increase in productivity in this sector requires development of mechanisation and offers good opportunities for AMIS. Annex 1 gives further details of the Tanzanian economy and background to the report.

1.8 Failure of centrally planned economic systems established following independence in the 1960s has led to revised economic policies including an enhanced role for private investment and free enterprise in a more market-oriented system. Rehabilitation of AMIS therefore would be a timely intervention in support of industrial and agricultural development.

1.9 This report is indicative in the sense that it proposes a strategy and a program broadly in line with what appear to be the major concerns of Government policy and the current status of the AMI system and the markets it is intended to serve. However it is the result of a relatively brief and superficial study of a situation in which others have spent much longer periods on detailed surveys and in direct contact with the Tanzanian farmers in order to understand their needs. The report is therefore intended as a basis for discussion and further development of the ideas expressed rather than a definitive pronouncement on the subject of AMIS in Tanzania.

## 2. SUMMARY AND CONCLUSIONS

2.1 In the absence of a formally defined strategy for agricultural mechanisation in Tanzania and the absence also of accurate statistics covering the use and demand for AMI products, assumptions have been made on the basis of stated Government policy and on published data concerning the size and structure of the agricultural economy of Tanzania.

2.2 Analysis on the above basis of potential demand compared with installed production capacity leads to the conclusion that, for **hand tools**, investments already made in production plant are sufficient to enable the AMI system to meet demand at least through the first half of this decade while, for **animal draught implements**, an increase in productive capacity may be required. For tractor drawn equipment, factory capacity is unlikely to yield more than half of anticipated demand.

2.3 At present, demand is weaker than might be expected. Farm incomes have been seriously affected by deficiencies in the state controlled marketing system for agricultural produce. Failure to buy the crops produced is compounded with severe shortage of transport and liquidity problems in the system that have led to prolonged delays in payment to farmers. These factors have combined with low prices for agricultural produce to deprive AMI consumers of purchasing power. Present Government policies to increase crop prices and projects designed to strengthen the crop marketing infrastructure will improve the situation.

2.4 Industrial capacity in the AMI system is under-utilised because demand has been constrained (see above 2.3) and because production facilities have deteriorated under weak management systems allied to the centrally planned nature of the Tanzanian economy.

2.5 The Tanzanian economy and political system are moving towards reversion to a market oriented system and the opportunity therefore exists to revitalise AMIS through management training, plant rehabilitation and rationalisation of inputs. However, strict adherence to Government policy in sensitive areas is advised because the trends mentioned above have yet to receive full acceptance by the governing Party.

2.6 The institutions needed to support AMIS in Tanzania are in place but require strengthening and better integration in order to play their full and intended part in AMI development.

2.7 Future demand for food and industrial products from the agricultural system will increase considerably to feed a rapidly growing population and provide materials for agro-industrial exports. Agricultural land is not a constraint but the level of agricultural mechanisation will have to be raised in order to achieve the required productivity from human resources in agriculture.

2.8 Mechanisation development in Tanzania may be defined initially in terms of transition from hand tool cultivation towards development of animal draught systems. The use of tractor power will depend on the rate at which the agricultural industry reverts to a market oriented system in which foreign investment in commercial production of industrial crops may once again play an important role and in which an emergent sector of local commercial farming may assume more importance.

2.9 The predominance of hand tool agriculture requires a well developed source of high quality tools. However rapidly animal draught systems may develop, hand tools will still be in demand for operations other than simple tillage. While bulk supplies should be sourced on industrial producers in Tanzania, the artisanal sector needs support in view of its role in the small rural industry sector and its capability for specialised production of local variants of hand tools.

2.10 Accelerated development of animal draught tillage in line with government policy requires an adequate local source of implements appropriate to local conditions and attuned to local demand. These sources already exist, in principle, in Tanzania but require rehabilitation as mentioned above.

2.11 Despite the relatively low importance of tractor powered systems at present, they do have a role in market sectors such as plantations and estates, larger farms (see paragraph 2.8) and equipment hire schemes. There is already a considerable population of tractors (12-18,000, depending on data source), probably 25% of which have been assembled in Tanzania. These need to be maintained as a national resource, replaced at an appropriate rate and provided with an adequate range of implements which, for the time being, should be imported. Calculation to determine demand for tractors and implements has been based simply on present intensity of use and the predicted increase in area under cultivation.

2.12 While some AMI producers may find it worthwhile to consider the systematic development of production of tractor drawn implements and the local assembly of tractors may be capable of further development, it is suggested that such developments should be self energising and that international efforts to support the AMI system should be concentrated on the hand tool and animal draught implement sectors.

2.13 In view of the considerations expressed above, a program has been designed to support and develop the AMI system in Tanzania by means of the following activities:

- Strengthening the institutional framework in which the industry operates;
- Strengthening the supply of raw materials and components to the industry;
- Strengthening the industry's management and marketing capabilities;
- Rehabilitating worn plant;
- Adding plant where required to complement and balance existing facilities.

2.14 The program suggested is planned for implementation in logical sequence over the decade between 1991 and 2000, depending on the timing of funding cycles. Most of the projects would be of value by themselves but if joined with the others in an integrated package, would produce a compound effect, enhancing the contribution of the individual projects.

2.15 There are 15 technical assistance projects in the program. Some of these are quite small and are addressed to individual targets such as feasibility studies preliminary to the installation of specific plant items. Others are large; broad enough in scope to bring about changes in the whole industry or in the ministry responsible for it, in response to the challenges of the marketing approach required for development. The program also contains four investment projects, three of which are dependent on feasibility studies while the other is a comprehensive rehabilitation project designed to restore the major AMIS producers to full productive capacity and to provide items of plant needed to balance their facilities.

2.16 Initial estimates suggest that the total cost of the program would be about US\$3m of which \$2m would be technical assistance.



2.17

The benefits generated by the program are expected to be:

- Increased local production : 10-11,000 tons, worth \$20m/year;
- Increased value added : \$7-8m/year;
- Increased arable area;
- Improved agricultural productivity;
- Increased employment;
- Generally improved quality of rural life;

### 3. PROGRAM CONTEXT

#### 3.1 Components and Linkages

Reference to the Base Diagram (Diagram 3.1) shows the major components of the system and the linkages between them. The market for AMI products is unsophisticated. Probably only 5% of cultivation is by tractor-drawn implements. A further 10% of cultivation is by ox-drawn ploughs and the remaining 85% is by hand hoe. The AMI production spectrum is therefore largely composed of hand hoes and related tools with a slowly growing trend to ox ploughs. Raw materials and complex components are imported. A relatively small number of enterprises manufacture most of the AMI products, the balance being made by a large number of rural artisans. Imports of whole goods are now limited to about half the tractors and some of the tractor drawn implements sold each year. Distribution is either direct to consumers or via a variety of public and private sector trading organisations. Support to users is provided either by the retailing organisation or by local workshops.

#### 3.2 Demand for AMI Products

Table 3.1 shows historic demand for the more important AMI products and a tentative forecast of future needs. Any forecast, and the program by which it may be met, should be the subject of a logically designed strategy for mechanisation of agriculture based on crop production programs and farming systems which are more properly the province of the Ministry of Agriculture. However, from an industrial point of view, certain basic assumptions can be made and provision retained for adaptation to a detailed mechanisation strategy once this has been elaborated. For instance, it may be assumed that while there may be some development of tractor powered mechanisation, the basic demand over the next decade or so will presumably be for improvements to, and expansion of, the range of ox-drawn implements and hand tools. Several studies have been made of the Tanzanian market for farm tools and implements. Most of them seem to have concentrated on identification of the existing market at various times in the 1970s and 1980s. Results of these studies vary considerably. In the paragraphs that follow, a fairly cautious approach has been adopted, steering a middle course between the limits suggested by others. The figures quoted should not be taken as other than rough estimates. The eventual strategy to be adopted for planning and sourcing AMI products should be dynamic enough to mould supply reasonably accurately to demand on the basis of the feedback loops built into a proper marketing system.

#### 3.3 Market Trends

Demographic growth may double the population within the next twenty years. Per capita food production has declined by about 15% in the last ten years and nutritional levels are below even Africa's average (FAO Yearbook, 1988). There is, therefore, considerable need for expansion of food production and a need to increase productivity since, in addition to the need to improve rural living standards, the growth rate of the rural labour force is slower than growth of urban populations. Some expansion of arable land area is feasible and current Government policy requires a 5% annual increase. However, much of the increase in production may have to come from improvements to mechanisation. While other means of increasing output still have to be imported to a greater extent mechanisation makes better use of local resources including human and animal power. An assured and expanding market for AMI products would therefore seem to provide a sound base for development of the industry.

In the forecast given in Table 3.1 an increase in arable area of 5% per year is derived from Government plans. A growth rate of 2.5% has been used for the rural population with the result that the number of farming units (based on a family of 5) may be expected to increase by about 20% by the year 2000 to about five million, with a concurrent increase in size of about 40% to 1.5ha. The frequency spread of farm size distribution is not known at this stage.

A noticeable feature of the historic demand pattern is the small number of implements per farming unit and per power unit. As farming returns to prosperity as a result of better pricing policies, farmers will be able to equip themselves more adequately, particularly in respect of planting and weeding implements. Annex 2 gives a more detailed breakdown of projected demand. In Table A2.2 estimates are shown of the number of implements per farming unit, the life span of each type and an estimate, also, of the extent to which this theoretical demand might be realisable, given the current state of extension of technology among peasant farmers and the unknown order of priorities with which they view their own feeble purchasing power. While the factors used are estimations rather than the results of research, the results, in the case of the major items in the list, agree broadly with estimates made by others including, for example, Mothander, Kjaerby and Havnevik in their book, "Farm Implements for Small Scale Farmers in Tanzania" (Scandinavian Institute of African Studies, Uppsala, 1989) in which prior studies have been reviewed and in which demand is analysed in terms of regional variations, soil types, cropping patterns and cultural preferences.

No attempt has been made to forecast a change in the pattern of tractor use. It may be assumed, however, that the use of tractors by rural communities expanding their cropped area will produce a need for additional machinery. Also, there has been some resumption of investment in plantations, much of it from overseas, and this is expected to increase tractor sales. If the level of usage remains constant at 347ha/tractor (assuming 12,000 tractors in operation), there will be a requirement for the present population to increase to 20-25,000. Together with replacements for existing machines, an annual demand for 3,000-4,000 tractors seems likely and implements in similar numbers will be needed to work with the tractors.

Demand forecasts shown in Annex 2 include additional columns to show the influence of improvements in extension of mechanisation and general agricultural technology and of the effect of extension together with active marketing for the years 1995 and 2000. In Table 3.1 below, these projections have been summarised. The enhancements due to extension and marketing have been included for animal draught equipment but not for hand tools. This change of balance may be assumed to reflect a slight uplift in the level of mechanisation over the period.

Table 3.1

Demand for AMI Products in Tanzania

Product \ Year	1980	1990	1995	2000
<b>1. Hand Tools (000)</b>				
Hoe	2,710	3,000	3,500	4,000
Machette	1,230	1,245	1,400	1,600
Axe	200	260	300	330
Sickle	124	125	140	160
Grass Slasher	90	100	120	135
Hand Sprayer	18	25	28	32
Wheel Barrow	--	8	9	11
<b>2. Animal draught (no.)</b>				
Plough	10,400	47,000	55,000	72,000
Plough Share	na	500,000	550,000	720,000
Plough Chain	na	156,000	185,000	240,000
Harrow	1,200	500	600	770
Furrower	na	1,000	1,200	1,600
Cultivator	500	170	200	250
Ox Cart	900	12,500	14,800	19,200
<b>3. Tractor draught (no.)</b>				
Tractor	700	1,200	3,000	3,750
Plough	800	1,200	3,000	3,750
Harrow	500	600	1,500	1,900
Cultivator	200	350	1,000	1,100
Planter	140	300	750	950
Drill	120	10	11	12
Trailer	350	1,200	3,000	3,750

A more complete table is given in Appendix 2

Source : See Par. 3.3 above

**3.4 Production**

Table 3.2 shows the major sources of AMI products used in Tanzania in recent history, together with the designed capacity of each source. Despite ample capacity in some areas, actual demand has not always been met. Conversely, in some years production has been in excess of actual demand for some items due to factors such as poor communication and lower than usual purchasing power in the market. The program described in this report is designed to address these problems. The figures given have been derived from a number of sources and it is possible that product mix in any one plant in a specific year may be different to that shown. Also, theoretical capacity in some cases has been drastically reduced by the worn state of production equipment. In the case of ZZK, on the other hand, improved production management has raised output of some items to higher levels than originally planned. A brief description of the

principal AMI producers is given below and in more detail in Annex 5.

#### **3.4.1 Ubungo Farm Implements Manufacturing Company (UFI)**

Established in collaboration with the Peoples Republic of China, UFI commenced production in 1970 as the flagship of the Tanzanian public sector AMI producers with a work force of 650 and installed capacity of 3,600 tons, mainly in hoes, ox ploughs and plough shares produced on three hot forging lines plus a small foundry. Located in Dar es Salaam, UFI also has responsibility for managing and distributing public sector imported AMI products.

#### **3.4.2 Zana za Kilimo Limited (ZZK)**

In collaboration with India, ZZK was established in Mbeya in 1974 to make hand tools and ploughs with a capacity of about 3,700 tons and a work force of 245. The production line proved to be poorly designed and output was below expectations until SIDA funded a management contract with a Swedish company in 1985. Missing items of plant are being installed and other items surplus to requirements are being sold off. By 1989 production of some items was in excess of original design capacity, using only a portion of the plant. Management restructuring is also starting to produce results.

#### **3.4.3 Mwanza Farm Implements Factory**

The Bulgarian Government financed the installation of this plant which was originally destined for production of tractor drawn implements and irrigation equipment but included hand tools and ox ploughs as side lines. Installed capacity is about 5,600 tons and the factory commenced production in the late 1980s.

#### **3.4.4 Small Industries Development Organisation (SIDO)**

A Government body responsible for establishment of small industries on the basis of industrial parks with shared facilities, SIDO also watches over development of the artisanal sector. Depending on the region, there are said to be metal workers throughout the rural community to the extent of 0.1-0.3% of the population. This indicates a possible productive force of, say, 20,000 artisans with a potential output of 4,000 tons of miscellaneous domestic and agricultural products and repair parts if properly equipped and provided with regular supplies of raw materials. SIDO also looks after a number of small scale industrial enterprises producing ox carts, ploughs and hand tools. A number of projects financed by SIDA, FRG, Holland and UNIDO have provided assistance to this sector for varying periods during the last ten years.

#### **3.4.5 Rural Craft Workshops**

Some fifteen public workshops were established under responsibility of the Ministry of Agriculture for production of items such as ox carts, wheel barrows, hand carts, furniture and household fittings. Assistance for some was provided by FRG and some had local support from CAMARTEC. Quality of management and product has yet to reach acceptable levels.

#### **3.4.6 Private Workshops**

There are possibly 10 private workshops employing 5-10 workers, 10-15 mission-run workshops and a much larger number of small open-air workshops scattered through out the country, making a varied range of items which often includes ox carts.

## 3.4.7

**Metal Engineering Industries Development Association (MEIDA)**

An association of medium-scale industries established in 1979 with Swedish assistance, MEIDA produced, in 1983, a study describing a selection of member companies capable of producing farm tools alongside their regular run of furniture, windows and other metal items. Three or four companies actually qualify as AMI producers.

Table 3.2  
Manufacturing Capacity for AMI Products in Tanzania

Product / Source	UFI	ZZK	Mwanza	SIDO	MEIDA	THEMI	TOTAL
<b>1. Hand Tools (000)</b>							
Hoe	2,000	750	1,900	50	250		4,950
Machette		900	200		250		1,350
Axe		250	20				270
Shovel/Spade		50	105		300		455
Sickle		75					75
Grass Slasher	60	6		70			136
Hand Sprayer		20	10				30
Wheel Barrow		6					6
<b>2. Animal draught (no.)</b>							
Plough	20,000	15,000	10,000	5,000	5,000		55,000
Plough Share	100,000			40,000		2,000	142,000
Plough Chain							0
Harrow		1,000	4,000	680			5,680
Furrower							0
Cultivator			4,000				4,000
Ox Cart						650	650
<b>3. Tractor draught (no.)</b>							
Tractor (TAMC)							1,500
Plough		800	550				1,350
Harrow		500	1,100				1,600
Cultivator		200	490				690
Planter			500				500
Drill							0
Trailer (TLLC)							600

A more complete table with source information is given in Annex 2.

## 3.5

Relationship between Supply and Demand for AMI Products

Table 3.3 shows the capability of the AMI system to meet current and expected demand. On the assumption that theoretical capacity may be restored and that all necessary

inputs are available, it would appear that demand for **hand tools** should be met from available productive capacity, as long as production is rationally planned, at least up to 1995. After that, total capacity may be insufficient : depending on the rate at which animal draught overtakes hand tool cultivation and the rate at which productivity in the major AMI producers can be improved. In the case of **animal draught implements**, there is a considerable deficit. Since these are produced, mainly, by the same factories as the hand tools, rational decisions will have to be made on choice of product to make. The calculation of this balance in terms of weight of product (Table 3.4) illustrates this point more clearly, especially when due consideration is given to reports that the principal factories have seldom, if ever, worked at full capacity. In Table 3.4 and Table A2.4, Annex 2, the effect on this balance of an effective level of capacity at only 60% of the theoretical level is shown. It has been reported that existing constraints have reduced effective capacity to, or below, this level.

From these calculations it appears that while the situation in 1990 appears satisfactory (at the theoretical level), there is no room for complacency and decisions on resource planning should be directed to restoring full productive capacity and decisions about future strategy should be taken while there is still time to plan for expansion. Tractor drawn implements further complicate this picture, (whatever the value given for future demand) particularly since they require a higher degree of technology to withstand the greater stresses placed on them. In the case of the tractor drawn implements estimates are provisional and tend towards increase in use of tined implements and decrease in use of ploughs and disc harrows in recognition of cultivation system requirements of semi-arid areas.

Another factor in these calculations is the requirement for small processing machines such as shellers, mills, hullers, pulpers and water pumps. These tend to be produced by a different sector, the heavier, multi-purpose factories, rather than the specialised implement producers. Nevertheless, they should be included in the planning of equipment for the agricultural sector. Figures have been included in Annex 2, mainly based on an ownership pattern of 1% of the rural farming units, as an indication of the potential.

Any strategy for sourcing requirements will need to consider the relative merits of further investment in productive facilities compared with the merits of importation and the mix of product that might be derived from either source. For example, it may, at some time, be preferable to obtain hand tools from the artisanal sector, supplemented by imports from a low cost source such as China, while concentrating the resources of the industrial sector on a more profitable mix of animal and tractor draught implements. Policy decisions on factors such as tariff structure will then be required to safeguard the industry. Also in this connection, specific components such as ground-engaging parts (shares, shovels, duck feet and discs) should, perhaps be sourced from specialist manufacturers possessing the technology to produce the required durability. Moves towards welded fabrication rather than forging and toolbar style implements for animal draught (vide CAMARTEC and THEMI) rather than simple ploughs are also avenues to be explored. Questions of strategy are explored in Section 4 below.

**Table 3.3**  
**Balance between Supply and Demand**  
(numbers of pieces)

Product \ Year	1990	1995	2000
<b>1. Hand Tools (000)</b>			
Hoe	1,837	1,428	965
Machette	105	-58	-244
Axe	11	-23	-62
Shovel/Spade	223	192	157
Sickle	-50	-66	-84
Grass Slasher	32	19	3
Hand Sprayer	5	2	-2
Wheel Barrow	-2	-3	-5
<b>2. Animal draught (no.)</b>			
Plough	8,300	-3,242	-17,000
Plough Share	-325,000	-440,000	-578,000
Plough Chain	-155,640	-194,000	-240,000
Harrow	5,180	5,060	4,900
Furrower	-1,000	-1,300	-1,600
Cultivator	3,800	3,800	3,700
Ox Cart	-12,000	-15,000	-18,500
<b>3. Tractor draught (no.)</b>			
Tractor	300	-1,700	-2,200
Plough	150	-1,800	-2,400
Harrow	1,000	0	270
Cultivator	330	-275	-400
Planter	200	-300	-400
Drill	-10	-11	-12
Trailer	-1,200	-3,200	-3,750

A more complete table is given in Annex 2.



Table 3.4

Balance between Supply and Demand

(weight of product in tons)

	Hand Tools	Animal Draught	Tractor Drawn	Total Weight
<b>1. Demand</b>				
1990	7,600	3,700	2,553	13,853
1995	8,500	4,150	6,211	18,861
2000	9,700	5,650	7,968	23,318
<b>2. Supply</b>				
UFI	2,750	920	0	3,670
ZZK	2,691	580	480	3,751
Mwanza	3,030	680	1,405	5,115
SIDO	223	287	0	510
MEIDA	950	180	0	1,130
Others	0	176	1,217	1,393
<b>Total</b>	<b>9,644</b>	<b>2,823</b>	<b>3,102</b>	<b>15,569</b>
<b>Total @ 60%</b>	<b>5,786</b>	<b>1,694</b>	<b>1,861</b>	<b>9,341</b>
<b>3. Balance</b>				
1990	2,044	-877	549	1,716
1990 (@ 60%)	-1,814	-2,006	-692	-4,512
1995	1,144	-1,317	-3,109	-3,282
1995 (@ 60%)	-2,714	-2,456	-4,350	-9,520
2000	-56	-2,827	-4,866	-7,749
2000 (@ 60%)	-3,914	-3,956	-6,107	-13,977

**3.6 Imports**

The shortfall in supply is theoretically made up by importation (to the extent that demand is satisfied). Figures published by FAO suggest that imports of implements averaged about 80m Tanzanian Shillings per year between 1983 and 1987. Depending on the exchange rate at the time and the product mix, this might have represented 100-200 tons of AMI products and appears small compared with the figure of about \$16m for total machinery imports. If tractors are deducted from this figure, the balance would appear to equate more nearly to 3,000 tons of miscellaneous items classified as agricultural machinery, amounting to about 20% of the local market. Hand tool imports come largely from Chillington (UK or Brazil), India or China. Animal draught implements have been imported from Zambia and India. Tractor drawn implements may be imported from Europe together with tractors or from Zimbabwe as a member of the PTA. UFI holds the official franchise for farm tool and implement importation

and distribution. It has been suggested that inefficient local production has been subsidised by profits from imported implements and that local production at low levels of plant utilisation is uncompetitive with imported goods. Government policy, however emphasises the importance of self sufficiency in production of agricultural inputs such as farm tools and seeks to minimise reliance on importation.

### 3.7 Agricultural Context

Agriculture is, and is likely to remain, the basis of the Tanzanian economy. It employs over 80% of the population, contributes about 60% to GDP and over 80% of export revenues as well as supplying industry with raw materials. Table 3.5 shows the main characteristics of Tanzanian agriculture. Regional variations in climate and altitude produce an environment in which a wide variety of crops may be grown but soils tend to be fragile and, while the area of potentially arable land is not a constraint, it is vulnerable to erosion and drought in some areas. Low crop prices and a weak marketing system have reduced motivation and economic ability among farmers to take advantage of modern methods and the technology level remains low. Recent policy adjustments, particularly on crop pricing, will remove some constraints. Internationally funded projects are in hand to rehabilitate the institutional framework for research, extension and marketing. Substantial price increases awarded recently favour production of wheat, rice and beans, to some extent at the expense of maize and cassava which have suffered disease problems and falling demand. No formal strategy has been laid down for mechanisation of Tanzanian agriculture but Government policy is supportive of development of animal draught systems and a foundation for technological development has been laid in national research and development institutions and training centres. Progress has been hampered, until recently, by the low purchasing power of the customer base but, as mentioned above, crop pricing policy is being adjusted to stimulate food production. Prices of strategic crops and of farm machinery are controlled. The overall policy of the Tanzanian Government is to strive for self sufficiency in both food production and the means of production and to develop crops with potential for industrial processing and export.

Table 3.5  
Agriculture in Tanzania

Product \ Year	1981/2	1984/5	1987/8
<b>1. Food Crops (000t) Production</b>			
Maize	1,654	2,067	2,359
Cassava	1,658	1,923	1,709
Millet/Sorghum	970	850	954
Paddy	320	425	644
Pulses	297	406	424
Wheat	95	83	72
<b>2. Industrial Crops (000t Purchased)</b>			
Seed Cotton	133	155	226
Coffee	55	48	50
Sisal	61	32	36
Cashew Nuts (raw)	44	33	20
Tea	16	17	17
Pyrethrum	2	1.5	1

Source: UNIDO Survey

### 3.8 Institutional Context

An important aspect of the institutional framework for AMI systems is the Tanzanian Government's intention to pursue the goals embodied in the Arusha Declaration in 1967 which set the framework for social development in which the state would play the major role in production and distribution and rural systems would be developed along communal lines. Management capability in the public sector has never been developed sufficiently to meet these goals and current trends are towards less public sector involvement and control, liberalisation of some aspects of the economy and involvement of the private sector in a more market-oriented system. The fact remains, however, that much of the AMI system is still in the public sector and some elements are likely to remain there.

The Ministry of Industry exercises control over public sector enterprises through the National Development Corporation and also plays an important role in controlling inputs such as raw materials into private sector manufacturers. Industrial policy favours the creation of a geographical spread of manufacturing industries, particularly those which serve agriculture. Industrial parks have been established in major population centres throughout the country's main regions. Institutions related to the AMI system are shown in the Base Diagram. Potentially, at least, the AMI system would appear to be well served by supportive institutions which could provide a good basis for development if a strategy can be designed and implemented that will install or strengthen the necessary linkages and ensure rational integration.

Details of major institutions are given in Annex 5. Those of particular significance are:

### Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC)

Located in Arusha, CAMARTEC is responsible for development of ideas in mechanisation and rural technology, either adapted from imported designs or from local initiatives. The Centre provides services to the industry in design, prototype production, testing, evaluation, component sourcing and training of both producers and users of machinery.

### Tanzania Engineering and Manufacturing Design Organisation (TEMDO)

Also located in Arusha, TEMDO is in the process of establishment to provide more fundamental services to manufacturing industry in terms of precision engineering and consultancy on design programs, human resource development and development of physical facilities.

### Small Industries Development Organisation (SIDO)

With headquarters in Dar es Salaam, SIDO has a number of branches at regional level and is responsible for general development of small and artisanal industry in terms of feasibility studies, financial planning and sourcing, marketing, design, training, component supply and the organisation of industrial estates.

### Metals & Engineering Industrial Development Association (MEIDA)

MEIDA is an association of producers in the metal working sector which has been involved with the Ministry of Industry in efforts to rationalise production of both whole goods and components for supply to other producers. Some seven members of the Association, non-specialist producers of a wide range of commodities, have contributed to meeting demand for hand tools and ploughs.

## 3.9 Infrastructural Context

The country's industrial infrastructure was installed in the 1970s under a major industrialisation program supported by socialist countries in eastern Europe and Asia. Due to poor maintenance, much of this infrastructure has deteriorated. Production plant is worn and unproductive. Services, particularly transport and communications, are in need of rehabilitation. Electricity supply is deficient and unreliable. However, projects are now in hand in many areas to rehabilitate and expand industrial infrastructure. Road and rail networks and equipment are being rehabilitated. The electricity distribution system is being overhauled. Present generating capacity is about 400mw, two thirds of which is from the hydro-electric sector which is capable of considerable expansion. The country also has sources of coal, gas and mineral ores and there has been some discussion of the establishment of steel production from local resources. An AMIS support program would therefore take place in an environment of infrastructural improvement.

Diagram 3.2

Importance of AMIS in Tanzania

<b>Problems to be Addressed</b>	<b>Policies Adopted in Response</b>	<b>Mechanism to be Used</b>	<b>Constraints to be Addressed</b>	<b>Measures to Use</b>
Low GDP/cap (\$210)	Economic growth, especially agriculture	Mobilise resources	Resources - human - financial	Education Aid programs
High external debt : scarce foreign exchange	Structural adjustment	IMF/IDA SAP	Pricing & marketing systems	Liberalise pricing & marketing
Negative trade balance	Stimulate exports	Expand output & quality of export crops	Low productivity	Raise farm gate prices
		Expand agro-based industry		Create strategy for mechanisation
	Substitute imports		Shortage of farm power	Expand ox training
Low nutritional level		Increase output of food crops		
Falling output of agriculture per capita			Low usage of good tools and machines	Extension of technology
Low rural prosperity	Stimulate rural industry & agriculture	Implant new, expand existing industry eg - AMI	See Table 4.1 Constraints to AMIS	Indicative Program for Development of AMIS

### 3.10 Importance of AMIS in the Tanzanian Economy

The importance of agriculture to the Tanzanian economy is described in paragraph 3.7 above and further illustrated in Diagram 3.2. Agro-based industries account for 55-60% of manufacturing value added and employ 75% of the labour force in the manufacturing sector. Other industries such as mining hold some promise for future development but, in the immediate future, expansion of agricultural output appears to provide the best means of resolving two of the most important problems facing the Tanzanian economy:

- **Standards of living**, particularly in rural areas, have declined in terms of per capita food production; agriculture has stagnated.
- **Excessive external debt** has accumulated because exports have consistently failed to support the heavy program of imports needed to produce industrial growth.

Agricultural productivity is low. Because 85% of cultivation is based on hand tools, the area cultivated is limited and full advantage cannot be taken of other yield-enhancing inputs. The change from hand tools to ox ploughs has been found to produce an immediate eight-fold increase in area cultivable per farming family. More thorough and timely cultivation by this means lead to further productivity gains through increases in yields per hectare. Further improvements can be added by use of appropriate implements such as planters and weeders and also by the complementary use of improved hand tools. Transport is assisted by the provision of ox carts. Post-harvest losses may be reduced by better storage and primary processing equipment. The development of AMIS, which includes all these elements, is therefore an essential component of the expansion of agricultural production required to address the problems of increased food availability and increased export earnings described above.

In addition, as was related above, the AMI system is an important employer of both urban and rural labour and makes a considerable contribution to the process of diversification of the economy into a wide variety of industrial avenues, adding value locally and substituting local products for the imports that would otherwise be necessary. Finally, AMIS provides, in itself, additional opportunities for export income once marketing programs among neighbouring states can be developed.

An area of concern which should be addressed is the profitability of the AMI system, particularly in view of the heavy capital investment already made and the cost of its upkeep. In a centrally planned system it is not uncommon for costs of operation to be met from a central budget, thus distorting the true picture of the benefits of alternative resource utilisation patterns. If the market for AMI products is to be liberalised, and especially if export marketing is to be considered, the competitive position of these products under a sustainable system of production economics will need close attention.

### 3.11 Government Objectives for the AMI System

The investments already made in the public sector for farm machinery production are witness to the Tanzanian Government's objectives in providing tools and equipment for agriculture. The principal objective at present is to consolidate past investments by removing bottlenecks in the system and by rehabilitating manufacturing plant which is no longer fully productive. It is considered that overall capacity is sufficient for immediate needs, if all plant can be fully utilised (but see paragraph 3.5 above). In addition, research and development facilities have been installed and are being developed under international aid-funded programs to improve quality control and production methods and to provide the industry with a wider range of products to make, better suited to the farmer's needs as they develop modern farming methods. Expansion of the country's export earning capability is a vital

component of the Government's objectives. The AMI system should be considered as a potential exporter to markets in neighbouring countries, perhaps in the context of a regional policy for integration of resources.

The current Five Year Plan embodies the official Agricultural Policy in which the following statements relate specifically to AMIS :

- "The immediate objectives will be the achievement of national food self sufficiency, as well as sufficient agricultural output to meet the expanding needs of our industrial sector, and to provide export earnings from export crops."
- "--nothing can alter the fact that the major task is to move the peasant farmers from reliance on hand tools to the use of animal or mechanically assisted implements ---"
- "Increasing the output and the efficiency of agricultural production in the villages is central to increased national output".
- "The move from hand tools to more advanced animal-drawn implements must be phased in with any expanded acreage".
- "It is to reduce the back-breaking labour involved in dependence on the hand hoe that the Government intends to put so much emphasis on the use of animal or other power assisted implements."

### 3.12 On-Going Development Activities

The following projects relate to the AMI system (see Annex 6 for details):

#### DP/URT/86/027 : Strengthening of Industrial Management Capabilities

Project ready for signature, US\$4,600 technical assistance to four named manufacturers (including National Engineering Company and Mang'ula Mechanical and Machine Tool Co.) and four to be named to improve productivity and capacity utilisation of existing plant and train staff.

#### TF/RAF/87/902 : Assistance to CAMARTEC

On-going project to provide technical assistance and equipment to strengthen CAMARTEC's capability for design and production of new prototypes and small batches of implements. Resident Junior Expert backed by periodic assistance from visiting experts and links to IPI. Assistance from UNIDO and Switzerland.

#### DP/URT/88/001 : Development of Small Scale Industries

UNCDF/UNIDO joint project awaiting programming of pre-formulation mission.

#### \*\*/URT/\*\*/\*\*\* : Assistance to 22 Foundries

UNIDO sponsored project : US\$1.01m to rehabilitate 22 foundries including \*\*\* belonging to, or serving the AMI system. Project Document prepared for discussion and enlistment of donor aid.

SI/URT/89/804 : Assistance to THEMI Farm Implement Co.

UNIDO project : US\$31,000 technical assistance to diversify production into new products. Approved June 1989. Nominations for training submitted.

\*\*/URT/\*\*/\*\*\* : Assistance to TEMDO

UNIDO sponsored project : US\$3.8m (\$1.2m IPF + \$2.6m bi-lateral) to provide technical assistance and equipment to establish precision engineering facilities to support the AMI system. UNDP will provide financial support if donors (possibly Japan and Denmark) can be found to co-finance.

IDA : US\$135m : Industrial Rehabilitation and Trade Reform

Support for the Recovery program; co-financing under negotiation.

IDA : US\$8.3m : Agricultural Research

First stage in rehabilitation of the research system. Co-financing under negotiation.

IDA : US\$18.4m : Agricultural Extension

Rehabilitation of Extension Service. Co-financing (AfDB) under negotiation.

IDA : US\$158.6 : Agricultural Reform

Structural adjustment (pricing) and institutional reform. Under appraisal.

CIDA/MEDA : Mbeya Oxenisation Project

Administered by the Mennonite Economic Development Associates (MEDA) in conjunction with the Regional Development Directorate in Mbeya, the project has established workshop facilities in a number of districts and works in association with organisations such as the Uyole Agricultural Centre to design, produce and promote ox-drawn implements and animal draught farming systems generally.

Japan : Kilimanjaro Industrial Development Centre (KIDC)

This project, started in 1981 as part of the Japanese program of assistance to the Kilimanjaro region, is basically a training program for blacksmiths.

In addition to the above, IDA and other agencies have projects in hand for rehabilitation of infrastructural components such as roads and telecommunications, port services and electricity supply. Traditionally, bi-lateral assistance has been available from countries such as Sweden, Germany, Netherlands and Great Britain for development of small and medium scale industries in the metal working sector. Sweden, in particular, has taken special interest in the AMIS and has commissioned several studies of the sector in addition to practical assistance.



## 4. PROGRAM JUSTIFICATION

### 4.1 Basic Issues

The program proposed for development of AMIS in Tanzania and laid out in Section 5 below is estimated, at this stage, to cost about \$3m, of which \$2m would be in technical assistance. This investment can be justified on the following grounds :

- without a comprehensive program the industry may deteriorate further to the point where employment levels are jeopardised and agriculture may be faced with the need for massive imports of the tools and equipment needed for food production;
- the proposed program would not only rehabilitate physical facilities but would establish an institutional base for self-sustaining development in future;
- the proposed program would re-establish annual production to the tune of 8-10,000 tons, worth a minimum of \$15m at CIF Dar es Salaam import prices of which 45-50% would be imported raw materials. This suggests that the investment of \$3m over a 5-10 year period could result in improvements to AMIS worth, eventually, \$7-8m per year in local value added.

### 4.2 Problems to be addressed

The principal problems concerning the AMI system in Tanzania relate more to the inability of the present industrial sector to meet the requirements of the market rather than to lack of industrial investment. Further investment in new factories is therefore not so important as the rehabilitation of existing facilities and the reinforcement of linkages which would enable the industry to correspond better with the requirements of the market place. Details of constraints to AMIS are shown in Table 4.1 and discussed further in paragraph 4.3.

### 4.3 Constraints

The important constraints to development of AMI production are shown in Table 4.1 together with details of on-going programs and suggestions for the alleviation of the constraints which are further developed as a program of projects in Section 5 below. The constraints are identified by "C" numbers which cross refer to the Base Diagram. The references in the last column identify project concepts outlined in Section 5 and detailed in the annexes shown. The importance of each of the basic types of constraint is estimated in the paragraphs 4.3.1 to 4.3.4 below as a percentage effect on production. In Section 5, however, the percentage effect of removal of these constraints has been globalised at 25% for the technical assistance projects to avoid overstatement of probable results. Major constraints may be classified under the following headings:

#### 4.3.1 Institutional Requirements

All the necessary basic institutions required to support the AMI system exist already in Tanzania but they exhibit a general lack of co-ordination and management weakness. The program therefore includes projects designed to produce better co-ordination between these institutions, to enable them to provide a better service to both producers and consumers of AMI products and to plan future development of a wider range of implements appropriate to the requirements of agriculture. Improvements to the institutional framework would add, possibly 5-10% to AMIS output in the short term but on the 5-10 year horizon would produce a much greater effect through the development of new models and the resolution of technical problems.

#### 4.3.2 Raw Material and Component Supplies

A major constraint to the AMI system is shortage of raw material and components. To a large extent this is due to a chronic shortage of foreign exchange which is unlikely to be resolved in the short term. At present those enterprises which do maintain production are acquiring raw materials through commodity aid programs linked to various forms of technical assistance and this is necessarily only a short term palliative. The strategy suggested is an in depth assessment of the raw material and component supply situation with a view to rationalising requirements as far as possible and providing the government with well documented justification for accurately defined import plans designed to make the best use of scarce foreign exchange. Armed with adequate justification it is expected that a better alignment of Government policies related to industrial development and foreign exchange allocation will be achieved. In addition rationalisation of component supply to maximise the use of local industrial production will benefit industry as a whole. Projects have also been included in the program to maximise the use of locally available scrap in production of steel profiles for AMI production. Alleviation of these constraints would produce an immediate effect, increasing AMIS output by 15-20%. Once other constraints have been removed the effect would be correspondingly greater.

#### 4.3.3 Management and Marketing

The heavy investment in manufacturing facilities in the AMI system in Tanzania has not been matched by parallel development of management and marketing skills. The system of central planning and allocation of output does not include the concepts of market research, marketing or salesmanship. Consequently there is no mechanism whereby production can be demand-led or whereby accumulated stocks can be sold by marketing promotion techniques. The concept of planning and implanting a management system to take advantage of trends towards a market oriented economy needs to be tackled if AMIS is to become more responsive to the needs of agriculture and more efficient in its use of resources. The program therefore includes management and marketing training projects designed to prepare the AMI system for the future and to enable it to take advantage of parallel projects for rehabilitation of its infrastructure. Successful implementation of this program in alleviating these constraints, and assuming parallel success in improving the supply of raw materials and bringing plant up to full productivity, would increase AMIS throughput by a further 15-20%.

#### 4.3.4 Plant Productivity

AMI producers in Tanzania are reported to operate at 60%, or less, of design capacity. A variety of factors are involved including such problems as raw materials and marketing which are dealt with in this report. One important factor is the condition of the production plant. Machinery is worn. Maintenance has suffered from lack of repair parts. Rehabilitation of plant, particularly at UFI; perhaps less at Mwanza which is newer, would permit the reinstatement of the 40% of capacity now unobtainable but only if, at the same time, the other constraints to productivity were to be removed.

TABLE 4.1

## INDICATIVE PROGRAM FOR AMI IN TANZANIA

## TABLE OF CONSTRAINTS

COMPONENT/ ITEM	C NO	CONSTRAINTS	ONGOING PROGRAM	ACTIONS REQUIRED TO RELIEVE CONSTRAINTS	REF.
<b>ENVIRONMENT</b>					
Ministry of Agriculture	C 1	Lack of strategy for farm mechanisation development	None	1. Assist. G.O.T. to formulate mechanisation strategy 2. Assume strategy on the basis of stated policies	
	C 2 C38	Low farming income due to low farm gate prices	GOT program to increase prices		
	C 3 C39	Weak marketing structure. Crop payment delayed	IDA project for Agric rehab.		
	C36	Deficient extension of mechanization technology	None	1. MOA project to strengthen extension service 2. Support for CAMARTEC	Annex 3.3
Ministry of Industry	C 4	Poor integration of institutions supporting AMI	None	1. Strengthen MOI/MDC co-ordinating capacity 2. Additional support for CAMARTEC 3. Support to make TEMDO functional	Annex 3.1 Annex 3.3 Annex 3.2
	C18	Lack of institutional market research	None	1. Support for CAMARTEC 2. Market research project	Annex 3.3 Annex 3.5
	C 5	Weak engineering support for AMI development	Netherlands project at TEMDO	1. Support for TEMDO	Annex 3.2
	C20	Poor integration of test program	UNIDO TF/RAF/87/902	1. Support for CAMARTEC	Annex 3.3
	C 7	Unattractive investment environment	GOT launching new investment code	1. Investment studies 2. Privatisation studies 3. Management studies	Annex 3.12 3.15 Annex 3.4 Annex 3.9
Financial environment	C21	Lack of finance	IDA/SAP	1. See input and distribution sectors	

Table 4.1 (contd.)

COMPONENT/ ITEM	C NO	CONSTRAINTS	ONGOING PROGRAM	ACTIONS REQUIRED TO RELIEVE CONSTRAINTS	REF.
<b>INPUTS</b>					
Raw materials	C 6	Deficient raw material supply	Intermittent bilateral aid	1. Raw material rationalisation project	Annex 3.6
	C23	Deficient procurement of raw materials through MOI		1. Raw material rationalisation project	Annex 3.6
	C24	Deficient distribution of raw materials in private sector		Include in distribution development project	Annex 3.11
	C 8	Lack of foreign exchange for material inputs		Rationalise raw material procurement	Annex 3.6
	C21	Lack of credit for input procurement		Include in raw materials rationalisation project	
Components	C30	Shortage of local components		1. Rationalise component supplies	Annex 3.8
R&D	C19	Lack of appropriate designs		See C 5	
Tariff policy	C17	High tariff on imported components		1. Policy issue	Annex 3.8
	C32			2. Rationalization studies	
Transport & Communications	C13	Poor transport infrastructure	Road/Railway projects		
	C14	Poor communication infrastructure			
Energy	C15	Shortage of electric power			
	C16	Deficient distribution	Distribution rehab.		
Human resources	C10	Restrictive labour legislation		1. Policy issue	
	C11	Low output from secondary schools			
	C12	Low quality output from vocational training	Sporadic bilateral aid	1. Strengthen vocational training system	Annex 3.7
	C22 C29	Shortage of skilled workers			

Table 4.1 (contd.)

COMPONENT/ ITEM	C NO	CONSTRAINTS	ONGOING PROGRAM	ACTIONS REQUIRED TO RELIEVE CONSTRAINTS	REF.
<b>PRODUCTION</b>					
Component supply	C25	Poor availability and quality of castings	UNIDO Project upgrading 22 foundries	1. Possible additional project for co-ordination into system	
Human resources	C26	Lack of production skills	Sporadic bilateral input	1. Inplant training packages 2. Management training	Annex 3.7 Annex 3.9
Management	C27	Lack of management skills	UNIDO management training project	1. Management seminars 2. Inplant training	Annex 3.9
Marketing	C28	Lack of marketing skills		3. Study tours 4. Marketing training	Annex 3.11
Production management	C33	Production equipment in poor condition	SIDA project at ZZK	1. Rehabilitation studies 2. Rehabilitation project	Annex 4.1
Quality control	C31	Poor quality control		1. Quality assurance as part of management project 2. Study availability of quality control equipment	Annex 3.9 Annex 4.1
PRODUCT	C41	Deficient product range		1. See C18 and C 4	
DISTRIBUTION	C35	Poorly developed distribution network		1. Project to strengthen MoI 2. Distribution study	Annex 3.1 Annex 3.1
	C34	Lack of finance for inventories		Include in distribution study	Annex 3.1

#### 4.4 Alternative Strategies

Various strategies have been considered for the development of AMIS in Tanzania but two factors stand out:

- Emphasis in Government policy on development of animal draught systems as the most effective means of development of peasant farming which is expected to remain the basic agricultural system in Tanzania;
- The heavy investment already made in production plant for hand tools and animal draught equipment.

The question of the most beneficial product mix cannot be resolved immediately. Firstly, the concept of market research needs to be implanted in order to gain a more accurate knowledge of real demand. Secondly, management of the AMI producers needs to be trained in

marketing and production management concepts in order to allocate and manage resources in the most efficient way to meet market needs. Once some progress has been made along these lines, various alternative product mixes may be evaluated in the light of a better appreciation of the costs and returns involved.

As suggested above (para 3.5), it may be that better returns on investment could be obtained by moving away from cheap hand tools to concentrate on animal draught and tractor drawn implements. A more economical source for hand tools may be found in China. Tractor drawn implements cost, today, about \$3,000 per ton CIF Dar es Salaam. Given the estimated demand shown in Section 3 above, it may be profitable to make these in Tanzania and the plant at Mwanza was established partly for this purpose. However, given the paucity of data on AMIS at this stage, it is suggested that these choices should be kept under review until such time as an a coherent strategy for mechanisation can be elaborated.

Given the embryonic level of institutional support for AMIS, the constraints presently felt throughout the system and the Government's policy emphasis on animal draught technology it would seem to be more sensible to concentrate efforts during the next five years, at least, on establishing a firm institutional base for AMIS, on satisfying the Government's aims regarding the oxenisation of the peasant farming base and on alleviating the more important constraints facing the industry before attempting to tackle the more sophisticated requirements of tractor powered agriculture. With this in mind, the program described in this report is designed to place AMIS in Tanzania on a firmer base from which decisions may be made with more confidence and from which plans may be launched for future development.

Strategies for the development of the AMI system may also be examined in relation to the four main product lines:

#### **Hand Tools**

There is probably sufficient capacity in the system for manufacturing the principal hand tool, the hoe, in various versions, for the next 10 years but quality needs to be improved and specific types needed in some areas (tanged hoes in the Southern Highlands, for example) should be included in industrial production as well as production in the artisanal sector. If other hand tools, principally machetes axes, are included, the capacity of the system will be insufficient to meet potential demand by the end of the decade. In addition a number of tools such as cane and sisal knives could be added and improvements to research and development institutions should widen the range to include such items as weeding and planting tools. It is not suggested at this stage that additional manufacturing capacity should be considered. For one thing the advance of animal draught cultivation may reduce the demand for hand tools and, also, the purchasing power of the market is still suspect.

#### **Animal Draught Implements**

The major emphasis in government policy for mechanisation is in the increase of animal draught tillage. It is in this area where the greatest need lies for immediate improvement of the range and quality of production and the eventual increase in productive capacity. To some extent additional capacity may be generated by a decrease in demand for hand tools. Otherwise it is suggested that additional quantities should be imported, preferably from within the PTA and regional strategies should be designed with this in mind.

## **Tractor Drawn Implements**

The future for tractor powered mechanisation in Tanzania is unclear, and is presently in its formative stages where locally assembled Valmet tractors and imported tractors coupled with imported implements from the PTA are meeting demand. Although the Tables in section 3 indicate a requirement for both tractors and implements, this is based only on maintenance of the current intensity of mechanisation over an increased cultivated area. In principle, the major farming systems in Tanzania will not support tractor powered mechanisation and the demand for tractors will reflect mainly development of industrial crop production. During the recent past, tractor sales were evenly divided between state farms and co-operative hire units, both of which market sectors have a doubtful future. A more successful form of multi-farm use may develop from the emergent commercial farming sector through commercial hiring as a means of offsetting purchasing and operating costs for the individual farmers concerned. Also, overseas investment in plantation, or estate agriculture (tea, coffee, sisal or sugar, for example) is beginning to produce a revival of this market sector and is leading to the importation of tractors and equipment as part of the investment package. Attempts to produce tractor drawn implements have, so far, floundered on the shortage of appropriate technology and skills in Tanzania. These may be developed through the implementation of the program suggested in this report but, in the meantime, it is suggested that tractor drawn implements should be sourced on other countries in the PTA and that Tanzanian resources should be concentrated on mass production of hand tools and animal draught implements.

## **Small Process Machines**

At present small quantities of machines such as mills, shellers and pumps are made locally, mostly by multi-product companies in the metal working industry rather than by other AMI producers. This is an area for development once design and development facilities are stronger and marketing skills have been improved. The removal of constraints such as raw material supply and component availability would also help this sector.

### **4.5 Situation at end of Program**

The proposed program is designed for implementation during the period 1990 to 2000 after which it is anticipated that the developments stimulated by the program will have become self-sustaining. In particular it is expected that, as a result of the program:

- (a) Tanzania's requirements for hand tools and animal draught implements and some small process machines will be met mainly from local production. This implies an increase in self sufficiency in hand tools and animal draught implements from about 80% in 1990 to 100% by 2000, be met by restoration of productive facilities to full design capacity. About half the requirement for tractor drawn implements would be met from local production by 1990. Production of small process and post-harvest machines would be substantially increased;
- (b) The capacity already present in Tanzania for AMI production will be fully and profitably utilised;
- (c) The Tanzanian AMI products will meet standards of quality and price enabling them to compete satisfactorily in the region;

- (d) Agricultural needs for new types of equipment will be capable of satisfaction through the services of research and development institutions in Tanzania and translation of new designs into industrial or artisanal production;
- (e) The relationship between industry and government with regard to ownership structure, legislative environment, labour relations and foreign exchange requirements will be based on mutual understanding of each others needs and co-operation to take maximum advantage of the opportunities for profitable development;
- (f) The developments implanted by the program will be self- sustainable thus ensuring continuity of the development process.

4.6 Intended Beneficiaries

The proposed program is national in scope so intended beneficiaries would be:

- (a) Tanzanian farmers and rural communities in respect of the availability of adequate supplies of good quality competitively priced AMI products;
- (b) Tanzanian producers of AMI products in respect of full understanding of immediate and developing market requirements, in respect of enhanced capability for meeting those requirements and in respect of the additional revenues and profits which would be available for re-investment in the development of AMIS;
- (c) Tanzanian workers in the AMI and related industries in respect of improved employment opportunities and acquisition of additional skills;
- (d) The rural women of Tanzania in respect of availability of better implements and small machines designed to relieve drudgery and release human resources for social development;
- (e) The Tanzanian economy in respect of the value added by increased industrial production, local substitution of costly imports, better utilisation of local resources, enhanced agricultural production and the possibility of increased export performance from both the agro-industrial sector and AMI itself.



## 5. INTEGRATED DEVELOPMENT PROGRAM

### 5.1 Program Framework

The AMI system in Tanzania is characterised by large scale sunk investments in production facilities which are no longer fully operative and at the same time a severe lack of management and marketing skills coupled with weak linkages between producer and consumer. The proposed program is designed to remedy these deficiencies by:

- (a) Strengthening the capacity of, and integration between, the institutions already present in the area of research and development;
- (b) Establishing a market research base for the industry as well as rationalising marketing and distribution systems;
- (c) Researching and rationalising the provision of raw materials and components both within and outside the country;
- (d) Rehabilitating production facilities where possible;
- (e) Adding missing links in the production process;
- (f) Assistance to the vocational training institutions and providing training as required in connection with the above paragraphs or as a separate output.

### 5.2 Program Objectives

The basic objective of the proposed program would be to increase the volume of farm tools and implements produced in Tanzania in close alignment with the needs of Tanzanian farmers and thereby to increase the prosperity of AMIS and expand employment opportunities for workers in the industry. These objectives are quantified in Table 5.1 below. Each project in the program is expected to have an incremental effect on output but the full value of that increment will only be achieved with the support of other projects in the program. Thus, full availability of raw materials would permit some improvement in output but not as much as if production plant were also to be brought up to full working capacity. Conversely, rehabilitation of plant would permit higher output, but only when raw materials are freely available will the full value of rehabilitation be realised. Both of these factors can only achieve their full potential if management and marketing skills are raised to a more effective level. The significance of the integrated nature of the program is that while each project has a value by itself, the combined value of all the projects acting in unison is greater than the simple addition of the results of the individual projects implemented in isolation.

Specifically, the proposed program would expect to bring the major AMI producers (UFI, ZZK and Mwanza) back up to full design capacity by 1995, to upgrade procurement and institutional facilities to add a further 10-15% to overall capacity throughout AMIS and thus to meet perhaps 90-95% of demand at that stage. Additional investment in complementary production plant together with these improvements in the institutional and management environment would enable hand tool and animal draught equipment production to keep pace with demand throughout the rest of the decade and would provide for about 50% of tractor drawn implement needs by the year 2000. In addition, the increase in management capacity would provide a platform from which investment programming beyond the scope of the present project might be made with more confidence.

The base line for Table 5.1, estimated current productivity of AMIS, is simply the reported level of output at 60% of rated capacity. This is, necessarily, a simplistic view of the

industry. Wide variations in availability of raw materials, electric power, cash or credit in the farming community and other such environmental factors have reduced production in some years to much less than 60% of capacity. Some factories are less in need of rehabilitation. Bilaterally funded projects fielding expert assistance have already made progress in upgrading performance of some factories. However, the table presents an aggregate view. Once the concepts embodied in the program have been studied and the details have been adjusted where necessary, the program may be re-valued and disaggregated for application to the institutions and factories concerned. If further analysis indicates that the industry is functioning consistently at much less than 60% of capacity, then it is probable that the effects produced by the program will be correspondingly greater and that the end result may not be very far from that shown in the table.

If efforts appear to be concentrated on the major producers, this is because the greatest benefits to the industry as a whole would result from this strategy. However, the support for institutional development and, particularly, for raw material procurement and distribution would benefit the smaller producers and the informal sector in more or less equal proportion. The program, likewise, does not neglect entirely the producers of small post-harvest or processing machines such as mills and hullers. These, too, would benefit from the institutional support and raw material and component rationalisation and, although more difficult to quantify, could be expected, as a result of the program, to meet, perhaps 30-50% of demand for these products by the year 2000.

Table 5.1

Program Objectives by Weight of Product (tons)

Description	Effect %	Hand Tools	Animal Draught	Tractor Drawn	Total Weight
Present Output	5,786	1,694	1,870	9,350	
<b>Program</b>					
1. <b>Technical Assistance</b>	25	1,000	1,000	500	2,500
Assistance to MoI					
Assistance to TEMDO					
Assistance to CAMARTEC					
Investment Structure					
Market Research					
Raw Materials					
Vocational Training					
Component Sourcing					
Management Training					
Marketing Training					
Distribution Organisation					
Bicycle Transport					
2. <b>Feasibility Studies</b>					
Rolling Mill					
Chain Plant					
ZZK Foundry					
3. <b>Immediate Investment</b>	60	3,000	1,500	1,250	5,750
Rehabilitation					
- UFI					
- ZZK					
- Mwanza					
Total Production 1995		9,786	4,194	3,620	17,600
Expected Demand 1995		<u>8,500</u>	<u>4,150</u>	<u>6,211</u>	<u>18,861</u>
Balance		1,286	44	-2,591	-1,261
4. <b>Eventual Investment</b>					
Rolling Mill			500	500	1,000
Chain Plant			1,200		1,200
ZZK Foundry			100	100	200
Total Production 2000		9,786	5,994	4,220	20,000
Expected Demand 2000		<u>9,700</u>	<u>5,650</u>	<u>7,968</u>	<u>23,318</u>
Balance		86	344	-3,757	-3,318

### 5.3 Technical Assistance Projects

The following technical assistance projects have been designed to alleviate constraints in the AMI system:

#### 5.3.1 **Assistance to the Ministry of Industry**

Recent trends towards a more market-oriented economy have introduced concepts of management with which the Ministry of Industry staff are not altogether familiar and a better understanding is needed of the integrated approach on which this program is based. A project is proposed whereby the ability of the Ministry of Industry to support industrial development may be strengthened. Essentially the project would consist of specialised training packages to be introduced through a series of inter-active seminars. Cost : \$190,000

#### 5.3.2 **Assistance to TEMDO**

The basic support to the manufacturing industry which this institution should provide has been attenuated by slow establishment of the institution. A project is proposed to strengthen the operation of TEMDO so that it may realise its potential in basic support to the AMI system. Cost : \$48,000

#### 5.3.3 **Assistance to CAMARTEC**

UNIDO is already providing technical assistance to this institution but further strengthening of management capabilities would improve the authority of the institution and its rate of progress in developing new and more appropriate implement designs. Cost : \$48,000

#### 5.3.4 **Ownership Structure**

Increased involvement of private capital in the AMI system will require adequate analysis of opportunities and constraints to facilitate the attraction of investors. The proposed project would establish a basis for the analysis of investment opportunities and the presentation of proposals to investors. Cost : \$48,000

#### 5.3.5 **Market Research**

A serious constraint to the AMI system is a lack of market information. Although market research is normally a function performed by each individual manufacturer and provision is made in the program to train AMI producers in this field, it is suggested that an immediate project at institutional level to establish a statistical platform for the AMI system would permit more rapid development at this stage. Cost : \$48,000

#### 5.3.6 **Raw Materials**

Foreign exchange constraints have produced a condition of penury in supply of raw materials to the AMI system. A project is proposed to provide technical assistance to the industry in rationalising its raw material requirements with a view to making it easier for the government to allocate adequate foreign exchange resources. Cost : \$290,000

#### 5.3.7 **Training**

A low level of skills has been reported in a variety of manufacturing and management vocations in the AMI system. A project is proposed which would assess the vocational training system as a whole as it affects the metal working industries and which would subsequently generate sub-projects to alleviate specific areas of low output. Cost : \$16,000

### **5.3.8 Component Supply**

AMI manufacturers should be able to obtain a reasonable proportion of bought-in components from local industry but at present component supply is seen as a constraint. A project is proposed to study and assess component supply opportunities and to design a rationalisation process to overcome some of the constraints. **Cost : \$108,000**

### **5.3.9 Management Skills**

A UNIDO project has already been mounted to upgrade the management skills of a number of EDC companies. A further project is proposed whereby this process may be extended within the AMI system. In particular the project would be addressed to the need for better production management, cost accounting and plant maintenance in order to equip the AMI system for a productive role in a more market oriented economy. **Cost : \$831,500**

### **5.3.10 Marketing Skills**

In addition to the management skills mentioned above (5.3.9) a project is proposed which would address specifically to installing marketing concepts and training in marketing skills in the AMI system. **Cost : \$97,850**

### **5.3.11 Distribution System**

The distribution system for AMI products should reflect the needs of consumers and be capable of anticipating these needs and providing a suitably rapid response. A project is proposed which would assess the present distribution system for AMI products and would suggest ways in which the system may be strengthened. The project would also provide a documentary base for complementary projects which may be needed to acquire physical distribution facilities, such as buildings or truck fleets. **Cost : \$28,150**

### **5.3.12 Bicycle Transport**

In connection with a request to study the possibility of support for the bicycle factory and in view of the success achieved elsewhere by the use of bicycle drawn trailers in rural transport, a project is proposed which would study and offer recommendations for the production of bicycle trailers. The project would also produce a documentary platform for any additional projects which may be needed in the bicycle manufacturing sector. **Cost : \$60,000**

### **5.3.13 Rolling Mill**

The continuous cast steel foundry produces billets which are only used at present for rod production. The addition of section rolling facilities at the steel foundry would permit production of profiles needed by AMI producers which, at present, are imported. A project is proposed for a feasibility study for the rolling mill. **Cost : \$27,150**

### **5.3.14 Chain Production**

The development of animal draught mechanisation is producing an increasing demand for trek chains which, at present, are imported. A project is proposed for a feasibility study for the installation of chain production facilities. **Cost : \$27,150**

### **5.3.15 Foundry for ZZK**

Hand tool production at ZZK leaves a residue of offcuts of relatively high

quality material for which no outlet currently exists in Mbeya. A small foundry using electric arc melting (and possibly investment casting) could be accommodated in the ZZK complex and would produce components for AMIS as well as for other industries in that area. Cost : \$27,150

#### 5.4 Investment Projects

##### 5.4.1 **Rehabilitation of Production Plant**

The three principal AMI producers have benefitted from a heavy investment in production plant. Some of this is now worn and needs rehabilitation. In addition, some production facilities are lacking : pattern making equipment and heat treatment plant at UFI for example. Quality control equipment (additional or replacement) is also required. A global project is proposed which would comprise the preliminary surveys, the planning process, the procurement and installation of new plant and the rehabilitation of existing plant as a series of sub-projects for UFI, ZZK and Mwanza. Cost : \$650-800,000

##### 5.4.2 **Chain Production**

Depending on the results of the feasibility study (5.3.14 above). A project is proposed for the installation of a factory to make trek chains. Cost : to be determined

##### 5.4.3 **Rolling Mill**

Depending on the results of the feasibility study proposed in paragraph 5.2.13 above, a project is proposed to install a rolling mill to produce plough beams and blade sections for AMI. Cost : to be determined

##### 5.4.4 **Foundry**

Depending on the results of the feasibility study proposed in paragraph 5.3.15 above, a project is proposed to install a small foundry to utilise scrap offcuts produced by ZZK in Mbeya to produce components for AMI and other industries in that area. Cost : to be determined

#### 5.5 Policy Measures

Successful implementation of the proposed program and the success of its impact on the AMI system will depend on the correct assessment of Government policies and new trends in these policies with particular reference to:

- (a) **Foreign exchange allocation** If government policy in respect of agricultural self sufficiency and the generation of employment opportunities in the manufacturing sector are to be achieved, parallel policies which provide for adequate raw material supply to the AMI system will need to be formulated or re-assessed;
- (b) **Employment** In the context of employment legislation, policy issues which hinder effective management need to be addressed in an atmosphere of full participation by all the parties affected;
- (c) **Ownership Structure** The involvement of private capital in manufacturing industry has become a part of Government policy. The extent to which the AMI system could be assisted by an injection of private capital either in the form of joint ventures or straight forward privatisation should be studied. The program includes a project to this end;

- (d) **Farm Income** Improvements in the mechanisation of agriculture will depend on enhancement of the purchasing power of farmers. Government policy in respect of prices for agricultural products now tends towards a steady increase of farm gate prices which will have a beneficial effect on the AMI system and should be maintained;
- (e) **Produce Marketing** Liberalisation of produce marketing benefits the AMI system again by improving farmers income and recent trends in this direction should be maintained;
- (f) **Tariff Structure** The imposition of import duties on raw materials and components for the AMI system while whole goods enter at a lesser rate or duty free imposes an artificial constraint on development of the AMI system. The tariff structure should be assessed with a view to lowering the costs of inputs for the AMI system. The possibility of providing some protection for local AMI producers against dumping of foreign whole goods may be considered also, once adequate quality standards are achieved and on condition that Tanzanian AMI can be shown to be competitive.

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IN TANZANIA

GENERAL

COUNTRY INFORMATION

<u>AREA:</u>	945,000 km <sup>2</sup>								
<u>POPULATION:</u>	23,5 million (1987/88)								
<u>POPULATION GROWTH RATE:</u>	3.3% per year (1987/88)								
<u>GDP AT CURRENT PRICES:</u>	Tsh 204.5 billion or US\$4,020,000 (1986) (increasing at annual rate of 0.7% in 1980-1985, 3.6% in 1986, and 3.9% in 1987)								
<u>GDP PER CAPITA:</u>	US\$ 210 (1987)								
<u>DISTRIBUTION OF GDP BY SECTOR:</u>	<table> <tr> <td>Agriculture</td> <td>59%</td> </tr> <tr> <td>Manufacturing Industry</td> <td>4%</td> </tr> <tr> <td>Construction &amp; Mining</td> <td>5%</td> </tr> <tr> <td>Service</td> <td>32%</td> </tr> </table>	Agriculture	59%	Manufacturing Industry	4%	Construction & Mining	5%	Service	32%
Agriculture	59%								
Manufacturing Industry	4%								
Construction & Mining	5%								
Service	32%								
<u>EXCHANGE RATE (OFFICIAL):</u>	TSh 200 = US\$ 1 (May 1990)								
<u>AVERAGE RATE OF INFLATION:</u>	30% per year (1980 - 1986)								
<u>OUTSTANDING DEBT:</u>	US\$ 500 million (1985)								
<u>EXPORTS (f.o.b.):</u>	US\$ 400 million (1988, estimated)								
<u>IMPORTS (c.i.f.):</u>	US\$1 200 million (1988, estimated)								
<u>PRINCIPAL EXPORT CROPS:</u>	<table> <tr> <td>Coffee</td> <td>US\$ 167,1 mn (1986)</td> </tr> <tr> <td>Cotton</td> <td>US\$ 30,9 mn (1986)</td> </tr> <tr> <td>Sisal</td> <td>US\$ 5,4 mn (1986)</td> </tr> </table>	Coffee	US\$ 167,1 mn (1986)	Cotton	US\$ 30,9 mn (1986)	Sisal	US\$ 5,4 mn (1986)		
Coffee	US\$ 167,1 mn (1986)								
Cotton	US\$ 30,9 mn (1986)								
Sisal	US\$ 5,4 mn (1986)								
<u>LIFE EXPECTANCY:</u>	(Male) 51 year (Female) 55 years								
<u>SCHOOL ENROLMENT:</u>	3.2 million (1988) (enrolment rate about 87% at primary level, and 4% at secondary level)								
<u>OFFICIAL LANGUAGES:</u>	English and Swahili								



## CURRENT ECONOMIC SITUATION

Tanzania's current economic crisis began to surface in the 1970s when the growth rate of GDP decelerated, and the growth rate of the directly productive sectors (agriculture, industry) declined even more dramatically. During the period 1980 - 1985, the volume of economic activity increased by an average of only 0.7% per year.

Attention in the 1980s turned to the search for ways of rehabilitating the run-down capital stock, especially in industry, physical infrastructure and agriculture. Re-direction of efforts towards rehabilitation began in the national economic survival programme of 1981 - 1982 with the focus being on consolidation of overall production and better utilization of existing capacity. This focus was narrowed further by the Structural Adjustment Programme (1982 - 1985), with the emphasis being on rehabilitation of existing capacity. The programme did not achieve its objectives due mainly to lack of foreign finance. 1986/87, 1988/89 saw the adoption of another three year programme called the Economic Recovery Programme (ERP). Its noteworthy feature is the intention to liberalise the economy and to encourage the increased participation of the private sector and a general reduction of state intervention in the economy as well as to rationalize industry and make it more efficient.

In July 1989 a new Five Year Development Plan was formulated to complement the ERP. Its aim is to increase capacity utilization and to ease the bottlenecks on essential imports.

As Tanzania entered 1990, inflation was running at 31.2%. The shops are reasonably well stocked but the population purchasing power has diminished. However the supply of goods is seen as a measure of success of the Economic Recovery Programme which began in 1986.

Important reforms were introduced after Tanzania signed its first agreement with the IMF. The main features of these reforms are:

- (1) Devaluation of the Tanzanian shilling
- (2) Increases in agricultural producer prices
- (3) Cuts in Government spending
- (4) Removal of most price controls
- (5) Improved tax incentives for investment
- (6) A greater availability of import licenses
- (7) Privatisation

Foreign aid to Tanzania resulting from these steps amounted to US\$1.6 billion during the three years of the ERP. The foreign debt during this period was estimated at US\$5 billion which represents a 42% increase over its 1986 debt of US\$3.5 billion. In December 1988 Tanzania debt arrears were about US\$881 million. Requests have been made for the rescheduling of the bulk of these arrears, while interest repayments now take more than 60% of the country's export earnings.

On paper the IMF and World Bank prescribed reforms are beginning to show positive results with exports increasing and economic growth at about 4.5% compared to a negative growth of the early 1980's. The five year development plan aims to achieve 6% economic growth by 1992. However, western donor countries have been reserved about the state of the economy and pressed for further devaluation of the Tanzanian Shilling to the Tsh 200 to US\$1 level which has now been achieved in May 1990.

Wrangling on this issue has caused the postponed implementation of the proposed IMF US\$350 million Enhanced Structural Adjustment Facility (ESAF) which is 4 times more than the IMF loan currently available to the Government. The IMF is standing firm on the ESAF until progress is visible in restructuring the agricultural marketing boards and co-operatives.

One of the serious adverse effects of the devaluation of the Tanzanian Shilling has been the effect on fixed salaries. Today, Government officials in senior positions of responsibility are earning the equivalent of US\$20 per month and, clearly, are unable to make ends meet without diverting their attention, time and energies to other forms of income to the detriment of their ministerial responsibilities.

Industry still labours under difficult circumstances of spare parts shortages but performance has improved, due largely to a more consistent supply of electricity.

Although the business climate has improved over the preceding 12 months and despite the liberalization measures in place and intended, meaningful foreign investment is still not forthcoming due largely to the absence of the long promised investment code and an alarming degree of corruption which has, almost by force of circumstance, permeated almost every aspect of every day living.

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The table below and those that follow provide an analysis of the agricultural industry and demand for AMIS products in Tanzania. These calculations are based solely on the estimated size and growth of the rural population and the number of farming families involved at an assumed average of five persons per family. This is an over-simplification of the needs of diverse cultures existing in widely varying agro-ecological zones, producing a range of crops, all of which generate a complex diversity of latent or manifest demand for tools and equipment. However, the calculations do provide a broad measure of the size and scope of the industrial sector needed to support agriculture and they thereby provide a platform for further analysis and discussion.

Table 2.1

Market Parameters

	1987	1990	1995	2000
Land Area (000 ha)	88,604.00			
Arable Growth Rate (%)	5.00			
Arable Area (000 ha)	4,160.00	4,816.00	6,146.00	7,844.00
Population Growth Rate (%)	3.30			
Population (million)	23.50	25.90	30.50	35.80
Agric. Population Growth (%)	2.50			
Agric. Population (million)	19.00	21.00	23.00	27.00
Arable Area per capita (ha)	0.22	0.23	0.26	0.30
Arable Area per Family (ha)	1.09	1.16	1.31	1.48
Arable Farm Units (000)	3,817.00	4,150.00	4,696.00	5,313.00
Arable Area per Tractor	347.00	347.00	347.00	347.00
Tractor Population	12,000.00	13,900.00	17,730.00	22,630.00

Source: Mission calculation based on:

- Planned arable growth rate of 5%
- Estimated rural population growth rate of 2.5%
- Agricultural family unit of 5 persons
- Arable area per tractor unchanged

Indicative Programme for AMI in Tanzania  
Annex 2. Table A2.2 AMI Product Demand

Product	Weight Theoretic		Life Realisable (%)	Demand	1987	90	95	95	2000	2000
	kg	No. per Farm								
<b>Hand Tools (HT)</b>										
Hoe	1.35	3.00	3	.75	2408750	3112752	3521794	3697883	3984586	4799921
Forl. Hoe	2.00	.5	5	.40	128467	166013	187829	197220	212511	255999
Machette	1.00	2	5	.75	963500	1245101	1402717	1479153	1593934	1919992
Axe	1.50	.5	6	.75	200729	259396	293483	308157	332049	399998
Pickaxe	3.00	.2	10	.40	25693	33203	37566	39444	42502	51200
Shovel/Spade	1.20	.7	5	.40	179853	232419	262961	276109	297516	358399
Sickle	1.00	.3	4	.40	96350	124510	140872	147915	159383	191999
Slasher	.50	.2	4	.50	60292	103758	117393	123263	132820	159999
Pruner	1.00	.1	10	.50	16058	20752	23479	24653	26564	32000
Cane/Sisal knife	1.00	.5	5	.75	240875	311275	352179	369788	398459	479998
Rake	1.00	.2	10	.25	16058	20752	23479	24653	26564	32000
Graver	9.00	.1	5	.30	19270	24902	28174	29583	31877	38409
Wheelbarrow	3.00	.1	10	.20	6423	8301	9391	9861	10626	12800
Maize Sheller	5.00	.2	5	.20	25693	33203	37566	39444	42502	51200
Motor	2.00	.2	5	.20	25693	33203	37566	39444	42502	51200
<b>Total HT</b>										
<b>Animal Draft Impts. (ADI)</b>										
Plough	36.00	.15	10	.75	36131	46691	52827	55468	59769	72000
Share	2.00	.15	1	.75	361313	466913	528269	554682	597688	719997
Chain	5.00	.15	2	.75	120438	155638	176090	184894	199229	239999
Teelbar	15.00	.001	5	.20	128	166	199	197	213	256
Harrow	40.00	.003	5	.20	385	498	563	592	638	769
Furrower	40.00	.005	5	.25	803	1038	1174	1233	1328	1600
Cultivator	40.00	.001	5	.20	128	166	199	197	213	256
Weeder	40.00	.002	5	.20	257	332	376	394	425	512
On Cart	15.00	.075	5	.20	9635	12451	14087	14792	15938	19200
<b>Total ADI</b>										
<b>Tractors (10% replacement)</b>					1200	1200	2919	3065	3242	3745
<b>Tractor Draft Impts. (TDI)</b>										
Plough	300.00				1200	1200	2919	3065	3242	3745
Harrow	400.00				600	600	1459	1532	1621	1873
Tiller	200.00				360	360	876	919	973	1124
Furrower	300.00				360	360	876	919	973	1124
Planter	300.00				300	300	730	766	811	936
Drill	40.00				10	10	10	11	10	12
Fert. Spreader	40.00				2400	2400	5838	6130	6485	7490
Graver	500.00				600	600	1459	1532	1621	1873
Rotary Cult.	289.00				300	300	730	766	811	936
Trailer	1000.00				1200	1200	2919	3065	3242	3745
Maize/G'nut Sheller	100.00				300	300	730	766	811	936
Maize Mill	100.00				3212	4150	4696	4931	5313	6136
Rice/Coffee Hulier	100.00				3212	4150	4696	4931	5313	6136
Coffee Pulver	50.00				3212	4150	4696	4931	5313	6136
Thresher	500.00				3212	4150	4696	4931	5313	6136
Water Pump	100.00				1606	2075	2348	2465	2656	3068
<b>Total TDI</b>										
<b>Total (Theoretical)</b>										

Indicative Programme for ARI in Indonesia

Annex 2. Table A2.3 ARI Product Based on Weight

Product	Weight (kg)	Weight (ton) 1990	Weight (ton) 85+82	Weight (ton) 2000	Weight (ton) 452+100	TOTAL Capacity (ton)
<b>Hand Tools (HT)</b>						
Hoe	1.34	3271	4296	5419	6529	6730
Fork Hoe	2.00	372	376	425	512	61
Machete	1.00	1345	1409	1594	1920	1750
Axe	1.50	789	440	499	600	405
Fickaxe	3.00	100	117	122	154	60
Shovel/Spade	1.20	279	314	357	430	546
Sickle	1.00	125	141	159	192	75
Slasher	.50	52	59	66	80	45
Pruner	1.00	21	27	37	42	50
Cane/Sisal knife	1.00	11	32	39	48	0
Rake	1.00	21	23	27	32	70
Graver	9.00	22	25	28	34	270
Wheelbarrow	3.00	25	29	37	48	13
Rice Miller	5.00	165	188	212	256	0
Winnower	3.00	65	75	85	102	0
<b>Total HT</b>		<b>7529</b>	<b>8583</b>	<b>9714</b>	<b>11702</b>	<b>9544</b>
<b>Animal Draft Inots. (ADI)</b>						
Plough	34.00	1681	1902	2152	2592	1980
Share	2.00	924	1057	1195	1440	264
Chain	5.00	378	890	996	1200	61
Toolbar	15.00	0	0	0	41	61
Narrow	40.00	20	27	28	31	237
Furrower	40.00	42	47	57	64	0
Cultivator	40.00	7	9	9	10	160
Weeder	40.00	17	15	17	20	0
On Cart	15.00	197	211	226	288	191
<b>Total ADI</b>		<b>3654</b>	<b>4145</b>	<b>4590</b>	<b>5449</b>	<b>2488</b>
<b>Tractors (10% replacement)</b>						
<b>Tractor Draft Inots. (TDI)</b>						
Plough	300.00	360	876	972	1124	405
Harrow	400.00	240	594	648	749	640
Tiller	200.00	12	175	195	225	138
Furrower	300.00	105	267	292	337	393
Planter	300.00	60	219	247	291	150
Drill	40.00	0	0	0	0	0
Fert. Spreader	40.00	84	224	259	300	0
Scraper	500.00	300	720	811	936	0
Rotary Cult.	289.00	97	211	234	271	159
Trailer	1000.00	1200	2919	3242	3745	0
Maize/Genut Sheller	100.00	20	72	81	94	0
Maize Mill	100.00	415	470	521	614	0
Rice/Coffee Huller	100.00	415	470	521	614	0
Coffee Pulver	50.00	208	225	236	287	0
Thresher	500.00	2075	2346	2654	3068	0
Water Pump	100.00	208	225	236	287	0
<b>Total TDI</b>		<b>5902</b>	<b>10039</b>	<b>11228</b>	<b>12970</b>	<b>1885</b>
<b>Total (Theoretical)</b>		<b>17156</b>	<b>22770</b>	<b>25633</b>	<b>26121</b>	<b>14197</b>

Industrial Programme for HPI of Tanzania  
 Annex 2. Table A1.4 ADI Production by Source

Product	Rated Capacity											TOTAL	TOTAL
	UPI Bar	Weight (ton)	SI Mbeva	Weight (ton)	Manica	Weight (ton)	SIBO Various	Weight (ton)	MEIDA Various	Weight (ton)	FERI Arusha	CAPACITY (pieces)	Capacity (ton)
<b>Hand Tools (HT)</b>													
Hoe	200000	2720	250000	1020	1800000	2584	50000	62	250000	240		4950000	6700
Fort Hoe		0		0		0		0		0		0	0
Rachette		0	600000	60	200000	200		0	250000	250		1350000	1350
Axe		0	250000	275	200000	30		0		0		270000	405
Pickaxe		0	20000	60		0		0		0		20000	60
Shovel/Spade		0	50000	60	105000	126		0	200000	360		455000	545
Siclie		0	75000	75		0		0		0		75000	75
Slasher	60000	30	6000	0		0	70000	35		0		136000	68
Pruner		0		0		0	50000	50		0		50000	50
Cane/Sisal Knife		0		0		0		0		0		0	0
Sake		0		0		0	70000	70		0		70000	70
Graver		0	20000	100	10000	90		0		0		30000	270
Wheelbarrow		0	6000	18		0		0		0		6000	18
Maize Miller		0		0		0		0		0		0	0
... ..		0		0		0		0		0		0	0
<b>Total HT</b>		<b>2720</b>		<b>2690</b>		<b>3030</b>		<b>227</b>		<b>650</b>			<b>9644</b>
<b>Animal Draft Insts.</b>													
Plough	20000	720	15000	540	10000	360	5000	180	5000	180		55000	1980
Share	100000	200		0		0	40000	80		0	2000	142000	284
Chain		0		0		0		0		0		0	0
Toolbar		0		0		0		0		0	500	500	2
Harrow		0	1000	40	4000	160	680	27		0		5680	217
Furrower		0		0		0		0		0		0	0
Cultivator		0		0	4000	160		0		0		4000	160
Weeder		0		0		0		0		0		0	0
Gr Cart		0		0		0		0		0	650	650	10
<b>Total ADI</b>		<b>920</b>		<b>580</b>		<b>620</b>		<b>297</b>		<b>180</b>			<b>2642</b>
<b>Tractors (10% replac)</b>		0		0		0		0		0			0
<b>Inst. Draft Insts.</b>		0		0		0		0		0			0
Plough		0	200	240	550	165		0		0		1750	405
Harrow		0	500	200	1100	440		0		0		1600	640
Tiller		0	200	80	490	98		0		0		690	136
Furrower		0		0	1310	393		0		0		1310	393
Planter		0		0	500	150		0		0		500	150
Drill		0		0		0		0		0		0	0
Fert. Spreader		0		0		0		0		0		0	0
Graver		0		0		0		0		0		0	0
Rotary Cult.		0		0	550	159		0		0		550	159
Trailer		0		0		0		0		0		0	0
Maize/G'nut Sheller		0		0		0		0		0		0	0
Maize Mill		0		0		0		0		0		0	0
Rice/Coffee Huller		0		0		0		0		0		0	0
Coffee Pulver		0		0		0		0		0		0	0
Thresher		0		0		0		0		0		0	0
Water Pump		0		0		0		0		0		0	0
<b>Total TDI</b>		<b>0</b>		<b>480</b>		<b>1405</b>		<b>0</b>		<b>0</b>			<b>1685</b>
<b>Total (Theoretical)</b>		<b>3670</b>		<b>3750</b>		<b>5115</b>		<b>510</b>		<b>1130</b>			<b>14197</b>

Product	Balance		95		95		2000		2000	
	Units	Weight (ton)	Units	Weight (ton)	Units	Weight (ton)	Units	Weight (ton)	Units	Weight (ton)
<b>Hand Tools (HT)</b>										
Hoe	1817246	2499	1428206	1442	1067207	1451	865414	1313	120019	204
Fork Hoe	-164617	-772	-187874	-171	-207091	-414	-212511	-425	-255499	-512
Ratchet	144334	105	-58717	-59	-203111	-207	-142624	-244	-56992	-570
Pick	16644	16	-22457	-25	-57565	-60	-62049	-67	-129993	-195
Pickaxe	-17207	-30	-17566	-32	-21415	-34	-22502	-38	-31200	-44
Shovel/Spade	222531	247	192029	220	145086	193	157464	169	96601	115
Sickle	-49510	-50	-65372	-66	-80311	-80	-84223	-84	-116999	-117
Slasher	22243	16	16507	9	6574	7	3162	2	-23999	-12
Pruner	22243	27	25521	27	24115	24	22436	22	19000	12
Cane/Sisal Knife	-211275	-211	-252174	-252	-285276	-286	-328459	-328	-479995	-480
Knife	42243	46	45521	47	44115	44	42436	42	39000	38
Graver	5092	41	1824	15	-1062	-10	-1677	-17	-8407	-76
Wheelbarrow	-2201	-7	-2291	-10	-4354	-13	-4824	-14	-6800	-20
Truss Sheller	-22207	-141	-27566	-183	-41416	-207	-42502	-213	-51200	-254
Wrench	-22207	-36	-27566	-35	-41416	-31	-42502	-35	-51200	-102
<b>Total HT</b>		<b>2665</b>		<b>1668</b>		<b>178</b>		<b>-70</b>		<b>-2058</b>
<b>Animal Draft Impls. (ADI)</b>										
Flooch	8208	299	2172	78	-2242	-117	-4769	-172	-17000	-512
Share	-224917	-659	-286249	-777	-420417	-281	-455668	-511	-527997	-1154
Chain	-155628	-755	-176090	-280	-154129	-271	-199229	-296	-229999	-1200
Footbar	224	5	212	5	222	4	267	4	244	4
Harrow	5182	207	5117	205	5059	202	5042	202	4912	196
Furrower	-1628	-42	-1174	-47	-1294	-52	-1326	-53	-1600	-64
Cultivator	3874	153	3812	152	3792	152	3787	151	3744	150
Reeder	-222	-12	-276	-15	-414	-17	-425	-17	-512	-20
Gr Cart	-11801	-177	-12427	-202	-14931	-222	-15298	-229	-18550	-278
<b>Total ADI</b>		<b>-625</b>		<b>-1476</b>		<b>-1201</b>		<b>-2021</b>		<b>-2521</b>
<b>Tractors</b>										
<b>Motor Draft Impls. (TDI)</b>										
Reaper	152	45	-1569	-471	-1262	-510	-1892	-563	-2295	-719
Harrow	1008	400	141	56	-9	-4	-21	-8	-272	-102
Tiller	272	66	-186	-57	-275	-55	-283	-57	-424	-87
Furrower	950	285	434	120	245	102	227	101	186	56
Planter	200	40	-220	-49	-305	-91	-311	-92	-426	-121
Grill	-12	0	-10	0	-11	0	-10	0	-12	0
Fert. Spreader	-2400	-91	-2928	-274	-3426	-257	-3485	-259	-3430	-300
Scraper	-500	-200	-1459	-720	-1505	-605	-1621	-611	-1877	-926
Rotary Cult.	250	72	-120	-52	-255	-74	-261	-75	-326	-112
Trailer	-1200	-1200	-2919	-2919	-3218	-3218	-3242	-3242	-3745	-3745
Maize/Gnut Sheller	-200	-20	-230	-21	-205	-20	-211	-21	-236	-24
Maize Mill	-4150	-415	-4694	-470	-5127	-518	-5212	-521	-6126	-614
Rice/Coffee Huller	-4150	-415	-4696	-470	-5127	-518	-5212	-521	-6126	-614
Coffee Pulver	-4150	-208	-4696	-225	-5127	-259	-5212	-265	-6126	-307
Thresher	-4150	-2015	-4696	-2245	-5127	-2529	-5212	-2456	-6126	-3069
Water Pump	-2075	-208	-2349	-224	-2529	-256	-2656	-266	-3018	-307
<b>Total TDI</b>		<b>-4038</b>		<b>-2154</b>		<b>-8182</b>		<b>-9344</b>		<b>-11085</b>
<b>Total (Theoretical)</b>		<b>-2952</b>		<b>-8522</b>		<b>-10904</b>		<b>-11426</b>		<b>-16124</b>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance for the Ministry of Industry

Project for 6 months

Cost : \$190000

Training

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials and most of the major AMI producers and the ancillary suppliers and primary processors of AMI raw materials during a 21-day mission to Tanzania in January 1990.

Problem Identified In Tanzania, after more than 20 years of central planning, the economic system is tending to revert to market-oriented free enterprise. The Ministry of Industry, which is currently unable to carry out an effective coordinating role, even under the old system, will still have a role to play, especially in coordinating the efforts of various institutions established to serve the AMI system. Ministry officials and staff have no knowledge or experience of free enterprise systems to guide them and their ability to assist the AMI system is therefore hampered. This affects, not only the institutional aspect of their work but also areas such as allocation of resources and the criteria now needed for value judgements.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objective The proposed project supports government plans to develop manufacturing industry for production of farm tools and animal draught implements for expansion of agricultural production.

Project Objectives The project's immediate objectives would be to strengthen the Ministry of Industry's capability to align Government objectives for the production of AMI goods through the development of AMI capacity, with the institutional resources at its disposal.

Project Description The proposed project, which would be located within the Ministry of Industry, would comprise a package of training programs designed for application through a series of seminars. Staff from institutions controlled by the Ministry of Industry and involved in support to AMI (TEMDO, CAMARTEC etc.) would be included in the seminars. Subjects would include, for example, such topics as:

- the role of markets, market research and marketing;
- the role of research and development in AMI;
- integration of research and development institutions;



- integration of research and development into production;
- production planning in a market-oriented economy;
- resource allocation for maximum benefit.

**Project Outputs** The immediate output from this project would be an identifiable number of trained officers and staff in the Ministry of Industry together with an officially accepted documentary plan for the achievement of better integration of the various institutions involved in support of the AMI system. A supplementary output could be a training program designed for regular use within the Ministry for staff development.

**Inputs** The project would be implemented over a one-year period, utilising the following resources:

**Staffing** The project would be implemented in two phases. Experts (probably a team of two) in institutional organisation would firstly assemble packages of training material to be tested for conformity with Government policies. The material would then be reproduced and used as the basis of discussion during a series of, say, four two-week seminars planned in advance in cooperation with Ministry officials. It is estimated that a period of two months would be required (4 person-months) for the first phase and a further three months (6 person-months) for the organisation and staging of the seminars (three weeks per seminar including preparation and assessment).

**Government Inputs** Ministry of Industry would provide a Program Coordinator for the seminars and second officials in groups for training. MoI would also provide accommodation for the seminars.

**Counterpart Body** The project would be located in the Ministry of Industry; the actual department or office to be identified during negotiations.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry, and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the institutions expected to service the AMI system and producers, both industrial and artisanal, of AMI goods in Tanzania with respect to the better support they would receive from the Ministry of Industry and with respect to the accelerated development of properly researched new models and types of tools and equipment for agriculture. Indirectly, beneficiaries would include the agricultural industry and the Tanzanian economy.

**Situation Post-project** It is expected that on completion of the proposed project the Ministry of Industry would be in a better position to assist the AMI system and the institutions involved would have a more purposeful plan of action, stronger linkages between themselves and with the Ministry on the one hand and the AMI system on the other hand.

**Environmental Impact** The project could have a beneficial impact on the environment through introduction of environmental concepts in industrial planning into the seminars.

**Role of Women** The seminars would be addressed equally to all staff in the Ministry and the institutions involved. The enhancement of mechanisation produced indirectly by the program is anticipated to benefit rural women specifically.

Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Preparation mission			x							
Preparation of material				xx						
Evaluation/Discussion				x						
Implementation					xxx					

**Risks** This project runs the risk that the political environment may not progress towards free enterprise quickly enough to justify a major effort to re-train the Ministry of Industry officials and staff. However, since the seminar approach would be interactive and would include higher officials in the planning phase, those exposed to it would benefit at least from a better understanding of their current role as well as being prepared for evolution of their tasks towards a new economic system.

**Issues to be Addressed** The project is designed to align various aspects of Government policy such as foreign exchange utilisation and priorities for industrial and agricultural development and self-sufficiency. Policy issues to be kept in the forefront of discussion would include investment policies, privatisation policies and foreign exchange policies. There would be no policy issues conditional to the implementation of the project.

**Budget** The following budget is suggested:

Systems experts 2	: 300 days @ \$350	105,000
Air tickets	: 6 days @ \$2,500	15,000
Subsistence	: 200 days @ \$100	20,000
Materials and reproduction		50,000
Total US\$:		<u>190,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY

IN TANZANIA

Technical Assistance

for the

Tanzania Engineering and Manufacturing Design Organisation (TEMDO)

Project for 3 months.

Cost : \$48000

**Problem Identified** TEMDO is currently receiving assistance (US\$3.8m) for equipment of its facilities but progress in establishing this institution has been slow and may be accelerated if attention is paid to training in management skills.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Project Objectives** The project's immediate objectives would be to strengthen TEMDO's capability to interact with other institutions (in conjunction with Project 5.3.1) and, more specifically, to strengthen its capability to plan and manage a meaningful program of activities in support of the AMI system.

**Project Description** The proposed project, which would be located within the Ministry of Industry, would comprise a package of management training programs designed to help those responsible for running the organisation to plan, market and manage a program of assistance to AMI producers and other institutions (particularly CAMARTEC) involved in the AMI system.

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials and most of the major AMI producers and the ancillary suppliers and primary processors of AMI raw materials during a 21-day mission to Tanzania in January 1990.

**Project Beneficiaries** The direct beneficiaries of the project would be the institutions for which TEMDO is expected to provide a service.

**Allied Projects** The project would be allied to the current project for development of physical facilities. It would also be allied to the rest of the suggested program which includes other supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry and to rehabilitate and supplement production equipment.

**Situation Post-project** It is expected that on completion of the proposed project TEMDO would be in a better position to assist the AMI system and would have a more purposeful plan of action, stronger linkages with other institutions and with the rest of the AMI system.

**Counterpart Body** The project would be located in the Ministry of Industry; as sponsoring Ministry for TEMDO.

**Risks** This project runs the risk that trained managers may leave TEMDO and thus deprive the organisation of needed skills. This risk may be alleviated by including in the management training program the subject of training as a management concept with the objective of establishing a regular program of staff development.

**Policy Issues to be Resolved** There are no policy issues to be resolved.

**Project Outputs** The immediate output from the project would be a realistic management plan, formulated by TEMDO management under training guidance, focussed on the maximum utilisation of TEMDO resources to carry out a full program of engineering design and manufacturing development contracts. The eventual return on this program, under whatever costing and pricing system is adopted, would constitute a measure of success for the project. Supplementary project outputs would be a management training manual for TEMDO and an identifiable number of trained management staff.

**Project Inputs** The project would be implemented over a three month period, utilising the following resources:

**Staffing** An international expert in management training would be recruited for a period of three months.

**Budget** The following budget is suggested:

Management Training expert	: 90 days @ \$350	31,500
Air tickets	: 1 day @ \$2500	2,500
Subsistence	: 90 days @ \$100	9,000
Materials and reproduction		5,000
Total US\$		<u>48,000</u>

### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Preparation mission				x						
Implementation				xx						

**Environmental Impact** The project could have a beneficial impact on the environment through introduction of environmental concepts in industrial planning.

**Role of Women** The training would be addressed equally to all staff in the Organisation.

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance

for the

Centre for Agricultural Mechanisation and Rural Technology (CAMARTEC)

Project for 3 months

Cost : \$48000

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials, the institutions involved and most of the major AMI producers during a 21-day mission to Tanzania in January 1990.

**Problem Identified** CAMARTEC is currently receiving assistance from UNIDO in the form of a Junior Expert providing technological guidance on machine design and small batch production. Judging by his reports and by discussion with CAMARTEC, further assistance in management training would help to guide the Centre in development of a more meaningful program to produce a better flow of designs ready for industrial or artisanal production together with publication of regular series of reports on a more formally developed test program.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Project Objectives** The project's immediate objectives would be to strengthen CAMARTEC's capability to interact with other institutions (in conjunction with Project 5.3.1) and, more specifically, to strengthen its capability to plan and manage a meaningful program of activities in support of the AMI system.

**Project Description** The proposed project, which would be located within the Ministry of Industry, would comprise a package of management training programs designed to help those responsible for running the Centre to plan, and manage a program of design, testing and development of AMI products.

**Project Outputs** The immediate output from the project would be a realistic management plan, formulated by CAMARTEC management under training guidance, focussed on the maximum utilisation of the Centre's resources to carry out a full program of machinery testing, design development and manufacturing contracts. The measure of success for the project will be the Centre's output of designs going into successful industrial production, the quantity of test results published and the throughput of components and machines manufactured in its workshops together with the financial returns from this activity in relation to the Centre's efficiency in control of its costs. Supplementary project outputs would be a training program and manual for CAMARTEC staff development and an identifiable number of trained management staff.

**Project Inputs** The project would be implemented over a three month period, utilising the following resources:

**Staffing** An international expert in agricultural engineering management training would be recruited for a period of three months.

**Counterpart Body** The project would be located in the Ministry of Industry; as sponsoring Ministry for CAMARTEC.

**Allied Projects** The project would be allied to the current project for development of technical facilities. It would also be allied to the rest of the suggested program which includes other supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the AMI manufacturers in respect of a flow of well developed designs of machines ready for manufacture and marketing plus reliable batch production of a selection of the bought-in components they require.

**Situation Post-project** It is expected that on completion of the proposed project CAMARTEC would have a purposeful plan of action with a program of tests and design developments and stronger linkages with other institutions and with the rest of the AMI system.

**Environmental Impact** The project could have a beneficial impact on the environment through introduction of environmental concepts in the selection of farm machinery design and industrial planning.

**Role of Women** The training would be addressed equally to all staff in the Centre and due emphasis would be placed on designs for AMI products chosen to improve the quality of life for rural women.

**Policy Issues to be Resolved** Policy issues to be addressed (not necessarily conditional to the project) are the extent to which CAMARTEC may be commercialised to provide financial support for its operations and the question of certification of new designs (or models) for use in Tanzania. A further issue to be investigated is whether the Centre's production facilities should be used for manufacture of whole goods in competition with industry or specialised components in support of industry.

#### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Preparation of material				x						
Implementation					xx					

**Risks** The risks associated with this project are that, as in the past, design projects are chosen which bear little relation to market demand or are not feasible for industrial production and that the Centre will be hampered by budgetary constraints. The majority of risks will be alleviated to

the extent that linkages and communication within the AMI system institutional framework will be strengthened by the integrated program and the Centre will then interact better with the AMI consumer base and producers. The risk of budgetary constraint would be lessened by the project if it were to include establishment of a system of license and royalty payments for designs transferred successfully to industry and a fee system for tests carried out whereby new models (local or imported) are certified for use in Tanzanian agriculture.

Budget The following budget is suggested:

Management Training expert	: 90 days @ \$350	31,500
Air tickets	: 1 day @ \$2500	2,500
Subsistence	: 90 days @ \$100	9,000
Materials and reproduction		5,000
Total US\$		<u>48,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance

for the

Study of Ownership Structure

Project for 3 months

Cost : \$48000

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials, the institutions involved and most of the major AMI producers during a 21-day mission to Tanzania in January 1990.

**Problem Identified** Until now, development of the AMI system in Tanzania has been concentrated in a small number of massive, public sector implement factories, an equally small number of very small private concerns and a large, but relatively unproductive artisanal sector. While productive capacity is theoretically adequate at present, calculations shown in this report suggest that if potential demand manifests itself during the coming decade, further investment in manufacturing capacity will be needed and, in any case, existing public sector factories need some investment in order to restore even their theoretical capacity. The possibility of expansion in the artisanal sector towards small scale rural industries also raises the question of investment policies. Government is in the process of revising the Investment Code to make it more attractive to foreign and local investors. Partial privatisation of public sector companies has been discussed : joint ventures combining additional funding with transfer of technology appear to present attractive opportunities for the development of the AMI system. In order to attract private investment, however, much more needs to be known about the state of existing industry and its relationship to market potential. This lack of a data base is seen as a constraint to development of the industry.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Project Objectives** The objectives of the proposed project would be to make available to prospective investors a data base describing the opportunities available for investment in the AMI system in Tanzania.

**Project Description** The proposed project, which would be located within the Ministry of Industry, would comprise a study of the AMI system, an analysis of its productive components and market potentials and the publication of a report outlining the results in a manner designed to assist government and potential investors in decision making processes.

**Project Outputs** The immediate output from the project would be a document setting out an analysis of opportunities for investment in the AMI system. On the assumption that some



opportunities will be favourable, the ultimate output from the project would be the investment of sufficient capital to enable the industry to meet market demand on a sustainable basis through, and beyond this decade.

**Project Inputs** The project would be implemented over a three month period, utilising the following resources:

**Staffing** An international expert in capital finance would be recruited for a period of three months.

**Counterpart Body** The project would be located in the Ministry of Industry.

**Allied Projects** The project would be allied to the rest of the suggested program which includes other supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the AMI manufacturers in respect of a flow of new capital.

**Situation Post-project** It is expected that on completion of the proposed project Government will have a clearer idea of where outside investment in the AMI system would be most beneficial and investors and aid funding agencies will have a reliable basis of information and projections on which to plan their approach to the industry's needs.

**Environmental Impact** The project would need to include provisions to ensure the avoidance of investments having a negative effect on the environment.

**Role of Women** The project would facilitate investment in companies producing implements designed to enhance the quality of life of rural women.

**Risks** There would be no risks attached to the project as such : investment plans based on the results of the project would be for the account of the investors.

**Policy Issues to be Resolved** Policy issues to be addressed (not necessarily conditional to the project) are the rate at which private capital may be expected to contribute to development of the AMI system; concerns about the wisdom of privatisation in some quarters and the proportions of public to private ownership desired. The project would serve to clarify such issues or to provide, at least, a factual base for their consideration.

#### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Preparation of material				x						
Implementation					xx					

Budget The following budget is suggested:

Management Training expert	: 90 days @ \$350	31,500
Air tickets	: 1 day @ \$2500	2,500
Subsistence	: 90 days @ \$100	9,000
Materials and reproduction		5,000
Total US\$		<u>48,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance

for

Market Research Studies

Project for 3 months

Cost : \$48000

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials, the institutions involved and most of the major AMI producers during a 21-day mission to Tanzania in January 1990.

Problem Identified The data base for rational development of the AMI system in Tanzania is weak. Various reports published during the past ten years give widely differing figures even for current demand and few predictions have been made on which development or investment can proceed. The demand predictions given in this report are described as theoretical calculations based only on assessment of the probable density of rural population in relation to an arable area which may, or may not, increase in line with Government plans. This ignores too many variables to be a safe guide to detailed investment or production planning and the lack of a proper market research study is a constraint to development of the AMI system.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products. Depending on the selection of projects from this program and their timing, this project may be subsumed by one of the others or may stand alone to serve as a guide to several of the others, in which case it would have to precede them.

Project Objectives The objectives of the proposed project would be to make available to production and investment planners a data base describing the opportunities available for marketing AMI products to each of the various market sectors.

Project Description The proposed project, which would be located within the Ministry of Industry, would comprise a study of the farming systems in Tanzania, an analysis of their requirements in tools and equipment, an analysis of the procurement potential of the various market sectors and a carefully calculated projection of realisable demand for each type of AMI product over the coming decade.

Project Outputs The output from the project would be a market research study giving detailed projections for demand for each type of product over the coming decade. A supplementary output would be the capability of the Ministry of Industry to make further market studies as required in the future.

**Project Inputs** The project would be implemented over a three month period, utilising the following resources:

**Staffing** An international expert in capital finance would be recruited for a period of three months.

**Counterpart Body** The project would be located in the Ministry of Industry.

**Allied Projects** The project would be allied to the rest of the suggested program which includes other supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the AMI manufacturers in respect of a sound data base on which to plan production and investment in productive resources.

**Situation Post-project** It is expected that on completion of the proposed project AMI management would have a clear picture of anticipated demand and the Ministry of Industry would have acquired the technology in market research use to implement the project.

**Environmental Impact** The project would have no environmental impact.

**Role of Women** The project would identify market potential for implements designed to enhance the quality of life of rural women.

**Risks** There would be no risks attached to the project as such : investment and production plans based on the results of the project would be for the account of the AMI producers who would be shown, through other projects in the programme, how to interpret, monitor and adjust their activities to a dynamic market research system. This project is a short term measure to establish an initial planning base.

**Policy Issues to be Resolved** Policy issues to be studied by the project relate to the development of a consumer base through improvements in crop pricing and marketing.

#### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Preparation of material			x							
Implementation				xx						

Budget. The following budget is suggested :

Capital Finance expert	: 90 days @ \$350	31,500
Air tickets	: 1 day @ \$2500	2,500
Subsistence	: 90 days @ \$100	9,000
Materials and reproduction		5,000
Total US\$		<u>48,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance for Raw Materials Procurement

Project for 2 years

Cost: \$290000

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary processors of AMI raw materials during a 21-day mission to Tanzania in January 1990.

**Problem Identified** In Tanzania, AMI producers (and the ancillary industries that serve them), whether well established or newly emergent; industrial or artisanal, experience difficulty in procuring raw materials. This has been identified as a constraint which, at best, reduces their rhythm of production and, at worst, brings them to a complete halt for periods which may run into weeks. The causes of this penury in raw materials derive basically from shortage of foreign exchange : most of the materials are imported. Shortage of foreign exchange, in turn begets problems associated with its allocation as a scarce resource and the bureaucracy surrounding establishment of priorities between and within industrial sectors in the context of a run-down centrally planned economy. Despite Government policies which emphasise the importance of agriculture, industrial development and self sufficiency in agricultural inputs, it has proved to be difficult to create a mechanism by which industrial priorities and foreign exchange priorities may be aligned to the benefit of the AMI system.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Project Objectives** The project's immediate objectives would be to strengthen the Ministry of Industry's capability to align Government objectives for the production of AMI goods through the development of AMI capacity, with priorities for allocation of foreign exchange. These objectives would be achieved by improving the planning base and thus clarifying real requirements for raw materials, both current and projected, by rationalising sourcing and distribution of materials and by establishing the mechanisms whereby this process may become self-sustaining.

**Project Description** The proposed project, which would be located within the Ministry of Industry, would entail the employment of local consultants supported by suitably qualified experts to produce:

- a study of raw material requirements in relation to planned production of AMI goods;
- a report embodying practical suggestions whereby sourcing of each type of material may be rationalised within a procurement plan which would make the best use of resources, indicate priorities and clearly justify allocation of adequate

foreign exchange. The report would take full account of recent trends away from central planning towards a more market-oriented system but would recognise, at the same time, the principles embodied in Government policies. The report would also indicate opportunities for use of local materials such as recycled scrap and identify any supplementary projects needed to take advantage of these opportunities, for eventual consideration and programming. The report would detail methods to be established for regular assessment of demand, methods to be established for conversion of demand into orders and supply contracts, procurement methods and financing methods to be adopted to ensure rational sourcing at advantageous, competitive prices. The report would suggest quality standards to be adopted;

- assistance to the Ministry of Industry for implementation of the recommendations embodied in the report;
- a system for monitoring progress and provision of further assistance over a limited period to help the processes set in motion by the project to become self-sustaining.

**Project Outputs** The project outputs may be measured in terms of an increased tonnage and value of raw materials input to the AMI system and by a corresponding increase in system outputs. By itself, it should result in a 10% increase in production but coupled with other projects in the program, the project would assist in increasing production by at least 30%, thus raising plant utilisation from 50% to 70% of design capacity. A supplementary output would be enhanced capacity for management of raw material flows in the Ministry of Industry.

**Project Inputs** The project would be implemented over a two-year period, utilising the following resources:

**Staffing** It is suggested that the project be organised as a joint venture between a local agency (TISCO, for example) and imported skills in the fields of metallurgy, economics and organisation. The function of the local agency would be, mainly, support and monitoring. The total requirement for expatriate skills would probably be ten person-months (see suggested budget, below). The project would play a supplementary role in enhancing the skills of the local agency through technology transfer and involvement in the study and the implementation process.

**Counterpart Body** The project would be located in the Ministry of Industry; the actual department or office to be identified during negotiations.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes a parallel project related to component supply and supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the producers, both industrial and artisanal, of AMI goods in Tanzania with respect to their supplies of raw materials and their ability to maintain production and meet demand. Indirectly, the project would benefit customers for AMI products, the agricultural industry as a whole and thus the basic economy of Tanzania.

**Situation Post-project** It is expected that on completion of the proposed project the Ministry of Industry would be in a better position to assist the AMI system in its raw material sourcing, that AMI producers would be able to procure a much higher proportion of their material needs than

hitherto and that foreign exchange resources would be more rationally applied to obtain an increased supply of raw materials for the AMI system. It is not suggested that the project would succeed in overcoming all shortages of raw materials but that it would achieve a major improvement in supply.

**Environmental Impact** The project should have a positive environmental impact in rationalising the use of non-replaceable resources and re-cycling scrap metals.

**Role of Women** The project would contribute to the programme as a whole and thus to the provision of equipment designed to improve the quality of life for rural women.

**Risks** The project would only attain its full potential when integrated with other projects in the program. To the extent that other projects are not implemented, the full potential is therefore at risk. Nevertheless, gains expected from the project as a free-standing activity would be substantial. Risks are also attached to the ability of the Ministry of Industry to adopt the recommendations produced by the project. The inclusion of monitoring and adjustment procedures in the project design are expected to minimise this risk.

**Policy Issues to be Resolved** The project is designed to align various aspects of Government policy such as foreign exchange utilisation and priorities for industrial and agricultural development and self-sufficiency. However, sectoral allocation of priorities for foreign exchange would be an issue needing clarification. The extent to which Government can, or will wish to, exercise a central planning function such as raw material procurement rationalisation in a developing climate of free enterprise also needs to be addressed. In this context, it is suggested that the relationship between external debt and foreign exchange earnings will continue, during the coming decade, to require central control of foreign exchange utilisation which should be enhanced by the project. The third area of Government policy to be addressed in relation to the project is the tariff structure with respect to minimisation of the cost of raw materials to industry and the possibility of protection for finished goods produced by the AMI system.

**Implementation Schedule**

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals	xxx									
Evaluation/Negotiation		xxxxx								
Contract signature			x							
Study mission			xxxxxxxx							
Report					xxx					
Evaluation/Discussion						xxx				
Implementation							xx			
Monitoring							xxx		xxx	
Adjustment								xxxx		xxxx



Budget The following budget is suggested:

Metalurgist	: Year 1	90 days @ \$350	31,500
Economist	: Year 1	30 days @ \$350	10,500
Systems expert	: Year 1	90 days @ \$350	31,500
	Year 1	30 days @ \$350	10,500
	Year 2	60 days @ \$350	21,000
Air tickets	: Total	6 days @ \$2500	15,000
Subsistence	: Total	300 days @ \$100	30,000
Local Support:	60% of expatriate fees		65,000
Local travel	:		25,000
Equipment	: Vehicles (2)		40,000
	Office		10,000
Total US\$			<u>290,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance

for

Vocational Training

Project for 3 months

Cost : \$16000

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with Ministry of Industry officials, the institutions involved and most of the major AMI producers during a 21-day mission to Tanzania in January 1990.

Problem Identified Vocational training facilities exist in Tanzania but their output of skilled personnel to the AMI system is said to be deficient in quality, especially with regard to work attitudes. To some extent this may be due to perceived conditions of employment (to be addressed by other projects) but there may be constraints inherent in the vocational training system itself which could be addressed by technical assistance.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Project Objectives The objectives of the proposed project would be to identify weaknesses in the vocational training system as it applies to AMI and to make recommendations to Government for action programmes which would result in a better flow of trained personnel into the AMI system. If necessary, the action programme suggested could be translated into further technical assistance projects.

Project Description The proposed project, which would be located within the Ministry of Industry, would comprise a study of the vocational training system as it applies to AMI and the preparation of a report outlining methods by which the quality of personnel graduating from the system may be upgraded with respect to skills and work attitudes.

Project Outputs The output from the project would be a report on the vocational training system, possibly some project concepts for further elaboration and, eventually, better availability of skilled or basically trained personnel for the AMI system.

Project Inputs The project would be implemented over a one month period, utilising the following resources :

Staffing An international expert in industrial education would be recruited for a period of one month.

**Counterpart Body** The project would be located in the Ministry of Industry but would have a direct bearing on the Ministry of Education.

**Allied Projects** The project would be allied to the rest of the suggested program which includes other supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry, and to rehabilitate and supplement production equipment.

**Project Beneficiaries** The direct beneficiaries of the project would be the AMI manufacturers in respect of better availability of recruits to a skilled workforce.

**Situation Post-project** It is expected that on completion of the proposed project Government would be able to take action to upgrade the vocational training system, either by re-direction of effort or by requesting additional assistance in areas where it is deemed necessary.

**Environmental Impact** The project would have no environmental impact.

**Role of Women** The project would identify potential for skills training equally for men and women.

**Risks** There would be no risks attached to the project.

**Policy Issues to be Resolved** Policy issues to be studied by the project relate to relationships between the Ministries of Industry and Education and to the possible need to study conditions of employment in the AMI system in relation to existing and possible future legislation.

#### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals		x								
Evaluation/Negotiation		xx								
Contract signature		x								
Preparation of material			x							
Implementation				x						

**Budget** The following budget is suggested:

Industrial Training expert	: 30 days @ \$350	10,500
Air tickets	: 1 day @ \$2500	2,500
Subsistence	: 30 days @ \$100	3,000
Total US\$		16,000

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance for Component Sourcing

Project for 1 year

Cost : \$108000

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified In Tanzania, AMI producers experience difficulty in obtaining regular supplies of locally made components of consistent quality. Castings are a particular problem but this also applies to other goods such as fasteners. In a more general sense this problem is demonstrated by a universal complaint that industry is run down because parts (ie components) for production or transport equipment are unavailable. Local availability of components is important in the context of foreign exchange shortage : if they are not available locally, they have to be imported, competing for foreign exchange with other necessary materials which can only be obtained by importation. Local components may also need foreign exchange for some proportion of their content but could often be made, at least partially, from local materials such as scrap.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Project Objectives The project's objectives would be to make a study, in conjunction with institutions such as TEMDO and CAMARTEC, into possibilities for rationalisation of component design to make better use of local resources. For example, reduction of the variety of nuts and bolts used in manufacture of a plough would facilitate procurement in an industrial economy where a wide variety of product has yet to be developed. Again, there may be a variety of ploughs competing for the market but if castings are a problem it may be possible to adjust designs so that they all use the same land wheel casting, thus facilitating procurement.

Project Description The proposed project, which would be located within the Ministry of Industry, would entail the employment of local consultants, probably the consultancy services of TEMDO and CAMARTEC, supported by suitably qualified international experts to produce:

- a study of component requirements in relation to planned production of AMI goods, grouping those components of similar function for rational sourcing;
- a report embodying practical suggestions whereby sourcing of each type of component may be rationalised within a procurement plan which would make the best use of local resources;
- a report identifying constraints to component production among other sectors of

industry serving the AMI system with a view to initiating projects for their alleviation;

- a system for monitoring progress and provision of further assistance over a limited period to help the processes set in motion by the project to become self-sustaining.

Project Outputs The project outputs may be measured in terms of an increased utilisation of local components, recorded in terms of tonnage or value, and an increase, consequently, in production of AMI goods.

Project Inputs The project would be implemented over a one-year period, utilising the following resources:

Staffing It is suggested that the project be organised as a joint venture between local agencies, (TEMDO and CAMARTEC) and imported skills in the field of production engineering. The function of the local agency would be design analysis, development support and monitoring. The total requirement for expatriate skills would probably be four person-months (see suggested budget, below). The project would play a supplementary role in enhancing the skills of the local agency through technology transfer and involvement in the study and the implementation process.

Counterpart Body The project would be located in the Ministry of Industry; probably at TEMDO.

Allied Projects The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes a parallel project related to raw material supply and supporting projects designed to strengthen the institutional framework for the AMI system, to improve management and marketing skills in the industry, and to rehabilitate and supplement production equipment.

Project Beneficiaries The direct beneficiaries of the project would be the producers AMI goods in Tanzania with respect to their supplies of components and their ability to maintain production and meet demand. Indirectly, the project would benefit customers for AMI products, the agricultural industry as a whole and thus the basic economy of Tanzania.

Situation Post-project It is expected that on completion of the proposed project AMI producers would be in a better position to source components and that production programmes would be less vulnerable to component shortage.

Environmental Impact The project should have a positive environmental impact in rationalising the use of local resources such as scrap metals.

Role of Women The project would contribute to the programme as a whole and thus to the provision of equipment designed to improve the quality of life for rural women.

Risks The project would carry the risk only that problems such as shortages of imported materials would be passed on further down the production chain, further from the direct control of AMI producers. This would have to be taken into consideration during implementation of the project and other projects in the program may be brought to bear on the vulnerability of the AMI system to this type of risk.

Policy Issues to be Resolved The main policy issue to be addressed would be the mechanism whereby suppliers to the AMI system may take advantage of facilities accorded to the system itself in respect of its priority position. For example, tariff concessions designed to support the

AMI system should also apply to goods imported for re-working and supply by others into the AMI system; otherwise AMI producers would tend to import components which would be better produced locally.

### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals	xxx									
Evaluation/Negotiation		xxxxx								
Contract signature			x							
Study mission			xxx							
Report				x						
Evaluation/Discussion				xxx						
Implementation							xxxxxxxxxxxxx			
Monitoring								xxx		

Budget The following budget is suggested:

Production Engineer	: Year 1	90 days @ \$350	31,500
	Year 2	30 days @ \$350	10,500
Air tickets	:	3 days @ \$2500	7,500
Subsistence	:	120 days @ \$100	12,000
Local Support	: 100% of expatriate fees		31,500
Local travel	:		15,000
Total US\$			<u>108,000</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance for Management Training

Project for 4 years

Cost : \$831500

Direct Assistance / Training

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified Farm tool and implement production in Tanzania was established on an industrial scale in public sector industries in a climate of centrally planned allocation of resources. The result has been lack of integration of the industry with its market (except through the bureaucratic channels of central planning) and lack of ability to respond to problems, challenges and opportunities arising from trends to a more market-oriented, demand-led free enterprise system. This lack of knowledge of free enterprise management systems is seen as a constraint to development of the AMI system and, even if central planning were to persist, it is still a constraint to the resolution of management problems.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's objectives would be to provide management personnel, from directors to foremen, in the three main AMI producers (UFI, ZZK and Mwanza) with basic knowledge of the principles and practices of industrial management under free enterprise systems and to develop entrepreneurial skills that have lain latent through the period of central planning. In the case of ZZK this process has already begun under a SIDA project and the proposed UNIDO project would provide back-up.

Project Description The proposed project, which would be located within the Ministry of Industry, would provide training packages for various levels of personnel in the three main AMI producers. The training would be applied by international experts in the fields of production management, production economics and industrial training. Although study tours for selected individuals would be a feature of the project, most of the emphasis would be on hands-on training in plant rather than academic lecturing. It is envisaged that a production management expert be seconded to each company (SIDA has already provided one for ZZK) for an initial period of at least three months and subsequent follow-up visits of varying duration during an

overall project period of three years. During this period, but, essentially, early in project implementation additional expertise would be applied in the fields of economics and personnel development (training), again with follow-up visits to consolidate achievement.

**Project Outputs** The project outputs may be measured in terms of an increased utilisation of the investment in plant, increased throughput and turnover of working capital and increased profits in the context of a sustainable operating program.

**Project Inputs** The project would be implemented over a five-year period, utilising the following resources:

**Staffing** The project would be staffed, essentially, with international experts, recruited for varying periods. The possibility of involving local expertise should not be overlooked, however, and skills available from local institutions should be made use of, thereby strengthening linkages within the AMI system.

**Counterpart Body** The project would be located in the three major AMI producers, UFI, ZZK and Mwanza farm Implements.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment. SIDA is already implementing a project in support of management and production reorganisation at ZZK. A management expert has been seconded for a period of at least two years and technical assistance from Chillington (UK manufacturer of hand tools) has also been accorded for improvement of quality control. The results of this intervention have been impressive : by selective improvements to production management and upgrading only part of the original plant, production has already exceeded the original (Indian) design capacity for some product lines. The proposed UNIDO project would support the SIDA initiative and provide continuity if necessary.

**Project Beneficiaries** The direct beneficiaries of the project would be the three main producers of AMI goods in Tanzania with respect to their ability to respond to challenges and opportunities and thereby develop the ability to meet market demand.

**Situation Post-project** It is expected that on completion of the proposed project AMI producers would be in a better position to take advantage of opportunities, to respond to market needs and to meet challenges and resolve production problems.

**Environmental Impact** The project should have a positive environmental impact in introduction of environmentally acceptable technology.

**Role of Women** Assistance would be equally applicable to female and male staff and would contribute to the programme as a whole and thus to the provision of equipment designed to improve the quality of life for rural women.

**Risks** The project would be vulnerable to risk of failure only if the quality of expertise offered is inadequate or if external conditions made production of AMI goods in Tanzania completely unviable. Otherwise, the project would have the effect of making the industry less vulnerable to failure by improving its management skills and would thereby reduce risks for other elements of the integrated program.

**Issues to be Addressed** Policy issues to be resolved prior to project implementation would be the level of autonomy accorded to each company within the structure of the National Development Corporation and the freedom of action therefore available to managers



undergoing training by the project. This would set the parameters within which the project would be able to function and within which productive resources may be re-structured or re-allocated.

### Implementation Schedule

Activity	Year -1	Year 1	Year 2	Year 3	Year 4
Proposals	xxx				
Evaluation/Negotiation		xxxxx			
Contract signature		x			
Support to UFI & Mwanza		xxxxx	xxx	xxx	
Support to ZZK			xxxxx	xxx	xxx

### Budgets The following budget is suggested:

Production Management experts	: Year 1	12mm @ \$9050	108,600
	Year 2	12mm @ \$9500	114,000
	Year 3	12mm @ \$9500	114,000
	Year 4	6mm @ \$9500	57,000
Production Economics expert	Total	6mm @ \$9050	54,300
Industrial Training expert	Total	12mm @ \$9050	108,600
Local Support	: 20% of expatriate costs		100,000
Local travel	:		50,000
Equipment	: vehicles (3) etc.		100,000
Materials			25,000
Total US\$			<u>831,500</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY

IN TANZANIA

Technical Assistance for Marketing Training

Project for 2 years

Cost : \$97850

Direct Assistance / Training

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified The centrally planned nature of Tanzanian industry, particularly the public sector enterprises which constitute the major producers of AMI goods, have never been faced with the concept of marketing their products : production was allocated to the distribution network and producers had no contact with the market. Much of their production was sold on "credit" in conditions which made it unlikely that the credits would ever be repaid. The credit funds have now become exhausted and stocks of implements are beginning to accumulate at manufacturers' premises. If the industry is to develop, the concept of marketing : the integration of consumers' requirements and producers' production planning, needs to be implanted. This is particularly important at this stage when the central planning concept is starting to revert to a more market-oriented, free enterprise system.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's objectives would be to provide management personnel with skills needed to adopt a marketing approach to management. The ultimate objective would be to enable AMI producers to monitor current demand, make reasoned projections, select types and designs of product appropriate to local demand for production and promote these in regular dialogue with the market, thus tuning production more closely to demand and making the best use of resources.

Project Description The proposed project, which would be located within the Ministry of Industry, would provide training packages for management personnel in the three main AMI producers. The training would be applied by international experts in the field of marketing training. Most of the emphasis would be on hands-on training in plant rather than academic lectures. This would be achieved by a series of short courses (2-3 week) rotated round the three producers and SIDO and interspersed with supervised periods during which managers would develop and apply practical marketing programs.

**Project Outputs** The project outputs may be measured in terms of an increased throughput and turnover of working capital and increased profits in the context of a sustainable operating program. Specifically, the project would produce a minimum of 20 managerial staff trained in marketing concepts, a set of marketing plans and action programs for each of the two years of the project period for each of the three main producers plus supervision of the following year's planning processes and a marketing manual designed to carry forward the training process after project completion. An increase in product throughput of at least 10% is anticipated as a direct result of the project.

**Project Inputs** The project would be implemented over a five-year period, utilising the following resources:

**Human Resources** The project would be carried out, essentially, by one or more international experts, recruited for varying periods totalling about ten person months.

**Materials** Chiefly training aids and material for local publication of the marketing training manual.

**Counterpart Body** The project would be located in the three major AMI producers, UFI, ZZK, Mwanza Farm Implements and SIDO.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment. The principal component of the program allied to this project is a general management training project. The two could be combined but this may produce an excessive workload on a weak management structure and, since different skills are involved, a staggered implementation schedule would be preferable.

**Project Beneficiaries** The direct beneficiaries of the project would be the three main producers of AMI goods in Tanzania with respect to their ability to respond to challenges and opportunities and thereby develop the ability to meet market demand. The Small Industries Development Organisation would also be included in the project to provide skills to pass on to its members in the artisanal and small rural industries sector.

**Situation Post-project** It is expected that on completion of the proposed project AMI producers would be in a better position to make decisions on production planning and the best uses of the resources at their disposal.

**Environmental Impact** The project should have a positive environmental impact in introduction of environmentally acceptable technology.

**Role of Women** Assistance would be equally applicable to female and male staff and would contribute to the programme as a whole and thus to the provision of equipment designed to improve the quality of life for rural women.

**Regional linkages** The marketing approach inculcated by the project would assist Tanzanian manufacturers to engage in exports to neighbouring countries and thereby achieve another major objective of Government policy.

**Risks** The project would be vulnerable to risk of failure only if the quality of expertise offered is inadequate or if external conditions made production of AMI goods in Tanzania completely unviable. Otherwise, the project would have the effect of making the industry less vulnerable to failure by improving its management skills and would thereby reduce risks for other elements of

the integrated program.

Issues to be Addressed None

Implementation Schedule

Activity	Year -1	Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals	xxx								
Evaluation/Negotiation	xxxxx								
Contract signature		x							
Support to UFI		x	x		x		x		x
Support to ZZK			x		x		x		x
Support to Mwanza			x	x			x		x
Support to SIDO			x			x			x

Budgets The following budget is suggested:

Marketing Training experts	: Year 1	7mm @ \$9050	63,350
	: Year 2	3mm @ \$9500	28,500
Local travel	:		5,000
Materials			1,000
Total US\$			<u>97,850</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Technical Assistance for Distribution Organisation

Project for 2 years

Cost : \$28150

Direct Assistance

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified The distribution system for AMI products in Tanzania has inherited weaknesses from its centrally planned and cooperative origins. It lacks an entrepreneurial spirit and a marketing approach. Physical distribution is hampered by the poor condition of the transport infrastructure. Machinery requiring repair services and maintenance support is poorly looked after. These weaknesses have been identified as constraints to the development of the AMIS in Tanzania. Farmers do not have a supply network responsive to their needs : neither do manufacturers have a system which provides a communicative link to the market place. Consumers and producers are isolated from one another.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's immediate objectives would be to produce a distribution plan for AMI products in Tanzania, to improve physical distribution, especially in remote areas, to improve the communication of market information in both directions along the distribution chain and to improve availability of service support. A secondary objective would be to improve the distribution of raw materials to rural industries and artisans in the AMIS.

Project Description The proposed project would recruit a consultant in distribution logistics to study the distribution requirements of the AMIS in Tanzania, to analyse the logistical problems revealed and to produce a series of documents for use by Government in re-structuring the regulatory framework for the system and for elaboration of projects to establish any physical facilities needed including warehouses, workshops, parts stores or transport fleets in either the public or private sector.

Project Strategy At present, there are several alternative avenues for distribution of AMI products. The official avenue is via the Regional Trading Corporations and the Agricultural and

Industrial Supply Corporation, both in the public sector. However, there are a number of commercial distributors and private traders and the AMI manufacturers engage in some direct distribution. There is also the Tanganyika Farmers Association (TFA), a private sector cooperative dating back to 1935. Already an important distributor of farm inputs in many areas, TFA also imports goods (including AMI products) on its own account and acts as agent for overseas suppliers. An objective of the project would be to assess these avenues of distribution and to design a distribution system to make the best use of these resources.

**Project Outputs** The immediate output would be the report and recommendations mentioned above. Ultimately, the project would produce a positive effect as an adjunct to the management and marketing training projects in the program. Increased distribution efficiency plus the positioning of stocks of product closer to the end users would add 5-10% to the output of the industry while improved repair services would increase the life span of implements.

**Project Inputs** The project would be implemented over a three month period, utilising the following resources:

**Human Resources** The project would be carried out, essentially, by an international consultant in distribution logistics.

**Counterpart Body** By virtue of its involvement with the rest of the program, the project would be located in the Ministry of Industry. However, it would liaise closely with the Ministry of Commerce whose Board of Internal Trade is responsible for commodity distribution.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment. The principal components of the program allied to this project are the general management and marketing training projects.

**Project Beneficiaries** The direct beneficiaries of the project would be the Tanzanian farmers of all categories; also the producers of AMI goods with respect to their ability to promote their products in the market place.

**Situation Post-project** It is expected that on completion of the proposed project AMI consumers would have the nucleus, at least, of a supply system responsive to their needs, carrying stocks of tools and implements tailored to seasonal demand and local preferences at competitive prices in a variety of outlets providing, at least in all but the most remote areas, a choice of supply source. Service requirements for implements needing maintenance, repairs and a regular supply of parts should also be met once the project has produced the desired effect.

**Environmental Impact** The project should have a positive environmental impact in prolonging the life span of resources such as farm implements.

**Role of Women** The project would contribute to the program as a whole and would specifically contribute to the improved availability in rural areas of equipment designed to improve the quality of life for rural women.

**Risks** The project would be vulnerable to risk of failure only if the quality of expertise offered is inadequate. This risk could be minimised by phased implementation of recommendations together with adequate monitoring and control.

**Issues to be Addressed** The position of the public sector distribution network and Government plans for its future (including investment plans) would need to be considered.

Implementation ScheduleImplementation Schedule

Activity	Year -1	Year 1		Year 2					
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals	xxx								
Evaluation/Negotiation		xxxxx							
Contract signature			x						
Consultancy period			xxx						
Report				x					
Implementation				xxxxxx					

Budgets The following budget is suggested:

Distribution & Logistics Consultant	:	3mm @ \$9050	27,150
Local travel	:		1,000
Total US\$			28,150

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY

IN TANZANIA

Feasibility Study for Bicycle Transport

Project for 2 years

Cost : \$60000

Direct Assistance / Experimental / Pilot

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

**Problem Identified** Two problems lead to the design of this project. Firstly, the management of the National Bicycle Manufacturing Company has requested in reorganisation of production. Secondly, specifically in relation to agricultural mechanisation, the rural transport infrastructure has deteriorated to the extent that delivery of agricultural inputs and outputs is jeopardised. While major, aid-funded projects have been set in motion to rehabilitate the transport infrastructure, the results, for peasant farmers, will not appear for some time. In other countries, simple, inexpensive bicycle trailers have been found to answer the majority of transport requirements for peasant farmers. A technical assistance project is proposed which would develop the concept of the bicycle as a load carrier and provide a platform for a wider investigation of the problems assailing the bicycle manufacturer.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Development Objectives** The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

**Project Objectives** The project's immediate objectives would be to produce acceptable designs for industrial production of bicycle trailers, to test market production of, say 100 units in year 1 and 500 in the second year. The objective would include elaboration of production and marketing plans for the following five years. Achievement of these objectives would be expected to place the venture on a sustainable, self-energising basis from then on.

**Project Description** The proposed project would recruit a consultant with experience in the design and production of bicycle trailers (possibly from NGO or Volunteer background) to work with CAMARTEC and the National Bicycle Manufacturing Company on the design and development to production stage of one or more types of bicycle trailer suitable for Tanzanian conditions in various parts of the country. Designs would be needed for water and fuel-wood carriage as well as transport of agricultural goods (including small livestock). The consultant would assist with planning for batch production and marketing promotion.



Project Outputs Project outputs would include:

- a feasibility study to test the validity of the bicycle trailer production concept
- designs for a range of bicycle trailers
- a successful prototype test program
- a pre-production run of 100 trailers for test marketing
- marketing promotion campaign material
- a market survey on which to base production plans
- an initial production run of 500 trailers
- production plans for the next two year's output of trailers
- a study of problems currently suffered by the National Bicycle Manufacturing Co. to be used as a platform for further project elaboration outside the UNIDO program currently under consideration.

Project Inputs

Human Resources The project would be carried out, essentially, by an international consultant in bicycle trailer design in conjunction with CAMARTEC. The project would be led by the consultant with support of a suitably qualified volunteer for an initial period of 12 months to initiate the project. A further period of consultancy would be required during the second year as follow-up.

Materials To ensure smooth progress, initial quantities of raw materials, sufficient for the prototypes and the first 100 trailers, should be provided by the project : a total of, say, two tons of steel sections and sheet. The wheels would be provided by the National Bicycle Manufacturing Co. at cost to the project in local currency.

Counterpart Body The most appropriate counterpart body would be CAMARTEC in conjunction with the National Bicycle Manufacturing Co.

Allied Projects The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment.

Project Beneficiaries The direct beneficiaries of the project would be the Tanzanian peasant farmers who currently lack transport facilities for marketing their crops or fetching their farm inputs. Beneficiaries would also include AMI manufacturers with respect to an additional product line.

Situation Post-project On completion of this project, it is anticipated that Tanzanian manufacturers would have access to proven designs for one or more models of lightweight trailer suitable for bicycle traction in the rural areas of the country on the basis of a feasibility study showing positive benefits. Prototypes would have been tested. Preliminary batches of trailers would have been sold. production and marketing plans would be in existence for following years.

Environmental Impact The project should have a positive environmental impact in promoting a non-polluting transport medium.

Role of Women Improved transport at village level would alleviate the tasks often carried out by women and children in carrying water, fuel-wood and farm produce.

Regional impact Successful designs of bicycle trailers would generate export income.

**Risks** Risks that the trailers would be insufficiently durable or of inappropriate design would be reduced by continuity of monitoring and adjustment during prototype assessment, during the first production run and during the follow-up consultancy in the second year. The project would include provision for operation of a guarantee scheme to promote confidence in the design. The basic commercial risks attendant on a new venture would be addressed by the feasibility study preliminary to the production phase.

**Issues to be Addressed** The main issue to be addressed during product design and market research is the feasibility of producing the trailers at a price which, together with distribution costs, can be met by the peasant farmer (in addition to the cost of the bicycle) and the possibilities of arranging credit.

### Implementation Schedule

Activity	Year -1	Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Proposals	xxx								
Evaluation/Negotiation		xxxxx							
Contract signature			x						
First Consultancy period			xxxxxxxxxxxxxxxxxxxxxxxx						
Design period			xxx						
Prototype manufacture & test				xxx					
First production run					xxxxxxxxxxxx				
First marketing campaign					xxxxxxxxxxxx				
Second Consultancy period								xxx	
Second production run								xxxxxxxxxxxx	
Second marketing campaign								xxxxxxxxxxxxxxxxxxxxxxxx	

**Budgets** The following budget is suggested:

Project leader (consultant)	Year 1	: 3mm	27,150
Volunteer	Year 1	: 12mm	16,223
Consultant	Year 2	: 1mm	9,500
Materials			5,000
Miscellaneous Costs			2,127
<b>Total US\$</b>			<b><u>60,000</u></b>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Feasibility Study for Rolling Mill

Project for 3 months

Cost : \$27150

Direct Assistance / Feasibility Study

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified The AMI system in Tanzania is critically short of raw materials such as steel profiles which have to be imported against scarce foreign exchange while considerable quantities of scrap are un-utilised or converted into reinforcing bar. The management of the continuous cast steel mill which feeds the re-bar plant have netered a plea for provision of a rolling mill to enable production of simple profiles such as plough beams and grader blades (used also to make plough shares). Feasibility of such an operation would alleviate a serious constraint to the development of the AMI system. A feasibility study is required.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's immediate objectives would be to produce a feasibility study on the installation of a rolling mill.

Project Description The proposed project would recruit a consultant with experience in economics and metallurgy to prepare a feasibility study for a rolling mill with a capacity of, say, 1500 tons per annum, based on partial output from the continuous cast steel mill and making, among other products, profiles for AMIS.

Project Outputs Project output would be the feasibility study.

Project Inputs A consultant metallurgist/economist recruited for a period of three months.

Counterpart Body The counterpart body would be the Tanzanian Steel Co.

Allied Projects The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects

designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment.

Project Beneficiaries The direct beneficiaries of the project would be the Tanzanian Steel Co. and AMI producers benefitting from better access to raw materials.

Situation Post-project On completion of this project, the parties concerned would know whether the investment in a rolling mill would be feasible or not.

Environmental Impact The project should have a positive environmental impact in re-cycling non-renewable resources.

Risks Risks of wrong conclusions being drawn would be reduced by adequate peer review of the consultant's report (feasibility study).

Issues to be Addressed The main issue to be addressed would be the sustainability of the proposed rolling mill in relation to the amount of scrap material available and other priorities for its use.

Implementation Schedule To be completed during the first six months of program implementation.

Budgets The following budget is suggested:

Consultant	3mm	27,150
Total US\$		<u>27,150</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Feasibility Study for Chain Plant

Project for 3 months

Cost : \$27150

Direct Assistance / Feasibility Study

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified Development of animal draught cultivation in Tanzania implies a need for about 150000 trek chains per year which may grow to, say, 250000 in the next ten years, representing a demand for about 1200 tons of chain per year. At present, these are imported against scarce foreign exchange while quantities of scrap material are available which could be used for chain production if appropriate plant were to be installed. Chains of similar specification would also be used in other agricultural and industrial applications, for example for load binding and sugar cane bundling. A preliminary feasibility study is required.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's immediate objectives would be to produce a feasibility study on the installation of a chain plant.

Project Description The proposed project would recruit a consultant with experience in economics and metallurgy to prepare a feasibility study for a chain plant with a capacity of, say, 1200 tons per annum, based on conversion of scrap material.

Project Outputs Project output would be the feasibility study.

Project Inputs A consultant metallurgist/economist recruited for a period of three months.

Counterpart Body The counterpart body would be the Tanzanian Steel Co.

Allied Projects The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and

supplement production equipment.

Project Beneficiaries The direct beneficiaries of the project would be the potential investors (possibly the Tanzanian Steel Co.) and Tanzanian farmers benefitting from better access to a local supply of good quality trek chains.

Situation Post-project On completion of this project, the parties concerned would know whether the investment in a chain plant would be feasible or not.

Environmental Impact The project should have a positive environmental impact in re-cycling non-renewable resources.

Risks Risks of wrong conclusions being drawn would be reduced by adequate peer review of the consultant's report (feasibility study).

Issues to be Addressed The main issue to be addressed would be the sustainability of the proposed plant in relation to the amount of scrap material available and other priorities for its use.

Implementation Schedule To be completed during the first six months of program implementation.

Budgets The following budget is suggested:

Consultant	3mm	27,150
Total US\$		<u>27,150</u>

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Feasibility Study for Steel Foundry

Project for 3 months

Cost : \$27150

Direct Assistance / Feasibility Study

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

**Problem Identified** While a number of foundries exist in Tanzania, (vide UNIDO project for rehabilitation of 22 foundries) it has been suggested that an additional foundry attached to the ZZK implement factory in Mbeya would be beneficial in converting high grade scrap offcuts into good quality steel castings for use in AMIS and other industrial sectors. The possibility of production of investment castings was also mentioned although the call for these would be largely outside AMIS.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Development Objectives** The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

**Project Objectives** The project's immediate objectives would be to test the feasibility of the installation of a small steel foundry (say, 200 tons per annum) within the ZZK complex at Mbeya.

**Project Description** The proposed project would recruit a consultant with experience in economics and metallurgy to prepare a feasibility study for a steel foundry with a capacity of, say, 200 tons per annum, based on conversion of high grade scrap offcuts resulting from implement and hand tool manufacture at the ZZK factory at Mbeya.

**Project Outputs** Project output would be the feasibility study.

**Project Inputs** A consultant metallurgist/economist recruited for a period of three months.

**Counterpart Body** The counterpart body would be the ZZK implement factory.

**Allied Projects** The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects

designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment.

Project Beneficiaries The direct beneficiaries of the project would be the Zana za Kilimo implement factory under whose sponsorship the foundry would be installed and, if this proves to be feasible, the AMI system and Tanzanian farmers with respect to a supply of good quality steel castings.

Situation Post-project On completion of this project, the parties concerned would know whether the investment in a foundry of the type suggested would be feasible or not.

Environmental Impact The project should have a positive environmental impact in re-cycling non-renewable resources.

Risks Risks of wrong conclusions being drawn would be reduced by adequate peer review of the consultant's report (feasibility study).

Issues to be Addressed The main issue to be addressed would be the sustainability of the proposed plant in relation to the amount of scrap material available and other priorities for its use.

Implementation Schedule To be completed during the first six months of program implementation.

Budgets The following budget is suggested:

Consultant	3mm	27,150
Total US\$		<u>27,150</u>



INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Rehabilitation of Production Plant

Project for 2 years

Cost : \$650-800,000

Dir . Assistance

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

**Problem Identified** Production plant in the AMI system in Tanzania, particularly among the three main producers, UFI, ZZK and Mwanza, has suffered from shortages of repair and maintenance parts due to foreign exchange restrictions and, in consequence, is worn and not fully productive. In addition, essential facilities such as a well equipped pattern making shop at UFI and heat treatment equipment are missing. In order to take advantage of other projects in the program, designed to upgrade the performance of AMIS and allied projects, such as those mounted by UNIDO for foundry rehabilitation and assistance to institutions such as CAMARTEC and TEMDO, these production facilities should be rehabilitated. Some plant (for example, Mwanza) is more recently installed and may not need immediate rehabilitation to the same degree. However, maintenance requirements are a continual necessity and assistance will be required even at Mwanza during the coming ten years.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products.

**Development Objectives** The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

**Project Objectives** The project's immediate objectives would be to restore production plant to full working order and to add complementary equipment where required to balance production facilities. This would add 5-6000 tons of AMI products to current levels of production. The longer term objective would be to place plant maintenance on a more secure footing so that productivity gains from this and other aspects of the program would be sustainable.

**Project Description** The proposed project would comprise the following activities

- a series of plant surveys to determine the extent of rehabilitation required and to make recommendations for maintenance programs. the specific origins of the equipment imply that the surveys should be made by representatives of the original suppliers : Chinese at UFI, Indian at ZZK and Bulgarian at Mwanza;

- feasibility studies to determine what additional plant is required. For example, UFI needs a new pattern shop for their foundry and better heat treatment facilities are needed in this plant at least;
- a procurement phase;
- a rehabilitation phase during which machines are progressively overhauled and returned to service. This would need assistance from the suppliers. This phase would include installation of the additional equipment identified;
- a training program conducted by the suppliers to upgrade skills in repair and maintenance and to inculcate the correct use and maintenance of the new equipment;
- project leadership and training programs on general topics such as parts procurement, inventory management and maintenance scheduling.

Project Outputs Project output would be:

- rehabilitation of existing equipment;
- installation of new equipment including:
  - a pattern shop at UFI
  - heat treatment facilities where required
- trained maintenance staff at each plant;
- maintenance schedules and budgets prepared for each plant;
- properly managed inventories of maintenance and repair parts in each plant.

Project Inputs

Human Resources The project would be led (continuously at first; then intermittently) over a three year period by an expert Chief Technical Adviser (CTA) in production plant maintenance. Assistance would be sought from original suppliers of the plant in respect of the specialised personnel needed to assess rehabilitation requirements and plan the rehabilitation program. Additional assistance in the form of short term consultancies would be required for the identification of additional equipment and for the feasibility studies in support of these requirements. On the assumption that suppliers inputs would be at their own expense, a total of 30 person-months of long term consultancy and nine person-months of short term consultancy is envisaged.

Project Equipment Inputs for project operation would include a pickup for the CTA and a minimum of office equipment including a computer, fax and photo-copying machines.

Production Equipment Inputs would include the additional equipment selected to complete production processes.

Materials Under this heading, the project would organise supply and funding for all the parts and materials needed for the rehabilitation process.

Counterpart Body The counterpart body would be the Ministry of Industry through the National Development Corporation.

Allied Projects The project would be of value on its own but would be of considerably more value when allied to the rest of the suggested program which includes supporting projects designed to strengthen the institutional framework for the AMI system, and to rehabilitate and supplement production equipment. The project would also be allied to the UNIDO project to upgrade 22 foundries.

Project Beneficiaries The direct beneficiaries of the project would be the major AMI producers.

Situation Post-project On completion of this project, the major AMI producers would have full use of all necessary factory facilities and equipment which would have been restored to full working order and capable of providing reliable service for at least the rest of the decade. Factory maintenance services would be equipped with the necessary tools and skills to continue regular maintenance of plant and equipment. Procurement (or production) and inventory management of parts needed for factory maintenance would be on a sound footing.

Environmental Impact The project should have a positive environmental impact in providing an opportunity to address features of plant operation such as waste or effluent disposal, energy conservation and working conditions which affect the local environment and may not have been taken into consideration previously.

Risks The most important risk attaching to the project would be the non-availability of parts for obsolete machinery, particularly in the case of UFI and possibly ZZK. In this case, additional feasibility studies and alternative strategies would be needed to replace non-repairable machines with alternative models or technologies. Other risks might be in delayed arrival of key parts or equipment and suppliers (or their governments) unwilling, or unable to absorb their share of the cost of the project. This would affect what might normally be the essentially bi-lateral financing of the material inputs for the rehabilitation process. In the event of wholesale changes to technology and massive new investment being needed to replace obsolete or un-repairable plant, a more profound study would be required to re-evaluate the feasibility of production of certain lines of tools or implements.

Issues to be Addressed The principal issue to be addressed would be the extent to which the supplying nations (China, India and Bulgaria) would finance the rehabilitation process and the extent, therefore, of other bi-lateral or multi-lateral funding needed.

Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Study proposals		x								
Evaluation/Negotiation		xxxx								
Contract signature		x								
First Consultancy period (CTA)			xxxxxxxxxxxxxxxxxxxxxxxxxxxx							
Follow-up Consultancy periods								xxx		xxx
Short term consultants			xxx			xxx		xxx		
Rehabilitation studies			xxxxxx							
Feasibility studies			xxx							
Evaluation				xxx						
Negotiations					xx					
Procurement						xxxxxxxxxx		xxx	xxx	
Implementation:							xxxxxx			
UFI								xxxxx		
ZZK									xxxxx	
Mwanza										xxxxx

Budgets The following budget is suggested:

		US\$
Chief Technical Adviser	24mm	228,000
Short Term Consultants	9mm	31,500
Project equipment		50,000
Total UN assistance		309,500
Factory equipment (to be defined)		150-200,000
Rehabilitation material (to be defined)		200-300,000
Total estimated project cost		650-800,000

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY

IN TANZANIA

Chain Production

Project for 2 years

Cost : \$...

Direct Assistance

Project Identification This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

Problem Identified The development of animal draught tillage implies the supply of chains, known as "trek chains" used to connect the ox yoke to the plough or other implement. At present, such chains are imported, mainly from China although a plant for chain production exists in Zimbabwe. Demand is expected to reach about 1200 tons per year by the year 2000 (mission estimate) including ancillary uses such as load binding and sugar cane bundling. Materials required could be sourced in Tanzania if plant were to be included (or sufficient existing capacity found) for conversion of scrap into steel wire of requisite quality.

Project Context The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products. The project would be based on a feasibility study carried out as part of the technical assistance portion of the integrated program.

Development Objectives The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

Project Objectives The project's immediate objectives would be to install plant for the production of trek chains to assist the development of animal draught tillage and substitute local production for imported goods.

Project Description The proposed project would comprise the following activities

- negotiation of investment finance based on the feasibility study;
- appointment of consultants for plant design;
- compilation of tender documents based on specifications outlined in the feasibility study;
- procurement processes under guidelines of whatever agency provides finance;

plant installation, commissioning and training.

**Project Outputs** Project output would be the plant, complete, commissioned and in production of acceptable quantities of chains of acceptable quality at an acceptable price.

**Project Inputs** Consultancy services and production plant.

**Counterpart Body** The counterpart body would be the Ministry of Industry through the National Development Corporation and possibly the National Steel Company.

**Allied Projects** Other projects in the integrated program.

**Project Beneficiaries** The direct beneficiaries of the project would be the farmers using animal draught technology with respect to a reliable supply of good quality chains and the Tanzanian economy in respect of the substitution of re-cycled scrap for imported chains..

**Situation Post-project** On completion of this project, a regular supply of locally produced chains.

**Environmental Impact** The project should have a positive environmental impact in re-cycling non-renewable resources.

**Risks** Providing the feasibility study covers all aspects of the viability of the venture, normal commercial risks would be covered. Eventually, the project faces the risk that accelerated development of tractor-powered tillage could diminish the market for trek chains. However, this is likely to be a slow enough process to permit the chain plant to diversify into other market sectors such as load chains and other products depending on wire bending and welding technology.

**Issues to be Addressed** The principal issue to be addressed would be the availability of entrepreneurial and managerial talent to take up the challenge of establishing this new industry.

#### Implementation Schedule

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Study proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Design studies			xxxxx							
Evaluation				xxx						
Negotiations					xx					
Procurement					xxxxx					
Installation						xxxxxxx				
Commissioning & training							xxx			
Production								xxxxxxxxxxxxxxxx		

**Budgets** The following budget is suggested:

Consultancy services: according to feasibility study

Factory plant: according to feasibility study

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

Rolling Mill

Project for 2 years

Cost : \$...

Direct Assistance

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

**Problem Identified** Certain steel profiles required for production of farm implements in Tanzania are imported against scarce foreign exchange while billets produced from local scrap are used only for production of reinforcing bars of relatively low value. The continuous cast steel plant wishes to diversify into products of higher value and could produce material suitable for rolling into plough beam and grader blade profiles : these being the principal materials used for ox plough production. Grader blade sections are cut for production of plough shares.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products. the project would be based on a feasibility study carried out as part of the technical assistance portion of the integrated program.

**Development Objectives** The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

**Project Objectives** The project's immediate objectives would be to install plant for the production of plough beam and grader blade profiles, using billets produced from scrap by the continuous-cast steel foundry.

**Project Description** The proposed project would comprise the following activities

- negotiation of investment finance based on the feasibility study;
- appointment of consultants for plant design;
- compilation of tender documents based on specifications outlined in the feasibility study;
- procurement processes under guidelines of whatever agency provides finance;

- plant installation, commissioning and training;

**Project Outputs** Project output would be the plant, complete, commissioned and in production of acceptable quantities of steel profiles of acceptable quality at an acceptable price.

**Project Inputs** Consultancy services and production plant.

**Counterpart Body** The counterpart body would be the Ministry of Industry through the National Development Corporation and possibly the National Steel Company.

**Allied Projects** Other projects in the integrated program.

**Project Beneficiaries** The direct beneficiaries of the project would be the AMI producers of animal draught implements.

**Situation Post-project** On completion of this project, a regular supply of locally produced steel profiles.

**Environmental Impact** The project should have a positive environmental impact in re-cycling non-renewable resources.

**Risks** Providing the feasibility study covers all aspects of the viability of the venture, normal commercial risks would be covered. Eventually, the project faces the risk that accelerated development of tractor-powered tillage could diminish the market for ox ploughs. However, this is likely to be a slow enough process to permit the plant to diversify into other market sectors such as components for tractor draught implements.

**Issues to be Addressed** The principal issue to be addressed would be the availability of entrepreneurial and managerial talent to take up the challenge of establishing this new industry.

#### Implementation Schedule

Activity	Year -1		Year 1			Year 2				
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Study proposals		x								
Evaluation/Negotiation		xx								
Contract signature		x								
Design studies			xxxxx							
Evaluation				xxx						
Negotiations					xx					
Procurement					xxxxx					
Installation						xxxxxxxxx				
Commissioning & training							xxxxx			
Production									xxxxxxxxx	

**Budgets** The following budget is suggested:

Consultancy services: according to feasibility study

Factory plant: according to feasibility study



**INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY**

**IN TANZANIA**

**Steel Foundry**

**Project for 2 years**

**Cost : \$...**

**Direct Assistance**

**Project Identification** This project was identified as part of an indicative program designed to alleviate constraints within the AMI system in Tanzania. The identification process included interviews with most of the major AMI producers and the ancillary suppliers and primary producers of AMI raw components during a 21-day mission to Tanzania in January 1990.

**Problem Identified** Zana za Kilimo implement factory has accumulated a large quantity of high quality scrap which it wishes to convert into iron or steel castings, some of which are required for implement production, the balance being marketed to other industries. Theoretically, at present, ZZK's scrap is supposed to be transported to the National Steel Co. for conversion but transport problems make this difficult. ZZK is located in Mbeya, remote from other scrap converters and remote, also from sources of high quality castings. Feasibility studies may show that it would be worthwhile to convert part, at least of ZZK scrap production on site.

**Project Context** The proposed project is an integral part of a program designed to alleviate constraints in the AMI system in Tanzania and thereby enable this industrial sector to play a full role in support of Government policies concerning self sufficiency in food production, the expansion of agriculturally based export industries, the development of industry and the substitution, where economically feasible, of local for foreign products. The project would be based on a feasibility study carried out as part of the technical assistance portion of the integrated program.

**Development Objectives** The proposed project would support Government policies for the development of manufacturing industries producing appropriate inputs (farm tools and animal draft implements) for the expansion of agricultural production.

**Project Objectives** The project's immediate objectives would be to install plant for the conversion of scrap steel at ZZK into steel or iron castings and thus provide ZZK and other industries in that locality with a reliable source of good quality castings.

**Project Description** The proposed project would comprise the following activities

- negotiation of investment finance based on the feasibility study;
- appointment of consultants for plant design;
- compilation of tender documents based on specifications outlined in the feasibility study;

- procurement processes under guidelines of whatever agency provides finance;
- plant installation, commissioning and training.

**Project Outputs** Project output would be the plant, complete, commissioned and in production of acceptable quantities of castings of acceptable quality at an acceptable price.

**Project Inputs** Consultancy services and production plant.

**Counterpart Body** The counterpart body would be the Ministry of Industry through the National Development Corporation and ZZK.

**Allied Projects** Other projects in the integrated program.

**Project Beneficiaries** The direct beneficiaries of the project would be the ZZK and other consumers of castings in that area.

**Situation Post-project** On completion of this project, a regular supply of locally produced castings in the Mbeya area.

**Environmental Impact** The project should have a positive environmental impact in re-cycling non-renewable resources.

**Risks** Providing the feasibility study covers all aspects of the viability of the venture, normal commercial risks would be covered.

**Issues to be Addressed** The principal issue to be addressed would be the market for castings in the Mbeya area and the likelihood of sufficient scrap being available to make the project worthwhile.

**Implementation Schedule**

Activity	Year -1		Year 1				Year 2			
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Study proposals		x								
Evaluation/Negotiation		xx								
Contract signature			x							
Design studies			xxxxx							
Evaluation				xxx						
Negotiations					xx					
Procurement						xxxxxxxx				
Installation								xxxxxxx		
Commissioning & training									xxx	
Production										xxxxxxxxx

**Budgets** The following budget is suggested:

Consultancy services: according to feasibility study

Factory plant: according to feasibility study

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA  
INSTITUTIONS AND COMPANIES

LIST OF ORGANISATIONS VISITED ON FIELD MISSION

**MINISTRY OF AGRICULTURE AND LIVESTOCK  
DEVELOPMENT**  
P O Box 9071  
Dar es Salaam  
Tanzania

**MINISTRY OF INDUSTRIES AND TRADE**  
P O Box 9503  
Dar es Salaam  
Tanzania

**UNITED NATIONS DEVELOPMENT PROGRAMME**  
P O Box 9182  
Dar es Salaam  
Tanzania

**AGENCY FOR INTERNATIONAL DEVELOPMENT  
USAID/TANZANIA**  
P O Box 9130  
Dar es Salaam  
Tanzania

**TANZANIA ENGINEERING AND MANUFACTURING  
DESIGN ORGANIZATION**  
P O Box 6111  
Arusha  
Tanzania

**RESEARCH AND  
DEVELOPMENT  
TRAINING**

**CENTRE FOR AGRICULTURAL MECHANIZATION  
AND RURAL TECHNOLOGY (CAMARTEC)**  
P O Box 764  
Arusha  
Tanzania

**TRAINING**

**JAPAN INTERNATIONAL CO-OPERATION AGENCY**  
P O Box 972  
Moshi  
Tanzania

<b>KILMANJARO INDUSTRIAL DEVELOPMENT CENTRE</b> P O Box 972 Moshi Kilimanjaro Tanzania	
<b>UYOLE AGRICULTURE CENTRE</b> P O Box 400 Mbeya Tanzania	<b>TRAINING</b>
<b>SOKOINE UNIVERSITY OF AGRICULTURE</b> P O Box 3003 Morogoro Tanzania	<b>TRAINING</b>
<b>MENNONITE ECONOMIC DEVELOPMENT ASSOCIATES</b> P O Box 89 Mbeya Tanzania	<b>MANUFACTURERS TRAINING</b>
<b>NATIONAL DEVELOPMENT CORPORATION</b> P O Box 2669 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>NATIONAL ENGINEERING COMPANY LIMITED</b> P O Box 1186 Dar es Salaam Tanzania	<b>MANUFACTURERS SERVICES</b>
<b>SMALL INDUSTRIES DEVELOPMENT ORGANIZATION</b> P O Box 2474 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>SMALL INDUSTRIES DEVELOPMENT ORGANIZATION</b> P O Box 1278 Arusha Tanzania	<b>MANUFACTURERS</b>
<b>SMALL INDUSTRIES DEVELOPMENT ORGANIZATION</b> P O Box Moshi Tanzania	<b>MANUFACTURERS</b>
<b>S.I.D.O. COMMON FACILITY WORKSHOP</b> P O Box 988 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>AFRO COOLING SYSTEMS LIMITED</b> P O Box 901 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>

<b>ALUMINIUM AFRICA LIMITED</b> P O Box 2070 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>AUTO MECH LIMITED</b> P O Box 4468 Dar es Salaam Tanzania	<b>MANUFACTURERS SERVICES</b>
<b>BARKER AND BARTON (TANZANIA)</b> P O Box 805 Dar es Salaam Tanzania	<b>SERVICES</b>
<b>BURNS AND BLANE (T) LIMITED</b> P O Box 9253 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>COMAFRIC LIMITED</b> P O Box 6673 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>DIAMOND MOTORS LIMITED</b> P O Box 7847 Dar es Salaam Tanzania	<b>DISTRIBUTORS</b>
<b>GREY IRON FOUNDRY CO</b> P O Box 128 Arusha Tanzania	<b>MANUFACTURERS SERVICES</b>
<b>KILIMANJARO MACHINE TOOL MANUFACTURING CO</b> P O Box Moshi Tanzania	<b>MANUFACTURERS</b>
<b>RIDDOCH MOTORS 1987</b> P O Box 40040 Dar es Salaam Tanzania	<b>DISTRIBUTORS</b>
<b>TANZANIA AUTOMOBILES MANUFACTURING CO LTD</b> P O Box 7108 Dar es Salaam Tanzania	<b>MANUFACTURERS</b>
<b>TANZANIA AUTOMOTIVE TECHNOLOGY CENTRE</b> P O Box 30190 Kibaha Tanzania	<b>MANUFACTURERS</b>

**TANZANIA TRACTORS MANUFACTURING CO LTD**  
P O Box 4851  
Dar es Salaam  
Tanzania

**MANUFACTURERS  
DISTRIBUTORS**

**TANZANIA-ZAMBIA RAILWAY AUTHORITY**  
P O Box 40160  
Dar es Salaam  
Tanzania

**ENGINEERING  
SERVICES**

**THE TANGANYIKA FARMERS' ASSOCIATION**  
P O Box 2010  
Arusha  
Tanzania

**DISTRIBUTORS**

**THEMI FARM IMPLEMENTS AND ENGINEERING CO LTD**  
P O Box 286  
Arusha  
Tanzania

**MANUFACTURERS**

**UBUNGO FARM IMPLEMENTS LIMITED**  
P O Box 20126  
Dar es Salaam  
Tanzania

**MANUFACTURERS  
DISTRIBUTORS**

**UNITED REPUBLIC OF TANZANIA  
RURAL ROADS MAINTENANCE PROGRAMME**  
P O Box 9231  
Dar es Salaam  
Tanzania

**SERVICES**

**ZANA ZA KILIMO LIMITED**  
P O Box 1186  
Mbeya  
Tanzania

**MANUFACTURER  
DISTRIBUTOR**

MAJOR TANZANIAN  
AGRICULTURAL MACHINERY MANUFACTURERS

1. **UBUNGO FARM IMPLEMENTS LIMITED**  
P O Box 20126  
Dar es Salaam  
Tanzania

Background

Established in 1968 and started production in 1970 in Government Sector in collaboration with China and is a subsidiary of NDC.

Capital investment : T.sh. 6 million

Manufacturing Activities

An agro hand tools and animal-drawn implements manufacturing company.

Product	Installed Capacity	Production (1983)
Hoes	} 3,600 tons	3 046 tons
Ploughs		
Plough spares		
Grass Slashers		

Land Building

Total area : 80,000 m<sup>2</sup>  
Built-up area : 35,000 m<sup>2</sup>

Manpower

Total : 650

Materials

Steel flats for 7000 forgings : Imported from Japan & Europe

Facilities

Machine Shop  
Forge Shop  
Material Testing  
Maintenance  
Engineering

Constraints

Lack of trained manpower  
Lack of foreign exchange for raw material

Comment

This is one of the major plant manufacturing hand tools and animal drawn implements catering to the domestic demand. The plant is utilised to the optimum level.

2. **ZANA ZA KALIMO LIMITED**  
 P O Box 1186  
 Mbeya  
 Tanzania

Background Zana Za Kalimo (ZZK) was established in Mbeya, Eastern Tanzania as a subsidiary of NDC in 1974. It hardly started any meaningful production until 1985 when a Swedish company M/S GAB-GENSE was appointed in a management contract funded by SIDA. Output and quality has been rather poor until 1989 when, under new top management, the difficulties and constraints were well addressed.

Manufacturing Activities

This enterprise has got excellent buildings and facilities including a on-rail materials handling overhead crane yard and expansive covered worksheds, housing forges, foundry, machine shop, toolroom, pattern shop and training centre.

Range of products and output for 1989 and forecast 1990 are as follows:

Product	1988	1988
Hces	120,346	214,210
Slashers	4,700	6,357
P/ Axes	12,439	9,676
W/ Barrow	5,923	6,220

Manpower

Total : 245

Materials

Steel Flats for forgings : Imported mainly from Sweden

Facilities

Forge Shop	Machine Shop
Paint Shop	Toolroom
Pattern Shop	Foundry

Constraints

Manpower skills and marketing function (this has been recognised and is being addressed).



3. **TANZANIA AUTOMOBILES MANUFACTURING CO LTD**  
 P O Box 7108  
 Dar es Salaam  
 Tanzania

**Background** Founded in 1978. The company's share capital is 90% owned by the Tanzania Government (60% NDC + 30% SMC) and 10% is owned by SAAB- SCANIA AB, Sweden. The technical management contract is with SAAB SCANIA. Production started in 1982.

Capital investment : T.sh. 50 million.

**Manufacturing Activities**

Vehicle assembly plant for heavy duty trucks. Valmet tractors in collaboration with the TRAMA-VALMET, Finland is also assembled in the same plant to utilise the excess capacity.

Product	Installed Capacity	Production (1983)
<b>SAAB SCANIA</b>		
- Trucks - 8 tons & above	1,200	117 trucks
- Buses -		20 buses
Tractors Valmet 604	1,500	414

**Land and Building**

Total area	65,000 m <sup>2</sup>
Built-up area	8,600 m <sup>2</sup>

**Manpower**

Total	:	110
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**Materials**

SKD/CKD kits	Imported
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**Local content for trucks**

Radiator, tyre & tube, silencer, paints

**Local content for tractors**

Radiator, paints.

**Constraints**

Lack of foreign exchange.

**Comment**

Tractors and trucks are being assembled with limited local content.

4. **ALUMINIUM AFRICA LIMITED**  
 P O Box 2070  
 Dar es Salaam  
 Tanzania

**Background** This is one of group companies of NDC with management agent - Comcraft Services Limited (Major), U.K. with share of 62% and private joint sector 38%. Established on 7th October 1960. It is organised in 6 different production units which operate as separate companies.

**Manufacturing Activities**

Product	(Tones) Installed Capacity	(Tones) Production (1984)
(i) <u>Aluco</u> Aluminum sheets & circles, foils, etc.	9,000	2,000
(ii) <u>Pipeco</u> Galvanised water pipes, tubular trusses, fencing tons poles, Z-purlins, cut plates etc.	9,400	5,400
(iii) <u>Galco</u> Galvanised corrugated iron sheets, gutters, ridges, etc.		22,300
(iv) <u>Steelco</u> Gold rolled steel sheets	75,000	24,300
(v) <u>Steel Cast</u> Steel Billets	18,000	7,700
(vi) <u>Ashesco</u> Asbestos cement sheets, pipes & moulded products	14,000	4,000

**Planned Utilization**

55% in 1984

**Manpower**

Managerial/Supervisory	70
Others	1,130
<u>Total</u>	1,200

Facilities

Hot rolling mill for aluminum  
Pipe plant with slitting line  
Galvanising plant  
Billet casting plant (continuous casting)  
Asbestos cement sheet plant  
Cold rolling mill for steel

Expansion/Diversification Programme

- (i) Installation of facilities in Pipeco division for making steel tubing used in bicycles manufacturing, manufacture of tractor drawn implements.
- (ii) Annealing line for cold rolled steel sheets in steelco division.
- (iii) Expansion of steel cast division with a new rolling mill for flats & sections.
- (iv) Colour coating line for GCI sheets in Galco division.
- (v) Coil to coil continuous galvanising of iron sheets.
- (vi) Large diameter steel pipes in Pipeco division.
- (vii) Aluminum extrusion plant in Aluco division.

Constraints for Exporting

- (i) Competitions from developed as well as some developing countries.
- (ii) Irregular commercial shipping schedules to foreign markets.
- (iii) High surface transport costs to countries around the geographical borders of Tanzania.

Comment

Well organized group exporting to Kenya, Uganda, Zambia, Rwanda, Burundi, UK, etc.

5. **SMALL INDUSTRIES DEVELOPMENT ORGANIZATION**  
P O Box 2474  
Dar es Salaam  
Tanzania

Background

Established in 1973

Services

SIDO provides the following services to small scale industries:

- Formulating plants at national, regional and district levels by undertaking survey.
- Providing comprehensive feasibility studies with respect to appropriate lines of manufacture.
- Co-ordinating with agencies for providing finance and other inputs.
- Providing machinery, equipment and tools on hire purchase as an attempt to industrialise rural areas.
- Providing and upgrading skilled personnel through training programme.
- Providing worksheds and engineering services.
- Assisting in marketing of goods and also market research.
- Effecting technology transfer both indigenously and from foreign source.
- Providing technical, economic and managerial how-how together with consultancy to small scale units.
- Operating a nationwide handicraft development and marketing programmes.

Comments

There are over 5000 small scale industries in the country, employing over 68 000 people and possibly 14-20000 metal working artisans.

6. **CENTRE FOR AGRICULTURAL MECHANIZATION AND RURAL TECHNOLOGY (CAMARTEC)**  
P O Box 764  
Arusha  
Tanzania

**Background** Established in November 1981 by an act of Parliament and started its operation in July '82. Is a merger of 2 separate institutions formerly known as Tanzania Agricultural Machinery Testing Unit (TAMTU) and Arusha Appropriate Technology Project (AATP).

Capital investment : T.Sh. 58 million.

**Functions of the Centre**

The functions of the centre include:

- (i) To carry out applied research, designed to facilitate the designing, adaptation and development of machinery and equipment suitable for use in agricultural and rural development.
- (ii) To develop and manufacture approved prototypes, components and cultural techniques for technologies and evaluate their suitability for local adaptation.
- (iii) To adopt foreign designs of agricultural machinery and equipment to suit local conditions of manufacture and maintenance.
- (iv) To perform tests on all types of machinery and equipment intended for use in agricultural and rural development in the United Republic and to publish their results.
- (v) To conduct short training courses designed to provide practical training and knowledge to village communities in the use and maintenance of agricultural machinery and other appropriate technology devices.
- (vi) To offer consultancy services on the designing, testing and other technical aspects of agricultural mechanization.
- (vii) To act as the national link with other national and international institutions engaged in activities related to the functions of the centre.

**Organizational Structure**

The centre is a parastatal organization under the Ministry of Industries. The running of the centre is directed by the Board of Directors under a Chairman appointed by the President of the United Republic of Tanzania. The day to day management of the centre is directed by the Director General, also appointed by the President.

There are three Directorates under the Director General, these include:

- (i) Directorate of Technology Development
- (ii) Directorate of Testing and Production
- (iii) Directorate of Extension and Training

Support services are given by the Finance and administration Division. The above mentioned Directorates are staffed with professionals, technicians and artisans. The office of the internal Auditor and Planning fall under the Director General Office.

**Achievements** The centre has a number of proven technologies in the field of agricultural mechanization and rural technology which can be adapted for use in various parts of Tanzania. The centre can presently offer both centre-based and field training as well as consultancy service for the production and use of:

- (i) Farm Implements
- (ii) Rural Transportation: Carts & Components
- (iii) Low-cost House Construction
- (iv) Water: Pumps & Storage Systems
- (v) Energy Saving Devices & Designs
- (iv) Publications and Radio Programmes

7. **AUTO MECH LIMITED**  
 P O Box 4468  
 Dar es Salaam  
 Tanzania

**Background** Established in May, 1984 and jointly owned by Comafic Limited and State Motor Corporation of Tanzania. Capital investment T.Sh.62.5 million.

**Manufacturing Activities**

An auto-reconditioning and rebuilding unit.

Product	Installed Capacity
Engines	1800 nos.
Gear Boxes	1200 nos.
Differentials	1200 nos.
Electric aggregates	1200 nos.
Miscellaneous spares	

**Land and Building**

Total area	17 acres
Built-up area	6700 sq. mtrs.

**Manpower**

Managerial/Supervisor	21
Direct Workers	119
Indirect Workers	81
<b>Total</b>	<b>221</b>

**Facilities**

Reconditioning Shop  
 Testing  
 Repair/Maintenance Shop

Expansion/Diversification Programme

Reconditioning, rebuilding, reclamation of auto vehicles, tractors, industrial locomotive and marine aggregates and assemblies like engines, gear boxes, differential, auto- electrical, clutch assemblies, etc.

Manufacture of wide range of spares for reconditioning and rehabilitations US \$ 1,200,000.

Manufacture of following on regular production basis:

- Shock absorbers and other suspension items: 500,000 pcs.
- Rubber components.
- Transmission gears including power take off units for tractors: 1200 assembled sets.
- Automotive springs - b. 'h coil and leaf springs: 20 000 sets.
- Body components
- Gaskets

Constraints

Import licence for raw materials and other items.  
Lack of technical manpower.

Comment

A good automobile reconditioning plant with ambitious plans to go in for the manufacture of automobile components for domestic replacement/OE/export to PTA countries.

8. **KILIMANJARO MACHINE TOOL MANUFACTURING CO**  
P O Box  
Moshi  
Tanzania

Background Joint Inter Government Protocol was signed in 1977 between the Governments of Tanzania and Bulgaria wherein Bulgaria agreed to set-up the Machine Tool Plant in Tanzania through Machine-Export. Production commenced in September 1983.

Manufacturing Activities

Machine Tool Plant for metal working and wood working machines with progressive manufacturing programme.

Product

Lathes  
Power Hack Saw  
Bench Drilling Machine  
Column Drilling Machine  
Pedestal Grinder  
Band Saw  
Planer  
Wood Working Lathe

Manpower

Total : 250

Materials

CKD Packs	}	
Castings (Some Local)	}	
Electrical	}	
Standard Parts	}	IMPORTED
Jigs & Fixtures	}	
Alloy Steels	}	
Paints	}	

Facilities

Machine Shop  
Heat Treatment  
Tool Room  
Engineering Design

Constraints

Lack of design and tool design engineers.

Comment

The plant has complete machining facilities. Foundry does not exist and there is no good foundry, except Railway's, available in Tanzania. Hence, most castings are being imported. Since the castings form approx. 80% of the total materials, local sources for integrated foundry is essential.

9. **NATIONAL ENGINEERING COMPANY LIMITED**  
P O Box 1186  
Dar es Salaam  
Tanzania

Background

Founded in 1967 succeeding "Twentsche Overseas Trading Company (TOM)"

NDC took this as a holding company in 1977. The share holders are:

National Development Corporation  
Workers Development Corporation  
East of Panayato and Tanzania Investment Bank

Capital investment : T.sh. 20 million  
Authorised capital : T.sh. 12 million

Manufacturing Activities

It is one of Tanzania's leading manufacturers of structural steel work. It also provides engineering facilities for outside work to be carried out in the machine shop, grinding shop and foundry. In addition, the company produces a wide range of tanks and containers. It also



provides erection and commissioning services.

<u>Product</u>	<u>Installed Capacity</u>
Structural Steel Works	2,000 - 3,000 tons
Manufacture of tanks of capacity up to 10,000 m <sup>3</sup> and containers	
Manufacture of spare parts for sugar, fertilizer plant, transport and defence.	
Jobbing orders	

#### Plant Utilization

Steel fabrication shop	60%	} in (1984-85)
Casting Section	30%	
Machine shop	60%	

#### Land and Building

Built-up area	40,000 sq.m
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#### Manpower

Total	397
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#### Materials

Pig Iron	Imported
M.S. Plates, sheets	Imported

#### Facilities

Machine Shop  
Grinding Shop  
Steel Structure and Tank Shop  
Foundry

#### Expansion/Diversification Programme

Tees/Elbows as standard product  
Front and rear weight of tractors  
Grinding balls for cement factory-steel casting

#### Foundry

Cast iron and non ferrous  
Manhole covers  
Cast hollow sections for bushes  
Road gullies  
Roll bodies for sisal and sugar factories  
Wheels for mining wagons, etc

Non-ferrous castings  
(Bronze, brass, gun metal alloy and aluminum)

Planned capacity

Ferrous	}	3600 tons/year
Non Ferrous	}	

10. **TRAILERS AND LOW LOADERS MANUFACTURING CO LIMITED**

Background

Established in January 1985  
Capital investment: T.sh 102.66 million

Manufacturing Activities

It is a trailers manufacturing company with plans for progressive indegenisation.

Product	Installed Capacity	Production (1984-85)
High speed trailers TPL 27-1	400	140
Low Loaders (Semi trailers) PN32-R	-	-
Agriculture Trailers		
5 tons	300	-
3.5 tons	300	-

Plant Utilization

60% in 1985 (upto March 1985)

Land and Building

Total area	:	20 acres
Built-up Area	:	6 acres

Manpower

Managerial/Supervisory	12
Direct Workers	57
Indirect Workers	40
<u>Total</u>	109

Facilities

Fabrication and press shop  
Assembly shop  
Maintenance shop

Constraints

Lack of foreign exchange for raw materials  
Lack of technological/engineering capabilities

Comment

Presently assembling trailers with imported SKD/CKD kits in technical collaboration with VOZILA GORICA of Yugoslavia.

INDICATIVE PROGRAM FOR THE INTEGRATED DEVELOPMENT OF THE  
AGRICULTURAL MACHINERY INDUSTRY  
IN TANZANIA

PIPELINE PROJECTS

PERTAINING TO A. M. I.

1. DP/URT/86/027 STRENGTHENING OF THE INDUSTRIAL  
MANAGEMENT CAPABILITIES, US\$4600,00

Objectives

To improve the productivity and capacity utilization of selected industrial enterprises and to provide training. The selected enterprises are:

The National Engineering Company  
Mang'ula Mechanical and Machine Tool Company  
Friendship Textile Mill, and  
Polyester Textile Mill

Additional four enterprises to be selected during the course of the project's implementation.

Status

The Resident Representative authorised to sign the project document on behalf of UNIDO.

Backstopping Officer/Unit: Mr Farah, IO/IIS/INFR

2. ASSISTANCE TO THE NATIONAL DEVELOPMENT CORPORATION (NDC)  
IN DEVELOPING A TEN YEAR PERSPECTIVE PLAN

Status

Official request forwarded to IO on 13 September 1989 for review and substantive comments.

Backstopping Officer/Unit: Messrs. Buckle and Kopolo, IO/T/MET/ENG

3. DP/URT/88/001 UNCDF/UNIDO PROJECT FORMULATION MISSION  
FOR THE PROJECT ON THE DEVELOPMENT OF SMALL-SCALE  
INDUSTRIES IN TANZANIA

Status

UNCDF has suggested a neutral pre-formulation mission to further conceptualize the project before a decision on the execution responsibility is taken.

Backstopping Officer/Unit: Ms. Taluy, IO/IIS/INFR

4. ASSISTANCE TO THE 22 FOUNDRIES, US\$ 1,010,00

Objectives

To reactivate and up-grade the capacity utilization of the foundries.

Status

Preparatory assistance document already forwarded to the field. The purpose of the preparatory assistance is to define the project elements and the commitment of all the parties concerned. The Government has been requested to explore possibility for the eventual financing of the necessary raw materials from the FRG Commodity Grant.

Backstopping Officer/Unit: Mr Buckle, IO/T/MET

5. ASSISTANCE TO TANZANIA ENGINEERING AND MANUFACTURING DESIGN ORGANIZATION (TEMDO), US\$3,8 MILLION (US\$1,2 MILLION FOR IPF AND US\$2,6 MILLION FOR BILATERAL DONORS)

Objectives

To establish physical facilities with pilot and demonstration tool room, forge room and heat treatment unit in addition to the existing design unit. To enable TEMBO to provide essential precision engineering services to the local industries.

Status

The UNDP office has confirmed that they would cost share the project if a bilateral donor could be identified. Government is to approach the Japanese Government as per the Resident Representative's letter of 26 June 1989. The Ministry of Industry has requested the Ministry of Finance to process the request. A reminder cable sent in November 1989.

Backstopping Officer/Unit: Mr Kitutaki, IO/T/MET

6. SI/URT/89/804 ASSISTANCE TO MESSRS. THEMI FARM IMPLEMENTS AND ENGINEERING CO. LTD., US\$ 31,000

Objectives

To assist the company in devising a strategy that will enable it to diversify its operations into the production of oil squeezers, decorticating machines, threshers, planters and seeders.

Status

The project was approved for financing under the SIS resources in June 1989. The nomination forms for the envisaged training have just been finalised.

Backstopping Officer/Unit: Mr Gladilov, IO/T/ENG.

**7. MBEYA OXENIZATION PROJECT**

**PURPOSE**

The purpose of the Mbeya Oxenization Project (MOP) is to develop and promote appropriate animal-traction technology for smallholder farming systems in the Mbeya Region.

**Specific Objectives/Outputs**

- Develop marketable animal-drawn weeding equipment
  - test marketing of 100 pieces of weeding equipment
- Facilitate design, production and marketing of ox-carts
  - test marketing of 25 ox-carts
- Design and test marketing of other ox-drawn equipment
  - field testing of 25 units of three different pieces of equipment
- Promote animal-traction farming systems
  - organize extensions seminars and animal traction fairs
  - develop a marketing strategy for ox-drawn equipment

**ADMINISTRATION**

MOP is administered by MEDA (Mennonite Economic Development Associates) of Winnipeg, Canada in cooperation with the Regional Development Director, Mbeya. Financing comes from three sources; the Canadian international Development Agency (CIDA), and RDD, and the Canada-Tanzania Counterpart Fund. Office and workshop facilities are located at Zana Za Kimimo, Mbeya and Mbozi Districts in collaboration with Kilimo, Uyole Agricultural Centre and other organizations.

The project is staffed as follows:

<u>Canadian</u>	<u>Tanzanian</u>
Project Director	Project Engineer
Agronomist	Administrator
Marketing Advisor	Marketing Assistant
Gender Issues Coordinator	Assistant Gender Issues Coordinator
Assistant Engineer (Open)	Training & Extension Officer
	Extension Coordinator & KILIMO
Liaison	
	Workshop Assistant
	Accounts Assistant

The project is scheduled to extend up to June 1991.

## PLAN OF OPERATION

MOP does not aim to become an ongoing institution -- the goal is rather to work through and to strengthen existing institutions. MOP has provision to work with production and marketing institutions in the government, parastatal and private sectors.

The planned activities include:

- Acquiring samples of potentially useful/saleable equipment from sources in Europe, Tanzania, India and other African countries.
- Testing this equipment with farmers in their fields to select and/or modify those pieces with the best potential. Develop understanding of current smallholder farming practices.
- Contracting our production of a sufficient quantity of prototypes of each piece selected for test marketing.
- Test marketing of prototypes through various marketing channels.
- Review of demand, design, and marketing strategy.
- Negotiations with organizations in the public and private sectors for commercially viable production and marketing of promising equipment.
- Facilitate extension, promotion and training through field days, seminars, contact farmers, training courses in support of the above process.
- Networking of national and international bodies concerned with animal traction.
- Facilitate commercial importation of components not readily available in Tanzania.

## PROGRESS TO DATE

- Office and workshop setup, placement of expatriate team and language study.
- Survey of animal traction use, cropping patterns and socio-economic conditions in 18 villages in Mbeya Region
- Importation of sample equipment from U.K., Senegal, Zimbabwe, Canada, and collection of Tanzanian equipment (UFI, ZZK, CARMERTEC).
- Study of current weeding practices/perceptions among farmers.
- Extension and training program underway in 14 villages using contact farmers for equipment testing and training neighboring farmers.
- Timely weeding demonstrations in six villages and a weeding research program with UAC in seven villages.
- A report on Women and Animal Traction in Mbeya Region, and plans for training and extension for women farmers. Pilot project established with RRM for women's group to do road maintenance using oxen.

- Two Regional marketing workshops held.
- Five demonstrations of MKOMBOZI plough to 350 district extension agents, marketing personnel and farmers.
- One ploughing competition/demonstration, attended by 75 farmers.
- One training course for 28 male and female extension agents and one seminar for ox-cart builders held in conjunction with Uyole Agricultural Centre.
- Two extension agents trained at draught animal course in Harare.
- The following equipment has been purchased, produced, tested and/or sold (test marketed to date:

ITEM	QUANTITY PURCHASED	QUANTITY SOLD	QUANTITY ON HAND
MKOMBOZI PLOUGH	102	94	8
MKOMBOZI HARROW ATT.	11	11	0
MKOMBOZI RIDGER ATT.	15	14	1
MOP CULTIVATOR	24	23	1
INTER-ROW CULTIVATOR	100	34	66
RIDGER SP	101	38	63
PLANTER MEALIE BRAND	2	2	0
CART AXLES	39	38	1
CARTS	8	5	3