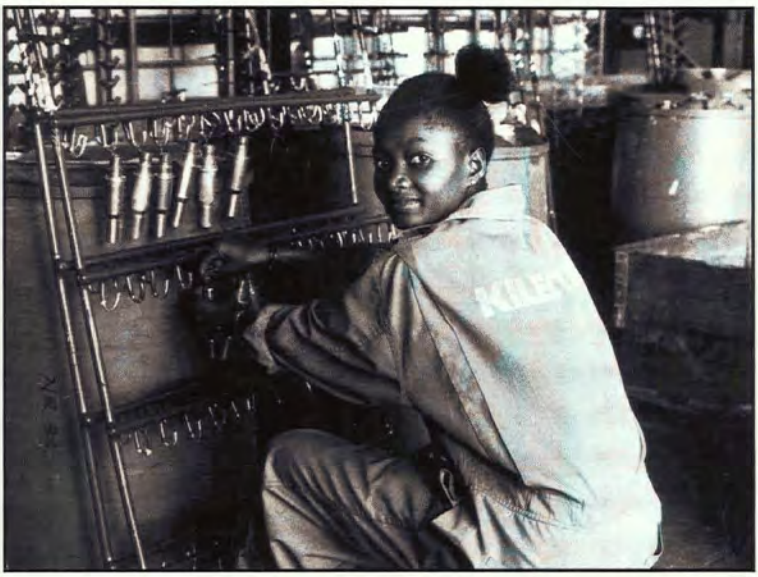
SIDA Evaluation Report, Industry, Tanzania

1988/2

SISTERHOOD ON TRIAL

An evaluation of the performance and linkages
of the sister industries in Tanzania



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SIDA

LIST OF ABBREVIATIONS

ATOMAC	Arusha Precision Tools and Die Makers Company
ACCO	Arusha Cutlery Company Ltd
AMI	Arusha Metal Industry Ltd
AGACO	Arusha Galvanizing Company Ltd
AMOCO	AMOCO Industrial Buffs Ltd
CFW	Common Facility Workshop
C&AI	Chemical & Allied Industries
DBL	Direct Backward Linkages
DFL	Direct Forward Linkages
FAWIPMA	Fabrication of Wire Products
GIFCO	Grey Iron Foundry Company
HAMMAX	Hammers & Axes Company
HIMA	Highland Knitwear Manufacturers Ltd
ILO	International Labour Office
IMAC	Iringa Maintenance Company Ltd
ISI	Import Substitution Industrialization
JASPA	Jobs and Skills Programme for Africa
KILECTRO	Kilimanjaro Electroplates Ltd
KIMESHA	Kilimanjaro Metal Shapers Ltd
KISCICO	Kilimanjaro Scissors Company
MAFOTCO	Mawenzi Forging & Tool Company Ltd
MOCCO	Moshi Cutlery Company Ltdz
MOTO	Moshi Handtools
NBC	National Bank of Commerce
NEM	Northern Electrical Manufacturers Ltd
NORRAPAK	Northern Packages Company Ltd
PEMACCO	Pioneer Electric and Consulting Company
SDP	Sister Daughter Programme
SIDA DCO	SIDA Development Cooperation Office Dar es Salaam
SIDA	The Swedish International Development Authority
SIDO	Small Industries Development Organization
SIP	Sister Industry Programme
SWEDFUND	Swedish Fund for Industrial Cooperation with Developing Countries
TECO	Tanzania Eyelets Company Ltd
TISCO	Tanzania Industrial Studies and Consulting Organization
UIF	Uhandisi Industrial Fasteners

Executive summary

This study is part of a continous evaluation of programme activities and centres on the Sister Industry Programme (SIP) in Tanzania – a programme for establishing locally managed small industries involving Swedish small- and medium scale industries.

The Sister Industry Programme was jointly developed by SIDA, SIDO in Tanzania and FIDE, a consultancy company, specializing in the transfer of technology to developing countries.

The programme was originally designed to draw upon the small-scale industry tradition existing in the Swedish county of Småland. The existing technological resource base in Småland fitted very well into the needs of developing countries, in their efforts to build up a manufacturing industry sector.

The programme was initiated in 1976 and has since then been responsible for the establishment of 30 new industries.

The SIP has been evaluated several times. However a common feature in most previous evaluations has been a lack of in-depth treatment of the sister industry companies.

The SIP arrangement has furthermore led to the introduction of new technologies in Tanzania and established a core of indigenous entrepreneurs managing their own companies.

The objective of this study therefore is to analyze the structure and performance of the established companies and their integration with the manufacturing industry and partly, other sectors ot the national economy.

FINDINGS

The evaluation shows that the achievments of the sister industries were quite mixed and a group of well-consolidated and growing companies was not difficult to distinguish.

After some years of operation it was clear that some of the companies were approaching stormy waters. Production was severely affected by management problems and there was an immediate need for restructuring. This posed a challenge to the Small Industries Development Organization (SIDO) to develop a strategy for active intervention.

In general however, the sister companies had managed to switch from a strong import dependence to a greater utilization of locally available raw materials.

The macro-economic developments in Tanzania have been most important for the sister industries. Foreign exchange restrictions and the devaluation of the shilling have forced them to explore local supply possibilities.

However a complete elimination of imports is not the ideal situation. Instead a dynamic agricultural sector is of prime importance for a successful industrialization where imports and backward linkages co-exist.

The sample companies had a production structure which reduced the "value" of the links emanating from the sister industries several of which generate a high value added. In this respect their performance is better than Tanzanian industry in general. (Arusha industries show a more encouraging picture than the rest as it takes several years before value added becomes significant.)

The establishment of the sister industries has resulted in increased local production of consumer- and intermediate goods. However though their life has been maintained artificially – as import support always implies – this can be defended if it means a net saving of foreign exchange for the country.

Up to 1986 the companies gradually developed their capacity to efficiently save foreign exchange for the country but the devaluation of the shilling meant in effect that more companies became net dis-savers of foreign exchange. Unless those companies manage to substantially improve their capacity utilization, their operations will lead to continued waste of scarce foreign exchange resources.

PROJECTIONS

In the future the sister industries will increasingly encounter management problems. Unless support is designed to strengthen the management capacity of the sister industries, the companies will not be able to continue to grow in Tanzania's new economic policy environment. These measures must involve much more than just management advisory services/training. A mandate to intervene and reshuffle management positions and also the actual closing down of non-viable enterprises, is necessary.

Moreover, if measures to boost production are not undertaken immediately, an already visible trend will be reinforced – a flow of capital out of the sister industries in to more rewarding activities. This requires close monitoring of the companies as a

tool for an active promotion of industrial development, by SIDO and SIDA. However a data base for this does not yet exist.

It is clear then that the coming five-year period will be one of consolidation and restructuring, rather than establishment of new enterprises.

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RECOMMENDATIONS

The present financial-economic criteria should be retained, but in future, SIDO project appraisals should include an assessment of the project in itself as well as its viability in a broader macro-economic sense.

Priority should therefore be given to those companies whose production represents a net saving of foreign exchange.

New sister industries should be selected within food processing, agricultural implement and generally within areas where potential linkages exist with the agricultural economy.

SIDO should actively try to identify companies in the country that can establish a productive relationship with SIDO associated industries and SIDO can assume an altogether more active role in promoting such linkages.

It is also recommended that a study analyzing the more qualitative impact should be undertaken to get a more complete picture of the impact of SIP.

CHAPTER 1
Introduction

This study was commissioned by SIDA as part of a continuous evaluation of programme activities. The subject matter is the Sister Industry Programme (SIP) in Tanzania, a programme for establishing locally managed small industries within the framework of a technology transfer arrangement involving Swedish small and medium scale industries.

BACKGROUND

The SIP has been the subject of several evaluations, for example Alänge (1979), TISCO (1980), Claesson (1982), Niklasson (1983), Ekengren (1984), Forss (1985) and Havnevik et.al (1985). The emphasis has varied, but a recurrent theme has been the organizational and administrative set up of SIDO in general, and of the SIP in particular. A common feature, with some exceptions, notably TISCO 1982 and Grettve & Larsson 1983, has been a lack of in-depth treatment of the sister industry companies, their structure and performance.

The TISCO report of 1980 mainly dealt with SIDO as an organization, its mode of operation and relationship to other local agencies with related objectives. The SIP as such was not subjected to a scrutiny in much detail, apart from a discussion on the organizational belonging of the industrial estates. With respect to the performance of the industrial projects handled by SIDO the report simply states:

> "No detailed information on industrial projects that have been implemented and are now in operation is available. Thus it is not possible to make any definite statements on their profitability or how they are otherwise performing"(TISCO, 1980:5:2, part I)

The focus of Claesson's report in 1982 was more on performance criteria. It contained an analysis of how the scarcity of local raw materials and the subsequent need for import affect the economic situation of the various sister companies in the Arusha industrial estate. It also discussed problems of financing, availability of

foreign currency, and the amount of working capital needed. Claesson presents data on profitability and general performance of seven companies, but he does not directly deal with linkages and value added in production. Based on these findings the report then concludes with recommendations for facilitating smoother and more efficient routines for handling imports of raw materials.

The 1982 TISCO evaluation of the 10 units at the Arusha Estate focussed on performance and financial issues. The report also pointed out the need for reducing the dependence on imported raw materials. Furthermore, the units should justify their import requirements on the basis of the utility of their products and thus qualify for import allocations. TISCO also emphasized that many units are undercapitalized and subsides on SIDO loans. So, for example, would only a few companies show profitability if SIDO's loans were properly charged. In sum, this report touches upon issues that are crucial also today and which the present report will elaborate upon in more detail.

The analysis conducted by Niklasson (1983) was one of the more sophisticated ones. Although it was limited to only four companies, it nevertheless is interesting from the point of view of methodology. The purpose was twofold. Firstly, to provide an economic analysis of the sister industry programme as a method of achieving transfer of technology. Secondly, to carry out economic evaluations of some of the industrial projects commissioned under the SIP. In focus is the profitability of the companies (which is regarded as less than satisfactory) and the pricing policy of the companies. The data thus compiled is then used for a discussion of the net foreign exchange effect of the companies.

Grettve & Larsson Associates made an extensive survey of the sister industries in Moshi, Mbeya and Arusha in 1983. The report covers project preparation and implementation. The major part is a rather detailed examination of each of the projects, where three subjects stand in focus: capacity and efficiency; foreign exchange effects; linkages and structural effects.

The conclusions were as follows:

- Most project worked with a 1/3 capacity utilization.
- Most of the projects were outright foreign exchange drains.
- Linkage effects were noticed for some companies, but the study did not perform a comprehensive analysis.

The Grettve & Larsson study was an important contribution to the analysis of the sister industries, as it was among the first that tried to incorporate into the analysis the foreign exchange saving effects of the projects, as well as their integration into the national economy through linkages.

Kilelectro in Moshi produces, among other things, locks and door hinges. Picture: Charlotte Thege, SIDA Photo Archive

basic structure and performance of the surveyed companies in Chapter 3 and also appendix 3.

Sari Scheinberg was responsible for: i) data collection in Tanga and the analysis in Chapter 3 together with Sverker Alänge.

Serve A. Malai was responsible for: i) data collection in Moshi; ii) data collection and analysis of secondary companies in Chapter 6.

In the field phase we were supported by the following SIDO regional economists: Mr. L. Kalima in Mbeya, Mr. Kiluvia in Arusha, Mr. A.J. Mwakamyanda in Moshi and Mr. E.Ntandi in Tanga.

This implies a sort of matrix organization where the team members, on the one hand, prepared their own reports, but also collected material which was used by the others in their analytical efforts. The preliminary reports of the team members were then discussed at two seminars, in Dar es Salaam and Stockholm. After taking into account the comments and criticism expressed at these two occasions, the final write-up was made by Jerker Carlsson.

CHAPTER 2

The deepening of industrialization

It has often been said that a typical peripheral society revolves around a number of serious structural deficiencies, of an almost universal character:

- Inadequate integration of agriculture and industry.
- Insufficient depth of production, i.e. lack of integrated economic circuits.
- Constriction of the internal market rooted in the social structure.
- Growing cleavages in society and economy.

The historical circumstances surrounding the formation of the modern Third World societies are rather wellknown and should not be repeated here. The attention of the reader is instead directed towards the prospects for change and development inherent in this structure. In order to address this issue it is our intention to draw lessons from history, more specifically the development experience of the peripheral countries of Europe.

THE EUROPEAN EXPERIENCE

How could, for example, the Nordic countries avoid peripheralization and embark upon a path of industrialization. Are their experiences in any way applicable to the developing countries of today?

This approach does not mean elevating the operating principles of highly industrialized societies into a model which is universally valid and from there issue prescriptions for societies still to be industrialized. Thus, to take into account the lessons from the history of Europe does not mean advocating eurocentricism. If specialization played a major part in the formation of distorted reproduction structures in the Third World, an analysis of historical cases with a high degree of specialization, but without comparable deformation, is important for the further debate on development policy.

The Nordic countries are cases where exportoriented production of agricultural,

forestry and mineral products did not lead to the emergence of typical enclave economies, but paved the way for a broad based and wellproportioned opening up of the domestic market.

The growth dynamics of the Nordic countries, and for that matter also of other European latestarters – Portugal, Spain, Ireland and Romania to mention a few cases – were exogenously determined and dependent. The important question is why the Nordic countries succeeded, in spite of association with the then industrialized countries, to develop into mature capitalist national economies – while the others, Portugal et.al., degenerated into European peripherals.

An important reason why the Nordic countries escaped this fate lies in their relatively early switch from the unprocessed staple goods such as grain, wood, iron ore to the first stages of processing, resulting in the export of semifinished and finished manufactures.

In the wake of the transition from raw material exports to exports of fini shed goods, the production lost its enclave character within the domestic economy. While in other parts of the world, monocultures and mining enclaves emerged, the increase in local wealth in the Nordic countries resulted in economic linkages. (Hirschman, 1969)

Yet, the linkage potential of the typical Nordic staple good was by no means particulary favourable. The potential forward and backward linkages of the food processing industry are more limited than those of the textile industry. Iron processing has a greater impact on upstream and downstream industrial activities than wood processing.

Probably crucial for Nordic development as a whole was the fact that production of initially unprocessed staple goods reached a really significant scale in the relatively small domestic economies. The dynamic impulses thus generated were strong enough to trigger off a relatively broadbased growth. Another result of this transition to processing was favorable external terms of trade. The Nordic countries imported raw materials and cheap consumption goods, while exporting processed, semiprocessed and raw materials required by other metropolitan countries. This prevented a deterioration in internal terms of trade between the primary and secondary sectors.

Export receipts were translated into an import substitution industrialization (ISI), based on a growing demand for equipment and consumer goods. This export effect is essential for understanding Nordic development. It resulted from the fact that the distribution of natural resources and productive capital was only moderately uneven. Where ownership of land, fishing rights, forests and mineral deposits is highly concentrated a broadbased ISI cannot take place.

Summarizing the features of the Nordic development scenario we can say that a

strong foreign demand was necessary, whereby investment capital was guided into the export sectors. The existence of linkage effects, extending beyond the export sector, created a local industry responding to local needs.

THE INDUSTRIALIZATION OF TANZANIA – A CASE OF PERIPHERALIZATION?

How will industry develop if sectorial integration is not achieved. The present industrial structure of Tanzania is quite illustrative in this regard. The longterm industrial strategy applied by Tanzania from 1975 onwards was outlined in the Third FiveYear Plan, 19761981. The major objective was to promote and establish industries catering for the basic needs of the majority of the Tanzanians. The first type of industries were specifically selected to serve this major objective: food processing, textiles, clothing, footwear, building materials and facilities to meet the requirements of education, health, transportation and water supply. The second type of industries consisted of industries using domestic resources to produce and supply intermediate inputs and capital goods to industries in the first category. A core group of local resource using industries were identified iron and steel, metalworking and engineering, industrial chemicals, paper, textiles, leather construction materials and electricity. An important objective related to the creation of this kind of industries was of course to increase linkages between and within economic sectors.

The structural features of the manufacturing industry sector as it has developed since the mid 70's will not be discussed in any detail here. The reader should, for an in-depth treatment of the subject, consult SkarsteinWangwe (1986) or Boesen, Havnevik et.al (1986). The latter also provides an excellent analysis of the socio-economic context within which the manufacturing industry has developed.

But there are nevertheless some striking features that should be mentioned here. Since 1966 the industrial sector has gradually developed a new structural pattern. By looking at the composition of output a shift towards intermediate and capital goods has taken place, largely along the lines suggested by the basic industry strategy. But, as SkarsteinWangwe point out: "Whether this shift is because or is in spite of the basic industry strategy is difficult to judge in definite terms." (SkarsteinWangwe, 1986:14) It may equally well be the result of the normal working of the ISI strategy, starting with simpler consumer goods production, then gradually embarking on production of more sophisticated consumer goods and intermediate goods, and in the last phase starting with capital goods production. But it is nevertheless clear that the basic industry strategy led to a more determined effort to establish later ISI-phase industries.

Thus, positive developments by way of structural change can be seen in the Tanzanian manufacturing industry. But how has the sector actually performed since the mid-70s?

The present state of affairs of Tanzanian industry was summarized by the World Bank in 1986 as follows:

> "...the performance of the manufacturing sector has been very poor, particulary over the past decade. Both output and value added have declined dramatically, while large investments continued to be channeled to industry. The massive investments have resulted in a sector whose installed capacity was intended to produce US$1.9 billion worth of gross output in 1984, but only produced a total output of US$480 million, utilizing US$423 million in inputs, while 75 percent of capacity lies idle and in disrepair. The sector is highly capital intensive and import dependent, and subject to low and declining labour and capital productivity. Exports are small and do not always result in a net foreign exchange contribution for the country. Imports to support the 25% capacity utilization in manufacturing are about six times the value of industrial exports"

This rather depressive picture should, of course, not hide the fact that the established structure contains a considerable growth and development potential. But the prospects for realizing this potential were small, due to the earlier discussed crucial relationship between industry and agriculture.

LESSONS FROM HISTORY

The development pattern of the North European countries came to serve as a model for many developing countries. It was certainly reflected in Tanzania's development policy as it was formulated during the 1970s. But why didn't development trigger off? A way of answering this question is to look at the specific sociostructural and institutional prerequisites in the Nordic scenario.

At the outset of their industrialization process the Nordic countries possessed:

- An agrarian structure conducive to agricultural modernization. There were few large estates, prevalence of medium-sized farms open to innovation, eradication of village penury, openness of landowners and tenants towards institutional reform and technical innovation.
- A moderate inequality in the distribution of gross resources.
- An income distribution which facilitated macro-economically relevant saving directed towards productive investment.
- A high average education level.

- Private enterprises prepared to invest and backed by an expanding banking system.
- A high level of organization of peasants and workers acting as a counterweight to industrial capital and state bureaucracies.
- A wide spread of technological innovation in all sectors, forming a basis for sectoral and macro-economic productivity gains.
- A stable political framework.
- An infrastructure which laid the foundation for inter- and intrasectorial differentiation.

The lesson to be learned from Nordic development history is then fairly apparent. Being at the onset of their industrialization predominantly agrarian countries, the strategic role of agricultural change must be emphasized. The size and nature of the industrial sector depended directly on agricultural productivity.

If agriculture succeeds in producing a sufficient amount of food for a growing urban-industrial population, sufficient quantities of raw materials for industrial processing, an exportable surplus facilitating necessary imports, and at the same time shedding labour, industry can develop and the rural areas can become markets for industrially produced consumer goods and equipment. The more efficient is agriculture, the closer the potential interrelationship between agriculture and industry and the greater the chance of a gradually emerging dynamics of intra-industrial linkages which become – against a background of growing agricultural productivity – the basis for selfsustaining economic growth.

If a non-productive interplay is the case, the result is a dissociated economy in general and industry in particular. A key factor in this process of dissociation is the social structure, whether or not it is conducive to structural change. If not, an export surplus will not be converted into larger production capacities, but mainly into imports of consumer and luxury goods for a social minority, whose behaviour is strongly oriented towards Europe.

Tanzania's growth structure was burdened with a fundamental distortion which highlighted the vulnerability of industrial growth to balance of payments problems. The country's main foreign exchange earner had always been the export crops of a smallholder based agricultural structure. In the early 80s it was painfully realized that agriculture had been neglected as a result of economic policies in general and agricultural policy in particular. (A much discussed factor in the latter policy framework has been the agricultural pricing policy).

Large resources were allocated to nonagricultural activities, and this allocation led to structural imbalances in the sense that agricultural output growth and productivity declined. A development which was strongly augmented by negative external factors. The resulting fall in agricultural production, for the domestic as well as for

the export market, led to a dramatic fall in the volume of imports paid for by exports. When it was realized that agriculture had been allowed to stagnate to such an extent as it actually had, the situation was such that adjustments were extremely difficult. An adjustment process was hampered by, in the first place, a fundamental disequilibrium between exports and imports, and this could be repaired only by availability of foreign exchange to increase production in agriculture and industry.

As Svendsen puts it:

> "Agriculture needed foreign exchange for inputs, the provision of which had fallen over the decade, and industry needed foreign exchange partly to produce consumer goods for agricultural producers in order to stimulate their production efforts, and partly to increase industrial exports" (Boesen, Havnevik et.al, 1986:70)

In conclusion then, industrial development was negatively affected by a stagnating agriculture in the following ways. Agriculture was not able to produce a food surplus for the nonagricultural population which necessitated scarce foreign exchange being used for food imports and also put a restriction on the growth of nonagricultural employment. Agriculture was not able to supply the industrial sector with raw materials, which reduced the rate at which industrial production capacity could expand.

Furthermore, agricultures function as a foreign exchange earner could not be realized to the extent necessary.

As we concluded with reference to the North European situation: all industrialization efforts starts with imports of means of production and intermediate inputs. It is then imperative that the industrial import capacity is maintained until industry can generate its own export and thus foreign exchange. Tanzanian agriculture was unable to perform this function and the result was disastrous for the manufacturing industry.

The increase in the demand for manufactured products cannot be wholly self-generated, i.e. within the industrial sector itself. Therefore it depends on the demand for industrial products generated in the agricultural sector, or the ability to export parts of its output to this sector. But as agricultural production, and productivity, did not grow to the extent needed, it curtailed the growth of purchasing power necessary for sustaining industrial expansion.

THE SISTER INDUSTRIES IN TANZANIAN CONTEXT

It was not within the setting of 1986 that the Sister Industry programme (SIP) was conceived. In the latter half of the 1970's, when this particular technology transfer

concept surfaced, the situation was altogether different. The viability of the basic industry strategy was built on the assumption of a vigorous export sector. The ability of the agricultural sector to act as the primary driving force, through the four functions outlined above, for economic development in general and industrial development in particular was not questioned.

The first detailed outline of what was to be come the SIP was made by a team headed by Bengt Sandkull in 1976. Among the different general objectives of SIDO there were three with an immediate implication for the design of the SIP. (Sandkull, et.al. 1976:8)

- Utilization of locally available resources and skills for providing selfreliance to the economy.
- Raising technology levels in rural areas by upgrading existing skills and introducing new ones.
- Undertaking production for substituting imports.

These general objectives were accepted by the team with the qualifications that particular emphasis should be given to the possibility of transferring technology which is adapted to Tanzanian conditions. Without, however, resorting to technological solutions that were very labourintensive and had a very low technical sophistication. Adapted modern technology would mean a possibility to avoid the common trap whereby industries would become import enclaves with little impact on industrial development and "for many years nonmanageable by Tanzanians". (Sandkull et.al., 1976:3)

In addition, factors such as the creation of employment and saving of foreign exchange should also be given consideration. In later discussions on the SIP strategy, the objective of creating a local entrepreneurial capacity – the creation of a local class of black entrepreneurs – developed to become, actually, one of the most prominent objectives.

The Sandkull team recommended a sister industry approach as the tool for implementing a small industry support programme; "a Swedish entrepreneur assists Tanzanians in starting manufacture of some basic goods". (Sandkull et.al., 1976:14)

A more detailed elaboration of the Sister Industry concept for technology transfer has been provided by Alänge:

> The technology has been supplied by Swedish small or mediumsized industries, the majority being small industries. A contractual agreement stipulating a longterm cooperation (510) years) has been established between each Swedish industry

> (senior sister) and the parastatal SIDO in Tanzania. SIDO acts as the negotiator and party of agreement for the Tanzanian side during the early phases. Normally the senior sister produces the same type of products as the new Tanzanian industry (junior sister) will start to make. This facilitates inplant training that takes place in Sweden. (Alänge, 1987:62)

The first sister-industries were started in Arusha 1978-79 under the umbrella of SIDO, sorting under the Ministry of Industry and Trade. These industries, as well as the ones started up in the early 1980's in Moshi and Mbeya, were established as part of an ISI strategy. The industries also received direct protection in that importation of competitive products was stopped. They were also given indirect protection as many other domestic producers ran out of raw materials due to the foreign exchange restriction, while the sisterindustries received import support through SIDO, financed by SIDA. The planned objective of utilizing local raw materials, integrating backwards, was not particulary visible as most of these companies showed a considerable import dependence, both with respect to raw materials as well as intermediate inputs. The training programme, an important part of the concept, proceeded smoothly and well over a hundred Tanzanians received training in Sweden.

While looking back at the different attempts to analyze and evaluate the SIP that has been made we have concluded that the training component has been subjected to proper evaluation (Forss, 1985). Equally so has the objective of entrepreneurship creation been subjected to a most thorough analysis (Alänge, 1987). However, the remaining issues to be evaluated relates partly to the other objectives set out in the original design of the scheme (utilization of local raw materials) and partly to the general objectives for industrial development set out in the prevailing national development strategy (establishment of linkages).

Previous evaluations has thus concluded that the SIP has succeeded well with respect to technology transfer and starting up a local production of basic consumer goods.

But, although not properly scrutinized, a recurrent theme in the different reports dealing with the SIP has been the inability to utilize local raw materials, in spite of the clear policy objectives originally set out. It has often been suggested that the major factor accounting for this has been the comparatively high technological level of the production processes. Thus, the initially chosen technology would act as a hindrance towards using locally available resources.

Apart from the industries using raw materials obviously not available in the country, it is of course a bit depressing that many of the sister industries in the SIP

MAFOTCO in Moshi. Production of hammers, knives, scissors, spanners, and coffee shears. Picture: Charlotte Thege, SIDA Photo Archive

continued to be import dependent when a major objective of the basic industry strategy was to establish upstream supply of such raw materials. The matter at hand is then of course whether or not the basic industry strategy has succeeded in creating the framework within which the sister industries were designed to exist.

The issue of integration through linkage effects, of which the utilization of local raw materials naturally forms a part, was a matter of prominence in the basic industry strategy. This issue also received attention in the strategy behind the SIP, albeit in a later stage. The sister industries were set up within industrial estates and in particulary one case – Moshi – the ambition was to create units that, on the basis of a common technology, would develop, in the first place, strong linkages with each other, but also with other industries and sectors in the country (See SIDA, 1986). The question to what extent the SIP has succeeded in developing the desired linkage effects should also be tested against the above mentioned causational factors – technology and changes in macro-economic environment.

To conclude, the issues of linkages and local raw material utilization shall be analyzed from two angles. The internal, i.e. the importance of the technology factor. The external, i.e. changes in the macroeconomic environment. Both factors can be said to determine the sister industries ability to utilize local raw materials and achieve a high integration in the national economy.

CHAPTER 3

Performance and structure

INTRODUCTION

For sound decision-making there must be good and reliable information from which to base it on. This is acutely relevant for such complex decision-making processes required in the planning and implementation of industry development in Tanzania. For SIDO and the others involved in this substantial task, the range of decisions at a strategic level and at operational levels, is very broad. More specifically, decisions span from strategic decisions concerning what kind of industrial projects to select for implementation in order to obtain a viable industrial structure; to more specific questions such as how to distribute foreign exchange for raw material import through the SIDA-financed import-support programme (which has been of decisive importance for the functioning and profitability of the firms concerned). Subsequently, SIDO's dependence on accurate information for its current operations and for supporting its direction in the future is obvious. However, with the absence of reliable basic data concerning these industries, SIDO's task will become extremely difficult - if not impossible.

As SIDO has the task of supporting all small scale industries in Tanzania, it recognizes that it is not possible to collect data about all these firms to the same extent. Below, we are limiting ourselves to discuss the data collection need for one specific SIDO programme, the Sister Industry Programme (SIP). This programme has during the last ten years been the programme which has used most resources per firm created, both in terms of investments and in terms of SIDO's human resources. Hence, putting aside the argument for the general need of collecting basic information, we believe that there is an urgent need to closely monitor this investment and to evaluate this programme. In addition, it is of interest to follow up because of SIP's role as a possible model for other countries' small scale industry development programmes. However, without basic data from the firm level, it is not possible to make any qualified evaluation, and the decision-making, for SIDO and other stakeholders, is rendered unnecessarily difficult and based on shakey data.

During the past ten year period, the sister industry programme has been

"evaluated" by several consultants and researchers. A common problem for all these evaluations has been that reliable statistics of the firms' performance and resources used have been missing. This results in evaluations based on scattered data or data collected at one specific point in time, mainly through brief visits at the industrial sites. As the fluctuations in capacity utilization, employment, etc. have been considerable, this "one-point-in-time" data collection gives clear limitations to the validity of such an evaluation.

However, these consultancy and research studies have collected a large amount of data, which together with the available statistics and information "buried" in folders at SIDO, FIDE and SIDA, could be compiled in a way that could permit an easy retrieval. For example, historical data on a number of important indicators derived from these sources could be put into a personal computer. This basic information together with a yearly updating of the data, could provide SIDO with a reliable data base for decision-making both at the headquarters and in the regional offices. In addition it would give future evaluation teams reliable background data and limit the time they need to spend on basic data collection.

In the following section, some basic data are provided about the sister industry firms and common facility workshops. Then follows, in the last part of this chapter, a discussion of the the need for improving data about the companies in order to facilitate better monitoring of the programme.

CHARACTERISTICS OF THE SISTER INDUSTRY PROJECTS

The development of the sister industry projects show considerable variations in terms of growth, diversification and internationalization in terms of export activities. However, the different projects should also be examined in a time perspective. While some of the projects in Arusha were started in 1978, some projects like HAMAX in Moshi and Kodawa in Tanga were started in 1985 and 1986 respectively. Table 2 provides information about start-year and the number of employees, turnover and capacity utilization in the companies in 1986.

The twelve companies started in Arusha have altogether created 423 jobs, while 366 persons are employed in the 13 units in Moshi and in the seven companies in Mbeya 187 persons are employed. This makes a total of 1067 jobs created as a result of the 30 projects started within the sister industry programme. Included in this total number are the figures from the NEM, MOCCO (Simon Engineering) and PEMACCO extensions which are outside the industrial estate sites. If we relate this number to the Swedish financed part of the total investment in the sister industry programme (163 M SE until April 1987), the average cost per new job has been 159,000 SEK (this calculation does not include the additional cost of the joint-venture Pemacco-Bevi).

Since the inception of the SIP, the majority of the funds channelled to SIDO has

been administered by FIDE. Through their SIDO account we can get a full picture of the investments made in the programme and the separate projects. Table 1 below summarizes the more detailed presentation in Appendix 3.

Table 1. Investments made in SIP projects up to March 1987 (SEK) *

	Hardware	Software	Total
Arusha **	36.309.166	14.002.851	50.312.017
Moshi **	41.406.035	19.775.104	61.181.139
Mbeya **	23.850.367	9.248.156	33.098.523
IMAC	7.243.309	8.145.212	15.388.521
Kodawa	2.115.194	417.701	2.532.895
Total	110.924.071	51.589.024	162.513.095

Comment: * Figures differ from Table 2.7, appendix 3, due to rounding.
** Includes Common Facility Workshops.

In Arusha, the total foreign component of the projects' cost was 50.3 M SEK (36.3 M SEK in hardware and 14.0 SEK in software). The comparable cost for the Moshi companies was 61.2 M SEK (41.4 M SEK in hardware and 19.8 M SEK in software) and for the Mbeya projects the total was 33.1 M SEK (23.8 M SEK in hardware and 9.2 M SEK in software). For the Tanga industrial estate, which only has one SIP project (KODAWA) and where the other nine projects were financed by the World Bank, the total foreign component was 8.3 M SEK (7.7 M SEK in hardware and only 0.6 M SEK in software). If we then study the individual projects in detail, we find that there are large variations in the total project cost (foreign component). For example, in Moshi; 7.4 M SEK for TANOPTIC as compared to 1.9 M SEK for AMOCO, and in Arusha; 10.8 M SEK for AMI and only 0.8 M SEK for KIMESHA, which nevertheless employs more people (35) than AMI does (27). See appendix 3, table 2.7 for a complete overview of the total project costs, including foreign hardware and software components and local costs.

Also the share of the software component (training, etc) in relation to the total cost, varies heavily between the different projects. For Shuma in Arusha the software share was only 15.3 %, while it for IMAC in Iringa was 52.9 %. One reason for IMAC's high share is that it is a service and consultancy company which sells its knowledge and skills in maintenance and repair to other industrial firms. As in all consultancy companies, its knowledge is its primary asset. However, also in some other cases the software share is high, sometimes depending on a comparatively low investment cost in hardware, e.g. FAWIPMA in Arusha (42.2 %). A comparison with the World Bank projects in Tanga shows that the software share in the projects is considerably smaller and in several cases negligible. On the other hand, this lack of training and startup assistance seems to be a contributing factor to the poor result in Tanga, where three out of nine projects

Table 2. Basic Data - Sister Industries, 1986

Company	Prod.start	No. of empl.	Turn over (M Shs)	Capacity utiliz. (%)
ACCO	May. 78	41 *	6.3	30%
AGACO	Dec. 82	35 *	11.9	40%
AMI	April 80	27 *	3.4	40%
C&AI	April 79	31	3.0	10%
FAWIPMA	Nov. 79	31 *	2.9	40%
GIFCO	May 80	20 *	3.0	5%
KIMESHA	June 78	35*	6.1	50%
Meru Wood	Feb. 78	27 *	5.8	n.a.
NEM	March 79	124 *	56.0	70%
Shuma	May 82	19 *	9.7	40%
Uhandisi	June 78	8 *	0.3	5%
CFW Arusha	1979	25 *	2.2	40%
Arusha Industrial Estate		**423**	**110.7**	
AMOCO	June 83	7	0.1	0%
HAMAX	Jan. 85	9	1.7	30%
KILECTRO	July 82	19	3.1	45%
KISCICO	Feb. 82	21	0.5	7%
MAFOTCO	July 83	31	1.6	13%
MOCCO	May 81	38	0.7	39%
Simon Engin	1983	110 **	30.0	30% **
MOTO	May 83	24	3.1	50%
NORRAPAK	July 82	13	5.0	40%
Tanlocks	July 81	40	4.2	9%
Tanoptic	Jan. 83	23	5.7	29%
TECO	April 82	9	8.6	26%
CFW Moshi	1984	22	1.4	45%
Moshi Industrial Estate		**366**	**65.7**	
HIMA	Oct.81	32	4.2	25%
M. Ceramics	June 85	30	1.5	40%
M. Clogs	Oct. 81	22	5.4	25%
M. Plastics	July 81	11	1.9	39%
M. Wood	Oct. 86	37	2.3	20%
PEMACCO	April 81	24	19.7	50%
CFW Mbeya	1981	3	2.4	n.a.
Mbeya Industrial Estate		**187**	**37.4**	
PEMACCO-BEVI	Jan. 87	45 *	25.0 *	50% *
IMAC, Iringa	Oct. 84	26 *	10.2 *	60% *
Kodawa,Tanga	June 86	20	2.0	45%
Sister Industry Program		**1067**	**251.0**	

Comments: Start date and employment, turnover and capacity utilization of the sister industries in 1986.
*=1987, **=estimation

never have been able to start production, although the machinery was delivered to Tanga already in 1982.

Looking at the performance of the companies in the table below we find that there are large variations in turnover among the different industrial projects.

In Arusha, one company alone, NEM, accounts for half of the total turnover, and it is expected to strongly expand further, resulting in a turnover of over 100 M Shs in 1987. Similarly, one company, Simon Engineering, had up to 1986 almost 50% of the total turnover in Moshi. One reason for their growth rate as compared to other sister industries, is their export activities. The growth has been made possible by financing raw material import by their own export of ready-made or semi-finished goods.

The same situation exists for PEMACCO, who has entered into a joint venture with their Swedish senior sister firm to form the Dar es Salaam based electrical service and maintenance company PEMACCO-BEVI. In this case the Sister Industry Programme made it possible for a group of capable entrepreneurs to start a new company, to get industrial experience and to establish a business relationship with a Swedish firm.

On the other hand, there are also a number of companies which show an extremely low turnover and capacity utilization. This is the case in Arusha as well as in Moshi. There are a variety of reasons for this poor performance, but in several cases one reason stands out. It is the combination of a weak board and incompetent management. The poor performance of some of the firms is also a result of the fact that resources (human and other) have been transferred away from the firm into different forms of side activities. Not only those firms with extremely low turnover belong to this group.

Hence, Table 2 also provides an indication of a strong need to radically restructure or to completely shut down a number of firms. The extremely low capacity utilization and turnover after several years of production should serve as an alarm bell. There might be other measures to take, but a thorough examination and re-evaluation of the management may be necessary. In some cases there might be a number of other reasons for the low performance, including difficulties in obtaining foreign exchange. For example, in the case of AMOCO, the major reason is a faulty selection of the initial product and the Swedish senior sister, for which the entrepreneurs are not to be blamed AMOCO is at present in the middle of a reorganization, including starting with a completely new kind of product (footballs).

The average capacity utilization in the sister industries was around 40% in 1986. Because of increasing competition from imports and difficulties in financing raw material import, the capacity utilization has been decreasing during 1987. However, there are extreme differences between the successful and less successful companies (within the range from 5% to 70%). Furthermore, several of the firms were started

only a few years ago and are still in the process of starting up. In most industries, it takes at least three years to reach a capacity utilization of 60%, when starting with a workforce with limited previous industrial experience.

However, table 2 only provides a picture of the situation in the companies at one specific point in time. Given the fluctuations in the environment it would be even more interesting to study trends over a number of years in the same company, i.e. to see the development over time of: number of employees, turnover, profitability, capacity utilization, market share, etc. (See table 3, and further on appendix 3, for this kind of information).

Table 3. Turnover-development over time in Arusha firms

TOTAL SALES (turnover) (thousands of shillings)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO		930	1,793	2,609	5,956	4,102	3,525	4,797	6,291	
AGACO						3,340	5,099	5,911	11,877	
AMI			3,700	5,200	3,600	5,400	6,900	6,500	3.400	
C & AI		1,500	4,000	5,000	5,000	5,000	5,500	4,000	3,000	
FAMIPWA				2,678	1,432	1,780	3,122	1,993	2,938	
GIFCO			658	N.A.	4,400	4,100	4,300	5,100	3,000	
KIMESHA	179	670	1,400	1,600	3,300	6,200	4,600	7,600	6,100	
MERU WOOD	178	146	647	476	732	227	2,658	3,826	5,811	
NEM		1,500	3,000	12,000	12,400	36,300	56,300	30,000	56,000	100,000
SHIMA						9,900	8,800	10,200	9,700	
UHANDISI			623	709	769	576		725	334	

Comment: N.A. = data not available

In Table 3, the development of total sales over time for the Arusha sister industries has been provided. If we look at the development of a few companies in detail, interesting comparisons can be made. In 1979, the starting year for both C&AI and NEM, the turnover was the same (1,500,000 Shs) for both companies. The following year C&AI had a slightly higher turnover than NEM, but from then on NEM has shown a strong increase, while C&AI remained at the same level and in the last years even decreased its yearly turnover. These figures indicate a possible difference in strategy and management of the two companies. If we then by assistance of supplementary data analyse what took place in these two companies during this eight year period we get the following result. C&AI remained more or less static (in terms of developing new markets or new products) and did the same relatively simple operation year after year and made a profit each year.

NEM, on the other hand, from the very start of the company had a vision and a goal of developing the company in several fields, including product development, new sources of raw material, new markets, etc. During the eight year period NEM

has implemented various activities to reach these goals. This difference in approach has been shown to give different development results, a knowledge which for SIDO can be relevant for strategy formulation and other important decisions. These include decisions concerning: the selection procedures for entrepreneurs and technology, the needed follow-up and further assistance and training activities for the benefit of the junior sister entrepreneurs, etc. However, the point is that this initial analysis of development trends over a number of years can serve both as a direct basis for decisions, as well as a starting point for a further in-depth analysis.

A comparison between another group of firms, KIMESHA, MERU WOOD and UHANDISI, points at their different development patterns. KIMESHA shows a very positive development pattern from an early stage, reaching almost full capacity utilization in 1983 and from then on keeping a high turnover close to full capacity utilization , with some fluctuations. MERU WOOD, on the other hand, started in the same year (1978) and had an identical turnover the first year, but a strong increase in turnover did not come until many years later, after several years of low turnover. MERU WOOD's increase was a result of a product change away from the originally introduced product from the Swedish sister. The third firm, UHANDISI, has since its start in 1980 remained at the same limited yearly turnover. This kind of comparative analysis can provide valuable insights into the developmental situation for different companies. Generally, it is advantageous to look at more than one indicator, e.g. to supplement the above analysis of turnover with an analysis of employment and of repayment by instalments.

Table 4 presents information about the share capital in a selected number of firms. The information about the paid in part of the share capital has never been looked at carefully, but a detailed analysis of a number of projects (SIDA, 1987) revealed the critical role of paid in share capital in the ultimate performance of the companies.

As can be seen in table 4, the amount of share capital varies within wide ranges between the different companies. Among the five sister industries shown in table 4, MAFOTCO and KISCICO from Moshi are clearly under-capitalized, with only 1 M Shs and 0.45 M Shs in share capital. C&AI and GIFCO in Arusha have a more

Table 4 Share capital and number of owners in a selected number of firms

	Share capital	Paid in	No. of own.	Majority owner's share
C & AI	5 M Shs	4 %	5	40 %
GIFCO	6 M Shs	N.A.	6	eq.
KISCICO	0.45 M Shs	N.A.	3	eq.
MAFOTCO	1 M Shs	43 %	7	8.5 %
TANLOCKS	3 M Shs	3 %	8	eq.
SAHARE W	0.015 M Shs	100 %	9	90 %

Comments: N.A. = not available, eq. = equally distributed shares.

realistic share capital volume, while TANLOCKS in Moshi would benefit from a slight increase. However, the interesting thing is to look at the part of the share capital that really has been paid in. In the case of TANLOCKS it is an extremely low percentage, only 3% (77,000 Shs). This means that the so called "owners" only have invested a very minor part of the risk capital which they were supposed to invest (six years after the start of TANLOCKS' operations in July 1981). If we then relate the above condition to TANLOCKS' poor performance, management-wise, one contributing factor to this performance seems to be the low risk element involved for the entrepreneurs.

For a comparison of possible risk-capital range within the industrial estates, Sahare Woodworks in Tanga, a World Bank financed project, has been added to the list of sister industries. In this case, the capital invested by the owners was very limited (15,000 Shs, including 12,000 Shs in downpayment for the hirepurchase loan and 3,000 Shs in working capital). Furthermore, in Sahare Woodworks one of the nine owners invested 90% and totally controls the company, while the remaining eight owners contributed with 10%, or 1,500 Shs (i.e. less than 200 Shs each).

These kinds of analyses, of share capital paid in and majority owners' share, are of great assistance in understanding the development of the projects. By monitoring and being aware of this situation, SIDO also gets the information needed for the implementation of corrective actions at an early stage in the project history.

PRESENT DATA AND THE DATA COLLECTION WITHIN THE LINKAGE STUDY IN 1987

The information presented above in Table 2 was mainly collected through interviews with the entrepreneurs in 1987. Together with other data for the linkage study, it was collected by a team of researchers in cooperation with SIDO's regional staff. One weakness with this type of data collection for time series data depends on the fact that things that happened before tend not to be taken into account. Especially, this is a problem when there is no documented information on business transactions. This results in data matrixes with big holes, since different persons can provide information from different years and of different comprehensiveness. To some extent our data collection has been supplemented by historical data from other sources, but there is still a need to make a more thorough search and analysis of documents.

This type of table only provides a picture of the situation in the companies at one specific point in time. However, it might be even more interesting to study trends over a number of years in the same company. To see the development over time of: number of employees, turnover, profitability, capacity utilization, market share, etc. (See Appendix 3 for this kind of information.)

It should also be noted that the above figures of capacity utilization are based on

estimates made by the entrepreneurs during interviews. These estimates are not always comparable since there are different ways of making this estimation in the different companies. Hence, these figures are not completely reliable but provide a coarse comparison of the capacity utilization between different firms.

A SUGGESTION FOR BASIC MONITORING INDICATORS

Our suggestion is that SIDO should build up a PC-based monitoring system of the Sister Industry Programme. The data base should not include all possible data, but concentrate on a number of important parameters. Our suggestion only includeS company level data, and not data on more aggregated levels.

First, there is a need for the more traditional "results indicators" (e.g. turnover, profitability, capacity utilization). Second, a number of important "process indicators" (e.g. board meeting date, training activities) should be added. The importance of including the last type of indicators has been clearly shown in the recent success stories of industrial development. For example, Japanese researchers and industrialists claim that the monitoring of process indicators in Japan, has been an effective means of increasing Japanese companies' relative quality, productivity and profitability. In Tanzania it could be even more valuable because of the turbulent economic conditions, which sometimes make traditional results measurements less relevant. For example, how is it possible to estimate the relative progress of a Tanzanian firm in terms of domestic turnover if the company's result is totally dependent on the allocation of import support from SIDO/SIDA. During periods when this situation exists it is necessary to use supplementary measurements.

We suggest that the following set of basic indicators should be collected and put into a personal computer at SIDO HQ. This has to be done at least once a year.

Result indicators

Turnover

a) local

b) export
- to Africa
  - to other African countries
  - to SADCC
- to Europe
  - to Sweden
  - to other European contries
- to other countries

Raw material cost

a) local

b) import

Import support allocated and used

Production cost
Profitability
Employment total
* management, salaried
* skilled, semi-skilled, unskilled

Market share
Capacity utilization
Total capacity
Production volume
Investment
Cost of imported machines and equipment
Local investments
Investment in software, total training/consultant costs
Loans
SIDO loans; amount
pay-back - amount outstanding and time
Other loans; amount
Rents of SIDO premises
Amount outstanding and time

Process indicators
Board meeting
Date of board meeting
No. of external professional board members
Annual report
Date ready
Share capital
Total share capital
Share capital paid in by the shareholders
Majority owner's share
Personnel development activities
Internal courses, no. of participants and days
External courses, no. of participants and days
Training in Sweden, no. of persons and days
Product development
No. of new products introduced during the year

CHAPTER 4

The concept of linkages

THE CONTEXT

Development is essentially the record of how one thing leads to another in an economy. In a fully developed economy the integration between and within economic sectors is high. These relations can be characterized as mutually beneficial as well as reinforcing. The linkages are a record of how such an interrelationship takes place.

They focus on certain characteristics inherent in the productive activities already in process at a certain time. These ongoing activities, because of their characteristics, push or, more modestly, invite some operators to take up new activities.

The establishment of an industry is the result of a demand for it's products, but it can also induce new activities and consequently new demand patterns. In theory it might seem that there is no reason why domestic supply of a new product should be a better driving force for accelerated development than supply from foreign sources. In practice, however, three important considerations strengthen the case for domestic production:

1. Domestic availability of an intermediate product creates forces which actively promotes its usage as an input for new economic activities.
2. Domestic production opens up possibilities for the acquisition and development of new technology.
3. Imports usually are more sensitive to variations in the balance of payments.

Two types of induction mechanisms can be said to be at work through the establishment of domestic production:

1. Impact through the supply of raw materials – linkage backward, i.e.every nonprimary economic activity may induce attempts to supply raw materials through domestic production.
2. Impact through the use of the product in question - linkage forward, i.e every

activity whose products does not only satisfy final demand, will induce attempts to use the product as an input for a new industrial activity.

Thus, linkage effects can be defined as: production/investment-generating forces that are set in motion, through input-output relations, when productive facilities that supply inputs to a particular line of production or utilize its output, are inadequate or non-existent. Backward linkages lead to new investment in input-supplying facilities and forward linkages to investment in outputusing facilities.

Entrepreneurial decision making in both the private and the public sectors is not uniquely determined by the pull of incomes and demand, but is also responsive to special push factors, such as linkages, emanating from the product side. Any industrial development policy must take these linkage effects into account. However, this can only be done with a knowledge of how strong linkages different economic activities generate. If we are able to derive measures of inter-industry flows in an economy, from an input-output table, it should be possible to rank activities according to the magnitude of their combined linkage effects. Bearing in mind that an I/O table is a static analytical instrument.

Hirschman is suggesting that within the directly productive sector a useful development strategy would be to encourage those activities with the potentially highest combined linkages. This will provide the greatest inducement and incentives to other activities to develop.

But how can the maximum combination of I/O relations be achieved for a developing country? As linkage structures are most developed in advanced countries it is tempting to use them for pinpointing sectors to be prioritized in a development programme. Not only with respect to the value of their own production per se, but depending on the further development stimulus they might generate.

But historically determined differences in socioeconomic conditions between north and south means that such an approach must be applied very carefully. The north is not always the mirror in which the developing countries can see an image of their own future.

But as the level and quality of statistics production in Africa has improved, sufficiently detailed macroeconomic indicators are now available for indication of the quantity and quality of different linkages.

In the case of Tanzania there exist empirical data needed to create an input-output matrix. Inputoutput tables were made in 1969, published in 1973, and in 1970, published in 1974. According to Skarstein – Wangwe another table, based on 1976 data, is currently being prepared. These are useful planning instruments and provides policy makers with a possibility to ascertain the overall interindustry flows within the economy and the role of the manufacturing industry as a growth generator. The data collected in this study will provide some insights into the

strength of the linkage effects emanating from the sisterindustries. By relating our findings to general macroeconomic indicators we should be able to get some indications on the "industrializing" role performed by the SIP companies.

THE TOOLS

The purpose of this chapter is to empirically verify the linkage patterns of the sister industries. In essence this means that we are interested in their procurement and sales patterns and their development over time. The objective is to measure the degree of integration with the national economy. The degree of sectoral dependence of an industry can be measured in two ways:

1. The share of its production representing procurement from other industries.
2. The share of its total production entering other industries.

These two ratios measures the direct backward linkage (DBL) and direct forward linkage (DFL) – the inputoutput relationship – of a particular industry. Direct backward linkages indicate to what extent a company has achieved upstream integration . Co-efficients are high if the company is drawing heavily on industries producing its raw materials and different intermediate inputs. Direct forward linkages indicate the direction of supply. High co-efficients will be found for those companies which produce little directly for final demand, but rather satisfy the intermediate demand of other companies.

The above ratios, furthermore, say nothing about the size of the industry in question. It is possible for an industry to record high DBL and DFL ratios, while at the same time its supply or demand of inputs to/from other industries may be of an insignificant magnitude. In order to take account of the size factor weighing is necessary. For our analysis it is of importance to show not only the DBL and DFL ratios of the respective companies, but also the aggregated ratios on the estate level as well as for the SIP as a whole. Therefore, we will weigh each direct linkage ratio by multiplying it with the share of the company's gross output in the average gross output of all producing industries. In this way we shall be able to neutralize the bias caused by a small company (output wise) with high direct linkage ratios on the aggregated ratios.

Classification of a commodity and its linkage character is, however, not always straightforward. This has introduced certain analytical problems, which the reader should be made aware of. A product can actually have a low or high DFL depending on its final destination. For example, is a tyre to be regarded as an "input" or does it go straight to satisfy "final demand"? It is an input when used in car manufacturing, but it satisfies final demand when it is bought by a private car owner. A similar classification problem concerns for example nails. Nails have a high DFL when sold

TECO in Moshi produces battery caps, bottom discs, eyelets, and mosquito coil stands. Picture: Charlotte Thege, SIDA Photo Archive

to a furniture maker or building constructor, i.e. they enter an activity which results in a value added production. On the other hand, when sold to a private house owner for repair purposes they can no longer be treated as an input, consequently the DFL is low. A similar problem occurs in the cases of MOTO and KISCICO, producing coffee shears and hand tools and scissors. Hand tools should be treated as a forward linkage when they are used by a carpenter or a farmer, as they are then used in a production process generating a value added. Similarly, when scissors are used by a tailor they are also a forward linkage. However, both companies are connected to their end consumers through wholesalers/retailers. Consequently we have no way of knowing the distribution between different usages. In both these cases we have therefore decided to treat the output from these companies as having no forward linkage effect.

Thus, a more detailed examination of a company's sales pattern must precede an interpretation of a DFL ratio. The company specific data presented here therefore tends to underestimate the forward linkage effects.

Therefore in addition to the linkage ratios we have also analyzed the procurement and sales patterns in order to substantiate the flows into and out from the companies. The procurement pattern has been broken down into imported and

locally available raw materials and intermediates. As intermediates we understand semi-finished goods entering the production process, spare parts, consumables like fuel and lubricants, welding rods etc. The sales pattern was divided into the following sub-categories: inputs to nonestate and estate companies; wholesale distributors; and retail/final demand.

It is important to note that data for local purchases does not differentiate between purchases of locally produced goods and goods bought from wholesalers and agents in the country. Consequently, the impact of this kind of "hidden" import as the latter category represent has not been accounted for. This affects primarily, or only, local purchases of intermediates. Locally bought raw materials are almost always locally produced, although in some cases they are based on imported raw materials undergoing a limited processing in Tanzania.

THE DATA SOURCES

The material used for collecting this information was obtained from company accounts – the profitandloss account, and the balance sheet and sales and procurement ledgers. Information on imports were taken from import support data collected at SIDO HQ. It should be noted that the quality and reliability of the available data was questioned by almost everybody with experience from the sister industry programme. In a sense they were right, the companies recording of their activities is not of a very high standard. This was particulary the case with the companies in Tanga. Their figures cannot be relied upon to a very high extent. But apart from this, with patience, stubbornness and a lot of time available, our experience shows that the necessary information can be collected.

The information is there, but its quality may often be debatable. Generally speaking, company accounts were the least problematic. A majority of the companies had audited accounts. In some cases they were manipulated with the well-known ambition of reducing the taxable profit. But it was not particulary difficult to detect the more blatant attempts and avoid biases thus created. More problematic, however, were sales and procurement statistics. They were usually kept in a very disorderly way and it was a timeconsuming task trying to structure them. Bias sources nevertheless still exist. If unrecorded sales did exist, to take one example, there was no way of checking this, particulary as production statistics in many cases were faulty.

In order to avoid possible bias sources with respect to procurements, information on imports was taken from import support data available at SIDO.

It should be noted, in passing, that the quality of this material leaves a lot to be desired. Figures on how much has been allocated to each company usually existed. But more serious, the actual utilization of import support was rather haphazardly recorded. The relationship between utilization and allocation is an important

planning instrument for the monitoring of the sister industries. It is therefore surprising that there obviously does not exist a coherent set of data on import support – how much has been allocated and how much has been utilized – at SIDO, SIDA Stockholm or at SIDA DCO in Dar es Salaam.

In short, the quality of the data collected has its shortcomings, which obviously affects our analysis. But it is equally clear that spending more time going through different company accounts would not be worthwhile. Certainly, the precision in our descriptions and projections would be better for individual companies, but it would not add much to the general trend our analysis has pinpointed. In spite of all these reservations, this study presents empirical data that is far better than anything that so far has been collected when examining the SSI sector in Tanzania. Other studies have usually limited themselves to utilizing aggregated figures provided by the national statistical authorities. The reliability of this material is surrounded with even more uncertainty.

At the outset we stressed the importance of applying a time perspective and avoid a static picture. Therefore, a picture of the situation at three points in time has been taken – during the 1:st and 3:rd years of production and in the final year of 1986.

A PROMISING SCENARIO ? – INTERPRETING THE RESULTS

In tables 1-2 the linkage structure of the SIP-companies and the Tanga companies is presented. The tables shows whether the companies have had high or low linkage ratios and if there has been a positive development since the first year of production up to 1986. (Detailed figures are available in Appendix 5).

The pattern that emerges from Tables 1-2 can be summarized as follows:

• Generally speaking, DBL ratios are much higher than DFL ratios. Only four companies records no direct backward linkages at all, namely ACCO, CFWArusha (which is doubtful), Tanlocks and Tanoptic. However, as many as 19 companies have no direct forward linkages at all. This pattern is a creation of the fact that during the time of projecting most of the SIPcompanies, the prevailing industrialization policy in Tanzania emphasized importsubstitution of consumer goods. It also reflects a more favourable economic climate, when balance of payments pressures did not necessarily cause import restraints. The younger companies, like for example Mbeya Woods and Mbeya Ceramics, were established in a different macroeconomic setting, which was also reflected in the industrialization policy. Consequently, the usage of local raw materials, strong back ward linkages, was an important consideration already from the start.

• In the case of DBL a majority of the companies have shown a positive trend since their first year of production. Thus, re-orienting the procurement pattern away

TABLE 1. CLASSIFICATION OF COMPANIES AFTER DBL RATIO AND TREND

COMPANY	DBL unw High	Trend	DBL unw Low	Trend	DBL unw None	Trend
ACCO					X	+-
AMI			X	+		
KIMESHA			X	-		
MERU WOOD	X	-				
FAWIPMA			X	-		
NEM	X	+				
GIPCO	X	+				
UIF	X	+				
C&A	X	+				
SHUMA			X	+		
AGACO	X	+-				
CFW - Ar. *					X	+-
TANLOCKS					X	+-
MAFOTCO	X	-				
MOCCO					X	+-
KISCICO	X	+				
MOTO	X	+				
NORRAPAK	X	+				
KILECIRO	X	+				
TECO	X	+				
TANOPTIC					X	+-
AMOCO			X	+		
HAMAX			X	+-		
CFW - M	X	-				
HIMA	N.A	N.A				
CLOGS	X	+				
PEMACCO	N.A	-N.A				
MPI			X	-		
WOODS	X	+-				
CERAMICS	X	+-				
CFW - Mb.			X	+		
IMAC			X	+		
SAHARE	X	+-				
TANGAMANO	X?	N.A.				
KWEMISHUZE	X	+				
KODAWA	X	+-				
KASA	X	-				
AKIL			X	N.A.		
CFW - T	X	N.A.				

Comments:

DBL = Direct backward linkage
UNW = Unweighted
Trend = Development since 1:st year of production
\+ = Positive trend
\- = Negative trend
+- = No change between measuring points in time

Low = Ratio between 0.0000 - 0.10000 in 1986
High = Ratio between 0.1000 - 1.0000 in 1986
? = Data unreliable
* = The CFW in Arusha reported no backward linkages. This is highly questionable, as they must have bought some spares, fuels, lubricants etc. locally.

TABLE 2. CLASSIFICATION OF COMPANIES AFTER DFL RATIO AND TREND

COMPANY	DFL unw High	Trend	DFL unw Low	Trend	DFL unw None	Trend
ACCO					X	+-
AMI	X	+-				
KIMESHA					X	+-
MERU WOOD					X	+-
FAWIPMA					X	+-
NEM					X	+-
GIFCO					X	+-
UIF	X	-				
C&A					X	+-
SHUMA	X	+				
AGACO	X	-				
CFW - Ar.	X	+-				
TANLOCKS					X	+-
MAFOTCO	X	+-				
MOCCO	X	+				
KISCICO					X	+-
MOTO					X	+-
NORRAPAK	X	+-				
KILECIRO	X	+-				
TECO	X	+-				
TANOPTIC	X	+-				
AMOCO	X	+-				
HAMAX					X	+-
CFW - M	X	+-				
HIMA					X	+-
CLOGS					X	+-
PEMACCO	X	+-				
MPI					X	+-
WOODS	X	+-				
CERAMICS					X	+-
CFW - Mb.	X	+-				
IMAC	X	+-				
SAHARE					X	+-
TANGAMANO					X	+-
KWEMISHUZE					X	+-
KODAWA	X	N.A.				
KASA	X	-				
AKIL	X	N.A.				
CFW - T	X	N.A.				

Comments: DFL = Direct forward linkage
UNW = Unweighted
Trend = Development since 1:st year of production
+ = Positive trend
- = Negative trend
+- = No change between measuring points in time
Low = Ratio between 0.0000 - 0.10000 in 1986
High = Ratio between 0.1000 - 1.0000 in 1986

from a heavy reliance on imports has not been too difficult. What caused the initially high import dependence?

Generally speaking it is not possible to conclude that a comparatively sophisticated production technology – an important policy cornerstone in the SIPstrategy – created an undue reliance on imported supplies.

In some cases this is of course true (MPI and Tanoptic) where the raw material simply was not available. The production technology had been adapted without considering the local supply situation, because it had had been regarded as important to have a local production of these particular products.

However, in most cases the high import dependence reflected an imbalance in that either upstream supply was not sufficient, or that supply quality was too low. Furthermore, the value of the shilling vis-a-vis the dollar and other major convertible currencies was held artificially high. As a consequence imports, from the point of view of the individual entrepreneur, could turn out to be much cheaper than local purchases of the same raw material. Thus, an attractive price and high quality made imports a preference. The fact that his import quotas were restricted, and thus put a limit to capacity utilization, did matter very little to the entrepreneur.

For a long time Tanzania was a protected market, competing imports of similar products were extremely difficult, and the local entrepreneur could more or less set his own price. In this situation profits could be held high at low capacity utilization levels and there was really no incentive for switching to local supply sources. During the last couple of years there has been a marked switch in the economic policy of the country. Import restrictions have been lifted to a high degree and the shilling continuously devalued. This change in the macro-economic setting has created new incentives for the entrepreneurs to consider local supply sources, if at all available.

• Looking at the direct forward linkages the situation is different. The impact of macro-economic policies for changing a given situation is less important than in the case of backward linkages. Instead the choice of products when the projects were designed turns out to be the main causational factor involved. At this stage macro-economic policies were of importance. The then prevailing strategical emphasis on import-substitution and production of basic consumer goods was quite influential in this – respect.

The 21 companies with a high DFL ratio also had it during their first years of operation. The same is true for those 18 companies with absolutely no direct forward linkages. This picture underscores the fact that there are no real incentives for the individual entrepreneur to change the initially chosen product composition, in order to achieve forward linkages, as long as it yields a satisfactory return. Even if

there were it would probably be quite difficult in the short to medium term to change the product mix, unless the production technology is flexible enough to accomplish this without substantial new investments.

We can conclude that unless forward linkages are not considered already at the stage of project design, it is very difficult to achieve such linkages over time. The product mix and the flexibility of the production technology are limiting factors. It is also important to realize that the creation of forward linkages is primarily a matter of concern for national policy makers, rather than the individual entrepreneur. If the market forces do not deliver a clear message to him to switch to input commodities, instead of satisfying final demand, no change will occur. The likelihood that this will be the case is rather low indeed. Thus, the initiative for accomplishing forward linkages must rest with the national authorities.

• Comparing averages of weighted direct linkages with averages of unweighted linkages shows a difference between SIP and nonSIP companies (See Appendix 5). In the former case industries with strong direct linkages contribute relatively little to total output. Thus, good linkage effects are not fully realized since the impact of companies with high ratios is diminished through a low share of total group output. In the case of Tanga it is the other way around. Companies with high linkage ratios are the ones with the largest share of Tanga output. But it should be noted that this comparison is extremely difficult to make as the quality of the Tanga material is low.

Moving from the companies to the estate level, Table 3 below shows the average DBL and DFL ratios for the 4 estates examined. In order to give an idea of the internal coherence of each estate, the standard deviation was also calculated. This ratio shows how much the linkage ratios of the different companies within an estate differ from each other. The higher the standard deviation the more disparate are the companies with respect to their ratios.

Comparing the estates one can conclude that during the first year of production Arusha, followed by Moshi, integrated most strongly backwards. This situation was changed in 1986. The explanation being that the newest Mbeya companies were specifically designed to utilize local raw materials, for example Mbeya Ceramics, Clogs and Mbeya Woods. The Moshi estate is the odd man out in this group. It shows a low backward integration, but very strong forward linkages. This is a result of the particular design of the Moshi companies. A number of them are placed in the middle of other companies production process, i.e. they are producing inputs for other industries processing for final demand. Good examples are Kilectro and Teco.

Arusha, on the other hand, is basically an example of an estate designed on the

TABLE 3. LINKAGE RATIOS - ESTATE LEVEL

ESTATE	DBL unw 1:st	DBL unw 1986	DFL unw 1:st	DFL unw 1986
AVERAGE				
ARUSHA	0.1163	0.1691	0.2407	0.2345
MOSHI	0.0665	0.1064	0.6593	0.6658
MBEYA	0.0451	0.2694	0.4000	0.3786
TANGA	0.4898	0.3277	0.2917	0.2944
STANDARD DEVIATION				
ARUSHA	0.1992	0.2023	0.3312	0.3302
MOSHI	0.1109	0.0934	0.4668	0.4708
MBEYA	0.0590	0.2407	0.4899	0.4503
TANGA	0.3855	0.1445	0.4187	0.3803

Comments: DBL = Direct backward linkage ratio
DFL = Direct forward linkage ratio
1:st = First year of production
unw = unweighted

basis of a traditional import substitution strategy. Most of the industries are producing for final demand, but the forward integration is nevertheless of some significance. The same pattern also applies for Mbeya.

The Tanga companies rank the highest in terms of backward linkages. These companies, with one exception, have had limited possibilities for imports. They are not participating in any import support scheme. Their forward integration is basically of the same magnitude as the Arusha companies. Most of them are producing for final demand.

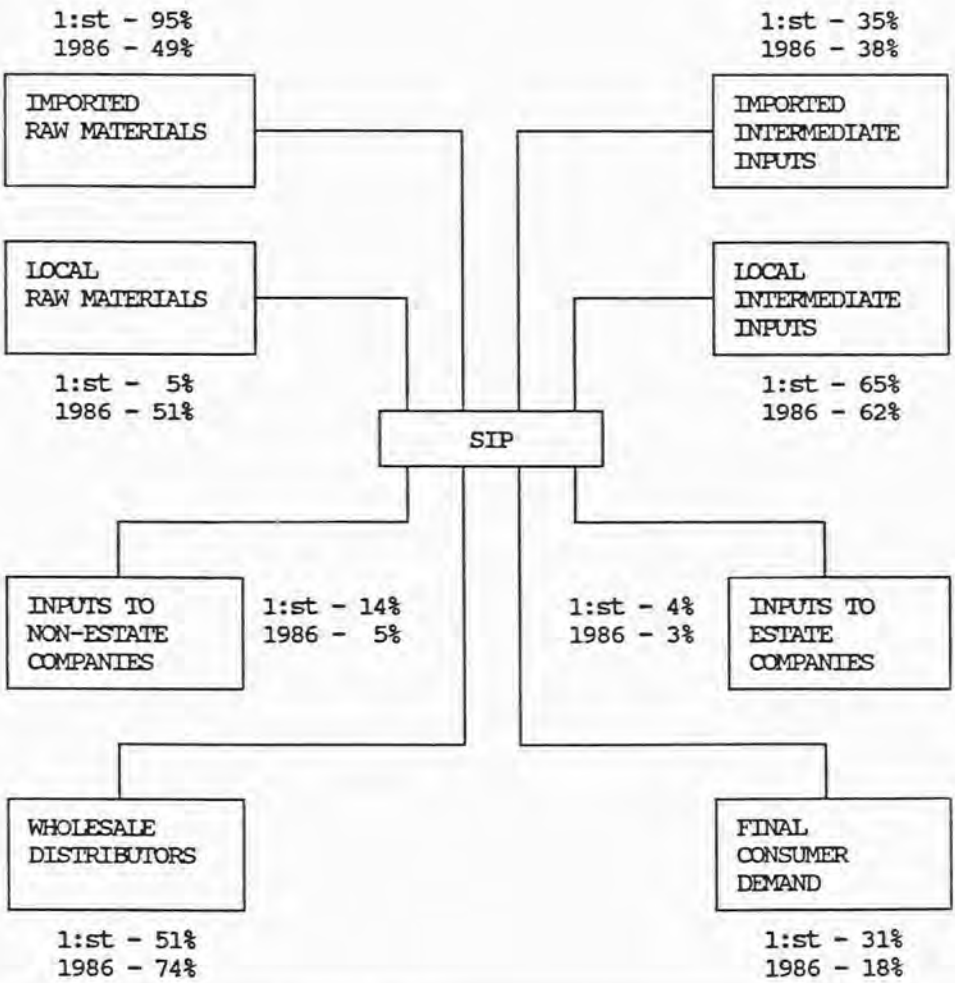
Figures 1– 4 below shows, finally, in a graphic outline the flows in and out of the different estates. Actual sales and their sources. Procurement flows and their destinations.

SPIN-OFF EFFECTS FROM THE SISTER INDUSTRIES

The issue under consideration in this chapter is the integration of the sister industries in the Tanzanian economy. The degree of integration has been measured by their inter -and intra-sectorial linkage effects. There are, however, other aspects of the role of the sister industries in the national economy. Although not directly related to the issue of linkages, They are nevertheless of interest here. They concern the general impact on Tanzanian industrialization performed by the SIP and its industries.

The term spin-off effects has been used to signify one such aspect. A spin-off is

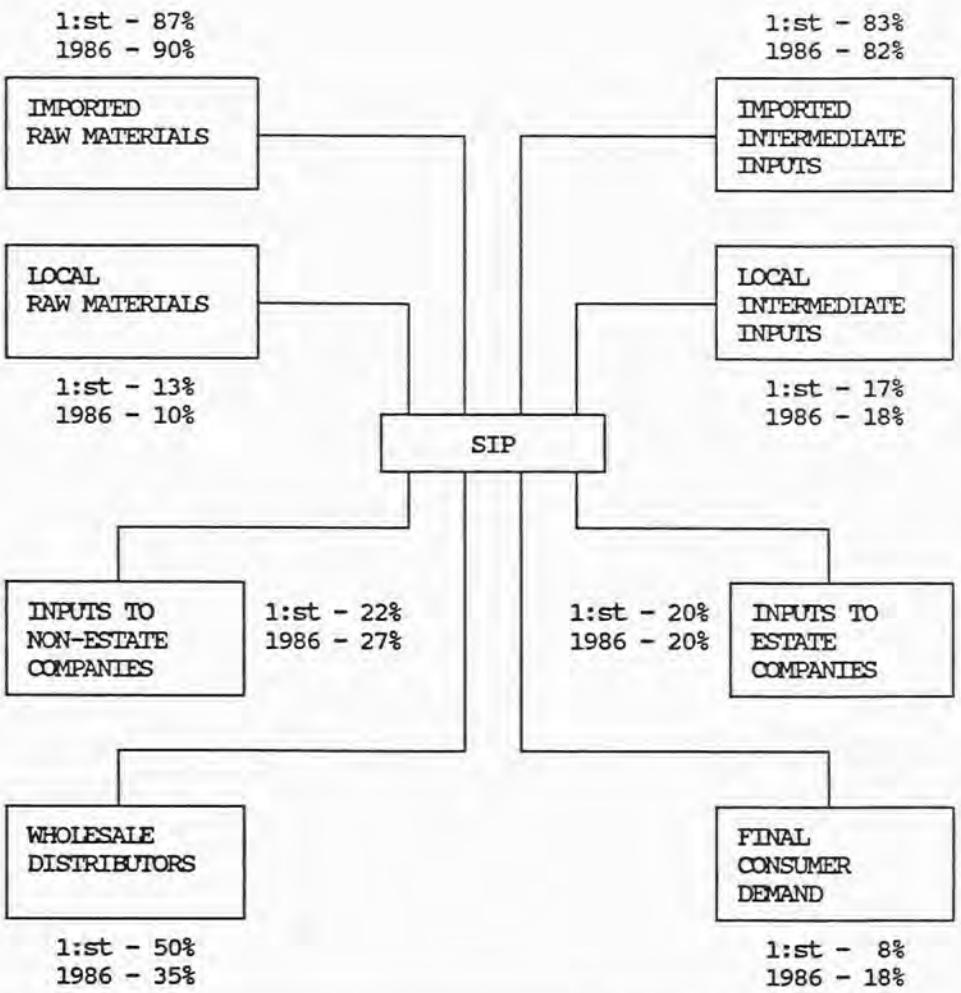
FIGURE 1. LINKAGE RELATIONS IN THE ARUSHA ESTATE
(First year of production and 1986)



an industrial enterprise that has been established as a direct result of a previously undertaken industrial activity. In our case it refers to companies that has been established after production was started in the junior sister. The activity of the spin-off should, to qualify as a spin-off, be clearly related, technology- and/or productwise, to the activity of the junior sister. In physical terms the spin-off company should also be located outside the industrial estate where the original company is operating.

From this definition follows that we shall exclude the different kind of side activities, usually designated "mradis", with no relationship whatsoever to the

FIGURE 2. LINKAGE RELATIONS IN THE MOSHI ESTATE
(First year of production and 1986)

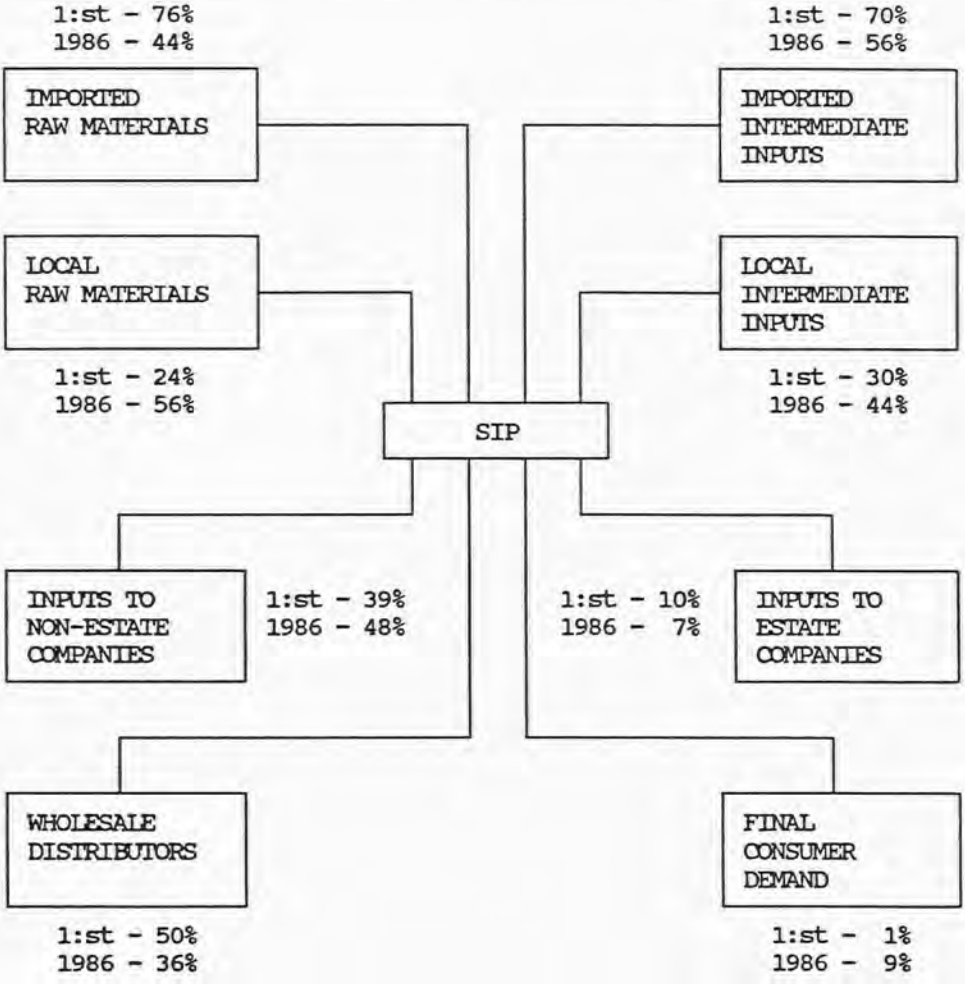


technology or products of the junior sister. These side activities comprises a wide range of business, and not always very small ones either for that matter: transport companies, farms, travel agencies, guest houses, restaurants, repair shops etc.

In some cases these activities can also be found in the informal sector. In these cases it is of course not very easy to get reliable information on their magnitude. –

Concerning spin-off effects it was not possible within the time available in Tanzania to collect detailed information on these companies. A contributing factor was the difficulty in getting the necessary information from the involved persons. We therefore do not claim that this list fully represents all spin-off activities. But the

FIGURE 3. LINKAGE RELATIONS IN THE MBEYA ESTATE
(First year of production and 1986)

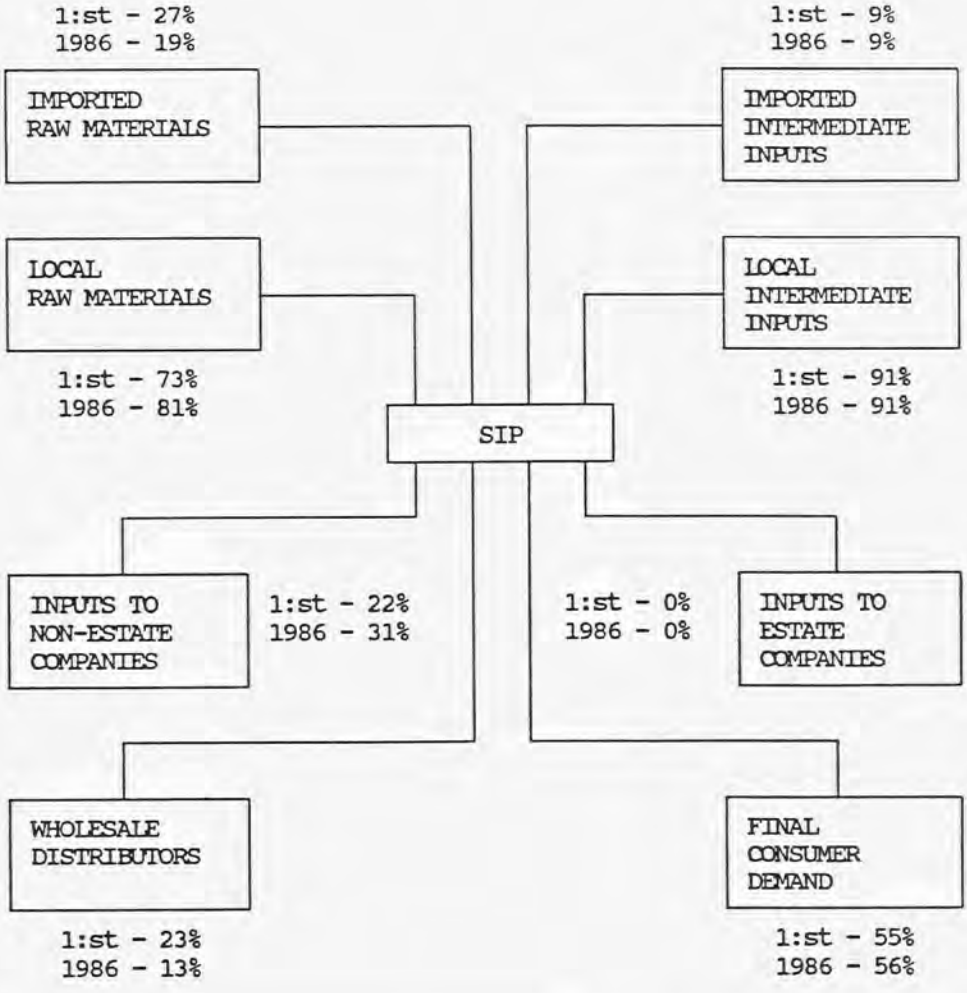


list definitely covers the largest undertakings. What follows below is therefore a listing of the more important activities that has grown out of the sister industries.

By far the largest spin-off to date is Simon Engineering in Moshi, producing different pressed household utensils like pots, pans and trays. Simon Engineering grew out from the activities of MOCCO and its technology for production of cutlery.

NEM in Arusha erected a large plant outside the estate with the purpose of transferring all its export production to this new building. It is not a "new" company, but rather an expansion of NEM itself. NEM has also entered into joint

FIGURE 4. LINKAGE RELATIONS IN THE TANGA ESTATE
(First year of production and 1986)



venture together with Finnveden Development and SWEDFUND. The company, ATOMAC, is to be a highly sophisticated tool-and-die workshop, with a clear export potential.

Meru Wood, also in Arusha, started off with a production of rulers. It later came to include doors. On the basis of its woodworking technology it started off with production of furniture. This production was located in a new building, and company, outside the estate.

The owner of AGACO, a galvanizing operation, has extended into the manufacture of buckets and wire nets. This manufacturing unit is located outside the estate and uses AGACO for the final galvanizing of its products.

In Mbeya, PEMACCO managed to develop a rather successful business operation of electrical motor rewinding, assisted by BEVI, Blomstermla. The cooperation went so well that a joint venture was developed, with SWEDFUND as the third partner, and a large unit for motor rewinding was built in Dar es Salaam.

A similar type of cooperation, growing out from a sister relationship, is the production of corkscrews in Usangi. This project was developed by MAFOTCO and GENSE International in Sweden.

Quite common has been for former employees of sister industries to use the knowledge acquired and start up their own enterprises.

The former managers of Uhandisi started, after leaving UIF, a mechanical workshop – Vulcan Engineering. Former employees of the CFW in Arusha established Azimio Engineering which is also a mechanical workshop. The former estate manager in Arusha developed a consultancy company, Ben & Fet Technical Consultancy Services Ltd. This company provides management services as well as developing different industrial projects.

In contrast to the above-mentioned projects, which can be characterized as "spontaneous" outgrowths from the SIP, there has also been developed a specific programme for establishing such spin-offs. The Sister – Daughter programme (SDP) is a SIDO project, run in collaboration with FIDE. The basic idea is to use the experience and expertise of former junior sister and have them act as "senior" sisters towards a newly created small industry working with the same kind of technology. SDP has been in operation for just over a year and has already come quite far. To date the following projects have passed the planning phase and are about to start up production.

MAFOTCO has been involved in the formation of Samada Engineering Works Ltd. This daughter produced dustbins and buckets and is now extending into forging with the assistance of MAFOTCO.

Norrapak performs a similar role for Entunde na Anakwe in Singida, which is a printing shop.

NEM, Kimesha and AGACO joined forces and established GALKIN. This

A SIDO-company in Moshi. Picture: Charlotte Thege, SIDA Photo Archive

project will produce lamps solely for export to IKEA in Sweden. Kimesha, finally, acts as backup towards Zembwela General Stores which is about to start up production of different aluminium utensils.

As it was not in the original terms of reference for this study to analyse the "spin-offs" in detail, we are not able to say much more about their structural features. But this account of formal and informal "spin-off" effects presents an impressive record, given the comparatively short time of operation of the sister industries.

DEMONSTRATION EFFECTS

In addition to the formal and informal "spin-offs" emanating from the sister industries, a final stimulus should also be discussed. It is important to point out that these demonstration effects have nothing to do with the technology used in the projects and their technological level in general. Which was the analytical starting point for the linkage effects and the value added. But even so, other types of stimulus resulting from the mere presence of operating industrial projects should be discussed.

One important objective of the SIP was to create indigenous entrepreneurs in a society where industrial activity traditionally had been the prerogative of Asians (foreigners or naturalized Tanzanians). An important indicator of the impact of the SIP would therefore be to what extent the success of these small entrepreneurs serves as an inspiration to other indigenous Tanzanians wanting to start up a small industry of their own. Indications from the National Bank of Commerce are strong, that among its applicants for small industry loans references are usually made to the SIP.

This demonstration effect is therefore important, but as it is of a qualitative nature, an assessment of its impact would require a methodology different from the one used in this study. The terms of reference for this study clearly does not allow for such an indepth analysis.

But as there are strong indications that the demonstration effects are of considerable importance, we recommend that such a study is undertaken. It would add in quite a substantial way to the findings of this report.

The SIP has over the years generated a lot of contacts between people and between institutions. Sometimes these contacts result in a tangible activity with a considerable development potential in Tanzania. Two such examples should be mentioned here. The Shimbi – Vrnamo Friendship Association, and the similar Usangi – Eskilstuna Friendship Association. The formation of these associations were initiated through the initiative of individuals in Sweden and Tanzania who had been in contact with the SIP. Naturally FIDE in Vrnamo and GENSE International in Eskilstuna served as catalysts in this process. The Friendship Associations have by now managed to engage people in Vrnamo and Eskilstuna in different projects, for example a mobile stonecrusher in Shimbi and an autoclave in Usangi. These kind of contacts should be expected to lead a life of their own outside the SIP and formal donor assistance programmes.

CHAPTER 5

Value added in the sister industries

INTRODUCTION

In the previous chapters we have discussed some general issues concerning the promotion of small scale industries and the transfer of technology and we concentrated the analysis to a study of linkage effects. The analysis will still be primarily concerned with the effects of the companies with their impact on the local economy. But whereas the discussion of linkage effects focussed on the physical output from the plants and the distribution of that output we will now look at the generation of value in the process of production.

Value added is commonly defined as the difference between the value of a company's total production and the value of the raw materials and intermediate products that were used in the production. To be more precise, value added is the gross value of production minus the value of raw material, packaging, fuel, energy, other intermediary inputs, and subcontracted labour. Value added is an account of the gross value that has been created in a company and it consists of compensation for the use of labour and capital (including the wear and tear of the capital stock).

If the value added in all companies and institutions in the country is summed up, we get the Gross National Product. As the definition above indicates, the value added is usually treated as a residual in the national accounts.

Why would anyone be interested in the value added of a number of industries? Why is it interesting as part of an evaluation of technology transfer? Let us first look at it from the national point of view. Industrial production is rarely an end in itself, it is a means to accomplish some other objective. The other objectives could be strengthened independence, self reliance, balanced regional development, employment – to mention some macro-economic objectives that would be of importance in Tanzania.

Value added is a necessary ingredient in a quantitative measure of to what extent such other objectives are realized through industrial production. Value added is not the only quantitative indicator, and the quantitative indicators are in themselves only

part of the argument. But if value added is high that is, for example, often an indication that several people are employed and that wages are high. It is also an indication that the capital resources of the country are gainfully employed. That they are expanded and that they generate a surplus for the owners of capital (private or public) and that the tax paying capacity is high.

If we look at any production chain from raw materials to final consumer, we often find the most profitable investment at the point where value added is highest. It is therefore generally of interest to developing countries to make sure that they control those phases of production. In many product areas Tanzania exports raw materials before they reach the phase where value added generation is high. Similarly, Tanzania often imports products (both intermediary inputs, capital goods and consumer goods) where there is little scope for increasing value added. This is a problem common to all developing countries.

Rweyemamu (1973) found that the manufacturing industry's share of value added was just below 10 percent of the GDP on the eve of Independence. During the 1960s the figure remained at that level, but this was not a cause for concern in itself. The problem was more the sectoral distribution of value added. The consumer goods industries accounted for 70 percent of value added, but capital goods, intermediate goods and building materials together accounted for the rest.

The thinking behind the industrial development strategy of the 1970s was based on the logic of increasing value added in the processing of agricultural commodities for export, and later, generating more value added by domestic production of basic commodities. But value added could increase the benefits of production for those directly concerned – labour, capital owners, and for the state directly through taxation. However, it does not guarantee a dynamic linkage to the development of other economic sectors. Obviously, the reverse is also true.

It is often argued that the further a product is processed, the higher the benefit to the local economy. But the nature of the product should enter the argument. It could well be so that further processing puts the producer at the mercy of the consumer. Particularly if he looses flexibility by investing in production for a monopsonistic market. This will of course depend on the nature of the product, on the number of sellers and the number of buyers – as well as on potential cooperation between any of the actors.

If we look at value added from the point of view of the company itself, the picture will be clearer. The risk and the potential benefits will be less complex. But it will be interesting to look at how value added is divided between different factors of production. A private entrepreneur would give priority to investments that optimize the value added on capital, whereas from a national point of view - or from the labour point of view – the share of value added from labour, licenses, taxes, should be optimised.

The packing department of a Moshi company. Picture: Charlotte Thege, SIDA Photo Archive

METHODOLOGY

In the present study value added has been calculated from the accounts of the companies. The annual reports have been analyzed and the components that make up value added have been retrieved. There are two ways to go about this exercise. The first is to treat value added as a residual, that is, to deduct costs of raw materials and intermediaries from the sales. The second approach is to find each item and add them up, that is, to add all costs for labour, capital, various fees and administrative overheads, taxes and profit.

In theory the result should be the same. But some items in the accounts are probably more accurate than others. We believe that there is often a tendency to underestimate the value of sales, and this tendency is difficult for the appropriate Tanzanian authorities to control. At the same time, we think there is also a tendency to exaggerate the costs that are associated with value added. But here the Tanzanian authorities are much stronger when it comes to enforcing discipline and controlling that the accounts are properly kept. We have chosen the second approach to our calculations. This is more cumbersome, but for the above reasons probably also more reliable. It is far from perfect as there will always be a grey zone of value which never enters the books – not in the form of costs, nor in the form of incomes.

VALUE ADDED GENERATED IN FIVE INDUSTRIAL ESTATES

The industrial estates in Arusha (12 companies), Moshi (12), Tanga (7), Iringa (1) and Mbeya (7) are indeed very different. Not only the number of companies, sectoral distribution of companies, age of the estates and the companies, and external cooperation; but also their performance. Let us now look at it from the point of view of value added.

Table 1 Value added at the five industrial estates (in TSH, 1986)

Arusha	54 million
Moshi	12 million
Iringa	9 million
Tanga	3 million
Mbeya	4 million

Note: The figures build on the data presented in Table 2. The Arusha estate is the most com lack data from some of the companies at the other estates. It is likely that in particular the would show a higher figure if data had been available.

As Table 1 indicates the total value added is far higher from the estate in Arusha than from any of the others. This could be compared to the data on linkages, which also indicate that the output from the estate is higher than from the four other estates. It should however be remembered that we lack data from four companies in Moshi and two companies in Tanga. The estates in Iringa and Mbeya are also much smaller.

But Table 1 only contains the figures from 1986 and the Arusha estate is also the oldest of the SIDO estates. Value added has increased steadily since the establishment of the companies in the late 70s and early 1980s – and a stagnation around 1985 for many. The trend for the other estates appears to be the same, but with a later start.

Table 2 presents the data for all the companies at the five estates. We have chosen a selected number of years rather than the total time series. This was largely a question of research economics. As the retrieval of data is very time consuming we decided to take only the minimal number of years – but years that would still show the development over time.

It is not surprising that value added is highest at NEM. The company has been quite profitable, employment is high, and the owners have invested in new production capacity. Value added at NEM is more than twice as high as the second best company. As we see, several other companies at the estate also generate a high value added – such as Shuma, GIFCO, AGACO, ACCO and AMI.

Only IMAC at the Iringa estate generates a value added that is otherwise above the average of the Arusha estate – and IMAC is an exceptional case. It should be noted

Table 2 Value added in the companies (in '000 TSH at current prices)

	Start	1st	3rd	6th	1986
Arusha					
AMI	(1980)	1 432	2 346	5 381	4 364
Kimesha	(1978)	86	518	1 500	2 500
GIFCO	(1980)	974	4 200	5 100	5 700
Uhandisi	(1978)	570	790	475	
NEM	(1979)	2 100	3 400	11 400	18 300
C & AI	(1979)	1 500	4 800	5 100	2 300
Fawipma	(1979)	n.a	640	760	1 860
Meru Wood	(1978)	170	190	590	1 400
CFW	(1979)	1 800	1 200	1 660	1 605
Shuma	(1982)	5 800	7 300	–	7 500
AGACO	(1982)	1 500	2 500	–	4 400
Acco	(1978)	1 100	2 150	–	3 600
Moshi					
Mafotco	(1983)	1 740	1 820	–	1 620
Teco	(1982)	920	2 030	–	2 220
Moto	(1983)	490	–	–	760
Kilectro	(1982)	1 350	1 600	–	1 650
CFW	(1984)	220	–	–	370
Kiscico	(1982)	750	–	–	–
Tanoptic	(1983)	1 600	1 350	–	1 707
Amoco	(1983)	–	–	–	–
Tanlocks	(1981)	–	–	–	–
Norrapack	(1982)	–	–	–	2 500
Mocco	(1981)	–	1 140	–	–
Hamax	(1985)	–	–	–	890
Iringa					
IMAC	(1984)	690	–	–	8 610
Mbeya					
HIMA	(1981)	1 380	2 390	–	2 010
Mb.Plastic	1981)	990	1 200	–	1 440
Mb.Ceramics	(1985)	–	–	–	–
CFW	(1981)	–	–	–	3 200
Pemacco	(1981)	–	–	–	–
Mb. Clogs	(1981)	2 190	3260	–	–
Mb. Wood	(1986)	–	–	–	–
Tanga					
Kasa	(1982)	180	170	–	120
Kodawa	(1986)	–	–	–	240
Kwemishuze	(1982)	–	–	–	–
Tangamano	(1984)	180	400	–	390
Sahare Woodworks	(1982)	640	660	–	590
CFW	(1984)	–	1 660	–	1 550
Akil	(1984)	–	–	–	–

that all labour costs for national personnel are included in the value added figures,but not the cost of expatriate personnel. As IMAC has much more resident expatriates than any other company its figure for value added would be even higher, but so the losses would of course be equally high.

There is a difference in the time series; the companies in Arusha and Mbeya mostly start with a low value added and show a gradual increase. The Moshi companies start at relatively higher levels and only in two cases do the figures increase steadily (TECO and CFW). The same applies for Tanga, with the exception of Tangamano.

Here we have been looking at value added in current prices, but if we look at the fixed prices the difference will be even more striking.

The data indicates a healthy growth in value added in a few cases only - if we look at the life span of the companies. At the SIDA supported estates the life of many companies depends on import support and we clearly see that when such support is withheld, value added declines and that is a certain indication that bankruptcy is approaching – even if that final step has not been taken to date.

There is one interesting exception. Value added at Meru Wood is quite low, but the trend is healthy. This company also has strong backward linkages to the agricultural sector and the management is highly competent. The company has received support for capital investment but not for raw materials. The production has also been changed to products with a higher value added than was at first intended.

But the figures on value added do not say all that much in isolation. It is only when they are compared to other data such as sales, employment, imports and capital formation that they begin to make sense. We shall also have to go beyond the industrial estate to see whether the performance in terms of value added is higher or lower – better or worse – than in other companies. Even so it should never be forgotten that value added is only one of the criteria by which industries should be judged.

VALUE ADDED IN RELATION TO SALES

The figures in Table 3 are perplexing. Several of the companies have a very high ratio of value added to sales. In five companies value added is actually higher than sales, and in another nine the ratio is higher than 0.5!

Let us first of all discuss what a reasonable, or common, ratio would be - and let us be careful to avoid evaluative statements at first. In a neighboring country, Kenya, a recent study of the Kenya Industrial Estates, indicated that small scale companies often had a value added up to 20 – 25% of sales. Developing country subsidiaries of Norwegian companies often have a ratio of 20% where Norwegian companies of a comparable nature have a value added to sales ratio of around 30%.

Table 3 Value added in relation to sales

	Start	1st	3rd	6th	1986
Arusha					
AMI	(1980)	0.38	0.63	0.83	1.29
Kimesha	(1978)	0.50	0.37	0.24	0.40
GIFCO	(1980)	1.46	0.95	1.18	1.90
Uhandisi	(1978)	0.91	1.38	–	1.43
NEM	(1979)	0.78	0.28	0.20	0.32
C & AI	(1979)	1.00	0.96	0.92	0.76
Fawipma	(1979)	–	0.23	0.24	0.63
Meru Wood	(1979)	0.94	0.29	0.29	0.36
CFW	(1979)	4.67	2.00	1.10	0.74
Shuma	(1982)	0.58	0.82	–	0.77
AGACO	(1982)	0.44	0.42	–	0.37
Acco	(1978)	0.61	0.52	–	0.57
Moshi					
Mafotco	(1983)	0.46	0.59	–	0.52
Teco	(1982)	0.54	0.61	–	0.36
Moto	(1983)	0.28	–	–	0.24
Kilectro	(1982)	0.93	0.45	–	0.52
CFW	(1984)	0.17	–	–	0.26
Kiscico	(1982)	0.48	–	–	–
Tanoptic	(1983)	0.58	0.37	–	0.30
Amoco	(1983)	–	–	–	–
Tanlocks	(1981)	–	–	–	–
Norrapack	(1982)	–	–	–	0.19
Mocco	(1981)	–	1.69	–	–
Hamax	(1985)	–	–	–	0.45
Iringa					
IMAC	(1984)	1.01	–	–	1.26
Mbeya					
HIMA	(1981)	0.32	0.44	–	0.48
Mb.Plastics	(1981)	0.81	0.79	–	0.77
Mb.Ceramics	(1985)	–	–	–	–
CFW	(1981)	–	–	–	0.66
Pemacco	(1981)	–	–	–	–
Mb. Clogs	(1981)	0.41	0.53	–	–
Mb. Wood	(1986)	–	–	–	
Tanga					
Kasa	(1982)	0.16	0.06	–	0.05
Kodawa	(1986)	–	–	–	0.12
Kwemishuze	(1982)	–	–	–	–
Tangamano	(1984)	–	0.09	–	0.07
Sahare Woodworks	(1982)	0.79	0.55	–	0.82
CFW	(1984)	–	2.18	–	1.46
Akil	(1984)	–	–	–	–

TANOPTIC makes optical spheric single vision lenses.
Picture: Charlotte Thege, SIDA Photo Archive

by and large, it is not uncommon to find ratios of 15 - 20% in small scale industries in the third world. Large scale, capital intensive companies often have a ratio which is 5 to 10 % higher. The same production would often have a ratio which is another 5 to 10% higher in an industrialized country.

How is it then possible to have a ratio of more than 50% in these companies? What are the consequences for the companies long-range performance? When the value added is higher than sales the companies must be running at huge losses. As raw materials and intermediary inputs also should be added to the cost we have an indication of the size of the loss. If we had treated value added as a residual – c.f. the above discussion on method – there would not have been any added value. But production did indeed take place and we have also discussed that there might be a tendency to diminish the real figures of sales – perhaps that is why the figures are surprising.

We should also remember that we have a discontinuous time series, we might have found production for stores in one year and the sales are realized next year – but not included in our data. It is also possible that production is financed from

external sources and thus does not enter into our statistics - but the value added does.

We have a few examples of companies with "nice" time series. We could point out the CFW in Arusha which starts at a high level but gradually reduces the ratio - indicating that the running losses are gradually reduced. The limited data on the CFW in Tanga points in the same direction, but the CFWs in Moshi and Mbeya do not exhibit the same trend. The data on the CFW in Moshi is particularly surprising and should perhaps not be trusted, Either an important cost element has escaped the bookkeeping, or the sales are exaggerated. It is not possible for us to advance any further explanation at present, it would be necessary to go deeper into the accounts.

There is no pattern of ratios that discriminate between different estates. Although it is true that the companies in Arusha generally show a higher ratio, some of them deviate. If we look at the other estates there are also always a few companies that are different. The samples are simply too small to generate any explanations at estate level, particularly as we lack information from a few companies.

VALUE ADDED AND EMPLOYMENT

The value added per economically active person in Tanzania was 1 200 TSH in 1967 (Silver, 1984). Value added was highest for people employed with water and electricity supply (around 11 000 TSH) and lowest in subsistence agriculture (315 TSH per person). Those employed in mining and manufacturing industry generated a value added of 7 900 TSH per person in 1967.

The relationship between value added and the number of employees is a common indicator of labour productivity. Industrial statistics in Tanzania are however ambivalent on this point. According to Skarstein and Wangwe (1986) labour productivity was rising throughout the 1970s until it peaked in 1978 with a value added per employee of 13 125 TSH (In large scale manufacturing, that is, companies with more than 10 employees. The companies in our study all have more than 10 employees). The ILO-JASPA report (1978)indicates that productivity peaked in 1972, and at a lower level of value added per employee. The World Bank (1977) indicates that productivity was at its highest in 1967.

By and large it can be said that labour productivity in industry has not been good mainly because of overmanning, capacity under-utilization and inadequate incentive systems. In total manufacturing, value added at constant (1966) prices declined by more than 8% per year on average from 1978 to 1981, and by almost 28% from 1981 to 1982. This means that productivity, or value added per employee, declined by 11.6% per year on average from 1978 to 1981, and by 24% from 1981 to 1982. (Skarstein and Wangwe, 1985).

The development of labour productivity in small scale industries has been much debated in this context. SIDOs 1977/78 Census and 1980/81 Survey indicated a

Table 4 Value added per employee in 1986

	Current prices	Fixed prices
Arusha		
AMI	161 300	41 100
Kimesha	71 400	18 200
GIFCO	285 000	72 600
Uhandisi	59 400	15 100
NEM	147 600	37 600
Chemical & Allied	74 200	18 900
Fawipma	60 000	15 300
Meru Wood	51 800	13 200
CFW	64 200	16 400
Shuma	416 000	106 000
AGACO	125 700	32 000
ACCO	87 800	22 400
Moshi		
Mafotco	52 200	13 300
Teco	–	–
Moto	31 600	8 000
Kilectro	–	–
CFW	16 800	4 300
Kiscico	35 700	9 100
Tanoptic	74 200	18 900
Amoco	–	–
Tanlocks	–	–
Norrapack	192 000	48 900
Mocco	28 000	7 100
Hamax	98 800	25 200
Iringa		
IMAC	–	–
Mbeya		
HIMA	52 000	13 300
Mbeya Plastic	130 800	33 300
Mbeya Ceramics	–	–
CFW	–	–
Pemacco	–	–
Mbeya Clogs	84 200	21 500
Mbeya Woods	–	–
Tanga		
Kasa	16 000	4 100
Kodawa	10 000	2 500
Kwemishuze	–	–
Tangamano	39 000	9 900
Sahare	59 000	15 500
CFW	81 000	20 600
Akil	–	–

value added per employee of 4 220 TSH in 1977/78 (1966 prices), and an annual decline by 0.5% to 1980/1981. Skarstein and Wangwe (1985) argue that these data are too vague to be believed. As the same factors that have negatively affected the productivity in the manufacturing sector apply to the small scale sector it is not likely that the lower decline rates are true. This is of course not the place to discuss this controversy any further. However it might be useful to keep it in mind when we review the figures for the five industrial estates in our survey.

At a first glance the figures appear incredibly high. Value added per employee varies between a low of 10 000 TSH at Kodawa to a high of 416 000 TSH at Shuma. The average for the Arusha estate is around 120 000 TSH per employee, in Moshi and Mbeya around 60 000, in Tanga around 25 000. But if we turn to fixed prices and deflate the figures with the implicit Gross Domestic Product deflator of 1986 (Economic Survey) we immediately get figures that correspond better to other industrial statistics. But even these look very high in comparison with the other time series, although they were based on the index year 1966. If we are to transform the 1976 prices to 1966 prices we arrive at a figure which is approximately a quarter of the 1976 amount. This indicates a spread between a low value added per employee of 700 TSH at Kodawa to a high of some 25 000 TSH per employee at Shuma. This is definitely not unrealistic considering the impact of technology, intensive training and continuous import support in the latter company.

The overall conclusion is that value added per employee is quite high among a large share of the sister industries, compared with the average performance in Tanzanian manufacturing industry. But considering the privileged position of the companies this is to be expected. But other small scale companies that are outside the support from Sweden and outside of the estates that benefit from this support show quite low figures, in fact lower than the average of manufacturing industry, which was also to be expected.

DISTRIBUTION OF VALUE ADDED

Up to now we have looked at the relative size of value added from different angles, but let us now turn to the distribution of value added.

Table 5 shows that this distribution varies a great deal. As an example, labours share of value added varies between a low of 6% in Shuma to a high of 90% in Kasa.

This variance is to some extent normal and would be expected. Companies where labours share of value added is relatively low (less than 15%) are found in the relatively capital intensive establishments, where turnover is high and employment is low. Companies where labours share of value added is high are, on the other hand, found in companies with high employment, and/or rather low turnover.

It is also to be expected that the distribution of value added varies over time.

Table 5 Distribution of value added (1986)

	Wages (%)	Depreciation (%)	Other (%)
Arusha			
AMI	20	14	66
Kimesha	26	4	70
GIFCO	8	9	83
Uhandisi	25	35	40
NEM	15	4	81
Chemical & Allied	18	4	78
Fawipma	32	24	44
Meru Wood	16	5	79
CFW	31	44	25
Shuma	6	9	85
AGACO	13	12	75
Acco	26	2	72
Moshi			
Mafotco	42	51	7
Teco	38	34	28
Moto	27	50	23
Kilectro	25	45	30
CFW	16	82	2
Kiscico	–	–	–
Tanoptic	–	–	–
Amoco	–	–	–
Tanlocks	–	–	–
Norrapack	–	–	–
Mocco	–	–	–
Hamax	13	40	47
Iringa			
IMAC	6	72	22
Mbeya			
HIMA	16	18	66
Mbeya Plastics	15	23	62
Mbeya Ceramics	–	–	–
Mbeya Clogs	–	–	–
CFW	–	–	–
Pemacco	–	–	–
Mbeya Wood	–	–	–
Tanga			
Kasa	90	–	–
Kodawa	63	–	–
Kwemishuze	–	–	–
Tangamano	66	18	16
Sahare	30	4	66
CFW	31	1	68
Akil	–	–	–

Arusha is the oldest estate and as a consequence the figures for depreciation are low, and the category "other" (that is, rent, taxes and profits) is higher. As value added usually increases rapidly during the first six years of production, (as we see in Table 2) and employment is quite stable, it is also natural that labour's share of value added is high in the younger companies.

How do these figures concerning distribution of value added compare with other patterns of distribution? First of all, labour's share of value added is quite low in all companies. In the industrialized countries, this is normally around 60% (see for example Howenstine, 1977). In foreign affiliates of multinational companies, the figure is between 40 and 50%. However, that does not say anything about the nature of production, age and size of the establishment.

One of the reasons the figure is quite low is of course the very low minimum salaries in Tanzania. Many of the unskilled workers in the companies will be employed at the minimum wage. It should also be remembered that some of the skilled workers, and the managers, are part owners in the companies. The most interesting part of their remuneration does not come in the form of wages but as profit.

Secondly, depreciation figures are very high, they would normally not account for more than 10 to 15% of value added. This shows that the capital investment is quite high indeed. This is also well known and follows from the combination of small size and relatively sophisticated technology. High figures were to be expected, but they nevertheless indicate a problem in the financial structure of the companies.

The third observation is that the category "other" is quite high. It has not been possible to distinguish between rent, profit and tax, as these were treated as a while during the data collection phase. It is however clear that the combined potential for taxation as well as profit is good in most cases.

VALUE ADDED AND THE UTILIZATION OF FOREIGN EXCHANGE

The Tanzanian economy has had a severe shortage of foreign exchange since the beginning of the economic crisis in 1978/79. The lack of foreign exchange has probably been the most important obstacle to the development of the country. In such a situation of extreme scarcity it becomes necessary to utilize the existing foreign exchange very carefully – for purposes of exclusive national concern and where the "return" is at its largest.

As we have seen above, several of the sister industries were planned at a time when the prospects for economic growth looked different, and they are thus dependent, but to a decreasing degree, on imported raw materials and spares. They have got access to foreign exchange from the Swedish import support. It is not likely that the companies had otherwise received foreign exchange allocations from

the Government in Tanzania. It is primarily because of the Swedish assistance, and a continued Swedish support after establishment, that they have been able to continue importing raw materials to sustain their production.

Now, an interesting question is whether this money has been effectively utilized – or has it meant throwing good money after bad. The World Bank (1987) indicates that the utilization of foreign exchange in the Tanzanian manufacturing industry has been detrimental to the country's development. Niklasson (1982) has looked at the utilization of foreign exchange in the small scale industries and he also arrived at a pessimistic conclusion concerning their prospects. But the situation is different today, we have seen more of the performance of the companies, and in contrast to the World Bank (which works with aggregate data) it should be possible for us to analyse the detailed contribution of some firms.

The reader should remember that these figures are only approximations. We have seen that the account of value added itself is open to criticism. The statistics on the allocation of import support were obtained from SIDO and on utilization from Svenska Handelsbanken (1983/84 onwards), the only organizations which have an accurate information on this. The information from SIDO points at a utilization rate well below 80%. But this varies from one company to the other, and from one year to the other. When we now look at the ratio between two figures that are themselves uncertain, we should of course treat the result with some care. But we nevertheless thinks this represents a true picture of reality, and we are more likely to have underestimated the positive impact of import support.

Table 6 presents the ratio between utilization of import support allocations and the generation of value added in the companies. It is the ratio between value added at current prices in Tanzanian Shilling, and the import support at current prices, converted to TSH according to the official exchange rate of each year. If the ratio is above one, this indicates an inefficient use of foreign exchange. If the ratio is below one, this points to an efficient use of foreign exchange, from the Tanzanian point of view. There might of course have been other possible utilizations of foreign exchange that would have been even more efficient, i.e., would have led to an even more favourable ratio between foreign exchange and value added – but that is beyond the scope of this report.

The table indicates that several companies start with a low level of efficiency in using foreign exchange, but as the production becomes consolidated the situation improves. NEM, Kimesha and GIFCO are some such examples. The third and sixth years of production they were so well consolidated that they made efficient use of their foreign exchange allocations.

But when we come to 1986 the situation changes. It appears as if 10 companies out of 13 make efficient use of foreign exchange, and in all cases the ratios have increased. The reason is that the figures for this year reflect the depreciation of the

Table 6 The ratio between import support allocations and value added

Company	Start	Year of production: 1st	3rd	6th	1986
Arusha					
AMI	(1980)	–	0.25	0.26	1.8
Kimesha	(1978)	–	0.67	0.20	0.32
GIFCO	(1980)	–	0.19	0.07	*
Uhandisi	(1978)	–	0.36	*	*
NEM	(1979)	–	0.68	0.16	0.24
C & AI	(1979)	–	0.41	0.13	*
Fawipma	(1979)	–	1.55	1.18	2.15
Meru Wood	(1978)	–	0.07	–	–
CFW	(1979)	–	–	–	0.49
Shuma	(1982)	0.20	0.21	–	0.64
AGACO	(1982)	–	0.24	–	0.36
ACCO	(1978)	0.59	0.46	–	*
Moshi					
Mafotco	(1983)	–	0.21	–	0.95
Teco	(1982)	–	–	–	–
Moto	(1983)	0.81	*	–	*
Kilectro	(1982)	–	0.25	–	0.96
CFW	(1984)	–	–	–	0.81
Kiscico	(1982)	1.32	–	–	*
Tanoptic	(1983)	–	0.59	–	1.40
Amoco	(1983)	–	–	–	–
Tanlocks	(1981)	–	–	–	–
Norrapack	(1982)	–	–	–	0.64
Mocco	(1981)	–	1.75	–	–
Hammax	(1985)	–	–	–	*
Iringa					
IMAC	(1984)	–	–	–	–
Mbeya					
HIMA	(1981)	0.86	0.33	–	*
Mb.Plastic	(1981)	–	–	–	*
Mb.Ceramics	(1985)	–	–	–	–
CFW	(1981)	–	–	–	0.18
Pemacco	(1981)	–	–	–	–
Mb.Clogs	(1981)	0.07	0.06	–	–
Mb.Wood	(1986)	–	–	–	–
Tanga					
Kasa	(1982)	–	–	–	–
Kodawa	(1986)	–	–	–	–
Kwemishuze	(1982)	–	–	–	–
Tangamano	(1984)	–	–	–	–
Sahare	(1982)	–	–	–	–
CFW	(1984)	–	–	–	–
Akil	(1984)	–	–	–	–

Explanation of signs
– Data missing because of lack of data or import support not granted
* (import supply not utilized)

TSH which took place during the latter half of the year. The value of import support quintupled in TSH while it remained the same in SEK. For several companies it was difficult to sustain production and to keep value added at the high levels already reached. Instead of the previous shortage of foreign exchange, the companies now found themselves in a situation where they could not afford the foreign currency.

The former system, which was changed in January 1988, for utilizing the import support was inappropriate in this new situation. A government system where the forex amount has to be covered in full in local currency already when opening a letter of credit, clearly does not increase the companies ability to utilize the import support given to them.

It would be interesting to have a new time series extending into the future. Will the patterns of the early 1970s be repeated? Is it possible to foresee an efficient use of foreign exchange? This depends on the availability of other inputs, the marketing and pricing of the products, the competition on the domestic market, etc. It is however relatively encouraging that seven companies do show an efficient utilization of foreign exchange already during the first year of the depreciation.

As the TSH has been overvalued up to 1986, it could also be argued that it is only now that we get a true picture of the utilization of foreign exchange. If we had introduced a shadow exchange rate for the TSH for the years between 1978 and 1986, we would have found a far less favourable ratio.

If, for example, the 1986 exchange rate had been used in the previous years, it is easily seen that only the ten companies showing a good ratio in that year used foreign exchange efficiently in the previous years and even for them it took some time until they performed well.

But one of the reasons that the figures do not look good is that value added is still relatively low in the companies. When the capacity utilization is low, the value generated in production is also low. Thus the denominator in the calculation is low and the ratio becomes high. If the companies had been able to produce at higher levels of capacity utilization, it would have been possible to increase the denominator relatively fast. The reader must remember that we look at a situation where the companies are kept alive through artificial breathing, as import support always implies. But the rescuing operation is not large enough to save the firms (except in the 10 cases referred to above) and the import support allocation does not have a full impact. The discussion above gives us good reasons to believe that in a majority of the firms, the import support would have been more efficiently used if the amounts allocated had been larger and if they could have been utilized by the companies more directly than the case is now.

CHAPTER 6

Further linkages with the industry sector

INTRODUCTION

This chapter should be seen as complementing the analysis performed in Chapter 4. It attempts to analyse the character of the industries that are connected to the SIP companies. The analysis gives an overview of how much a direct linkage ratio is "worth" in terms of contribution to the national economy in this second linkage step.

The sister industries sold and bought from well over a hundred major other companies in the country. They have been labelled "secondary" industries and are defined as companies that are related to primary companies through backward and forward linkages.

It has not been possible within this study to do a comprehensive analysis of their structure and linkage patterns. Instead, we made a random sample of 10 companies, where we applied basically the same analytical model as for the sister industries. The companies selected are primarily connected to the sisters through backward linkages, i.e. they are delivering raw materials and other inputs to the SIP industries. Needless to say, we don't claim that these result are in any way be representative for the whole group of "secondary" companies. But they do give us an insight into some of the crucial aspects for evaluating linkage effects.

PERFORMANCE OF SECONDARY INDUSTRIES

We have collected some basic information on the performance of these companies, shown in Tables 1 – 3. By far the largest company with respect to turnover is Friendship Textiles, followed by National Steel and Steel Rolling Mill. Sales for all companies have shown considerable growth rates from 1977.

But so have their costs. For some companies the increase in costs is staggering, for example, JeJe Industries and CIC.

The cost/sales ratios are therefore not very encouraging, 6 out of 10 companies are in the range of 88% – 105%. Performancewise, if we shall believe reported figures, the companies are no particular success stories. The performance of the parastatals has been to a large extent caused by the monopoly position of most of them.

Table 1 "Secondary" Industries – Total Sales ('000 Tsh)

	1977	1979	1982	1986
Amboni	13012	21654	13296	4474
CIC	24174	36344	98736	143051
JeJe	n.a	20295	8301	61504
Friendship	179174	254433	338763	534198
PrintPak	126	4006	6590	11193
Green Beach	n.p	n.p	n.p	2206
KIBO Paper		85135	101984	118543
National Steel	88138	49730	42730	224152
Steel Rolling	34243	78771	96280	296679
Heinkel	n.a	39042	95052	102461

Table 2 "Secondary" Industries Total Costs ('000 Tsh)

	1977	1979	1982	1986
Amboni	n.a	n.a	n.a	n.a.
CIC	17034	23773	85718	150359
JeJe	n.a	19035	7211	57096
Friendship	134937	162797	239411	407521
PrintPak	370	2382	2957	10332
Green Beach	n.p	n.p	n.p	2338
KIBO Paper	n.a	65800	61528	78148
National Steel	73650	33730	36458	224152
Steel Rolling	28509	74272	81873	256523
Heinkel	n.a.	25644	26950	47700

Table 3 "Secondary" Industries Total Costs/Sales (%)

	1977	1979	1982	1986
Amboni	n.a	n.a	n.a	n.a
CIC	71	65	87	105
JeJe	n.p	95	87	93
Friendship	75	64	71	76
PrintPak	294	59	46	92
Green Beach	n.p	n.p	n.p	106
KIBO Paper	n.p	77	61	66
National Steel	84	69	85	98
Steel Rolling	84	95	85	87
Heinkel	n.a	66	29	47

However, generally 1979 was a good business year for most firms and the worst year was 1986.

VALUE ADDED

The secondary industries are located in the two major industrial towns – Dar es Salaam and Tanga. They are a mixture of purely private companies, joint private and

state and state owned par excellence. Their performance differ according to ownership. While it is generally assumed that the private companies would perform better than the purely public companies, our figures reveal the reverse. But it might well be that most of the privat companies are reluctant to give correct performance figures for obvious reasons. Consequently, we shall treat their performance records with some caution.

Let us start by looking at the value added figures for 1986 in the following table:

Table 4. Value Added "Secondary" Industries, 1986 (Tsh)

Friendship Textile Mills	Shs 126.7	million
Heinkel Chemical Industries	" 97.7	"
Kibo Paper Industries	" 40.4	"
Steel Rolling Mills	" 40.2	"
National Steel Corporation	" 5.2	"
Printpak Ltd	" 0.9	"
Green Beach	" (0.13)	"
Commercial & Industrial Combine	" (7.3)	"
JeJe Industries	" 4.4	"
Amboni Plastics	n.a	

Except for Heinkel Chemical Industries, on average from the available figures, the state parastatals rank ahead of the private firms. The state parastatal are the Friendship Textile Mills, Kibo Papers, Steel Rolling Mills, National Steel Corporation and Printpak. Except for Heinkel the rest of the private firms occupy the bottom position – Green Beach, Commercial & Industrial and Je Je Industries. The case of Amboni Plastics is peculiar as its management in Tanga declined to offer any figures on production. The little data there is were made available from The National Price Commission.

If the sister industries in each estate are seen as a unit, the Arusha and Moshi estates well defend a position among the top 5. Looking at individual companies, NEM clearly should not be regarded as small industry any longer with its 1986 value added of 18.3 million.

It is of course of crucial interest for our general discussion to determine the degree to which these industries can be regarded as "assembly" industries, or if a substantial part of their sales value is generated in their own production process. The table below gives the value added to sales ratio and shall be compared with Table 3 in Chapter 5.

Without going into too many details it is clear that the ratios above are, on average, lower than the corresponding ratios for the sister industries. To this should be added that many of the "secondary" companies are quite import dependent (See

HIMA in Mbeya. The company makes knitted garments.
Picture: Charlotte Thege, SIDA Photo Archive

Table 5 Value Added in Relation to Sales (Tsh)

	1977	1979	1982	1986	Aver.
Friendship Textiles	0.25	0.36	0.29	0.24	0.29
Heinkel Chemicals	–	0.34	0.52	0.58	0.48
Kibo Papers	–	0.23	0.40	0.34	0.32
Steel Rolling Mills	0.17	0.06	0.15	0.14	0.13
National Steel Corp	0.16	0.31	0.15	0.02	0.16
Printpak	–	0.41	0.55	0.08	0.35
CIC	0.30	0.35	0.13	–	0.26
Green Beach	–	–	–	–	–
Je Je	–	0.05	0.13	0.08	0.09
Amboni Plastics	–	–	–	–	–

Appendix 4). Thus, a low ratio coupled with a high import dependence would mean that the linkage effect is basically transferred abroad. Such a company is probably a net consumer of foreign exchange and therefore a loss to the country. A good case in point is Steel Rolling Mills, another is JeJe Industries.

A distinct feature of the sister industries was the low share of labour in total value added. The companies in this sample conform more to what can be expected as

labour accounts for on average 48% of value added, compared to 21% for the sister industries. But still low compared with what is normal in the industrialized countries. Adding to the impression of the sister industries as rather capital intensive is also the share of depreciation in value added. For our "secondary" companies the average is 13% and for the sisters 28%.

Table 6 Distribution of Value Added, 1986 (%)

COMPANIES	WAGES%	DEPRECIATION %	OTHER %
Friendship	70.7	15.7	13.6
Heinkel	11.1	4.3	84.6
Kibo Papers	24.0	8.2	67.8
Steel Rolling Mills	6.3	28.1	65.6
National Steel Corp	90.0	9.7	0.3
Printpak	52.7	8.8	38.5
CIC	–	–	–
Green Beach	–	–	–
JeJe	38.2	19.2	46.2
Amboni Plastics	–	–	–

What can we conclude on the basis of this rather brief analysis of the companies that are related to the sister industries through linkages? The structure of these companies can be summarized as follows:

- They show a modest performance in terms of profitability.
- The value added generated in the production process is not particulary high.
- They are to a large extent dependent on imported inputs, particulary so regarding raw materials.
- They are, on average, less capital intensive than, for example the sisters themselves.

Taken all these structural features into account, we would be tempted to suggest that the linkage ratios emanating from the sisters are reduced through their connection with these "secondary" companies.

To what extent we cannot say with precision, as quantitative data is not of sufficient quality for making such a detailed analysis. High import dependency and low value added (in relation to sales) are the primary factors accounting for this. We suspect that in these 10 cases, very few justify their existence from the point of view of saving foreign exchange.

It should be noted, however, that this a matter of concern not so much for the design of projects within the SIP, but rather for the formulation of the national industrialization strategy and the projects it approves.

CHAPTER 7

Conclusions and recommendations for the future

CONCLUSIONS

This study has concerned itself with three things:

1. The structure and performance of the sister industries.
2. Their forward- and backward integration in the economy.
3. The value added generated in their production.

Performance-wise the study showed that the record of the sister industries were quite mixed. It was not difficult to distinguish a group of well -consolidated and growing companies.

But it was equally true that after some years of operation some of the companies were approaching stormy waters. The need for immediate restructuring was there. Production was seriously affected not by technical problems primarily, but rather management problems. At the start-up of the programme, technological problems were in focus. The senior sisters, assisted by SIDO and FIDE, were well-equipped to handle them and a good working relationship obviously developed. Today the problem frontier has shifted and management restructuring stands in focus. This certainly poses a challenge to SIDO and other actors in the SIP, to develop a strategy for active intervention.

Before turning to our analysis of the integration of the companies in to the national economy, it should be pointed out that the viability of a sister industry project can not be judged by linkage criteria only. Equally important criteria are technology transfer and the strengthening of local production capacity.

The examination of the linkage effects showed promising developments. In general the sister companies had, to a large degree, managed to switch from a strong import dependence to a greater utilization of locally available raw materials and other inputs. This reorientation was largely a result of macro-economic forces, i.e. a worsening balance of payments position and a devaluation of the shilling.

The forward integration of the sisters proved to be less dependent on such factors. As it turned out there were in general small changes between the first year of production and 1986. Companies with no forward linkages in their first years of operation seldom managed to create them later on. There were some differences between the estates as well. Most noteworthy, perhaps, was that the Moshi estate had achieved the best forward integration. While at the same time being the most import dependent. There were no particular differences between Tanga, on the one hand, and the sister industry estates on the other.

We would like to point out though that even if an industrial project does not record any forward linkages, it may nevertheless be a "good" project if it satisfies public demand for essential consumer goods. The products can also be labelled "incentive" goods, i.e. they serve for example as an important incentive to farmers and thus stimulate their production.

From our analysis draw the following general conclusions regarding the possibilities for establishing good linkage effects. Linkage effects are determined by:

1. The level and structure of the surrounding industrial and agricultural sectors. In other words, these sectors ability to establish "supporting" economic activities.
2. The potential of the company itself. This is determined by factors such as: a) ownership/integration with foreign companies; b) the product mix of the company; c) the chosen technology.

The strength of the influence from (1) and (2) above, varies considerably from company to company. A generalized approach for different kind of linkage effects is not possible to formulate. In certain cases the product mix and the technology itself are the most important variables. Our analysis shows that the strength of direct forward linkages is primarily dependent on these variables. In the case of backward linkages the surrounding economy should be added as an important variable.

For the sister industries and their backward linkages we can conclude that neither their technology nor their product mix has prevented them from developing such backward integration. More important has been macro-economic developments in Tanzania. Foreign exchange restrictions and the devaluation of the shilling have forced them to explore local supply possibilities.

Equally important has been the existence of industries that were able to supply them with needed inputs. This, in turn, is to a certain extent a measure on the success by which the national industrialization strategy has been applied.

However, the arguments above should not be taken to imply that the ideal situation would be a complete elimination of imports. Clearly, imports are necessary in any industrialization effort. It would be shortsighted to devise a strategy with

such an objective in mind. Instead, the gist of our argumentation in Chapter 2 was that a dynamic agricultural sector is of prime importance for a successful industrialization where imports and backward linkages coexist.

Even if backward linkages exists, thanks to the establishment of an upstream supplying company, the analysis cannot stop there. What happens if an upstream company, like Aluminium Africa, has a very low value added and actually has a negative foreign exchange saving effect? The immediate effect is of course that the "value" of such a link tends to become very close to zero. Our analysis of the "secondary" companies presented indications to that effect. Although quantifiable evidence was not at hand to the extent necessary, the analysis nevertheless showed that our sample companies had a production structure which reduced the "value" of the links emanating from the sister industries

The present review has shown that several of the sister industries generate a high value added. Their performance in this respect is better than Tanzanian industry in general. But not all companies generate a high value added, and a sustained development is linked to continued support with raw materials and imported intermediate goods.

The time series indicates that it takes several years before value added becomes significant. Therefore the industries in the Arusha estate show a more encouraging picture than the rest. It will take several years before the Moshi and Mbeya estates will reach figures that look as healthy as they do in the former estate.

A review of the distribution of value added indicate that wages share of the total is surprisingly low compared to international data. On the other hand, depreciation is higher than what is common for Tanzania. This primarily reflects the capital intensive nature of their operations.

A most interesting analysis concerned the sister industries utilization of foreign exchange. But the results should, of course, be interpreted with some caution. Our analysis shows that up to 1986, the companies gradually developed their capacity to efficiently save foreign exchange for the country. But in 1986 dramatic changes took place. The devaluation of the shilling in effect meant that more companies became net dissavers of foreign exchange. Given that the present economic policies continues, our results point in the direction that unless those companies manage to substantially improve their capacity utilization, and thus the size of their value added, their operations will mean a waste of scarce foreign exchange resources. Therefore when allocating import support, priority should be given to companies whose production represents a net saving of foreign exchange. Furthermore, under present circumstances in Tanzania the former government rules for utilizing import support acted as a hindrance to the companies efforts to increase production. A system whereby the companies had to put up 100% "cash-cover", i.e. the forex amount had to be covered in full in local currency when opening a letter of credit,

1. The SIP arrangement has led to the introduction of new technologies in Tanzania.

2. The programme has furthermore established a cadre of indigenous entrepreneurs managing their own companies. The demonstration effect of this example is most probably quite important for Tanzania.

In total, the more long-term, intangible aspects are in general positive. Although by no means negative, the more immediate, tangible ones are less positive. The final question is: how shall they be weighed against each other?

RECOMMENDATIONS

1. It is recommended that present financial-economic criteria applied whenselecting sister industry projects are retained. This report has shown that, for example, the technological level and capital intensity etc., has not led to the creation of industries that are adverse to the industrial development ambitions of Tanzania.

2. But, SIDO project appraisals should, in the future, include not only an assessment of a project's viability in itself, but also its viability in a broader macro-economic sense. An estimation and evaluation of linkage effects are to this end important indicators.

3. Given the important relationship that exists between agriculture and industry, and the foreseeable macro-economic situation, it is recommended that in the future new sister industries should be selected within the areas of food processing, agricultural implements and in general utilizing the potential linkages that exist with the agricultural economy.

4. SIDO can assume a much more active role in promoting increased interindustrial linkages, not only of course for the sister-industries but for all industries under the SIDO umbrella. It is recommended that a scheme along the lines of the "TAMCO-project" run by MEIDA should be initiated. SIDO should actively try to identify companies in the country that can establish productive relationships with SIDO associated industries.

5. In order for SIDO to fulfill its task of monitoring and planning small scale industry development it should strengthen the capacity of its Department for Research and Planning. This Department should establish systematic routines for collection and analysis of data pertaining to the performance of SIDO associated industries.

It is proposed that a comprehensive programme is to be developed for organizing and implementing such a scheme. Information could be collected on a yearly basis, using SIDO's regional economists. Final preparation of submitted data would be done at SIDO HQ, where a proper data base is to be established. We believe that without correct and up-to-date company information basic SIDO functions can not be performed.

A Moshi-based Sister Industry. Picture: Charlotte Thege, SIDA Photo Archive

6. Our survey has concluded that many sister-industries are in immediate need of structural adjustment. They have entered a stage where different kind of management related problems have surfaced. A scheme for assisting the companies in this respect should be a high priority of SIDO.

7. It is recommended that proper procedures for recording the allocation and utilization of import support should be established.Such procedures should be worked out in cooperation between SIDO and SIDA DCO.

8. The allocation of import support should be based on a proper analysis of the performance and actual needs of a company. Value added and utilization of foreign exchange should be important criteria used when allocating import support.

9. It is also recommended that an indepth study of the companies ability to save foreign exchange through their production is undertaken. The knowledge thus gained would provide both SIDO and SIDA with an important tool for monitoring the current programme and for future policy formulation.

10. This study has dealt with quantitative indicators of linkage effects only. But the demonstration effects of the SIP has only been descriptively treated. In order to get a full picture of the impact of the SIP, it is recommended that a study is undertaken where the more qualitative impact is analyzed.

APPENDIX 1

Terms of reference

BACKGROUND

The Sister Industry Programme has been in operation in Tanzania since 1977. Its purpose has been the establishment of locally managed small industries, working in close cooperation with Swedish companies producing similar products with a similar technology. The technology transferred to the Tanzanian companies has deliberately been designed as to provide them with every opportunity to reach high productivity levels and international quality standards. The companies are active in various branches, but metalmanufacturing pre-dominate.

One of the principle ideas in the SIP is that industries created should contain a great potential for integration into the national economy and avoid an "enclave" character. Another basic principle is that in the transferring process, a large "software" component is included, i.e. key personnel in the companies receives extensive training for long periods at the "sister" industry in Sweden. The effectiveness of the programme shall therefore be judged against these two basic principles.

The programme has generally been regarded as a success. However, to date no complete evaluation of its performance has been made, except for the "software" component. This part of the programme was subject to an extensive evaluation by Kim Forss in 1985 and presented in his report "Training Abroad". But the "hardware" component still remains to be evaluated, i.e. the appropriateness of the technology used and the selection of products, in terms of socioeconomic linkages and the contribution made to the development of the Tanzanian economy.

Such an evaluation cannot, however, be made at the present moment as there is a substantial lack of information on the companies performance in this regard.

OBJECTIVES

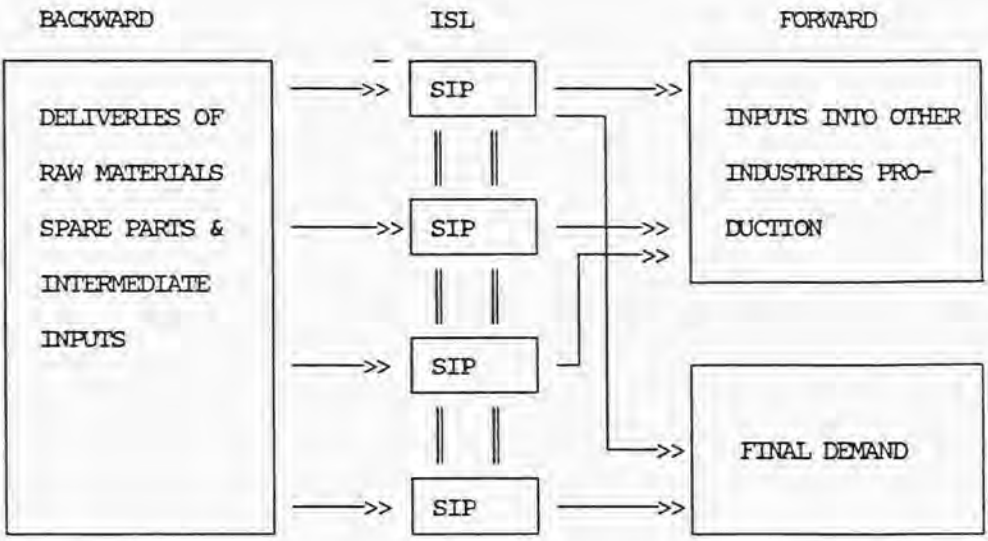
In view of the foregoing, the general objective of this study is to collect empirical data about the companies and investigate into the socio-economic impacts exercised by the SIP-industries, within the manufacturing industry itself, as well as with other sectors of the Tanzanian economy.

PLAN OF ACTION

The study shall contain four separate sections:

• Collection of basic economic and financial data about the companies. The lack of reliable and consistent data about the SIP-companies and their economic and financial situation has seriously impeded any serious analysis of the SIP as such. This proposed study attempts to alleviate this problem by collecting information regarding: initial investment in machinery and infrastructure; employmen ; financial structure; type and level of production; capacity utilization; value added per employee; turnover and profitability; ownership structure. The collection of this information shall be co-ordinated with SIDO, which is presently conducting its own survey of the SIP companies.

• Assessment of the strength and nature of the companies forward and backward linkages. One of the main ambitions of the SIP has been to establish companies with complementary products and closely related production technologies and thus obtain natural possibilities to develop a network of intercompany relations. Not only among the SIP companies themselves, but also with other industries and other economic sectors, for example agriculture. By doing so, the traditional weakness of a traditional import-substituting industry should be avoided, i.e. its tendency to form isolated importgeared enclaves with very small linkages with other parts of the economy.



ISL = Inter SIP - companies backward- and forward linkages

The quantification of these linkages is extremely important from the point of view of assessing the SIP. One can distinguish between forward and backward linkages. Forward linkages can be defined as the effects on employment and production in companies receiving deliveries of inputs from companies lower down the scale in the production process. Backward linkages, on the other hand, are the effects on employment and production in companies delivering inputs to companies higher up in the production process. The figure below illustrates these relationships.

The square Backward contains companies delivering products that are used by the SIP-companies in their production process. The upper square Forward contains companies that purchase products from SIP-companies that are used as inputs in their production. The lower square Forward contains deliveries from SIP-companies that goes to satisfy final demand among consumers. Finally, the column ISL contains purchases and sales of intermediate products among the SIP-companies themselves.

The linkage effects could, of course, be extended further as the non-SIP companies in the squares Backward and Forward probably connects to other companies elsewhere in the economy. This is, however, outside the scope of this study, since the number of companies involved would render it unfeasible to carry on the study this far.

- Analyzing the value added generated in the production of the companies.

Tanzanian industry, like industry in any other African country, is predominated by consumer goods industries, established with import-substitution in mind. The importsubstitution industrialization (ISI) strategy involves four concepts: i) replacing the imports of specific goods by the domestic production of the same goods; ii) channelling consumption away from imported goods towards locally made products; iii) decrease in the import content of domestic manufactures; iv) increase in local value added in industrial production.

Without repeating the extensive international debate on the ISI-strategy, one can simply conclude that the end result, all over Africa, fell short from fulfilling these expectations, particulary, perhaps, with respect to iii) and iv) above.

A change in focus to intermediate goods products were regarded as containing better prospects for internal integration of the economy by creating both backward- and forward linkages, as well as increased local value added production. As the SIP established industries, to the extent possible, was geared towards intermediate goods production, an analysis of their value added is highly warranted.

The definition of value added is well-known. It represents the contributions of labour (through wages and salaries), the services of capital (through interest and depreciation), and of enterprise (through profits). If taxes (through duties and/or

expenditure taxes) are imposed on production, they must be deducted from the value of output since they represent transfers of income from one group to another by the government, for which there is no counter-flow of productive services. Similarly, where subsidies are made available to a firm, they should be included since they depress the price at which the good is sold to a level which is below the full cost of the resources employed in producing it.

However, in an underdeveloped economy the concept contains a weakness in that value added camouflages an important distinction which can be made in the outgoings of a firm. On the one hand, there is that class of payments a firm has to make which are themselves inputs to other sectors of the domestic economy (through local wages and salaries, interest on local loans, dividends to local owners etc.). On the other hand, there are those payments which are to recipients abroad (through technical fees, fees for patents and licenses, profits to foreign owners, salaries to foreign experts etc). This makes it necessary to introduce the concept of domestic value added, which is calculated by summing the relevant types of costs paid locally. This measure represents more adequately an assessment of the contribution which this particular investment is making to the Tanzanian economy.

- Assessment of developmental impact of SIP-companies.

On the basis of material collected under the three headings above analyse and assess the micro and macro performance of the SIP-companies.

ORGANIZATION OF WORK AND TIME SCHEDULE

Data collection shall take place in the industrial estates of Moshi, Arusha, Mbeya and Tanga. The companies in the latter estate has not been established according to the principles guiding the SIP. It has been included in this study for reference purposes as it would be very useful to compare SIP and non-SIP established companies with respect to their effects on the national economy.

The investigation shall take place on two levels: the company level and the estate level. The latter is justified since the industrial estate concept has been regarded as an important tool for promoting industrial development.

As this study involves a fair amount of work with respect to the physical collection of data, it is necessary to employ the services of locally based research assistants. They shall assist during the fieldwork in Tanzania (phase 3) and also collect data at companies, identified during this phase, in the period between phase 3 and 4. The material thus collected will be reviewed during the followup visit to Tanzania (phase 4).

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PERFORMANCE INDICATORS

TABLE 2.1 TOTAL SALES (turnover) [thousands of shilling]

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO		930	1,793	2,609	5,956	4,102	3,525	4,797	6,291	
AGACO						3,340	5,099	5,911	11,877	
AMI			3,700	5,200	3,600	5,400	6,900	6,500	3,400	
C & AI		1,500	4,000	5,000	5,000	5,000	5,500	4,000	3,000	
FAWIPMA				2,678	1,432	1,780	3,122	1,993	2,938	
GIPCO			658	N.A.	4,400	4,100	4,300	5,100	3,000	
KIMESHA	179	670	1,400	1,600	3,300	6,200	4,600	7,600	6,100	
MERU WOOD	178	146	647	476	732	227	2,658	3,826	5,811	
NEM		1,500	3,000	12,000	12,400	36,300	56,300	30,000	56,000	100,000*
SHUMA						9,900	8,800	10,200	9,700	
UHANDISI			623	709	769	576		725	334	
AMOCO						200	600	578	148	
HAMAX									1,700	
KILECTRO					305	1,440	2,690	3,490	3,140	
KISCICO					1,559	2,890	4,011	2,407	518	
MAFOTCO						676	3,727	2,899	1,621	
MOCCO					1,244	613	1,304	526	712	
SIMON EGINEERING						5,000	20,000	60,000	30,000	100,000*
MOTO							1,756	1,840	3,117	
NORRAPAK					1,040	1,300	2,450	3,150	4,950	
TANLOCKS				1,460	960	5,984	6,041	2,369	4,200	
TANOPTIC						2,754	1,802	3,591	5,686	
TECO					1,689	1,999	3,305	5,999	8,608	
HIMA					4,286	3,121	5,422	4,179		
MBEYA CERAMICS									1,500	
MBEYA CLOGS					4,790	6,380	5,771	5,354		
MBEYA PLASTICS					1,218	2,002	1,498	1,696	1,850	
MBEYA WOOD									2,300	
PEMACCO									19,748	
PEMACCO-BEVI										25,000
IMAC								666	5,287	10,173
KODAWA									1,976	

*) estimated

TOTAL SALES (turnover) [thousands of shilling]

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL							550	900	0	0
GALAXY			has never started							
KASA					1,040	2,000	2,640	2,450	2,180	1,620
KODAWA									1,976	
KWEMISHUZE					3,000 (19 months)		1,150	1,470	0	0
MAENDELO NI VITENDO					0	0	0	0	0	0
MAKWILO AUTOGARAGE					n.a.	n.a.	n.a.	not in operation		
SAHARE WOODWORKS					810	1,200	840	650	720	180 (6 month)
SHELLCRAFT			has never started							
TANGAMANO							5,300	5,530	6,200	3,110
CFW, ARUSHA		385	607		818	986	n.a.	1,500	2,154	
CFW, MOSHI							1,307	1,415	1,401	
CFW, MBEYA								2,102	2,390	
CFW, TANGA							906	760	1,056	2,194

TABLE 2.2 CAPACITY UTILIZATION

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO	100%	100%	100%	100%	100%	45%	40%	30%	30%	
AGACO						40%	40%	40%	40%	
AMI			40%	50%	40%	50%	70%	70%	40%	
C & AI		10%	40%	40%	40%	35%	30%	20%	10%	0%
FAWIPMA			40%	40%	40%	40%	40%	40%	40%	
GIFCO			20%	30%	30%	30%	20%	15%	5%	0%
KIMESHA	40%	40%	60%	60%	60%	80%	60%	50%	50%	
MERU WOOD										
NEM		40%	45%	55%	55%	60%	68%	70%	70%	
SHUMA					35%	40%	35%	40%	40%	
UHANDISI			30%	35%	40%	30%	20%	35%	5%	
AMOCO						20%	25%	15%	nil	
HAMAX								25%	30%	
KILECTRO					10%	20%	25%	60%	45%	
KISCICO					11%	18%	25%	15%	7%	
MAFOTCO						37%	38%	20%	13%	
MOCCO					60%	28%	32%	25%	39%	
SIMON EGINEER									30%*	
MOTO							33%	40%	50%	
NORRAPAK					25%	45%	55%	40%	40%	
TANLOCKS				9%	11%	13%	10%	9%	8,8%	
TANOPTIC						30%	30%	29%	29%	
TECO					9%	10%	17%	44%	26%	
HIMA						55%	40%	27%	25%	
MBEYA CERAMICS									40%	
MBEYA CLOGS					67%	67%	42%	25%		
MBEYA PLASTICS					30%	45%	n.a.	34%	39%	
MBEYA WOOD									20%	
PEMACCO										50%
PEMACCO-BEVI										50%
IMAC										60%
KODAWA					Roof sheet				45%	45%

*) estimated

CAPACITY UTILIZATION

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL							75%	110%	0	0
GALAXY			has never started							
KASA					40%	55%	70%	55%	15%	10%
KODAWA									48%	45%
KWEMISHUZE					30%		30%	30%	0	0
MAENDELO NI VITENDO					0	0	0	0	0	0
MAKWILO AUTOGARAGE					n.a.	n.a.	n.a.	not in operation		
SAHARE WOODWORKS					n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
SHELLCRAFT			has never started							
TANGAMANO						60%	60%	60%	55%	50%
CFW, ARUSHA		30%	40%	40%	40%	40%	40%	40%	40%	
CFW, MOSHI							35%	42%	45%	
CFW, MBEYA										
CFW, TANGA					25%	29%	32%	37%	39%	

TABLE 2.3 PROFITABILITY + profit/ - loss (thousand of shilling)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO	>		+ B							
AGACO		(sales - prod cost)			>	+151 B	n.a.	+267	+424	
AMI			>	+ B						
C & AI		>	+ B							
FAWIPMA		>				+ B				
GIFCO			>	+ B						
KIMESHA	> + B									
MERU WOOD	>						+ B			
NEM										
SHUMA										
UHANDISI	>			+ B						
AMOCO						>				
HAMAX								> +	B	
KILELTRO										
KISCICO					>		+400 B	+		
MAFOTCO						>				
MOCCO				>						
SIMON ENGINEER										
MOTO						> + B	+	+	+	
NORRAPAK							+ B			
TANLOCKS				-1790	-1280	+900 B	+300	+300		
TANOPTIC						> + B				
TECO										
HIMA										
MBEYA CERAMICS										
MBEYA CLOGS										
MBEYA PLASTICS										
MBEYA WOOD										
PEMACCO										
PEMACCO-BEVI										
IMAC							>	-89	+644 B	+800
KODAWA										

B = year of reaching break-even
+ = profit
- = loss
> = start of production

APPENDIX 3

PROFITTABILITY (thousands of shilling)

	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL						>+90 B	+140		
GALAXY									
KASA				>					
KODAWA								>	
KWEMISHUZE				> +833	B	+232	+145		
MAENDELO NI VITENDO				>					
MAKWILO AUTOGARAGE				>					
SAHARE WOODWORKS	Fig.unreliable no accounts		(loss all years acc to MD)	> +16 B		+465	+215	+135	+325	Unreliable figures
SHELLCRAFT									
TANGAMANO	Estimation based on (sales - production costs)					> n.a.	n.a.	+3370	+4136	Unreliable figures
CFW, ARUSHA									
CFW, MOSHI						>		+ B	
CFW, MBEYA									
CFW, TANGA				> SIDO		SIDO	+560 B	-1300	-271	

B = year of reaching break-even
+ = profit
- = loss
> = start of production

TABLE 2.4 EMPLOYMENT (total)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO	17	27	49	54					48	41
AGACO						11			11	35
AMI			31	34		39			35	27
C & AI		11		36					31	0
FAWIPMA			6	18		17			17	31
GIPCO			29	33		35			35	20
KIMESHA	5	9	12	18		23			23	35
MERU WOOD	10	9	10	19					18	27
NEM		15	19	28	28	29			59	124
SHUMA						30			30	19
UHANDISI	7	9	7« » 6	7	8	8			8	8
AMOCO						14			7	
HAMAX								10	9	
KILECTRO						12			19	
KISCICO					16				21	16
MAFOTCO						16			31	
MOCCO				80	33				38	
SIMON ENGIN										110
MOTO						21			24	
NORRAPAK					8				13	
TANLOCKS						26			40	
TANOPTIC						19			23	
TECO						9			9	
HIMA						28		25	32	
MBEYA CERAMIC									30	
MBEYA CLOGS					21	26	21	27	22	
MBEYA PLASTIC					30	42	n.a.	15	11	
MBEYA WOOD									37	
PEMACCO						22			24	
PEMACCO-BEVI										45
IMAC										26
KODAWA									20	20

EMPLOYMENT (total)

	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL						22	21	0	0
GALAXY		has never started							
KASA				11	10	10	7	7	7
KODAWA								20	20
KWEMISHUZE					9	9	9	0	0
MAENDELO NI VITENDO				7	0	0	0	0	0
MAKWILO AUTOGARAGE				n.a.	n.a.	n.a.	not in operation		
SAHARE WOODWORKS				30	25	20	15	10	7
SHELLCRAFT		has never started							
TANGAMANO					15	13	13	13	12
CFW, ARUSHA			21						25
CFW, MOSHI						23		22	
CFW, MBEYA								31	
CFW, TANGA				19	19	19	19	19	19

TABLE 2.5 EMPLOYMENT (salaried only)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO	> 5	2		4						6
AGACO					>	4				3
AMI			> 7	8						8
C & AI		> 4		6					7	0
FAWIPMA		>	2	6						9
GIPCO			>	11						10
KIMESHA	>									5
MERU WOOD	> 1	2	4	4						3
NEM		> 4								17
SHUMA					>	4				4
UHANDISI	> 2	4	<->	3						4
AMOCO						> 6			2	
HAMAX								> 3	4	
KILECTRO					>	4			8	
KISCICO					> 6				6	
MAFUTCO						> 2			6	
MOCCO				>	8				8	
SIMON ENGINEER									10	
MOTO						> 12			14	
NORRAPAK					> 3				3	
TANLOCKS				>					10	
TANOPTIC						> 9			9	
TECO										
HIMA				>		7		3	5	
MBEYA CERAMICS									5	
MBEYA CLOGS				>	5	5	5	5	5	
MBEYA PLASTICS				>	18	24		6	6	
MBEYA WOOD									> 5	
PEMACCO				>					16	
PEMACCO-BEVI										> 28
IMAC							>			7
KODAWA									> 3	3

APPENDIX 3

EMPLOYMENT (salaried only)

	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL						> 1	1	0	0
GALAXY									
KASA				> 3	2	2	1	1	1
KODAWA								> 3	3
KWEMISHUZE				>	3	3	3	0	0
MAENDELO NI VITENDO				> 1	0	0	0	0	0
MAKWILO AUTOGARAGE									
SAHARE WOODWORKS				> 4	n.a.	n.a.	n.a.	n.a.	1
SHELLCRAFT									
TANGAMANO					> 1	1	2	2	2
CFW, ARUSHA	>		3						3
CFW, MOSHI						> 6		6	
CFW, MBEYA								5	
CFW, TANGA				> 3	3	3	3	3	3

TABLE 2.6 DOMESTIC MARKET SHARE

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
ACCO	100%		100%			100%			95%	
AGACO	galvanizing services					100%		100%	100%	100%
AMI	valves (not totally correct)		100%	100%	100%	100%	100%	100%	100%	100%
C & AI	detergents	7%		7%			7%		7%	
FAWIPMA			50%		50%			50%	50%	
GIFCO			25%		25%			25%	40%	
KIMESHA	80%		80%			80%			80%	
MERU WOOD	5%		5%			25%			75%	
NEM		100%		100%			100%		90%	
SHUMA					80%		80%		60%	
UHANDISI	50%		50%			50%			50%	
AMOCO						30%		75%	90%	
HAMAX								20%	20%	
KILECTRO									45%	
KISCICO					95%		90%		50%	
MAFOTCO						50%		40%	35%	
MOCO					100%	100%	100%	100%	100%	
SIMON ENGINEER										
MOTO						40%		20%	20%	
NORRAPAK					5%		5%		5%	
TANLOCKS				40%		40%			25%	
TANOPTIC						90%		80%	45%	
TECO										
HIMA								80%		
MBEYA CERAMICS										
MBEYA CLOGS								100%		
MBEYA PLASTICS								95%		
MBEYA WOOD										
PEMACCO										
PEMACCO BEVI										
IMAC										
KODAWA										

DOMESTIC MARKET SHARE

	1979	1980	1981	1982	1983	1984	1985	1986	1987
AKIL	handmade paper					60%	30%	0	0
GALAXY	cardboard boxes, project never started								
KASA	shoe laces			40%&	45%	50%	35%	30%	30%
KODAWA	roof sheets						very small local market		
KWEMISHUZE	pencils				60%	60%	60%	0	0
MAENDELO NI VITENDO	narrow tapes for zippers			0	0	0	0	0	0
MAKWILO AUTOGARAGE									
SAHARE WOODWORKS	furniture			very small, local market					
SHELLCRAFT	tin containers, project never started								
TANGAMANO	grey sheeting				5%	5%	5%	5%	
CFW, ARUSHA	20%		30%			30%		30%	figures not reliable
CFW, MOSHI						small			
CFW, MBEYA									
CFW, TANGA				very small					

TABLE 2.7 TOTAL PROJECT COST (thousand of SEK)

	Foreign		Total		
	Hardware	Software	foreign	Local (Shs)	TOTAL
ACCO	5,102	1,577	6,679		
AGACO	4,074	1,171	5,245		
AMI	7,555	3,292	10,847		
C & AI	1,293	473	1,766		
FAWIPA	1,438	1,052	2,490		
GIPCO	5,190	1,354	6,544		
KIMESHA	436	338	774		
MERU WOOD	695	295	990		
NEM	2,876	1,592	4,468		
SHUMA	4,396	795	5,191		
UHANDISI	892	610	1,502		
Arusha Ind. Est.	33,947	12,549	46,496		
AMOCO	1,360	556	1,916		
HAMAX	2,141	1,144	3,285		
KILECTRO	5,617	1,276	6,893		
KISCICO	3,337	1,775	5,112		
MAFUTCO	8,347	4,282	12,629		
MOCCO	288	498	786		
SIMON ENGINEER	n.a.				
MOTO	3,191	1,715	4,906		
NORRAPAK	2,148	1,259	3,407		
TANLOCKS	4,622	2,788	7,410		
TANOPTIC	4,322	2,570	6,892		
TECO	4,286	1,417	5,703		
Moshi Ind. Est.	39,659	19,280	58,939		
HIMA	2,954	1,070	4,024		
MBEYA CERAMICS	5,312	1,888	7,200		
MBEYA CLOGS	1,360	1,144	2,504		
MBEYA PLASTICS	2,640	950	3,590		
MBEYA WOOD	5,344	2,193	7,537		
PEMACCO	1,378	1,752	3,130		
Mbeya Ind. Est.	18.988	8,997	27,985		
PEMACCO-BEVI	n.a.				
IMAC	7,243	8,145	15,388		
KODAWA	2,115*	418*	2,533*		

*) See also next page "Tanga"

TOTAL PROJECT COST (thousand of SEK)

	Foreign Hardware	Software	Total foreign	Local (SEK)	TOTAL
AKIL	263	nil	263	1,107	1,370
GALAXY	498		498	715	1,213
KASA	193		193	421	614
KODAWA	2,115	418	2,533	643	3,176
KWEMISHUZE	1,172		1,172	358	1,530
MAENDELO NI VITENDO	379		379	358	737
MAKWILO AUTOGARAGE	1,083	179	1,262	491	1,753
SAHARE WOODWORKS	103		103	358	461
SHELLCRAFT	811		811	358	1,169
TANGAMANO	1,094		1,094	698	1,792
Tanga Ind. Est.	7,711	597	8,308	5,507	13,845
CFW, ARUSHA	2,264	1,341	3,605		
CFW, MOSHI	1,530[1)]	282	1,812[1)]		
CFW, MBEYA	4,088	179	4,267		
CFW, TANGA	48[1)]		48[1)]	562	

Exchange rates: 1 US $ = 6,2 SEK = 62 Shs (July 1987)
100 Shs = 80 SEK (1982-83)

All local costs in Tanga are calculated for exchange rate 1982-83, except additional investment (1,378,000 Shs) in Kodawa in 1986, the exchange rate 100 Shs = 20 SEK has been used.

1) These figures for the Common Facility Workshops do only include that part of the investment which was financed by Swedish foreign aid.

TABLE 2.8 SHARE CAPITAL and amount paid in (Shs)

	Share capital (Shs)	Amount paid in	No. of share holders	% of share of majority owner	Start of prod.	Total hardware investm. in SEK	Share cap in % of hardware investm.	Paid in hardware
ACCO					May 78	5,102		
AGACO					Dec 82	4,074		
AMI			SIDO		Apr 80	7,555		
C & AI	5,000,000	4%	5	40%	Apr 79	1,293	38,7%	1,5%
FAWIPMA					Nov 79	1,438		
GIFCO	6,000,000		6	equal	May 80	5,190	11,6%	
KIMESHA					June 78	436		
MERU WOOD			4		Febr 78	695		
NEM					March 79	2,876		
SHUMA			DDC		May 82	4,396		
UHANDISI	2,500	100%	10	cooperative	June 78	892	0,03%	0,03%
AMOCO			5		June 83	1,360		
HAMAX			25%SIDO		Jan 85	2,141		
KILECTRO			5		July 82	5,617		
KISCICO	450,000	n.a.	3	equal	Febr 82	3,337	1,3%	
MAFOTCO	1,000,000	43%	7	8,5%	July 83	8,347	1,2%	0,5%
MOCCO					May 81	288		
SIMON ENGI					1983	n.a.		
MOTO					May 83	3,191		
NORRAPAK					July 82	2,148		
TANLOCKS	3,000,000	3%	8	equal	July 81	4,622	6,5%	0,2%
TANOPTIC					Jan 83	4,322		
TECO					Apr 82	4,286		
HIMA			6		Oct 81	2,954		
MBEYA CERAMICS			SIDO		June 85	5,312		
MBEYA CLOGS			3		Oct 81	1,360		
MBEYA PLASTICS					July 81	2,640		
MBEYA WOOD			6		Oct 86	5,344		
PEMACCO					Apr 81	1,378		
PEMACCO-BEVI			joint venture		Jan 87	n.a.		
IMAC			SIDO		Oct 84	7,243		
KODAWA	see next page							

SHARE CAPITAL and amount paid in (Shs)

	Share capital (Shs)	Amount paid in	No. of share holders	% of share of majority owner	Start of prod.	Total hardware investm. in SEK	Share cap in % of hardware investm.	Paid in hardware
AKIL			5	96%	Febr	263		
GALAXY	not started yet					498		
KASA			3		1982	193		
KODAWA			3	family owned	June 86	2,145		
KWEMISHUZE			8	equal	June 82	1,172		
MAENDELO NI VITENDO	trial production only			cooperative	1982	379		
MAKWILO AUTOGARAGE			n.a.			1,083		
SAHARE WOODWORKS	15,000		9	90%	June 82	103	1,5%	1,5%
SHELLCRAFT	not started yet		n.a.			811		
TANGAMANO			5		Sept 82	1,094		
CFW, ARUSHA			SIDO		1979			
CFW, MOSHI			SIDO		1984			
CFW, MBEYA			SIDO		1981			
CFW, TANGA			SIDO		1984			

Exchange rate = 1 SEK = 10 Shs (July 1987)

APPENDIX 4

Composition of linkages

Below follows an account of the nature of input/output patterns for each company in the four estates. These patterns are presented in a diagrammatic form with an accompanying text. In the figures the following abbreviations were used:

TI – Total inputs of raw materials and intermediates.
LRM – Raw materials purchased locally.
IRM – Imported raw materials.
LI – Supplies of intermediate inputs bought locally.
II – Imported intermediate inputs.
TS – Total sales
WhS – Wholesale
FD – Final demand
Rt – Retail
IE – Input to estate companies
INE – Input to nonestate companies

The percentage figure above the bars for LRM and LI indicates their share of total procurements of raw materials and intermediates respectively. It should be noted that if these purchases are less than 1% of total procurements they have not been recorded.

PROCUREMENT AND SALES PATTERNS IN THE ARUSHA ESTATE

Meru Wood

The company has almost totally relied on domestic suppliers of raw materials, primarily wood for the production of doors, rulers etc., from 121 000 Tsh in 1979 to 2 172 000 Tsh in 1986. Wood is bought from various farmers in western Kilimanjaro. Spare parts are bought from various small shops in Arusha, to the

KIMESHA

Between the years 1980 and 1985 this company substantially increased its purchases of raw materials from Aluminium Africa in DSM. The value was 227 000 Tsh in 1980 and 1.8 million Tsh in 1985. Local raw materials thus accounted for, on average, 91% between 1980 and 1986.

Also the procurement of intermediates, from Henkiel in DSM, increased rapidly after the first year of production. So did purchases of spare parts from the CFW within the estate.

The forward linkages of KIMESHA are primarily directed to RTC's in Moshi and Arusha (50%), different other wholesalers (30%), and government institutions (20%). This pattern has remained very stable over time.

ACCO

This company does not record any local purchases of raw materials, intermediates or spare parts. ACCO's deliveries of cutlery goes to three categories of customers: HOSCO (taking on average 80% of total sales 1978 1986); Hotels (12%) and; Schools (8%). These outlets ensures ACCO of a nationwide market.

SHUMA

SHUMA does not buy any local raw materials locally. However, procurement of intermediates has increased over time. Mainly spare parts from the CFW and various small shops in Arusha. The value has more than doubled between 1984 and 1986. Parts of SHUMA's output has been categorized as going straight to "final demand". RTC's in Tanzania took 70% of total sales in 1982, rising to 80% in 1986. Between 50-20% of its output can be considered as a forward linkage. Around 10-20% going to building contractors in Arusha. The remainder being sold to different government institutions.

AGACO

The National Steel Corporation has, since the first year of production in 1982, supplied intermediates to values varying between 227 000 Tsh and 452 000 Tsh. Representing 53% of total intermediate input purchases in 1985 and 74% in 1986. No local raw materials or spare parts were bought locally. AGACO's production enters the market for final consumption galvanized products supplied to TANESCO, Tanzania Post and Tele-communications (TPTC) and general contractors like JANDU , or, subcontracting activities galvanizing nails for SHUMA. The proportion of output being classified as "inputs into other companies production process" has diminished between 1983 and 1986. The share being 30% and 13% respectively. By far the most important customers are TANESCO and TPTC, on average they buy between 70-80% of total sales.

CFW

The CFW records no local backward linkages. This is in itself utterly surprising. In the comparable cases of Moshi, Mbeya and Tanga purchases of spares, fuels, lubricants etc certainly takes place. But the management of the CFW was, in spite of this, quite adamant on this point. Its forward linkages was during the first years of production mostly directed to customers outside the estate. But from 1984 customers within the estate began to assume some importance. So for example, in 1986 1%3 of its total sales of 2.2 million Tsh went to estate customers.

PROCUREMENT AND SALES PATTERNS IN THE MOSHI ESTATE

TANLOCKS

This company records no local backward linkages, except of course electricity and water. Its linkages extend almost completely to foreign suppliers for raw materials like: lock parts, brass profiles, drill bits, cutters, hand tools, sand belts and lubricating oil. There has been no change in this pattern since start of production in 1981. TANLOCKS sales are either directly to various local building constructors or wholesalers like the RTC's and BHESCO.

HAMAX

The company started production in 1985, which makes it impossible to measure any changes in linkage patterns. The forward linkage pattern is basically the same as for TANLOCKS. Backwards it integrates with local suppliers of grinding material, varnish and different consumables. However, major raw materials are supplied by the senior sister company GAB GENSE. They consist of semifinished hammers and axes, consumables and machine spare parts.

KISCICO

A producer of scissors and surgical instruments, its major customers are wholesale units like HOSCO, RTC, TPTC and to a final consumer Central Medical Stores. Locally bought inputs consisted mainly of miscellaneous spares, fuel and lubricating oils, which where bought from different general merchants and petrol stations in and around Moshi and Arusha. Their share of total intermediate inputs varying between 26 and 42% between 1982 and 1986.

Necessary raw materials such as stainless and carbon steel, grinding and polishing material, hand tools and spares were supplied by GAB GENSE in Sweden. This linkage pattern was very stable between 1982-86.

MAFOTCO

By forging pieces of knives, scissors, spanners coffee shears, lockers and hammers, MAFOTCO integrates forward quite strongly with other companies in the

estate. Backwards the company procures fuel and lubricants locally from AGIP, spare parts and consumables from various small retailers in the neighbouring area as well as from DSM. The share of local intermediates varying between 24 and 61% between 1983 and 1986. For its major raw materials it relies on foreign supplies: boron steel (for plough shears), alloy tool steel, spare parts and consumables. GAB GENSE is the sole supplier.

MOTO

The production of coffee shears, cutting shears, screw drivers etc. is distributed through either wholesalers in the usual fashion, or straight to different retailers. The distribution is nationwide. Local raw materials was used to some extent. UHANDISI supplied coffee pruner and side cutter rivets during the first year of production in 1983/84. In 1985 and 1986 Kilimanjaro RTC supplied pipes for manufacturing of spark plug spanners. In 1986 the share of locally procured raw materials had risen to 16%.

In the category intermediate inputs, grinding wheels, polishing buffs and wax were bought locally. However, not from AMOCO. The local share of intermediates accounted for 54% of total intermediate purchases in 1986. Imported raw materials, by far the most important, consisted in the early years of primarily carbon steel. Later, spring wire and magnesium chloride for the manufacture of wet grinding stones were bought from GAB GENSE. The same company also supplied essential inputs such as tools, drilling fixtures, trimming and forging tools. GENSE also supplied some machine spare parts.

NORRAPAK

The production of cardboard boxes and printing blocks was sold to various customers locally and in DSM and Zanzibar. The forward linkages must be characterized as being inputs into other companies production processes. Backward integration when it comes to raw materials has increased over the years since 1982. The share of local raw materials and intermediates have consequently risen over time as the figure shows.

Locally paper board was bought in increasing quantities from Pulp & Paper Mills Ltd in Moshi, 5 tons in 1984 and 15.25 tons in 1986. Similarly, printing ink was bought from Printpak Ltd in DSM, 70 kg and 200 kg in 1984 and 1986 respectively. Henkiel Chemicals Ltd supplied glue from DSM, 80 kg and 200 kg in 1984 and 1986. Among intermediates, BP (Tz) Ltd supplied lubricants from Moshi. The reverse trend was noticeable with respect to imports. GAFS Kartong AB supplied less quantities of paperboard over time and in 1986 only quality paper for special packages, not available in Tanzania. Printing ink continued to be imported, the reason being the local suppliers lack of raw materials. In the case of glue, it also

had to be imported as the local variant did not meet specifications and too often was of low quality. Intermediate inputs of an essential character, needed for the block making unit to be operational, photographic plates, graphic films and chemicals had to be imported from Grafiska AB in Sweden. Also machine spare parts had to be imported.

MOCCO

This cutlery operation is the only one which exports its products through an arrangement with GAB GENSE. In fact the major part of its production of knife blades went to Sweden, only smaller quantities reached the local market. Local backward linkages were very weak negligible amounts of wooden handles for locally sold knife blades. Instead MOCCO is completely dependent on the imports of raw materials stainless steel rods, intermediates grinding and polishing materials (although some quantities were bought from AMOCO), and machinery spare parts. GAB GENSE was the sole supplier.

AMOCO

The forward linkages of this company is characterized as inputs into the production process of other companies. Polishing buffs and compound were sold within the estate to ACCO and MOCCO. Outside the estate to TAMECO and MPL in DSM. In the first year of production nothing in the form of raw materials, intermediates were bought locally. Cotton and sisal cloth, chemicals for polishing compound were imported, as well as threads and lubricants. However, in 1985 cotton and sisal cloth was to a large extent procured from local sources as was nails. Supplier were Kilosa Carpets C:o and Usafiki Textiles Mill in DSM for cloth and the Arusha estate for nails. Only chemicals and threads as well as some machine spares were imported. In 1986 the proportion of local purchases was significantly reduced due to a very large procurement of chemicals for polishing compound.

KILECTRO

Production started in 1982 and consisted of zinc, nickel and chromium plating services for companies within and outside the estate. The direct forward linkage effect is therefore very high. Most of its production, between 7397%, was deliveries within the estate to MOTO, TANLOCKS, TECO and AMI. The main customer outside the estate was PAL in Dar es Salaam, for whom KILECTRO plated stoppers.

KILECTRO has shown a healthy trend with respect to local purchases. From being completely dependent on imported raw materials it has now managed to procure about 1/4 of its needs from the National Steel Corporation (mild steel rounds). Still, however, it depends on imports from Sweden for essential raw

materials like zinc and nickel. The Swedish supplier, IMASA, also supplies KILECTRO's total need of intermediate inputs as well as spare parts.

TANOPTIC

Production of optical spheric single vision lenses started in 1982. The customers were opticians and medical units in the MoshiArusha region and DSM. Local backward linkages can simply be described as being non-existent. Through Optileks AB, Sweden it imported its raw materials optical lenses, and intermediates such as lubricating oil and polishing rugs and various machine spares. This pattern remained very stable over time.

TECO

This production of shoe eyelets, battery caps and bottom discs, mosquito coil stands, started in 1982. As with KILECTRO, the direct forward linkage effect is very high. Its main customers are: Tanzania Shoe C:o, Annanda Footwear, Morogoro Leather Goods, Arusha Boot House, Matsushita Electrical C:o, Nyanza Shoe C:o and Mosquito Coil C:o.

The development of its backward linkages has been healthy. From the outset it was basically completely dependent on imports, it has begun to diversify. In 1986 8% of its raw material needs were procured locally (steel flat washers). Around 88% of its intermediate needs were also procured locally (fuel, lubricants, tools and spare parts).

CFW MOSHI

Production consisted of different service jobs, repairs and production of machine spares, jigs and fixtures, water storage tanks, wheel barrows and animal traps. Customers were located in the estate as well as outside it: Tanga Industrial Corporation, Tanzania Breweries, coffee estates and garages. Substantial amounts of raw materials were bought locally: mild steel sheets, plates, equal angles, black pipes, hollow sectionals and round bars. Local suppliers were National Steel Corporation and PIPECO in DSM. Machine oils were bought from BP (Tz) in Moshi. These developments have meant that the share of locally bought raw materials of total raw material procurements has increased between 1984 and 1986 from 54 to 57%. A similar trend is clear also for local intermediate inputs, increasing its share from 9 to 17% during the same period.

Imports consisted of various tool steel materials, brass bars and hard plastic round bars, i.e. materials not available in Tanzania. Among intermediates tools, welding electrodes, grinding and cutting wheels and different finishing materials were also imported.

PROCUREMENT AND SALES PATTERNS IN THE MBEYA ESTATE

HIMA

In the original design of this company the knitted garments were to be based on imported dyed acrylic yarn. This choice was determined by technological reasons and the nature of demand. During the last years import restrictions have made it very difficult for HIMA to procure needed materials. Attempts to switch to dyed cotton yarn have been discussed, but supply problems within Tanzania have been difficult to overcome. M/S Sunflag in Arusha is the only producer of dyed cotton yarn in the country, but has not been in a position to supply HIMA due to a lack of chemicals.In order to keep production going in spite of this, the company has successfully developed new products, and orders for stitching of uniforms from undyed cotton yarn have been received.

Forward linkages are simple enough, the garments are sold either straight to the final customer, or via wholesalers where RTC is the most important.

MBEYA CLOGS

Most of the raw materials needed for clogs production are available in the country. Leather is supplied from Morogoro and Moshi tanneries and wood from local saw mills around Mbeya. Up to 1984 the soles were also imported, but thereafter supplied from Mbeya Plastics. Most of the intermediate inputs are imported glue, staples, thinner, thread and paint.

As in the case of HIMA the products are distributed through either wholesalers or supplied straight to the final user.

PEMACCO

Repairs of and production of electric motors have been treated as an input by us. Consequently, PEMACCO shows very strong forward linkages.

MBEYA PLASTICS

This company suffered, like HIMA, from a not very appropriate product mix toys and a given excessive reliance on imported raw materials.

Attempts have been made to switch to more appropriate products household utensils, but the dependence on imported raw materials will continue. Backward linkages nevertheless exist, for example, some small metal parts for the toys are now being manufactured by the CFW.

Needless to say, forward linkages are nonexistent as the products are distributed through wholesalers like Elimu Supplies, RTC, and Biashara Consumer Services.

MBEYA WOODS

This newly created company produces furniture from locally available soft wood. Plywood is also available locally. TWICO saw mill in Mbeya is the major suppliers. Some inputs like glue, varnish, sandpaper etc. has to be imported. But wire nails are obtained from various local suppliers Tanzania Wire Products in DSM, Mbeya Machine Parts, Desai Mbeya Wire Nails.

At the present moment Mbeya Woods production of furniture accounts for the smallest share of total output value. By far the largest product during its first year of production has been cases for Pepsi-Cola bottles. This should be regarded as an input and consequently give Woods a substantial forward linkage.

MBEYA CERAMICS

The production of table wares and tiles utilizes a substantial amount of local raw materials ball clay, quartz, feldspar, dolomite, volcanic rock and kaolin. Small amounts of intermediate, albeit quite important, products are imported nabo frit, colour oxide, gypsum, pot press oil etc. No forward linkages can be recorded as the products satisfy final demand only.

CFW MBEYA

Local suppliers of raw materials and intermediates are utilized, even if the trend is somewhat declining. Malm Montagekonsult (Tz) welding equipment, grinding material), Tanzania Oxygen Ltd., M/S Kwimba Auto Spares (DSM) Ltd., Zana Za Kilimo steel rods and shafts, Green Beach Ltd. iron flats and bars, Steel Rolling Mills Ltd. (Tanga) mild steel round bars, angles, flats), National Steel Corp. Ltd (DSM) tool steel, ordinary steel plates, bars, MEIDA hand tools.

The output of the CFW should be classified as inputs into other companies production in the form of tools, machine repairs etc.

IMAC

IMAC's raw material needs are satisfied through imports. However, some intermediate products are obtained locally, mainly oxygen gas, electrical and mechanical material, chemicals. Roughly half of its total procurement of intermediates is satisfied in this way.

Being a maintenance company IMAC shows very strong forward linkages through repairs of machines and the manufacture of different spare parts.

PROCUREMENT AND SALES PATTERNS IN THE TANGA ESTATE

KWEMISHUZA

The company started production of black lead pencils in 1982. Its forward linkages are negligible as the products are sold straight to the final consumers. The main customer being Tanzania Elimu Supplies.

Its major raw material needs are satisfied on the local market. Black lead, binding glue and slats are bought from AFINA in Dar es Salaam.

KASA

The sole product is shoe laces, which started in 1982. In the beginning it delivered only to Tanzania Prisons. But in 1986, it began to supply Bora Shoe C:o. The latter should be regarded as a direct forward linkage, accounting for 40% of total sales value. Its backward linkages are quite strong. Cotton yarn is bought from Commercial Ind. C:o in Tanga, acetone from AISCO Ltd. also in Tanga, while SIDO in Dar es Salaam supplies colouring agents. Intermediate inputs are procured locally to a large extent and consists of fuel and lubricants.

AKIL

Production of handmade paper board has been going on since 1985. It supplies Sumata, J.V. Group and Tanzania Shoe C:o with paper board. Consequently, it has a high forward integration. During its first year of operation most of its raw material needs were imported (china clay, bleaching powder, acids). Paper waste was bought from local printers in Tanga.

TANGAMANO

This company was quite difficult to extract reliable information from. But at least a rough pattern can be distinguished. Tangamano Textiles produces grey sheeting, which started in 1982. Its forward linkage effect is nil, as its products are sold mainly to various RTC's. In contrast, integration backwards is much stronger. All its supplies of cotton yarn is obtained from Urafiki Textiles in Dar es Salaam and Coastal Textiles Ltd. in Iringa. Spare part and fuel and lubricants are likewise obtained locally.

SAHARE WOODWORKS

Sahare produces office and household furniture. Production started in 1982. Its linkage pattern is straight forward. Wood is the major raw material and is of course available locally. Intermediates like glue and nails are also available locally. There is

no forward integration as the furniture is sold directly to the final consumer. It should be said that this company also kept totally inadequate records and its figures should be interpreted cautiously.

KODAWA

Kodawa has been in operation for about one year. It is producing sisal fibre roofing sheets for house construction. The linkage pattern, after only one year's production, is not very representative. Basically KODAWA only needs to import acacil, for strengthening and preserving the sisal fibres. All other items are available locally. The backward linkage pattern in the diagram is not representative as it includes one quite large import of acacil. This supply should cover more than one years production. Classification of its forward integration is not easy as its production is sold to private houseowners and construction companies. Only the latter qualifies as a forward linkage and according to our information it would represent 17% of total sales.

CFW TANGA

The CFW has been in operation since 1984 as a spares/machining workshop. The activities have been quite diverse, but a major product seems to have been spares for the MUTEX textile mill in Musoma and Commercial Ind. C:o in Tanga. In 1985 it also produced wheel barrows and sack barrows which was sold to RTC and AISCO. Thus, over the period the CFW have accomplished a substantial forward linkage. The unit also integrates favourably backwards. Mild steel shafts, angle iron etc were bought from Tanga Steel Rolling Mill. Other retailers in the Tanga area supplied intermediates as for example welding rods, lubricants etc.

"SECONDARY" INDUSTRIES

AMBONI PLASTIC LIMITED - Tanga

This is a private company established in 1969 for manufacturing plastic crates for the beer and soft drink industries in the country under the patent of Alexander Schoeller Company Limited of Switzerland. The company started production in September 1970. The shareholders are: Amboni Ltd 60 %, WSchoeller International 15 % and Tanganyika Development Finance Co. TDFL 15 %.

The major products are as follows:

Industrial plastic containers, blow moulded and injection moulded with capacity ranging from 1 to 20 litres, plastic bottle crates for various beverages.

The major customers for this firm are local industries: the brewery; vegetable oil companies; pharmaceuticals and household cleaners; paint factories; chemical

factories; food processing firms; liquid detergent factories and lubricating oil companies.

Most of the raw materials come from Europe, while 90 % of intermediate inputs are of local origin, and 10 % imported from Europe. 80 % of the spare parts have their origin in Europe, and the balance of 20 % are obtained locally.

It has not been possible to get the production costs of the company, since the management flatly refused to disclose this data. But the TDFL 1986 (24th) Annual Report and Accounts reveals the trading results for the year ended June 1986 that the company realised an after tax profit of Shs 4.853 million and declared a divided of 80 % of the paid up share capital, and that it is generally operating profitably.

COMMERCIAL & INDUSTRIAL COMBINE - Tanga

CIC was established in 1962 and started the production of garments the same year. Other textiles materials came on stream in 1982. In the same year that KASA a smallscale firm within the Tanga SIDO Industrial Estate started buying cotton yarn from CTC for their production of shoelaces.

Like Amboni Plastics Limited, CIC is a private concern with five shareholders. The main product lines are textiles and garments. The major customers include appointed dealers in Dar es Salaam, Mwanza, Tanga and Arusha.

Regarding raw materials sources the trend since 1977 through 1986 has been as follows: 1977 – 4 % local and 96 % imported; 1979 – 33 % local and 67 % imported; 1982 – 74 % local and 26 % imported; 1986 – 70 % local and 30% imported. So up to 1982 as imports became difficult to buy, the tendency has been to try as much as possible to buy from local sources.

Sources of intermediate inputs have mainly been local, while machinery spare parts are to a large extent imported.

Furthermore, trade liberalization has led to increased imports of cloth, which has certainly affected the company. The imported clothes have been of superior quality in both texture and tailoring, not to mention the very competitive prices.

JeJe INDUSTRIES Ltd. – Dar es Salaam

JeJe Industries Ltd is a private company based in Dar es Salaam. There are three shareholders with equal shares in the company. Production started in August 1978 producing the following: nail wires, square-twisted wire, mild-steel washers, wire nails, roofing nails, barbed wire and chain-link. These product find an easy local market and to date no export has been made.

The major sources of raw materials are from overseas, while the bulk of the intermediate inputs have their sources locally. As for machinery spare parts there is a fair division between local and foreign sources.

GREEN BEACH COMPANY Ltd. – Dar es Salaam

Green Beach Company Ltd is a private company located in Dar es Salaam, established on 13th July, 1984 and started production a month later on 31st August, 1984.

The shares of this company are divided among three shareholders as follows: Salum Manyanga 60 %, Consolate Manyanga 20 % and Charles Mburuma 20 %.

The company manufactures furniture and grilles. The main customers are the general public, parastatal institutions, private organizations and government ministries.

Two main raw materials are steel rods and timber. Steel rods are secured from Steel Rolling Mills. Tanga, while timber is from Tabora, Ifakara, etc. Intermediate inputs are readily available from retailers in Dar es Salaam. Regarding spare parts procurements has been insignificant. Production started only a couple of years ago and no major breakdowns have occurred. Thus,only some minor spare parts have been bought from retailers locally.

HEINKEL CHEMICALS Ltd. – Dar es Salaam

Heinkel Chemicals Limited is a private company established on 15th July, 1969 in Dar es Salaam. Production started in 1970. The company manufactures glues, detergents and disinfectants, textile and leather auxiliaries.

Major customers have mainly been the Tanzania Cigarette Company, Tanzania Shoe Company and the Tanzania Breweries. There are various other small buyers.

Most of the raw materials for manufacturing Heinkel products are imported. As for the intermediate inputs there is a fair division between local and imported items. Machinery spare parts are mostly imported.

Generally, the company faired well and provides a substantial amount of direct forward linkages, especially intermediate inputs. The backward linkages are generally poor as most inputs are imported.

PRINTPAK Tanzania Ltd. – Dar es Salaam

Printpak Tanzania Ltd is a parastatal, a stateowned concern. It was established on 1st August, 1977 and started production in October 1977. The main products produced are weboffset inks, sheet feed offset inks, dlexographic inks and duplicating inks.

The main customers are Printpak itself, Tanzania Litho Arusha, Kibo Paper Industries Dar es Salaam, Kibo March Corporation of Moshi, NFC of Dar es Salaam and MIFUKO Ltd.

The main raw materials are imported as follows: white lived chipboard from Vrg Papier Reeds International; sack kraft paper Elof Hansson Vrg Papier; fluting paper

Thoresen & Co, Elof Hansson; pulp (unbleached) Thoresen & Co, Elof Hansson Firm; food board Thoresen & Co; wood for writing Thoresen & Co, Elof Hansson; label paper Elof Hansson; white sack kraft Elof Hansson; poly coated sack 1300 mm Vrg Papier, 1076 mm Vrg Papier, Eckman S.A.T. board 240 gm/m2 Fritzwco, 250 gm/m2 Bremen. Machinery spare parts come mostly from Cox Machines of UK.

FRIENDSHIP TEXTILE MILLS Ltd.

Friendship Textile Mills is a stateowned parastatal company, and was established on 9th April, 1966. Production started in July 1968 mainly producing cotton yarn and cotton fabrics.

The main customers for the company's products have been Regional Trading Companies, government institutions and ministries, private companies and individuals.

Regarding raw materials the sources have mainly been local cotton. Intermediate and other inputs, viz: dyes, chemicals and packing materials are mainly imported. As for machinery and spare parts a substantial amount is imported, while a small amount is purchased locally.

KIBO PAPER INDUSTRIES Ltd.

This company started as a private company in 1965 and went into voluntary liquidation in 1969. In 1970 it was acquired by the National Development Corporation, and thus it become a national parastatal. By that time it had an accumulated loss of Shs 3.035 million. In 1971 NDC commissioned M/S Packages Ltd of Pakistan as managing agents. In 1979 it was transferred from NDC to Tanzania Karatasi Associated Industries TKAI.

The major products are corrugated paper boxes, packaging materials (inner cartons and tea sachets) labels including packets for cigarettes and gum tapes.

The main customers are thus the following: Tanzania Cement Companies, Tanzania Blenders tea sachets, animal feeds companies and Tanzania Food Corporation.

Sources of raw materials are the Southern Paper Mill (SPM) Internal Paper Mill and Kibo Match Corporation. SPM supplies sackkraft for production of multi-wall bags for cement, animal feeds, etc. Internal Paper Mill supplies craftliner and cutting medium for sackcraft paper, while Kibo Match Corporation supplies materials for manufacturing packaging materials. Some craftliner and cutting medium for boxes are imported. 30 % of the pulp is imported, and 70 % of waste paper.

NATIONAL STEEL CORPORATION

The company was incorporated on 4th October 1966 as a state parastatal. The

TABLE 4:2. DIRECT BACKWARD AND FORWARD LINKAGE RATIOS, ESTATE LEVEL

1:st year of production and 1986

	DBL unw 1:st	DBL unw 1986	DFL unw 1:st	DFL unw 1986	DBL w 1:st	DBL w 1986	DFL w 1:st	DFL w 1986
avg Aru.	0.1163	0.1691	0.2407	0.2345	0.0345	0.1753	0.2649	0.1924
avg Mosh.	0.0665	0.1064	0.6593	0.6658	0.0395	0.0558	0.3724	0.4056
avg Mbey.	0.0451	0.2694	0.4000	0.3786	0.1009	0.1612	0.9346	0.2355
avg SIP	0.0826	0.1600	0.4600	0.4517	0.0465	0.1225	0.4955	0.3215
avg Tanga	0.4898	0.3277	0.2917	0.2944	0.5102	0.3961	0.1493	0.3362
std Aru.	0.1992	0.2023	0.3312	0.3302	0.0443	0.2794	0.4567	0.5136
std Mosh.	0.1109	0.0934	0.4668	0.4708	0.0600	0.0622	0.3010	0.3008
std Mbey.	0.0590	0.2407	0.4899	0.4503	0.1600	0.1750	1.4452	0.4284
std SIP	0.1535	0.1871	0.4621	0.4590	0.0809	0.2051	0.7352	0.4284
std Tanga	0.3855	0.1445	0.4187	0.3803	0.5019	0.1569	0.2128	0.3719

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SISTERHOOD ON TRAIL

The performance of the companies involved in the SIDA supported Sister Industries Programme in Tanzania was mixed: while some companies were well off, others had severe production problems and were in need of immediate restructuring.

The evaluation suggests a new strategy for active intervention in the industries by the Tanzanian co-ordinating body, SIDO, which needs to play a more active role in the process.

These are some of the findings of this evaluation, done by the FIDE-consultants Jerker Carlsson, Sverker Alänge, Kim Forss, Serve Malai and Sari Scheinberg.

Sweden's bilateral development co-operation, handled by SIDA since 1965, comprises 17 programme countries: Angola, Bangladesh, Botswana, Cape Verde, Ethiopia, Guinea-Bissau, India, Kenya, Laos, Lesotho, Mozambique, Nicaragua, Sri Lanka, Tanzania, Vietnam, Zambia and Zimbabwe.

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ISBN 91-586-7103-X
ISSN 0283-0736

SWEDISH INTERNATIONAL DEVELOPMENT AUTHORITY