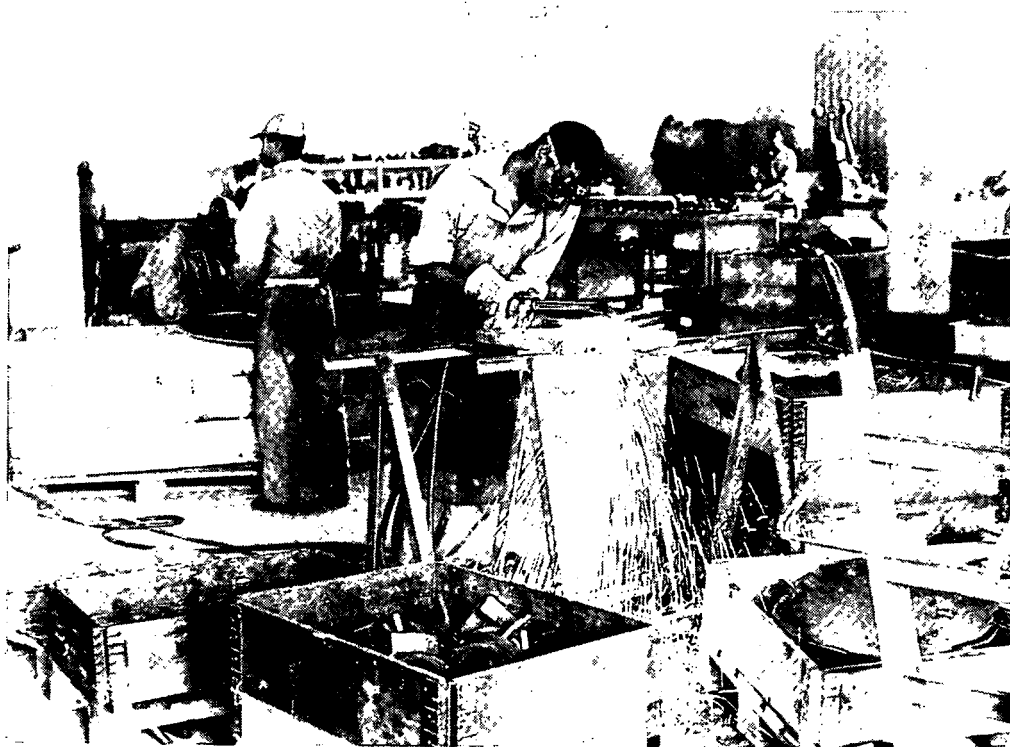


# **The Development of Competence in Three Industrial Rehabilitation Projects in Mozambique**

by  
**Clay Norrbin, Börje Wallberg,  
Lennart Wohlgemuth**



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## **SUMMARY AND RECOMMENDATIONS**

### **Background**

Since 1983 SIDA has supported a program for industrial rehabilitation in Mozambique. The main objective of the program is to create economically and financially viable companies run by local management and staff.

Three state-owned companies are at present being rehabilitated under this program. They are Agro Alfa (farm implements), Electromoc (installation, service and repairs of electrical machines) and Ermoto (service and repairs of combustion engines including total renovations). The rehabilitation program consists of improvements with regard to hardware (buildings, equipment, spare parts and raw materials) as well as software. The software component which includes transfer and development of technical knowledge, work organisation and industrial know-how is the most important part of the program. The Swedish support is channelled through direct contracts between a Swedish company and the relevant Mozambican company, a so called sister industry contract.

As a consequence of the Economic Recovery Program (PRE), the situation for industrial undertakings has changed considerably since the beginning of 1987. All economic entities including also state enterprises are being given increased autonomy and accountability. Due to devaluations and the abolition of price control for most products, relative prices have changed considerably, and this, together with the effects of the continued disturbances on the economy by bandit activities, has changed the conditions for the companies being rehabilitated.

In view of the considerable changes mentioned above and that almost five years have elapsed since the rehabilitation program started, it was agreed between the Ministry for Industry and Energy and SIDA to study specifically achievements reached and problems met in the transfer of technology and industrial know-how within the sister industry model. Delays have occurred compared with the original plans and it is important to assess whether the reasons for these delays are due to external or internal reasons and to discuss how to overcome the problems in the future.

The study was accordingly performed during a two week period in the end of August 1988. Each of the three companies were studied thoroughly and a great number of employees at all levels were interviewed.

Agro Alfa which consists of three separate factories was the company that was most severely affected by the recent developments. Before PRE Agro Alfa could sell all the agricultural implements it could produce. Due to the serious security situation in the provinces and the price increases after the devaluation, the internal market almost came to a standstill. Furthermore, another internal producer is being built up in Beira and competing products are imported into the country, mostly via emergency assistance. Agro Alfa is at the same time extremely dependent on imports of raw materials. Before the factory in Beira starts production it will be important to analyse the needs of agricultural implements in Mocambique and to agree about different lines of products to avoid duplications.

The sister company of Agro Alfa is the Swedish company "Överum". Together they have achieved substantial results based on the transfer of industrial know-how from the sister company. Progress has however been

much slower than planned, as the rebuilding and re-organisation is still not completed. The forge which was added to the project at a later date has barely started production.

Training of workers and also foremen in the practical running of the new techniques has been performed on the job and by sending key people to Sweden (20 persons). A lot still remains to be done on basic training, particularly in the forge. On supervisory and management level progress has so far not been very good. It may soon be possible for local management to run the foundry with regular supervision. In other important areas even after five years, local staff with the right qualifications and experience have yet to be recruited to the project.

Electromoc started its rehabilitation program in 1983 in cooperation with the Swedish company "Bevi International". The rehabilitation concentrated on one of the present three departments, DME, a repair shop for electrical motors. The physical rehabilitation was also delayed here but the building work and all installations were finalized in early 1985. Since that time the cooperation has concentrated on the building up of knowledge at DME. Bevi has recently been requested to participate in the rehabilitation of the other two enterprises of Electromoc (SATIP and FQE).

It has taken time but today Electromoc has built up an impressive internal training system. Evening classes are open for all who lack sufficient theoretical knowledge. Systematic on-the-job training is being implemented on a basic as well as on a more advanced level. Some foremen and management training has been implemented. Bevi is well integrated and participating in this training program. A further step forward in technical training is being prepared.

Ermoto the third company was included in the program only in early 1986. A contract was agreed upon with the Swedish company Sterner and Blomquist. After two years and some delays the reorganisation and rebuilding phase has now come to an end. Most efforts so far have been required for the supervision of building works, procurements and installations. Some on-the-job training has taken place mostly to introduce the staff to the new equipment and techniques. It has been reported that Ermoto has had some problems in retaining some of their staff. Of twelve persons trained in one course three were taken to the army.

A considerable upgrading of the factory has taken place and today engines (52 makes) can be completely renovated.

The Swedish staff is at present embarking on a more systematic program for on-the-job training. The level and documentation of that training has been discussed. The factory has at the same time planned and started vocational training at the work place, which however needs some further support and upgrading. So far no foreman training has been planned. Together with the management of Ermoto, Sterner and Blomquist is working on improvements of the management systems, mainly in the areas of administration and economy.

#### Observations

In summary considerable achievements have been reached in the three companies. New products have been developed and old products have been improved. Work organisation has been improved. New machinery and equipment has been procured. New lay-outs have been made and employees have been introduced to and trained in the new equipment and techniques. In all,

this has led to a substantial transfer of industrial know-how to the Mozambican companies.

These achievements however, constitute only a first step in a process to improve industrial knowledge and must be followed by further steps. The general progress has furthermore been much slower than planned. Delays have occurred in all projects and on all levels, mainly due to delays in the building activities. The fulfilment of the ultimate objective of the project "that conditions should have been created at the companies to enable them to operate with only limited support by expatriates" will therefore not be reached at the time of the expiry of the contracts.

PRE has had a considerable impact on the conditions under which the companies operate. Electromoc and Ermoto both seem to have adjusted to the economic conditions and are making some profit. In terms of foreign exchange they are both making considerable savings for Mozambique by doing repairs that will reduce the requirements for imports.

Agro Alfa, however, has as mentioned above, been severely affected by the recent developments. The internal market has almost come to a standstill. Development of new products as well as marketing will therefore be an overriding concern of the company.

Although much has been done with regard to the transfer of technology and the starting up of training activities, much still remains to be implemented. It is therefore imperative that present training programs and procedures are improved and implemented.

It is true that delays in construction work have delayed training programs in general. More could, however, have been done in Ermoto and Agro Alfa to

raise the general standard of education of the staff at an early stage. This was done with reportedly good results at Electromoc.

The Swedish experts have devoted too much time to construction work which should have been completed upon their arrival and to the installation of new equipment giving less time than foreseen to on-the-job training of staff. Now the situation demands more efforts for training. Few of the original Swedish experts were recruited for their pedagogical skills. Today they have good knowledge of local conditions and speak Portuguese. However, they still need support to build up and run efficient man-power programs. In this work CFI will be instrumental.

Collaboration between the companies and CFI has not been implemented as planned, mainly due to the fact that the strengthening of CFI was delayed until mid 1988 because of recruitment problems. So far the companies also seem to have been too busy with the installation activities to do more than very practical on-the-job training.

So far none of the three companies have reported any difficulties in retaining their staff except for Ermoto's loss of staff to the army. In the long run, however, considering the investments which have been made in human capital, it will be important to establish staff policies with staff development schemes, remunerations and incentives that will make it possible for the companies to keep their staff.

In some top positions there are still vacancies that have proven to be difficult to fill with Mozambicans on the employment conditions offered. Instead these posts will have to be filled by Swedish experts. Alternative solutions as e.g. contract employments of Mozambican specialists should be tried.

An important weak point in some places in the enterprises is that there are no, or very few, instruction manuals, drawings, spare part catalogues, etc. This question must be dealt with without delay by the Swedish sister companies since it is an important obligation in all the three contracts.

Many of the delays and problems discussed above are outside the responsibilities of the sister companies.

A close review of the contracts between the Swedish and Mozambican sister companies shows that obligations agreed upon have been basically fulfilled. However, the review also indicates that the contracts have not been specific enough, particularly as regards the responsibility to implement necessary manpower development activities including training.

The lack of precision in the contracts might partly be due to a conscious policy based on trust in the Swedish sister industries and their ability to plan and implement a project of this nature. Another reason could be that the preparation of the projects was not enough detailed to draw up proper plans of operation for the transfer of knowledge component. Responsibilities were not spelt out in such detail that afterwards they can be understood by the parties concerned. This has made necessary follow-up difficult.

In addition, the system of follow-up has been too weak. The lack of a more detailed plan of operation is perhaps the major reason, but there are also questions which should have been clearer to both parties where more could have been done to fulfil obligations on both sides. Recruitment of the requisite high level staff as well as the preparation of proper and

well prepared training programs are examples of such questions.

Better preparation, more detailed contracts and a stronger system for follow-up could also have made it easier for the relevant unit within the ministry for Industry and Energy to work out a system for monitoring the program. It now appears that such monitoring has not been done in a systematic way in the past. In the future the Unit should be manned in a way that it can fulfil this objective and the new Swedish expert should concentrate more on policy questions and monitoring than on giving practical support to the sister companies.

An important obstacle to a successful transfer of management skills are the different environments in which the two sister companies operate. The legal status and the ownership of the Swedish companies makes it possible for them to be in full control of their own management. For their support and guidance they have a board of directors which is composed of a wide range of persons with professional skills and contacts in the Swedish society. The Mozambican companies have a more difficult role to play as the management is not in full command of company activities. Much is still decided on ministry level and they do not have a board to assist and guide them.

The general approaches chosen by the three Swedish sister companies have been different. The experts from Bevi have worked mainly in an advisory capacity while the other two have de facto been more directly involved in decision making. Also the engagement of head office management in Sweden has varied. It seems clear that when head office management has been more active, the result of the transfer of technology has been more efficient.

Swedish expertise, backstopping and the transfer of industrial know-how as well as training in Sweden or any similar country is costly. But so is vocational and technical training of high standard all over the world. In industrial countries this cost is borne by the education system and the employers only spend a minor percentage on the in-company training of their employees.

In Mozambique the present state of education and vocational training has forced employers to take upon them a larger share of education and professional training. This means an additional burden for the enterprises and an additional cost. The major part of this cost must however be seen as an investment cost for industrial know-how and in human capital. Much of the aim of the technical assistance in the projects assessed is to provide a transfer of knowledge to raise the competence of the Mozambican enterprises.

It is therefore reasonable that the sister companies, which should compete with similar companies elsewhere, should not be asked to cover more than a minor part of the total cost of the sister industry cooperation.

### Recommendations

The cooperation between the sister companies should, after the expiry of the present contracts, be allowed to be extended for a new period of three years.

The new contracts should be based on a detailed plan of operation describing the different activities to be implemented. The training programs and procedures and the modes for the cooperation with CFI should be particularly emphasized. Work on these plans of operation should start immediately.

A new follow up procedure based on the plans of operation should be worked out and implemented during the new contract period. The Swedish expert attached to the coordination unit should take special responsibility for the follow up.

The number of Swedish experts on long term contracts should be as few as possible and a phasing out plan for each expert should be included in the contract. To facilitate such a phasing out and ensure flexibility a limited number of consultancy months for short-term duties should be included.

The contribution of the Swedish experts in the future will mainly be concentrated to the field of training and transfer of technology and management questions. New recruitments must therefore be prepared for this new task and training prior to the taking up of appointments in Mozambique be strengthened accordingly. Particular emphasis should be put on Portuguese and pedagogics.

As part of the new contracts the Mozambican companies must finalize an established organisation with posts and job descriptions and recruit qualified staff to fill the relevant vacancies.

Each Mozambican company must establish a policy for personnel development at the companies. These should include a package of incentives to meet expected increased competition on the labour market.

Marketing must receive particular attention by the companies. Agro Alfa in particular must work to find new products and new markets. If no solutions can be found, SIDA should consider withdrawing from this sub-project.

The legal situation of the Mozambican sister companies should be clarified and boards of directors be established to ensure the proper running of the companies.

The key persons necessary to allow the phasing out program of the Swedish experts to be implemented, should be recruited before the new contract period starts.

The Mozambican sister companies should pay not more than ten percent of the counter value of the technical assistance received from SIDA.

## 1. **BACKGROUND**

Since 1983 SIDA supports a program for industrial rehabilitation in Mozambique. The main objective of the program is to create economically and financially viable companies run by Mozambican management and staff.

Three state-owned companies are presently being rehabilitated under the program. They are Electromoc (service and repairs of electrical machines and installation works). Agro-Alfa (farm implements) and from 1986 Ermoto (service, repairs and renovations of combustion engines).

One part of the rehabilitation program consists of improvements in hardware - buildings, equipment, spareparts and rawmaterials. A second, important part of the program consists of a transfer of industrial know-how, ranging from management systems to run the companies in an effective way to on-the-job training of workers on the working place. The Swedish support to this program is channeled through direct contracts between a Swedish company and the relevant Mozambican company, a so called Sister industry contract.

Since the beginning of 1987, the Economic Recovery Program (PRE) has considerably changed the conditions for industrial development. State enterprises are now being given increased autonomy and economic rights. Relative prices have changed much through a number of devaluations. Continued disturbances by bandit activities have severely affected communications and the internal market in the country. These factors have meant a great change of the conditions for the companies under rehabilitation. In view of this current situation and that almost five years have now

elapsed since the rehabilitation program started, it was agreed between the Ministry of Industry and Energy and SIDA that a study should be undertaken of the achievements reached and problems met in the transfer of technology and industrial know-how within the sister industry model with suggestions for improvements and future cooperation.

To perform this study SIDA nominated Mr Lennart Wohlgemuth, Assistant Director General at SIDA, Mr Börje Wallberg, Senior Manpower Development Adviser at SIDA and Mr Clay Norrbin, Consultant in Training and Human Resources Development from Jakko Pyöiri, Finland.

The study was made in Mozambique during two weeks in the end of August 1988. Prior to the field study a one-day seminar was held in Stockholm with participation of the project managers for the three Swedish sister companies, SIDA's project manager, Swedind and two of the members of the mission.

The two weeks in Mozambique consisted of a general seminar with Swedish Technical Assistance experts on knowledge development issues, study visits to all three companies and most of their production units, interviews with many employees and intensive discussions with representatives from the six sister enterprises, CFI, SIDA and the Ministry of Industry and Energy (MIE). A preliminary summary and recommendations was produced and discussed with all parties concerned before the team left Mozambique.

The members of the team would like to express their sincere thanks to all those who contributed so actively in giving information about the projects and in discussing all findings and ideas that form the basis of this report. Since the report deals with

general observations and recommendations rather than with the three projects in particular, special reports on Agro-Alfa, Electromoc, ERMOTO and CFI are presented as Annexes 1 to 4.

## 2. **OBSERVATIONS**

### 2.1 Construction Delays

Two of the projects, Agro-Alfa and ERMOTO, are delayed between one and two years. Construction work has taken much longer than expected. One reason for this has been the lack of cement and reinforcement irons. Most seriously affected is the forge where the delay is now two years. It is even doubtful whether it will be ready until the middle of 1989. This means that the Swedish experts have had to devote more time than expected to work with construction and installation problems. The adviser at the forge has thus now worked for two years without production being started. It is apparent that the difficulties in the building sector in Mozambique were underestimated and that this has had an overall negative effect on the transfer of industrial know-how so far.

It was advocated by some of the Advisers that these construction delays had been very negative for the transfer of knowledge process, since it is only when the production has started that a full assessment can be made of the staff's capabilities to cope with their jobs.

The case of Electromoc and Bevi International is different. To avoid unnecessary construction problems when the old DME workshop had to be replaced an available and suitable building was purchased for the installation of a new production unit. The new repair shop was ready already in 1985 and it is evident that

the longer time in use has meant considerable advantages for the process of competence building within the company.

## 2.2 Successful First Phase

Most of the major installation work has now been completed - with exception for what still remains to be done at the forge. The improvements in all three companies are impressive.

New machinery and equipment has been procured and installed. New lay-outs for the production units have been made and work organisation has been restructured in all three companies. New products have been developed and old products have been improved. New techniques have been introduced in all three companies. The staff has been trained to handle the new equipment. The general order and cleanliness in the factories is very good. Two of the companies, Electromoc and ERMOTO are already generating some profit though still not enough to be satisfied. Agro-Alfa's financial situation is not good since the internal market has come to a grinding halt due to bandit activities in the country (see below).

On this level there is no doubt that the projects have been very successful. It is evident that the total support in terms of equipment, installation, development of products, production planning and on-the-job training has meant a great transfer of industrial know-how from the Swedish sister company to the Mozambican. To that extent the sister industry concept has been more efficient than an alternative where the different components of the Swedish support had been offered separately.

## 2.3 Outstanding questions with regard to the Sister Industry concept in Mozambique

There are, however, still many outstanding questions which will have to be dealt with. Some of them are related to the established working relations between the sister companies, others to the knowledge building process.

### 2.3.1 Management support

There has apparently not been a planned and implemented conscientious strategy on how to develop the management support to the companies. It has rather been left to each Swedish sister company's personnel in Maputo to try to find their roles in the cooperation with the management of their Mozambican company.

At the same time there is an implicit strategy given in the preparatory document and in the contracts since they rather specify the technical questions in the rehabilitation schemes than the competence building process. This has not necessarily been done because of a lower interest for human resources development. It is a much more difficult task to analyse and specify such activities in advance. Much of the original idea of sister industry cooperation is to create a program of knowledge development, but this was never codified in any contract.

The three Swedish sisters now have different roles to play. So far it appears that there have been more planned contacts between Bevi's management and the management of Electromoc. Bevi has had much experience from a previous sister industry cooperation project in Tanzania and has based much of its work in Mozambique on this. The management of Electromoc has also been experienced enough to know what knowledge

and advantages they could draw from their Swedish sister.

In Agro-Alfa there is still "a management gap" which impedes the establishment of a real management development cooperation. All three factory directors have little formal schooling. They are good administrators, but their lack of technical knowledge will make it difficult to take over from the Swedish experts. There are also many vacancies on key posts. Looking at the Swedish sister it is apparent that the Overum team in Maputo has been given more independence and delegated responsibility for the project. The annual meetings between Overum and Agro-Alfa have been described as more of project programming sessions than a mutual discussion between two sister industries with close links between them. When considering Agro-Alfa's present weak financial situation it could be questioned whether Overum, if there had been closer economic ties between the two companies, would have let Agro-Alfa continue their present production of tractor-driven and ox-driven ploughs.

In ERMOTO the situation is still more unclear. The contract between Sterner Blomquist (SB) and ERMOTO does not stipulate any cooperation on management development. It emphasizes technical rehabilitation, including introduction of new techniques and assistance in establishing administrative and financial routines. Management development questions were first mentioned in a memo from Swedind in early 1988 but the contents of such a cooperation has never really been clarified. The contract also stipulates ERMOTO's right to "submit instructions" and that SB "shall comply with the situation".

After the rehabilitation of the workshop SB will now work with the training of staff and with the estab-

lishment of administrative and financial systems and routines. Their participation in other areas of management development such as management rules and procedures, staff and staff development policies, marketing, financial policies and long-range planning will be limited to what ERMOTO's management is interested in and will request advice for. This means that so far SB's role is more of a consultant's than that of a real sister industry cooperation.

One reason for this on the Swedish side may be that the ownership of SB has changed since the contract was signed and that the present management in Sweden also prefers to see the cooperation more as a technical rehabilitation project. Another reason may be even simpler, that the cooperation under this contract is the youngest and that the two companies have not yet found their roles. It may also depend on a certain lack of local experience in running and developing a workshop like ERMOTO. The management is still young and inexperienced and cannot be expected to be able to identify every aspect where they could get advice and support from the Swedish experts. Only two persons in ERMOTO's management have had the possibility to visit SB in Sweden. Initial language problems on the Swedish side could be another factor.

A question pertaining to all three projects is an important difference in management styles between some of the Advisers and their national counterparts. It was reported that the Advisers made much more frequent visits to the shop floor to discuss and supervise than their counterparts. In a situation where a full input by everybody is essential to secure a good production it should be anticipated that the Mozambican management established a routine of daily inspections at factory level.

The question of management support should however be better clarified in the future. Otherwise SB will be able to conclude their work in complete accordance with the contract and yet without ensuring a future proper management and running of the company.

### 2.3.2 Sister industry concept differently understood in Mozambique

From the observations above it can be concluded that the sister industry concept has been very differently understood in the three companies and that the cooperation between the Mozambican and the Swedish companies has developed in different ways.

Senior staff from BEVI which also has a sister industry project in Tanzania have pointed out that the preconditions for this kind of projects have been very different in the two countries. In Tanzania the original idea was better marketed - with the support of a Swedish consultant - and the two sisters were better prepared for what was expected from them in their cooperation. The Tanzania enterprises were usually managed by people with an industrial background and they had a better idea of the areas into which they wanted support and how the transfer of industrial know-how should take place.

In Mozambique the idea came from above, from the ministry, to remedy a situation which was becoming catastrophic. It was also described how the management of Electromoc in the beginning felt compelled to enter into an agreement with BEVI and that it took some time before a full cooperation could be established.

It is natural that it takes some time to establish a cooperation like this, but with better preparations

and more knowledge about the preconditions by all parties involved, it is likely that both time and money could have been saved.

A definitely positive feature of this cooperation has been the overall continuity of the personnel involved on both sides. All three Swedish sisters have had the same project coordinator for most of the duration of the projects. The Mozambican sister industries' top management has remained more or less the same and there have been few changes on Ministry level. This has been a major reason for the positive tendency of an increasing understanding and cooperation between the sister companies and the transfer of industrial know-how which has so notably taken place. Only SIDA-DCO in Maputo has had frequent changes of staff on the industry coordinator's post, five in four years!

#### 2.3.3 Different management environments - an obstacle for a sister industry cooperation

An important obstacle for a successful transfer of management skills are the totally different environments in which the two sister companies operate in Sweden and in Mozambique.

The Mozambican industries are organized under the Ministry of Industry and Energy where many decisions concerning their activities are still being taken or worse - are not being taken. Their legal status has still not been regulated. This makes decision-making on company level difficult and there are many examples on how this have negatively influenced the development of the companies. The present salary structure e.g. has proven to be insufficient to attract qualified Mozambicans to important posts in

marketing and production. Yet this problem had been left without action for many years with reference to the existing salary structures.

Another problem which will probably now have been resolved has been the companies' possibilities to recruit graduates from higher technical education. In the present situation of great shortage of qualified technical manpower the government has chosen to allot those few graduated to other enterprises than those supported by the sister industry cooperation. The results of this policy are evident, the possibility to establish cooperation with a transfer of knowledge to qualified Mozambican counterparts diminishes and there is a risk that the more experienced foreign advisers take over their counterparts' jobs and become more of executive "gap-fillers" than advisers.

A third problem has been the long discussion without decision about the countervalue payments for foreign expertise, which has made it difficult for the sister industries to make long-term planning.

Another issue of importance concerns the differences in how the Swedish and the Mozambican companies are directed. The Swedish companies have an owner structure and an independant legal status where the owners have appointed a board of directors to supervise and direct the enterprise. The company management's role in such a situation will be to run the company in accordance with established policies and to reach objectives set. Within this framework all decision-making rights have been delegated to the management which is totally responsible to the board of directors for the results obtained.

In Mozambique none of the companies have a board of directors to support, supervise and set guidelines.

Such a board of directors would in the Swedish sister companies have a broad representation with representatives with experience from banking, the company's market including exports and the community. On company level in Mozambique this means that the management will have to deal with many questions on a level that would be dealt with by a board in their Swedish sister companies as e.g. the establishment of finance and marketing strategies. They also have to represent the company on levels where it would have been more natural for a board member to act as their spokesman. If Agro-Alfa had had a board member from the authority responsible for the import of equipment to the agriculture sector, it would e.g. be difficult to believe that the recent big purchases of tools and equipment from abroad would have been done without exploring Agro-Alfa's possibilities to produce at least some of it.

Thus this different business environment has been an obstacle for the sister industry cooperation. It can also be concluded that the Swedish sister companies were not really prepared to cope with these differences.

According to information given, plans are being prepared to alter the legal status of the Mozambican enterprises to one more similar to the status of the Swedish sister companies. This will probably improve the situation much, but it will at the same time put more pressure and responsibility on the management of the companies. The management's competence will therefore become of even more crucial importance to meet the new objectives.

## 2.4 Transfer of Knowledge-Education and Training

Although very much has been achieved so far as regards transfer of knowledge, much still remains to be done. There are two important issues to consider the educational level of the staff and their vocational standards.

### 2.4.1 The low level of education

The most important appears to be an underestimation by all parties concerned about the low level of general education in Mozambique in general and in the three enterprises in particular. Although it was stated in many preparatory documents that the general education standard of the staff was low, this did not lead to any early special measures to improve the situation. Agro-Alfa did run a literacy program in the early 80's but not much has happened since. In Electromoc unforeseen problems arose in this context. The workers who had little formal education but long working experience proved to be very unwilling to accept new methods and techniques and had difficulties to grasp why changes should be necessary. In ERMOTO there are still workers with important work that will not be able to read instructions required to perform their jobs.

So far Electromoc is the only company which has tackled this question. After a discouraging experience with the adult education system, the company now employs teachers on freelance basis and runs evening classes. Today there is a policy that all employees shall reach the 5th and 6th grades.

This should have been done in the other two companies as well, especially since there was ample time for education due to the delays in the construction work. Now education programs will have to be started

without delay if the educational level of the employees shall correspond with the demands of a well functioning modern enterprise. It must be the responsibility of the Mozambican companies to set objectives for the improvement of their staff's educational levels, to establish an education policy, if necessary with incentives and to get the education going.

#### 2.4.2 Vocational and professional training

It has already been recognized that on a basic level the results of transfer of technical knowledge are impressive. The next phase to get the companies in full production in the most economical way will however require much more efforts as regards professional training than before. All three companies have now embarked upon ambitious programs for professional training. Both ERMOTO and Electromoc have started small in-company vocational schools. In Agro-Alfa a similar training program is being prepared with the help of Overum that will supply books and other training materials.

At ERMOTO Sterner Blomqvist has started an on-the-job training program where the staff in each particular department, e.g. the reception, is followed closely at their normal work and continuously instructed by the responsible adviser. This program has not been altogether accepted by ERMOTO's management which would like to add more to the training and course materials and work instructions to support the trainees at work once the training is completed.

Although the training now going on or being planned for is a great step forward, the following observations must be taken into account.

## 1. Manuals and Training Materials

There is a general shortage of manuals and work instructions in all three companies. This makes all training efforts more difficult and makes it difficult for the trained staff to refer to instructions. Since all three contracts very clearly put the responsibility on the Swedish sister companies to procure necessary documentation, they should now each make an assessment of what is still needed and make a plan to remedy the situation.

It was noted that ERMOTO had made a vainless effort to procure textbooks in Portuguese in Portugal. SB had also tried to make some contacts in Brasil but so far little had happened. The SB team did not know about the ILO material MES (Modules of Employable Skills) and had never been briefed about it.

Each company has its own problems in finding good training materials but their basic problem is the same, to find the right sources which can help them with contacts, advice and sometimes selection. In this CFI, Centro de Formação Industrial could be instrumental since they have since long established contacts with SENAI, the large Brazilian vocational training organisation. It should also be part of the briefing and training at SIDA before an assignment commences to be informed about what course material there is and what useful contacts SIDA could offer to the sister companies. This would enable them to work in a more planned way with the procurement and production of training materials.

## 2. Technical advisers - their role as instructors - more language training needed

Many of the Swedish experts have, as stated above, devoted much time to construction work of which most

should have been completed before their arrival, to the installation of new equipment and to an on-the-job training of the staff who will operate the new machinery. They have had to play many roles and have come to function largely as "fixers". Few of them have been recruited for their pedagogical skills. Technical capabilities have been the most important recruitment criterias so far. There have been advisers with poor knowledge of Portuguese. Today most have good knowledge about Mozambican conditions and most of them speak acceptable Portuguese. Although they have come to work intensively with training issues, it cannot be expected that they shall be able to function as full-fledged pedagogs in every aspect. The balance between technical and pedagogical skills will always have to be considered and technical factors and knowledge of local conditions will still have to carry much weight.

From now on, the sister companies will need competent assistance to create and run a professional and valid manpower development program. In this work, CFI could be instrumental. It has recently been strengthened with a Swedish expert with a professional training background.

In the future, when the Swedish sister companies make new recruitments, pedagogical skills and knowledge of Portuguese should be more important criterias for selection than hitherto. The training in Portuguese must be improved and possibly prolonged. As things now stand, consultants get less Portuguese training than employees on SIDA contracts.

The reason for this is that the costs for language training for consultants are debited to the total project costs and to the country frame, whereas language training for contract employees is debited

to an internal SIDA account for language training. Thus the consultants language training is kept to a minimum to keep consultancy costs down!

This system should be changed without delay.

### 3. Supervisory training

Local staff of the the supervisory level is a vital but weak point in the three companies. The older, more experienced supervisors have little formal education and their possibilities for further development are limited - with some exceptions though! The younger, better educated supervisors have little work experience and have difficulty to be accepted by the older workers. Interviews with supervisors and foremen showed that they emphasized technical knowledge and capabilities as the most important prerequisites for their jobs. This is not surprising considering that the projects are still in a stage of technical rehabilitation.

During the coming years, however, other questions like planning, productivity, supervision and staff motivation will be of increasing importance and few of the supervisors have had any training or experience to meet these new demands. The supervisors are a key group for the production results on the shop-floor. It is therefore very important that an analysis is made on their present skills and knowledge compared to the work they are supposed to do and to design a training program in accordance with this analysis.

This is a task where some of the analysis and training will definitely have to be done by the sister industries themselves, but there are also elements

where it should be advantageous to do it jointly between the companies and with the assistance of CFI.

## 2.5 Management Development and Training

As has been described earlier, the managements of all three Mozambican sister companies have visited their Swedish sisters, studied their management techniques and have had some management training. There is also a continuous management development process going on in the daily cooperation between the local management and the Swedish advisers. This management development and training is however far from sufficient. There are still many vacancies in responsible positions. This calls for special efforts in recruitment and improved policies and methods in recruitment. When these posts are filled it is of outmost importance that the new recruitees will be adequately prepared for their jobs.

For those managers already in positions the management development program must be developed further to prepare them better for the new conditions created by the economic recovery program. Marketing questions will become of outmost importance and financial policies and procedures will be decisive for the success or failure in all three companies. A more open labour market will offer new challenges. It can be anticipated that their qualified personnel which has been extensively trained and developed will receive tempting offers by other employers. To counteract this, new personnel policies with incentives and adequate remuneration schemes will have to be worked out. It cannot be expected that the management of the three companies shall be able to master all these wide and difficult areas of management operations without training and assistance from the Swedish sister companies and not only from their

advisers in Mozambique. At this stage of management development it would be preferable with a more active dialogue and support from management to management between the sister companies. For training courses of general management nature, the companies should make a joint project together with CFI.

## 2.6 Staff Policies - Staff Incentives

The remaining vacancies on some top positions in the companies are indications that incentives and remuneration schemes are still not adequate to attract qualified Mozambican personnel. For most categories so far, none of the three companies have reported any difficulties to keep their staff. This is not surprising. All three have for Mozambican conditions good staff policies. They give transport to their staff, lunch, run comparatively large education and training programs. The salary structures are said to be reasonable and the possibilities for personal development and promotion within the companies are not bad. The rehabilitation work has meant a great increase in their technical knowledge and also - not the least - that many of them have been regularly exposed to the care and interest of their management and the Swedish advisers. It is well-known from research that this kind of attention always has great impact on the individual's motivation and performance.

When production is in full swing and the novelty of the new techniques and procedures has sunk, it can be anticipated that some of this positive atmosphere in the companies will go down.

The changes due to PRE will also mean a more challenging labour market than before. The risks of losing qualified personnel will increase and will force the companies to adopt more active even aggres-

sive staff policies. Different measures should be tried. At Electromoc preparations are now being made to introduce an extra payment for piece-work which is one way to increase the productivity used more extensively by the Swedish sister companies. There is much room for improvement since the time spent on repair of a similar engine was now said to be three to four times longer than in Sweden.

Other ways to improve the personnel's participation in their companies' progress could be to link the remuneration schemes to the profit or to offer them to buy shares individually or in cooperative forms once the legal status of the companies has been established.

The difficulties in recruiting Mozambican personnel on some key positions must be tackled in new ways but with as little disturbance as possible on the general staff policies and remuneration schemes. One suggestion could be to offer qualified persons contracts on limited time, e.g. three to five years to organize a function or a department and to train a possible successor and other staff. This kind of employment scheme is not unusual in industrialized countries where a contracted, qualified person receives a higher salary and other incentives but has less security of employment compared with those permanently employed. This will be much less expensive for the Mozambican society as a whole than keeping Swedish advisers for a longer time than necessary.

A neglected category of staff for which special attention should be given as regards selection and remunerations and incentives is the storekeeping staff. Badly functioning stores are a heavy financial burden to any company and this function will still need much attention.

Another question to consider for the management of the three companies is the connection between the workers living conditions and educational standards and the technical level they are supposed to maintain at work. Cleanliness and good order are decisive factors for the quality of work. The improvements in these respects are impressive but the Swedish advisers report that it needs a constant supervision to keep up standards. One reflexion given was that many of the workers now live in two different worlds. At work they deal with for Mozambican standards fairly high technology and they are studying hard to improve their educational and professional levels. At home their living conditions remain more or less unchanged. Many of them have very simple local housing with poor sanitation facilities and few possibilities to make lasting improvements. This difference between two worlds could in the long run prove to be an obstacle for further development.

A staff housing program could be a tool both in a general education and an incentive program. It could also be a more active way to minimize an unwanted turnover of staff.

## 2.7 CFIs Role in the Sister Industry Cooperation

CFI, Centro de Formacao Industrial, started its work in 1986 under the Ministry for Industry and Energy. CFIs main objective is to support Mozambican industry with local management training. During its two years in existance CFI has built up a good economy and an impressive training program but so far mainly on lower levels and in general subject such as English, accountancy, typing and secreterial duties. CFI is still largely lacking a management and a middle management training program. Such a program would be of great importance to the sister industries in

their management development work. Much time work and money could be saved if CFI could offer courses in which all three companies could participate. CFI could also assist the companies with the analysis and making of manpower and training program. Therefore, already in the beginning of 1987, SIDA decided to support CFI with industrial training expertise. The experts should have a wide experience from training and manpower development within the Swedish industry. The latter criteria was considered important since the sister industry concept was based on a Swedish industry model. There had also been a negative experience with consultants from Portugal, employed by a Swedish consultant, because they were teaching methods which were not in line with the chosen technical and administrative concepts.

Another important objective with the strengthening of CFI was that the institute, when working with the sister industries should acquire enough knowledge and experience about industrial training on management levels to be able to build training programs to the benefit of the whole industry.

Due to recruitment problems SIDA could not fill this post until July 1988. This has meant a considerable delay in the CFIs development. In the meantime it has been decided to put the management courses to an international tender instead of waiting for a gradual development of them in cooperation with the sister industries.

The Review Mission originally advocated that this was an unsuitable alternative that would risk to delay CFIs course production and important training activities, especially in the sister industry projects where the phasing out programme should now be of an outmost importance. In reality it appears that the

international tender has been an efficient tool to reduce costs, since the best proposal originally was some 80% higher than the second best proposal. The main remaining problem is now that CFI is still very weak in professional staff with industrial experience. It means that unless CFI can recruit some more experienced staff both on part-time and on full-time there are great risks that the internal transfer of knowledge effects of the consultant's interventions will be low. This problem will be even more accentuated towards the end of 1989 when a UNIDO-project amounting to US\$ 2 million will be implemented. The question must be asked: Who will be the receiver at CFI? Or is it sufficient that this consultant will run training courses for the industry without any receiving capacity at CFI?

CFI has proposed to organize a ten months' study with one consultant from Sweden and two Mozambican nationals from each sister company to analyze their training needs and to assist in the elaboration of training programs. The reasons for this proposal are reasonable and in fact more or less the same as are described as weak points in this report as e.g. poor definition of training in the contracts, the lack of concrete training plans, lack of evaluation methods and underqualified counterparts.

Although the reasons for such a study are acceptable, it is not recommended that it should be carried out in the way proposed. Had this been before the sister industry projects were agreed upon, it would have been highly recommended. Today, however, the situation is different. All six sisters now have between two and a half and five years experience of the cooperation and most parts of the analysis have already been done in an implicit way. It would be an unnecessary delay to spend almost one third of the

next contract time to analyze training needs that are more or less known. It would also be difficult to advocate the need for an additional longterm consultant compared with other felt needs for expertise within the sister industry project and with the restriction on Swedish personnel in Mozambique imposed by SIDA's management. CFIs role would rather be to act as a consultant - a midwife - to help the sister companies formulate their training needs and to elaborate training programs with objectives, contents, methodologies, activities, and follow-up programs. CFI should also train training managers, instructors and on-the-job trainers. This will certainly be a sufficiently big task for the institute at this stage. For this CFI shall utilize primarily the resources in the Mozambican society.

It will be important for CFI to be able to use as resource persons on part-time or freelance basis experienced professionals from the industry sector. Otherwise CFI will not be able to run a high level management training programme for many years.

Where no national resources are available, CFI shall have the possibility to draw on short-term consultants and/or to train promising staff in-country or abroad. The institute should also be assisted in the creation of functioning administrative systems to deal with consultancy work and training courses.

This kind of assistance is somewhat unorthodox since it does not describe and budget in detail the different components of the support but rather leaves to the management of CFI and the training adviser to work out a plan for the development of the institute to be supported by Swedish development funds. This must now be a priority task for CFI.

## 2.8 Coordination of the Project

There has been a dual coordination of the project with one consultant working from Sweden and another consultant working directly in the Ministry's unit for rehabilitation of industries, Gapricom. The consultant in Sweden has been much of a broker with a responsibility for investment studies, finding Swedish sisters and the preparation of them and for an overall support and follow-up of the project. The consultant in Gapricom has been responsible for administrative routines and the follow-up of budgets and payments in the project. He has also worked both on a policy level and with practical questions regarding imports and goods for the projects. To a large extent he has functioned as a "fixer" for the Swedish sisters, a function which has been greatly appreciated by them. This dual coordination has however meant some confusion about duties, responsibilities and authorities and it has been agreed to amalgamate the two roles and have one consultant as a technical support in Sweden and in Mozambique.

This is rational in a situation where most of the technical rehabilitation is finished and the Swedish sisters have become acquainted with the Mozambican environment. The role of the consultant should however be altered in a way that his "fixing" and supporting role in Mozambique should diminish and most of his work be geared to creating systems for follow-up and monitoring of the transfer of knowledge components in the projects. This will be further elaborated below under "Follow-up and evaluation" (Chapter 3).

### 3. FOLLOW-UP AND EVALUATION

From what has been described in the previous chapters, it is natural that follow-up and evaluation of the projects has been difficult and subjected to many different opinions especially as regards the so called transfer of knowledge component. During the first rehabilitation phase the technical questions have carried more weight and have been easier to assess. In the absence of any project documents on manpower development these questions have had a lower priority. The annual meetings between the managements of the sister companies have had more a status of technical follow-up and a project planning session than a follow-up of the development of an industrial know-how. If these meetings were held more frequently it is possible that they would develop into sessions of a more dynamic and cooperative character.

Due to frequent changes of industry coordinators at SIDA DCO in Maputo SIDA's follow-up has been concentrated to the annual sector reviews led by SIDA's program officer in Stockholm.

The need for a follow-up which is more oriented towards the development of an industrial know-how has arisen for two reasons:

Firstly, the economic recovery program has put the companies under pressure to reduce their own costs and increase their efficiency.

Secondly, all the projects have now entered into a new phase where the more easily evaluated hardware installation period is finished and more subtle progress as e.g. company- and staff professionalism, management, production and quality have to be

assessed. It will therefore be an imminent task to create a system where these factors can be followed and evaluated during the next three year contract period. They must all be assessed with consideration taken to the actual situation within each company. Based on a mutually agreed description of the present situation within each company a plan of development should be made. For each sector where improvements are necessary, there should be a project document which clearly outlines the responsibility of each party, the activities to be undertaken, resources needed inclusive total costs of budget etc. The responsibility for this work lies with the two sister companies but the general follows-up and evaluations should preferably be done by the Ministry assisted by the coordinating consultancy firm. The results of these follows-up should then be discussed at least once a year in a seminar with all parties involved, possibly during an annual sector review.

#### **4. COSTS AND BENEFITS OF TECHNICAL ASSISTANCE**

In 1988 Electromoc and ERMOTO are expected to make small but reasonable profits on their activities. Future prospect for the two companies are good due to improved quality of production and lack of serious competition. The two companies are already making a good contribution to the country. ERMOTO will if successful, lessen the demand for import of new engines, thereby saving much foreign exchange\*. Electromoc will do the same and in addition, the company will save foreign exchange by decreasing the need for sending electric motors abroad for repairs. In the early 1980s such repairs were made in South Africa at a value of some 500.000 dollars annually. Agro-Alfa will probably make a loss for the first time in 1988. Its future looks rather bleak if efforts to

\* The costs for a complete overhaul of an engine have been estimated at about 25% of the price of a new engine.

diversify production and increase exports will not give immediate results. A reasonably quick recovery is paramount for the company's survival. If solutions will not be found, it should be discussed whether the company shall continue to be supported.

In accordance with PRE all three companies have to pay countervalue in meticaais for all imported goods as all commercial entities in Mozambique today. For raw materials and spare parts this has to be paid out of the sales proceeds, and for investments this will be paid over a number of years. Lately it has been discussed whether the full countervalue of technical assistance or a percentage of it should be paid in meticaais.

The new economic recovery program and the discussions about its consequences for the sister industry program has created much unrest among all parties concerned. The discussions about countervalue for foreign advisers have hit the projects in two ways. The Mozambican companies found themselves in a situation where they - if they would have to pay for the technical advisers in full - would not be able to continue the cooperation. This could have forced them to look for foreign expertise elsewhere, but what would then have happened with the sister industry concept which was originally so important?

As for the Swedish advisers the situation also deteriorated quickly. It became an acknowledged truth that they were extremely expensive and this was sometimes used in discussions. This has not enhanced the moral and the spirit of cooperation between the parties.

To some extent this discussion is founded on a lack of knowledge about the costs for technical assistance

from so called developed nations in general. Swedish technical assistance is accounted for in detail, from preparation costs in Sweden right up to repatriation costs after the assignment. Most other agencies do not account for their actual costs for technical assistance. It is either kept apart from the funds allotted to the country (like Danish aid) or is included in the total costs for a project like many socialist countries do. In these cases there is rarely a discussion about costs for technical assistance.

Another factor to take into consideration is that the salary component for the advisers is only a minor part of the costs. Social security, travels, housing and family grants for schooling etc account for most of the costs. It is therefore difficult to reduce these costs. SIDA's experience from recruitment of experts from other countries as e.g. Portugal and Brasil also show that those experts are not less expensive than those recruited in Sweden. The only way to recruit technical assistance experts at a lower cost would be as volunteers or on direct contracts with considerably low salaries and less social security and benefits. This however excludes the larger part of a resource base for recruitment and a sister industry arrangement would be difficult to get going. Consequently, the costs for technical expertise are rather dependant on the way of recruiting and employing people than linked to their nationality - naturally still with the exception of recruitment from countries with very low salaries and low social costs.

It is now important that the costs to be funded by the company are being worked out and agreed upon without delay. As things now stand it is difficult for the managements of the companies to run their establishments efficiently and at the same time to

plan for the future. It also effects the moral of the foreign advisers and their counterparts.

Setting a price on technical assistance has some advantages. It makes it clear for the recipients that technical assistance like everything else has its price, and forces the companies to budget for a person that later will be exchanged by a national professional. However, it is neither reasonable to request the companies to carry the full cost of technical assistance nor to treat experts from different countries differently.

Swedish expertise, backstopping and transfer of industrial know-how as well as training in Sweden or any similar country is costly. But so is vocational and technical training of high standard all over the world. In industrialized countries this cost is borne by the education system and the employers only spend a minor percentage for the incompany training of their employees.

In Mozambique the present state of education and vocational training has forced employers to take upon them a larger share of education and professional training. This means an additional cost. The major part of this cost must, however, be seen as an investment cost for industrial know-how and in human capital. Much of the aim of the technical assistance in the projects assessed is to provide a transfer of knowledge to raise the competence of the Mozambican enterprises.

It is therefore reasonable that the sister companies, which should compete with similar companies in other countries, should not be requested to cover more than a minor part of the total cost for the sister industry cooperation.

After careful consideration, the review team has come to the conclusion that it is not possible to make any scientific cost-benefit calculation in the technical assistance component of the project. Costs are always possible to calculate. As has been stated above, it is also possible to assess the economic result both on a company level and the society level. To assess to what extent the results are due to the technical assistance component is on the other hand practically impossible. Benefits have to be assessed by other means than in money terms.

Based on such discussions which have been made in the chapters above, the review team is of the opinion that the benefits of technical assistance to the three companies by far outweighs the costs for it.

## 5. **RECOMMENDATIONS**

The recommendations given below have been divided into three main parts. The first part deals with the ongoing projects and how to improve the competence building process. The second part contains recommendations on what should be considered to avoid some of the problems and difficulties observed in this report if new enterprises were to be included in the sister industry cooperation.

A third part of the recommendations is directed to SIDA to improve the training situation for the consultants.

### 5.1 **Recommendations for the present sister industry projects**

#### 5.1.1 **Prolongation of contracts - but with conditions**

The cooperation between the sister companies must be seen as a longterm project for the transfer and

build-up of industrial know-how. Therefore, at the expiry of the present contracts the cooperation should be allowed to be extended for another three years. In this new phase human resources development should receive the highest priority. The sister companies shall each present an establishment and a manpower development plan at least for the three years to come. Staff rules, policies and schemes for remunerations and incentives must be worked out. In the contracts the different activities for manpower development and training shall be described.

Each sister company's responsibilities and undertakings shall be defined. This can be done in the form of subcontracts to the present existing contracts.

#### 5.1.2 Planned phasing-out of Advisers

The number of Swedish technical advisers on longterm contracts should be as few as possible and phasing out plan for each expert should be included in the contract. To facilitate such a phasing out and to ensure flexibility, a limited number of consultancy months for shortterm assignments (= up to 6 months) should be included.

#### 5.1.3 Clearer objectives for Swedish Advisers

The contribution of the Swedish Advisers should be concentrated to the field of management development, the development of management systems, manpower development in general and training. Their job descriptions should consequently be looked over again and where necessary, be amended to include these tasks. This will have consequences both for the present Advisers and for future recruitments. Advisers will now have to plan their daily work more than before and apply pedagogical aspects on most of what they

are doing. An important aspect to consider in this context is that there must be a mutual agreement on "management styles" to prevent that the Advisers and the national management act in different ways and "sell" confusing messages. In many cases their knowledge of pedagogics and instruction techniques will probably need to be updated or supported by professionals e.g. from CFI.

For future recruitments of Advisers it is essential that both pedagogical skills and a sound knowledge of Portuguese will carry more weight than before.

#### 5.1.4 Improved SIDA briefing and training on knowledge development

Since transfer of knowledge and competence development is becoming such an important issue in all development projects this should also be recognized as a priority area in SIDA's and the consultants' preparation of experts.

It is recommended that a larger part of the regular preparatory courses should be devoted to all aspects of this subject. SIDA's training center should also develop courses where individual consultants can prepare themselves for their future roles as "competence builders" (see 5.3).

#### 5.1.5 More Portuguese training and briefing for new Advisers

Swedish Advisers who are recruited for complicated development assistance projects must be better prepared before they start working. In this respect it is equally important that they can communicate on an acceptable level in Portuguese and that they are really aware of what is expected from them in their new positions as Advisers. It is also necessary that

they have been properly briefed about their country of assignment and the preconditions for their daily life and work.

Presently Swedish Advisers from sister industries and other consultancy firms get less language training and briefing than staff employed at SIDA contracts. This situation, which very much depends on internal budgeting questions and unclear policies on training for consultants should be rectified without delay (see 5.3).

#### 5.1.6 Mozambican vacancies to be filled

Unless there are reasonably qualified staff on all responsible positions, there cannot be an efficient transfer of industrial know-how. To avoid that Swedish experts have to act as gapfillers, action should be taken to recruit staff for vacant key positions. The difficulty to find a marketing manager for Agro-Alfa is illustrative. The marketing function is essential for the future development of the company. There are some suitable national candidates for the job but they demand better conditions than Agro-Alfa has so far been allowed to give. On the other hand their demands cost only a fraction of what a Swedish expert would cost.

In this context it is suggested that a system of time limited contracts for high level key persons is tried out. The contracted professionals should be given a specific task to develop e.g. the marketing function over a given period, proposedly three to five years and to develop junior staff to take over after this period. In this way the contracted managers get better emoluments in exchange for a lower grade of employment security.

#### 5.1.7 Establishment of staff policies

Each of the sister companies now needs to establish a recruitment policy to find people that can fill vacancies and a staff policy with incentives that is attractive enough to keep the trained staff. Otherwise much of the intended manpower development program for the next three years runs a risk to become a failure. If no senior professionals can be recruited the sister companies should try to recruit a number of younger professionals as management trainees and give them special training before a final selection of the best is made.

#### 5.1.8 Legal status of companies - Board of Directors

It is essential that the companies shall get an autonomous position as soon as possible and that their managements be supported by a Board of Directors. A Board of Directors will be a prerequisite for the development of a management. With a well-chosen representation in the Board of each company they can act as the companies' spokesman in discussions and in a positive sense, present local production sources as alternatives to some imports of goods under foreign aid programs. If in the future SIDA is asked to support companies which do not have an independent status and a functioning Board of Directors, SIDA should give special considerations about the format of cooperation. The sister industry concept should be avoided and the support should rather be in the form of a consultancy work to perform specific tasks within a rehabilitation scheme.

#### 5.1.9 Better use of vocational training system

Although the endeavours of all three companies to build up their own vocational training system are necessary and much appreciated this is both a time consuming and costly activity. It is therefore recom-

mended that all three companies should try to utilize more of the existing vocational training system. SIDA is now increasing its support to SETEP and it should now be the right time to start a deeper discussion between the employers and the SETEP on how the latter organisation can best contribute to the development of technical knowledge and proficiency for the Mozambican industry.

5.1.10 Support to CFI

CFI should try to develop gradually and in pace with its own development of experience and qualifications. The sister industry cooperation offers a good opportunity for this. The original approach with a support to sister industries in their work with manpower development and training should be kept since it offers a unique chance to learn from practical experience. Training courses based on actual needs should be worked out or purchased and adapted as needs have been defined.

For their work to support the sister companies CFI should charge normal Mozambican consultancy fees in meticaís. CFI shall be able to use the still unbudgeted funds for shortterm consultancy support, procurement of materials, textbooks, courses and equipment to support improvements in administrative systems. CFI should now make a plan for the three year period but with an emphasis on the first year's interventions to be discussed with all parties concerned.

In this context it must be mentioned that CFI with its present staff will probably have great difficulties in functioning as an active receipient to the US\$ 2 million program financed by UNIDO.

#### 5.1.11 Marketing

It is obvious that marketing question have so far not received enough attention and that they now need to be dealt with in a serious way. In particular in Agro-Alfa will be a matter of survival for the company to develop new products and new markets. New methods are required to get qualified candidates for these posts (see 5.1.6).

#### 5.1.12 Countervalue for foreign expertise

Based on the discussion in chapter 4 about costs and benefits it is suggested that the sister companies should pay no more than 10 percent of the costs for foreign expertise to the projects. This rule should not only apply to Swedish Technical assistance in the sister industry projects. The rule should be applied to all similar projects supported by foreign aid programs.

### 5.2 Recommendations for future sister industry cooperation

#### 5.2.1 The sister industry concept in the present situation

Many of the problems within the present sister industry cooperation noted in this report are closely connected to the present difficult situation in Mozambique. For Agro Alfa the internal market has collapsed and it must now be up to the owners to decide whether the company shall be supported. The existing national education and vocational training systems have suffered much from the difficult situation of the country.

The implications of such problems should be dealt with in depth before any new projects are taken into the sister industry cooperation.

### 5.2.2 Areas of cooperation, size of industries and the time factor

The kind of work performed by ELECTROMOC and ERMOTO has been well suited for a sister industry cooperation since it has a direct implication on a permanently critical situation in Mozambique - the generally poor standard of maintenance. Their areas of business also give immediate benefits to the country since they reduce some of the needs for expensive purchases abroad. Had the situation in the countryside not deteriorated as it did, Agro Alfa would probably also have been a good choice for this kind of cooperation.

All three enterprises run a unit production which makes them less vulnerable than a process industry like FAPEL/FAPACAR.

The size of all three companies also appears to be well-chosen. They are middlesized, sufficiently big to have a need for proper management, production planning, financial policies and routines etc. Yet they are not too big and bureaucratically structured which could impede a transfer of industrial know-how. From this point of view also the Swedish sisters have been well chosen. They have long experience of their business and are somewhat bigger than their Mozambican sisters which is beneficial for the transfer of knowledge situation.

A third factor is the duration of a sister industry cooperation. It is evident that the cooperation between ELECTROMOC and BEVI is the most advanced. This could be attributed to BEVI's greater international experience or to their approach to the project, but it is just as likely that the longer duration of the cooperation (5 years in comparison with 2 1/2 for

ERMOTO) has been at least equally important. A sister cooperation of this kind is more of a long process of development between two partners than an ordinary project with production goals and fixed timelimits.

#### 5.2.3 An analysis of the company and its environment

For the sister cooperation, the ultimate goal is the transfer of industrial know-how. Thus the investments in hardware should rather be looked upon as tools to achieve this goal. With this aspect in mind the feasibility studies, preparatory documents and plans of operation should analyse in depth the preconditions for a transfer of industrial know-how.

They should study and assess not only the company, its organisation and its staff, but also the company environment as e.g. ownership conditions, labour market situation, dependance on government rules and regulations, etc.

On the next level the staff at all level should be assessed - in many cases professionally tested - to enable the parties to agree on an action plan for manpower development and training.

Staff policies, recruitment strategies and staff conditions including remuneration and incentive schemes should simultaneously be assessed since they form an important basis for future manpower development strategies. Planned changes in equipment, techniques and procedures should be matched against the above proposed analysis.

All these factors must then be taken into account and a strategy be developed on how to bridge the gap between the existing local competence and the ultimate goal of improved technical standard and quality in production. This strategy will eventually result

in a number of sub-projects in manpower development activities and training which can be implemented in a planned way and in pace with the physical rehabilitation of an industry.

With this kind of early analysis and careful planning for the development of qualified local staff, the Swedish sister industry will have to lay at least equal importance on training skills when recruiting advisers. The Mozambican sisters will have to make efforts to recruit as competent persons as possible to fill key posts which can match the objectives agreed upon.

A follow-up and evaluation of each sub-project will be an important instrument to judge how far the transfer of knowledge process has advanced and it will be easier to make current adjustments.

When in a sister cooperation there are job descriptions for each post at all levels and instructions covering most aspects of work and these instructions are understood and followed by those concerned, then much of the transfer of knowledge process has been carried out in a proper way. Then only the more difficult "management approach" remains to be dealt with. This must be based on a series of company policies covering a wide spectrum of subjects such as production, marketing finance, maintenance, personnel and last but not least "management styles".

This proposed "Human resources development approach" is a great task and it can hardly be expected that any sister industry will ever really have all the resources to work in this way. Therefore the sister industries should jointly try to utilize as much of the resources in the society as possible (vocational training schools, adult education, universities and

CFI) - if they are of acceptable quality. This will also need a closer study which preferably should be done at a very early stage. Often it is both cheaper and more efficient to give some support for the upgrading of a regular training institution rather than to feel obliged to set up a new, similar training within a rehabilitation project.

#### 5.2.4 Early support to and alternative methods for management training

Early management seminars with participants from all parties concerned can give more possibilities to get to know each other and discuss various aspects of cooperation before problems arise. They can give the Swedish partner a more realistic picture of his undertakings and a better understanding of the sister industry concept for the Mozambican partner. The "Swedish model" which undoubtedly forms the base for the sister industry projects can be discussed and it will be possible to change or modify less suitable or acceptable aspects of it at an early stage.

An important aspect of management training is the establishment of management models. This could be done by a greater use of mentorship - a closer cooperation and sharing of knowledge between individuals in the same position in the two enterprises. This will possibly increase the costs but if given to the right people and well-planned, the benefits could be rewarding.

#### 5.2.5 Contract on manpower development and training activities

When the manpower situation has been analysed, it should now be possible to agree on a manpower development plan on the above-mentioned sub-projects and to include these activities in a contract or in a

special agreement. In this context it must however be stressed that such a contract or agreement on "software activities" can never be as specific as a contract on physical improvements. There must always be much room for adjustments, improvements and changes since the preconditions for knowledge development is constantly changing. Therefore this part of the contract must be under constant discussion between the sister industries. But it is an important improvement to have a contract on an action plan for knowledge development since it defines the program agreed upon and the obligations of both partners.

5.3 Recommendations on the costs for training of Swedish Advisers

Training in Portuguese and preparatory training for consultants are presently debited to the project and to the Mozambican development assistance funds whereas the costs for the same kind of training for persons employed on SIDA contracts are debited to an internal training account. This make consultants look more expensive in comparison to contract employees. A result of this is that consultants generally try to economize and keep the time for training as short as possible. Where contract employed Advisers have had at least eight weeks of Portuguese and a two weeks' preparatory course before their assignment, it is not uncommon to meet consultants that have only four weeks of language training and a couple of days of general briefing, sometimes none at all. This is not a good situation and SIDA should now change the situation without delay in a way that gives both categories access to the same kind of training on the same conditions.

Many of the interviewed Swedish Advisers had been sent to Mozambique with very little preparation and

it is recommended that SIDA's Training Center should run special preparatory courses on knowledge development for individual consultants before their departure.

**AGRO ALFA**

Sister Industry: Överums Bruk, Överum

Agreement: Contract signed on 28 February 1984

ERMOTO: Number of employees, around 300

Agro Alfa is the largest manufacturer of farm implements in Mozambique. The production program consists of animal and tractor driven implements and hand tools such as hoes, knives, hammers, machetes and axes.

The factory stems from the period before independence and has continued production ever since. In 1983 the factory was run down and the quality of the production was very low.

The rehabilitation work is being carried out in cooperation with Överums Bruk AB since early 1984 under a five year sister industry contract. The Swedish company GAB-Gense has been subcontracted for the establishment of a forge.

Agro Alfa consists of three separate factories, one foundry, one forge and one plough factory. The two first were originally built to support the third and largest factory, but can today be seen as separate entities.

**Results during First Phase**

The rehabilitation work has been implemented according to schedule but with some major delays. New buildings have been erected (mainly at the forge), old buildings have been rehabilitated and improved, new techniques have been introduced, new lay-outs have been laid for the production and new work organisations introduced. New products and improvements of old products based on the industrial know-how of the sister company have been introduced. New machinery and equipments have been achieved and managers have been trained to use the new techniques and equipments.

The changes at the factory are noteworthy and the results must be commended. However delays in comparison with the original plans have occurred and many problems have arisen.

Delays are mainly due to an underestimation of the slowness in the building sector of Mozambique today. Buildings and installation work are still far from being finalized. The management and the Swedish technicians have therefore had to concentrate on these questions far longer than anticipated and other important work has had to be postponed. This is particularly serious for the forge, where it is questionable if installations even will be finalized before the middle of 1989!

A second major problem has been the non-availability of skilled local manpower at all levels. Both parties overestimated the basic schooling of the staff and the availability of people with technical training. Lack of basic theoretical knowledge on the shop-floor and problems to recruit higher level personnel has made the training part of the project more important and more difficult than originally planned. So far the company has not worked out a proper policy for manpower development.

The third and most acute problem stems from the effects of the security situation and the economic recovery programme on the market situation for Agro Alfa. Before PRE Agro Alfa could sell all agricultural implements it procured. Due to the war in the country and the very large price increases after the devaluations, the internal market has almost come to a standstill. On top of that competing imports, mostly via emergency assistance, are allowed freely into the country. The company is seriously trying to come to grips with this problem, by trying to introduce new products, improving its sales organisation locally and perhaps most promising at present, through promoting its exports. However, the department for marketing still remains to be built up both quantitatively and qualitatively.

At present Agro Alfa is in a very weak economic position. Sales and therefore also production has fallen considerably and are far below plans. The cash flow is negative and 1988 may for the first time result in a loss. The future may however not be as bleak as that. Efforts to increase exports seem to give positive results. Agro Alfa must however put considerable efforts to improve its situation and needs all possible support from the responsible Mozambican authorities as well as from Överrum.

### Knowledge Development

As Agro Alfa had been a producing company for many years at the time when the rehabilitation work started, there were a large number of workers with relevant skills. Agro Alfa had also reached the level of literacy for all its workers. In the first years during the installation period the major training activities took place at the shop floor, a training of workers and foremen to handle the new techniques and the new equipment was introduced. In certain cases this also required some theoretical training to make the workers understand new techniques such as e.g. measurement.

This on-the-job training was complemented by bringing some key persons to Sweden for longer training periods, up to 7-8 months. Some 20 persons were trained in that way. They were three factory directors and qualified workers in areas for which no alternative training was available in Mozambique. Training in Sweden is extremely expensive but at this early stage it was found to be the only alternative available. It also increased the

understanding between the two sister companies.

Today, when the production is starting at the forge, a more cost-efficient method is tried. Introductory training on the new equipment is performed in the factory by an expert from Sweden.

Now when most of the installations have been completed it is planned to start a training more tailor-made for each trade within the company. Simple training materials are being prepared, taking into account that many of the staff can barely read and write, and a time schedule is being finalized. The training will also cover foremen and production managers. Much still remains to be done to make the planned training efficient. Cooperation should be sought with CFI to get a more pedagogical approach to this training program.

Foremen training and training of management personnel has so far been weak. However, the plans discussed above also include some administrative training for supervisory personnel, but more of this kind will be needed.

In view of the delays discussed above and all other extra work upon the Swedish experts it is considered that the on-the-job training implemented so far has been efficient. On-the-job training, independently of how well it has been done, can never make up for the lack of formal training of or for the lack of trainable persons on professional and managerial levels.

All three factory directors have little formal education. All of them are reported to be good administrators, but the lack of technical knowledge can never make them ready to take over completely from the Swedish experts. So far only one engineer with academical qualifications has been recruited as a potential factory director. As regards the head of the development department, a key function for a company like Agro Alfa and the head of marketing department, no appointments have so far been made. Therefore, it has not yet been possible to start training for these key functions!

So far most of the staff recruited and trained by the company appears to be prepared to stay. However, as a result of PRE it will be much easier to move to other companies in the future, also to the private sector. It is therefore high time for Agro Alfa to work out a personnel policy, including a policy on incentives for skilled people to stay in the company and a recruitment policy to attract new people to the company. It appears that although Agro Alfa has introduced some incentives, other companies, including other state owned companies, are already more competitive. The low profitability naturally limits the possibilities for the company to be too gene-

rous but it will have to be very vigilant in this respect if it shall not lose too much in a future competition about skilled personnel.

### The Sister Industry Approach

Total cost for the rehabilitation program so far has been some SEK 92 million. Of that SEK 50 million has been spent on the sister industry contract on activities in Mozambique as well as in Sweden. It is extremely difficult to make a cost benefit calculation for all these activities, but it is not probable that any other form of cooperation could have supplemented the sister industry concept. Within the existing cooperation Överum has transferred industrial know-how of a kind that only a company in the same field has the knowledge to do. The methodology of heat treatment is e.g. only used by such a company. Agro Alfa has also drawn on Överum's know-how for the development of new and improved products. Such know-how which has been built up at Överum during many decades is very difficult to get hold of and the costs and profits for this knowledge development are intangible.

One of the objectives of the original project was to create conditions for Agro Alfa to enable it to operate eventually with only limited support by expatriates. This objective has not been fulfilled. It is however impossible to assess to what extent this is due to a less efficient transfer of knowledge by the experts from Överum or to the problems discussed above. Looking at the contract between Agro Alfa and Överum it appears that Överum has met its obligations as they were originally agreed upon in this contract.

The contract however was not specific enough as regards knowledge development and training. This question is discussed in more general terms. It is always possible to argue that a sister industry such as Överum should have foreseen the problems and been more active to tackle them when they occurred. Even when obligations such as finding the right persons for key positions were not met, Överum could have taken more initiative. But on the other hand, a middle-sized Swedish company of limited experience from developing countries cannot hardly be expected to do more than has been done by Överum in the very difficult situation they have met in Mozambique.

To a certain extent closer contacts between the two companies and more involvement by the top management of Överum in the day-to-day running of Agro Alfa might have made the cooperation more efficient. Signs of improvements can be seen in the fact that Överum has made a bid for some larger export contracts in which Agro Alfa products have been included.

**ELECTROMOC**

Agreement: Contract signed on October 4, 1983  
Technical Assistance: AB BEVI International

ELECTORMOC: Number of employees: 300 (DME = 90;  
SATIP = 130; FQE = 80)

According to the contract the main operation objective of ELECTROMOC (DME) is to provide repair service of electrical motors, transformers and generators. The establishment and continued development of the workshop at Machava should be made with participation and support of BEVI. BEVI is active in the same electrical repair production area and is able to supply ELECTROMOC with the necessary machinery, equipment and technology.

According to the contract the obligations of BEVI should also be to transfer the technology to ELECTROMOC by the supply of documents and by training in Mozambique. In performing such duties BEVI should act in the best interest of ELECTROMOC with the overall objective to achieve the best economical results for ELECTROMOC and to train the personnel of ELECTROMOC to enable them to run the plant at the desired quality and agreed capacity and without the support of BEVI. With the assistance of BEVI rehabilitation of the other two ELECTROMOC units SATIP and FQE has now also been started.

**Achievements and Problems**

Since much of the equipment in the DME old workshop had to be replaced a new building was required. To avoid unnecessary problems with delays in construction an available and suitable building was purchased for the installation of the new production unit. This made it possible to keep the old unit in operation. Efforts to improve the technical knowledge within the company could be started early. The delay was limited to the delivery and installation of the new equipment.

In 1985 the new unit was ready for start up. At present almost all types of electrical machinery up to 10 KV can be repaired.

Performance tests of the production line have been accomplished and accepted by all parties. Training of personnel has been implemented both in Sweden and locally.

The first part of project has been successfully accomplished. It is now possible to save an amount of approximately 500.000 USD a year which was previously spent for the overhaul of electrical equipment in South Africa and Zimbabwe. Discussions with ELECTROMOC reveal that at

present the main problem is to what extent the technical assistance shall be paid by the individual companies. According to the 1988 budget an amount of maximum 10% is calculated to be borne by the company. This will give a rentability of 14% which is a low figure for a similar service company. It is however important to notice that the cost aspects have meant a critical examination of further technical assistance. During the discussions between the companies a considerable reduction has been agreed upon:

	88/89	89/90	90/91	
before	79	71	43	manmonths
now	58	53	31	"
Reduction	21	18	12	manmonths

or totally 51 manmonths compared with the previous plans. Hopefully these savings are carefully analyzed to avoid that the knowledge development process will be a failure and that the final objectives will not be achieved.

So far the project has mainly concentrated on technical problems and improvements of quality. Therefore the problems concerning management aspects have now to be given priority. It had been an advantage if this had been dealt with in parallel with the investment and physical rehabilitation period. The impression is however that the Mozambican management is well aware of the problems and will put special emphasis on them.

### Knowledge Development

According to the contract a training program was elaborated and presented by BEVI shortly after the signing of agreement. This program agreed upon by the two parties, was prepared on their previous experience from a similar project in Tanzania. The general level of education of the personnel in the project was however overestimated. Workers with long practical experience but low education had difficulties in understanding that more training was required if the expected quality of repair work was to be achieved. A more direct practical instruction during one and a half year became necessary to make it possible to keep up to production targets and at the same time maintain the expected quality. During this period an organised training, step by step, was not possible according to BEVI's local advisers.

Later on, a more systematic training was planned but the level of education was too low. Therefore training in general subjects e.g. mathematics, etc, had to be organized and according to ELECTROMOC the following courses have been accomplished.

No. of participants	Subject	Time h
11	El-machinery and transformer	70
6	El-machine laboratory	70
5	Special calculation for el-machinery	70
6	Mechanical knowledge	70
4	El-drawings (SATIP and FQE)	70

These courses have been implemented as classroom training based on a draft program. The documentation or instruction manuals have been written by the trainees during the training course. Some theoretical materials and handbooks have also been available and set of instruction manuals and specific handbooks have been prepared. The intention is now to organise a 2-year course for 18 participants in Basic technics and another course for winders of el-motors. The Swedish team is planning a 6-months' practical training course but with a stepwise evaluation of achieved results.

A special room for training and laboratory tests has been made available, equipped with an el-motor test bench earlier utilized in the el-training in Sweden.

The production technicians, at present five, are participating in all technical training. In average they have a higher basic education (9-12 years) but they are young and have only been employed for about 2 years. Their young age is not expected to give any supervision problems since they have the required technical knowledge.

In addition to the above-mentioned training programs the following program has also been implemented abroad:

No. of participants	Training period	Subject	Level	Place
3	4 months BEVI	Production technique	Middle	Sweden
2	4 months BEVI	Repair & maintenance of electric motors	Middle	Sweden
4	4 months BEVI	Repair & maintenance of electric motors	Basic	Sweden
1	10 days BEVI	Marketing	Middle	Sweden
1	10 days BEVI	Marketing	Basic	Sweden
3	30 days ICEP	Repair of transformers	Middle	Portugal
2	15 days CONTREX	Welding machinery	Middle	Sweden

Even if the training abroad was said to have been successful, it would be advisable in the future to try to find out if similar training is available in a Portuguese-speaking country at a lower cost.

At the time of the reviews the managing director of ELECTROMOC was participating in an International Management Training Course in Sweden, financed by BITS and he will receive some further practical information by BEVI before returning to Mozambique. It is the intention of ELECTROMOC that during the next period of assistance the management training will be intensified.

The turnover of personnel in the company is very low and only a few are leaving yearly. It might be that the salary-level, together with fringe benefits e.g. transport, lunch, etc, is competitive but it can also be the result of a very active internal training and manpower development that makes it possible for staff to be promoted to higher positions. A well established positive personnel policy can motivate people to feel more responsibility for the company and give it a positive image. This might be proved by the fact that when ELECTROMOC is advertising for new employees, the number and quality of applicants has increased considerably.

#### Transfer of Technology and Industrial Know-how

BEVI has participated in the installation and start-up of a new production unit. This implies that quantity as well as quality of the repair work has been improved. Big repairs of el-motors and transformers which were earlier sent abroad are now being made within the country. This means considerable savings of foreign currency for Mozambique. The company has been reconstructed and organized in a way similar to BEVI. According to the present budget, the company will give an acceptable profit, even if 10% of the costs for the technical assistance have to be borne by the company.

Due to a misunderstanding, some documentation concerning the technical know-how was delayed but has now been handed over to ELECTROMOC.

For the management of ELECTROMOC it is now a priority that managerial development will be given much attention and that the rehabilitation work will be concentrated on the other two units, SATIP and FQE.

A result of the findings made during this study gives a general impression that when considering the sister industry concept, BEVI has so far been the most successful company. An important reason for this is probably that it is also the longest cooperation and that the management of ELECTROMOC has been more experienced and in a better position to learn from the sister cooperation. BEVI is also the only Swedish sister of the three with previous experience from developing countries.

**ERMOTO**

Sister Industry: Sterner Blomquist, Malmö

Agreement: Contract signed on 25 September 1985

ERMOTO: Number of employees, around 150

ERMOTO is the largest of three companies in Maputo which carries out repairs and renovations of combustion engines and transmissions. This project was based on a report made by the Swedish consultancy firm, Idhammar, which was made in 1984 and an evaluation of this proposal made by Sterner & Blomquist in June, 1985. The report contains a rather detailed description of technical alterations and improvements recommended. It also states that the level of the Mozambican staff was reasonable but that they still needed much training and that special attention should be paid to this aspect. It does not, however, give any suggestions or indications as to how this problem should be solved. The contract only states that: "the rehabilitation of ERMOTO shall be carried out with the continuous support of a "sister company" in Sweden, active in the branch and able to submit know-how through transfer of technology and training of personnel."

The contract also states the different interventions agreed upon:

- a complete assembly of machinery and tools, including spareparts
- a thorough education of ERMOTO's personnel in administrative handling systems and in general technique of reconditions of gas engines and big diesel engines with the application of thermal spraying and other relevant modern techniques presently applied within the industry
- a specialization of ERMOTO's three workshops.

In the contract there is no direct mentioning of any cooperation in the management of ERMOTO. In paragraph 2.10.1, however, it is stated that "ERMOTO may at any time submit instructions to Sterner Blomquist relative to the execution of the Work or part thereof. Sterner Blomquist shall comply with such instructions".

The contract does not give any indications on what shall be achieved over a given period. Therefore, it is difficult to follow up activities against any goals and objective set.

On the other hand it can be advocated that management operation and training both are implicit parts of any sister industry cooperation.

#### Costs and Technical Assistance (Annex 1)

The costs have been estimated at SEK 13.000.000 - over a period of four years and four months. For training and basic training there is a budget of SEK 1.95 million. Most of the training funds have been utilized for the training of ERMOTO's management staff in Sweden. SEK 0.95 million were budgeted for basic training during the first two years. These funds have been used to get an internal training centre going.

Technical assistance from Sterner Blomquist has been estimated to 118 man-months on longterm contracts in Mozambique, 4 on shortterm contracts and 4 months work in Sweden.

#### Results achieved during the first Phase Impressive

The cooperation between ERMOTO and Sterner Blomquist commenced in September 1986 when the first two Swedish technicians started their work in Maputo, mainly with the installation of new equipment and on-the-job training of some of the Mozambican staff. Now, after two years, most of the installations have been completed. The lay-out of the workshops has been considerably improved and Mozambican staff can now handle the new equipment. ERMOTO which previously only could do part renovations of engines, can now completely renovate 52 different engine makes. The quality of work has improved much which in the long run will certainly prove itself in fewer guarantee repairs and a longer durability of the renovated engines. New techniques as metalspraying of worn surfaces on crankshafts and new welding techniques are now being used. An oven for heat treatment of surfaces still remains to be installed.

This new technical know-how from the Swedish sister company means a great improvement in quality which is difficult to measure in term of money. The transfer of knowledge effect is impressive.

The renovation of one large diesel engine costs about SEK 40.000 - which shall be compared with the cost for a new engine, SEK 120.000. 60% of the costs for a renovation consists of imported spareparts or consumables. Thus ERMOTO's activities already mean great savings in foreing currencies although the company's own profits are still moderate.

Looking at the results so far and the company's business idea and size, the selection of ERMOTO for sister industry cooperation appears to be a good choice.

During the last year Sterner Blomquist has had a third member of the team in ERMOTO, a specialist in administration and finance administration of the workshop who is at the same time coordinator of the project.

### Problems

In spite of the impressive improvements described above, problems encountered have been many. The rebuilding and installation program has been delayed and there are still some minor installations which are still not finished. The training situation is still bad in spite of all efforts made. It is evident that neither of the five parties, SIDA, Sterner Blomquist, ERMOTO, the Coordinating Unit and Swedind, had any realistic idea of what education and professional capabilities were necessary to rehabilitate the company. Much of this problem is to be found in an insufficient preparatory work before the agreement was concluded. As in the other two projects, no real analysis of the staff's educational and technical level was made. Thus Sterner Blomquist was confronted with an educational and professional situation which was far more difficult than they could have expected, considering that the company had no previous experience from work in developing countries. Apparently, ERMOTO's management was equally unaware of the real training needs since it took over one year until efforts were started to raise the standard of the staff. Still there are no established standards set on minimum educational levels for the staff. It was reported that there are still some persons working on responsible posts who are illiterate. In the long run this will impede further development both of the individuals and of the company since technical and quality aspects will demand an education level where people can read instructions and work in accordance with set tolerances, etc.

### Lack of manuals and work instructions, etc

The management of ERMOTO stressed that they are lacking documentation of many different kinds as e.g.:

- repair manuals
- sparepart manuals
- instructions for internal work routines
- step by step instructions for different working elements
- manuals and instructions for the management of stores

It was agreed that Sterner Blomquist shall make special efforts to supply ERMOTO with such documentation. Some work instructions still remain to be written during the coming years.

The production of training materials and the above documentation appears to be a narrow sector for Sterner Blomquist. The kind of work ERMOTO is doing demands many

manuals and instructions and it will need special efforts by both sister companies to produce what is necessary.

### Transfer of knowledge

Training activities so far have been

- two six-weeks' training period in Sweden with Sterner Blomquist for ERMOTO. General Manager and Finance Manager
- 6 weeks' training in thermal spraying in Maputo by a short-term consultant
- 3 weeks' training in spareparts handling and computer systems for spare part personnel.

ERMOTO has now also started an internal training program for its workshop staff with 24 persons divided in two groups. They study two hours a day five days a week in:

Mathematics	65 hours
Workshop engineering	40 "
Material instruction	50 "
Calculator counting	50 "
Drawing engineering	65 "

This program will be carried out in cooperation with the SB team which will supply training materials and give certain theoretic lessons.

The SB team has also started training department-wise by closely following the staff in one department for a longer time in their daily work and instructing them directly when they meet a problem. A three weeks' training of the reception staff had just finished.

A training plan with this kind of training had been presented by SB but ERMOTO's management had not altogether accepted it. They felt that there was too little real training in the concept, that the theoretical training was lacking, that the objectives were unclear and its content not specified. They were also lacking training materials to support the trainees. SB had difficulties in understanding what was now to be done to meet ERMOTO's demands. With some justification they claimed that this method of training was the most efficient since it was directly aimed at improving staff performance at work.

To a large extent this is a methodological problem which goes back to the original concept of the project where much emphasis was laid on technical questions. According to the contract only one of the two technicians should have previous pedagogical experience and most of the work during the first two years has been to install equipment and get into production. Now when more emphasis has to be

put in manpower development programs the SB team will need support to be able to develop a manpower development plan together with ERMOTO's management. In this work they should initiate a close cooperation with Centro de Formação Industrial where the recently installed Swedish Adviser will have a special responsibility for training support to the three sister industry projects.

The project was lacking suitable training material in Portuguese. The MES material (Modules of Employable Skills, an ILO/SIDA training material for mechanics) was not known to the SB-team. They wanted some assistance to explore the Brazilian market for suitable material since a visit to Portugal had given poor results. An assistance of this kind could be given either by CFI which has good contacts with the Brazilian vocational training organisation SENAI or by SIDA which is now working with the questions of supplying training materials to aid projects. Another solution to the materials production problem could be to let the trainees themselves produce manuals for their work as a result of the on-the-job training courses.

#### The Sister Industry concept

The sister cooperation between ERMOTO and SB appears to be the least developed. The reasons for this are most probably to be found on both sides. The change of ownership and executive management at Sterner Blomquist after the cooperation had started, could have had an impact on the active interest from the Swedish side. At the same time it must be stated that the cooperation has benefited from having the same coordinator in Sweden all the time. Of the three advisers two are externally recruited. Although all three now speak Portuguese, ERMOTO's management claims that lacking knowledge of the language has had an initial impeding effect on the cooperation.

As stated above the contracts do not specifically mention anything about management cooperation but rather emphasizes administrative questions. The advisers' role as a transferer of wider management skills has become clear to all parties only during the last year.

To ensure a smooth and profitable running of the company, much has still to be done by ERMOTO. Work has been started to make a valuation control of the company's assets and a depreciation scheme, but it has not yet been finalized. These are important basic facts for the calculation of working costs, pricelists, etc. So far this work has not been given enough priority. Another problem has been the reluctance to change prices after a devaluation of the meticaís has taken place. As late as in July 1987 the pricelist for 1985 was used. This means considerable losses for the company and puts SB's responsibility for the creation of "a viable company" in a difficult posi-

tion. Another important question which is still awaiting a policy discussion and management decisions is the establishment of a staff policy with clearly sets rules and regulations.

A computer study which was undertaken by SB had been taken over by Gapricom to be done by a Swedish consultant. Since then nothing has been heard of what is happening with the study. This also risks to delay the introduction of a new administrative system.

The long periods of absence for ERMOTO's General Manager on training also give reasons for concern, since much of the development work risks to come to a standstill during this time.

The factors described above reflects more of a consultant's work to rehabilitate an industry rather than a sister cooperation. SB has so far not really got a possibility to work with ERMOTO on a wider scale. Their activities are directed to certain specific areas rather than to an improvement of the company as a whole. This might be due to the fact that the cooperation between SB and ERMOTO is much younger than in the other two projects and that the management and administration questions have only been dealt with during the last year.

The costs can be distributed as follows:

PERIOD	1.3.1986 30.6.1988	1.3.1986 30.6.1989	1.3.1986 30.6.1990
1. Civil construction	300	100	400
2. Equipment	4600	1000	5600
3. Vehicles	700	-	700
4.1 Raw materials	350	-	350
4.2 Spareparts	2000	7000	9000
5. Technical ass.	3450	3000	6450
6. Training	600	-	1000
7. Backst. costs	1000	-	1500
8. Basic training	950	-	950
TOTAL	13950	12050	26000

TRAINING/TECHNICAL ASSISTANCE	Manmonths		
1. Longterm contract	63	55	118
2. Shortterm	3	1	4
3. Training in Sweden	2	2	4

**CENTRO DE FORMACAO INDUSTRIAL (CFI)**

Centro de Formação Industrial started its activities in 1987. It has built up an impressive organisation relying mainly on training in English, typing, secretarial work and accounting. Its future development will according to plans be more to the training of management and middle management staff.

CFI charges course participants or their enterprises a, for Mozambican conditions, comparatively high fee which now has given the Institute a sound financial basis in local currency for local activities.

Already at the end of 1986 CFI was identified as a suitable institution to support the sister industry cooperation but with some assistance from SIDA.

The original concept of the Swedish support to CFI was to strengthen the Institute with a Training Adviser to support the sister enterprises in their important training work. It was considered that some of this training could be done jointly between the three companies and that the training programs worked out under the sister companies would then also benefit other Mozambican industries.

Due to difficulties to recruit a Training Adviser with a suitable background, the actual strengthening of the Institute took place only in June 1988.

In the meantime it had become important to speed up the creation of new training programs on high levels and it was decided in the Ministry to put these courses on an international tender. This has changed the original concept where the Swedish Adviser was supposed to assess the different training demands and to draw on training resources in Sweden and elsewhere. In this new situation with a consultant running a number of management courses for the Mozambican industry during a short time, it will be very important to strengthen CFI with some coordinators of different subjects.

CFI:s primary role in the sister industry projects should be to act as a consultant, an initiator of a knowledge development process. It is a difficult role where CFI will have to balance between its own organisations's limited professional competence and the important needs of the companies.

CFI will also have to arrange training courses of common interest to the three companies (as well as to other Mozambican companies) at the same time as the competence of its own staff must be raised.

CFI:s management has presented its concern over its present administration of training courses which they feel could be a major obstacle to further development. It was agreed that CFI would make a study over the present situation and put up proposals to SIDA as to how these problems should be solved.

The above mentioned questions are now of absolute priority for CFI. In the long run there are many opportunities for a further development of the centre but this development must necessarily take its time.

CFI could become a national focal point for industrial management training, arrange conferences on manpower development and train training managers, etc.

But the first important goal for CFI is to support the sister industries in a way that the Institute can learn by experience and get a reference object for further marketing of its services.

**CENTRO DE FORMACAO INDUSTRIAL (CFI)**

Centro de Formacao Industrial started its activities in 1987. It has built up an impressive organisation relying mainly on training in English, typing, secretarial work and accounting. Its future development will according to plans be more to the training of management and middle management staff.

CFI charges course participants or their enterprises a, for Mozambican conditions, comparatively high fee which now has given the Institute a sound financial basis in local currency for local activities.

Already at the end of 1986 CFI was identified as a suitable institution to support the sister industry cooperation, but with some assistance from SIDA.

The original concept of the Swedish support to CFI was to strengthen the Institute with a Training Adviser to support the sister enterprises in their important training work. It was considered that some of this training could be done jointly between the three companies and that the training programs worked out under the sister companies would then also benefit other Mozambican industries.

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CFI:s primary role in the sister industry projects should be to act as a consultant, an initiator of a knowledge development process. It is a difficult role where CFI

will have to balance between its own organisations's limited professional competence and the important needs of the companies.

CFI will also have to arrange training courses of common interest to the three companies (as well as to other Mozambican companies) at the same time as the competence of its own staff must be raised.

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3 August, 1988

## TERMS OF REFERENCE

### EVALUATION OF THE TECHNICAL ASSISTANCE WITHIN THE PROGRAM FOR INDUSTRIAL REHABILITATION, MOZAMBIQUE

#### 1 Background

Since 1983, SIDA supports a program for industrial rehabilitation in Mozambique. The main goal of the program is to create economically and financially viable companies. After the rehabilitation the local management and staff, sometimes in a commercial cooperation with a foreign firm, are expected to produce goods and services which are competitive on the local market and preferably also internationally.

Three State-owned companies are at present under rehabilitation, viz, Agro Alfa (farm implements), Ermoto (service and repairs of combustion engines) and Electromoc (service and repairs of electrical machines). The Swedish support is given as a package containing both hard-ware (buildings, equipment, spareparts and raw-materials) and soft-ware. The transfer of technology and industrial know-how is the thrust of the cooperation. The rehabilitation of the specific companies is undertaken through so called sister industry contracts between Mozambican and Swedish industrial companies.

Since the beginning of 1987, the Mozambican industry lives under different conditions than under the centrally planned system which was imposed gradually after independence. A more market oriented approach has been established giving increased autonomy and accountability to the enterprises. Furthermore changes have been made in key macroeconomic parameters, especially a considerable devaluation, which have drastically changed the conditions under which the industry as well as the whole Mozambican economy operate. These changes form a part of the Program for Economic Recovery (PRE) launched in the beginning of 1987.

#### 2 Objectives

The evaluation should focus on the achievements and problems associated with the transfer of technology and industrial know-how within the sister industry model as it has been implemented in the program for industrial rehabilitation in Mozambique. It shall be mentioned that the evaluation has been given priority because of the problems encountered to terminate the cooperation and

phase of the Swedish personnel in accordance with established plans.

It has been agreed between Sweden and Mozambique that the transfer of technology and industrial know-how will also in the future be the thrust of the cooperation between Mozambique and Sweden in the field of industrial rehabilitation and small-scale industry development. Emphasis should therefore be given to provide conclusions and recommendations to improve the mechanisms which guide the transfer of industrial know-how within sister industry contracts.

Special attention should be given to the problems involved in building up management capacity. In this context it is also of special interest to assess the internal technological and management capacity of the companies to respond to changes in conditions which are external to the company e.g. increased exposure to (foreign) competition or changes in the market etc.

It is the intention that the Mozambican experience be analysed also in a broader context in order to draw general conclusions about the merits and draw-backs of the sister industry model, for the transfer of technology and industrial know-how in implementing industrial rehabilitation projects. The sister industry model could in this context be assessed against other mechanisms for technology transfer e.g. individual and commercial contracts.

The evaluation should furthermore include a discussion on how the national economic value of the technologies and skills transferred can be assessed. This should not only include the value of the short-term contributions to national objectives but also the estimated social value in the long-term of the technology transfer. The cost of the soft-ware component should be set against the value of the long term socio-economic impact. This means that the evaluation should stress the dynamic process going on in the industries under rehabilitation, rather than concentrating in mere static evaluations of the past and present situation in each industry. Such an approach will also be constructive when discussing how the cost for technical assistance should be born by the economy as a whole and by different companies receiving the support.

### 3 Duties

The evaluation shall comprise, but not necessarily be limited to, the following tasks:

- Describe the management role adopted by the Swedish companies and the concept for the transfer of technology and industrial know-how. Here it is of importance

to know if the roles have been chosen after an established strategy (company approach) or, as a result of individual/circumstantial factors (e.g. management capacity of the junior sister, characteristics of the individual Swedish and Mozambican project managers).

- If different approaches have been adopted analyse and explain the reasons therefore and assess if methods adopted have been successful and based on an investigation of possible achievements within the contract period.
- Analyze and describe the achievements and problems associated with the transfer of technology and industrial know-how within the sister industry model. The analysis should also point out if there are some specific problem areas (e.g. technical, financial, managerial) or if problems/achievements are general and not particularly related to specific areas.
- Try to be as specific as possible e.g. can a change be noted in the capacity of the Mozambican personnel to take over vital decisions. If so what levels (e.g. management, production, economy, sales)?
- Assess if size of company, ownership and organization of the company are of importance for the achievements and problems encountered.
- Describe to what extent qualified Mozambican personnel have been recruited to the various companies after decision to rehabilitate the companies. Have Mozambican key personnel stayed? Describe measures needed to ensure that qualified local key personnel stay (e.g. need for incentives).
- Analyze and describe how Centro de Formacao Industrial can best assist the sister industry companies. Elaborate on CFI's possibilities to:

assist in analyzing training needs and assist in the elaboration of training programmes

collaborate in the organization and supervision of the training activities within the sister industries

carry through training, in particular in general subjects on base level or in other fields where CFI can be more cost efficient compared to sister industry cooperation.

The consultants shall based on the analysis of the above mentioned issues and other possible considerations provide conclusions and recommendations to ensure an increased efficiency in the transfer of technology and industrial know-how within the sister industry cooperation.

tion. The fact that experience has shown the difficulty to phase out technical assistance within agreed periods and budgets calls for an examination of possibilities to improve the cooperation.

The Education Division at SIDA initiates and implements a large number of studies regarding education and training, especially in SIDA's programme countries.

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Swedish International Development Authority (SIDA)  
Education Division  
S-105 25 STOCKHOLM

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