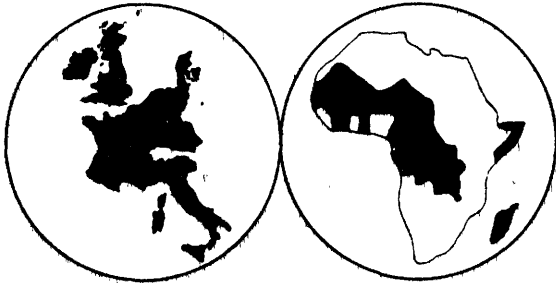


**POSSIBILITIES OF ESTABLISHING EXPORT INDUSTRIES IN THE
ASSOCIATED AFRICAN AND MALAGASY STATES**

- **ELECTRO-MECHANICAL EQUIPMENT**
- **ELECTRONIC EQUIPMENT**

SUMMARY REPORT



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SUMMARY REPORT

PREAMBLE

In view of the priority which the second Association Agreement (Yaoundé II) gave to the industrialization of the Associated African States and Madagascar and the opportunities which the manufacture of certain products for export could offer some of these States, the Commission of the European Communities, in agreement with the Associated States, commissioned a programme of studies on the possibility of setting up certain export industries in those countries.

These studies, carried out sector by sector, cover the following products or groups of products:

Livestock products:

- meat
- hides and skins, leather
- footware
- articles of leather

Electrical and electronic equipment:

- electro-mechanical equipment
- electronic equipment

Processing of wood and manufacture of articles of wood:

- first stage of processing (sawing, peeling, slicing)
- second stage of processing (profiles, mouldings, plywood, panels)
- finished products (for building purposes and furniture)

Iron and steel products:

- pelletising of iron ore and steelmaking by electrical processes
- ferro-alloys (ferro-silicon, ferro-manganese, ferro-nickel)

Preparations and/or preserves of tropical fruits:

- (dates, bananas, citrus fruits and essential oils, pineapples and preserves in syrup, cashew nuts, groundnuts for direct consumption and various exotic fruits)

Manufacture of cigars and cigarillos.

The same method was used for all these studies. It involved analysing, first, the potential markets for AASM manufactures in the industrialized countries (the Community in particular) and, secondly, the specific conditions of production for the product or products in the AASM States best placed to produce and export them.

All these studies were carried out by independent experts. The Commission defined the aims of the studies and kept a constant check on progress but, since the experts acted quite independently, what they reported reflects their own findings only and the conclusions to be drawn from them.

The study on electrical and electronic equipment was supervised by the IFO-Institut für Wirtschaftsforschung - Munich. The team consisted of

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The Commission and the team of experts wish to thank all those who kindly contributed to this study, which they hope will prove to be a useful source of information for all the organizations, administrations and investors interested in the industrialization of the Associated African States and Madagascar.

This summary report exists in French, German, English, Italian and Dutch.

Reports of studies carried out by experts on each sector can be obtained free of charge (in French only) from the following address:

Commission of the European Communities

VIII/B/1

200, rue de la Loi

1040 Brussels (Belgium)

ELECTRO-MECHANICAL AND ELECTRONIC EQUIPMENT

The purpose of the study carried out on electro-mechanical and electronic equipment was twofold:

- (i) to examine the possibilities which exist in the AASM for manufacturing and exporting this equipment and, where appropriate, to draw up specific projects;
- (ii) to form, on the basis of this analysis, a more definite opinion of the possibilities offered, on a more general level, of making full use of the potential labour force of the AASM by setting up sub-contracting or other labour-intensive industries.

Among the industries and products reviewed in this programme of studies, the production of electrical and electronic equipment is the only sector which is not primarily concerned with the processing of raw materials (wood, textiles, meat and leather, fruit and vegetables, etc.,) but makes full use of another factor of production - labour. The analysis of this sector is therefore based on a different method from that adopted when carrying out the other studies.

These start from a selected range of products and groups of products which had been defined in a preliminary study¹. They then make a detailed assessment of the potential demand in the industrialized countries for each of these products and compare it with each Associated State's available resources of raw materials, production factors and capacities and industrial infra-structure and environment. This comparison leads to the definition of a certain number of proposals for projects, which assess their feasibility and the specific conditions required for their execution.

The study dealing with electro-mechanical and electronic equipment on the other hand, is mainly concerned with identifying those articles, whether intermediate or finished, which could be produced in countries where wages are low and, in particular, in the AASM. The reason is that an export-oriented industry

¹"Pré-sélection des industries d'exportation susceptibles d'être implantées dans les Etats Africains et Malgache Associés" (Pre-selection of export industries suitable for setting up in the AASM).

in this sector can only be set up in the AASM through direct or indirect sub-contracts awarded by large concerns in the industrialized countries, because:

- (i) only industrial concerns in the developed countries have mastered and control the technology of essential stages of the overall manufacturing process;
- (ii) the same large concerns constitute the only market for most of the components and intermediate products which can be manufactured cheaply in countries where wages are low.

The fact that there are no open and transparent markets for intermediate electro-mechanical and electronic products and that finished products in this sector are remarkably varied, both technically and commercially, particularly complicates the task of defining what products can be transferred and the technical characteristics, manufacturing processes and specific prices of such products. This study proposes to identify this group of products and their characteristics by a method involving several approaches designed to cover all the various aspects of the problem.

The analysis then deals, as in the studies on the other sectors, with the conditions for manufacturing the products selected in the various AASM and leads to feasibility studies for a number of specific projects.

A. IDENTIFICATION OF PRODUCTS

To identify the products which could be manufactured in countries where wages are low, the survey proceeds in five stages:

- (i) definition of the structural elements of the different groups of electrical and electronic equipment (labour coefficients and other factors of production, influence of transport costs, etc.);
- (ii) analysis of the growth of the industrialized countries' imports of these products from the developing countries;
- (iii) analysis of the development of the electrical and electronic industry in a few selected Asian countries (Singapore, Hong-Kong, Taiwan);
- (iv) assessment of the technical and economic prospects in selected fields of the electrical and electronic industry;
- (v) analysis of foreign investments and the policy of European firms towards setting up electrical and electronic industries.

The results of these partial analyses suggest that research should be concentrated on the following products and groups of products:

Semi-conductors

Active electronic components mainly comprise electronic tubes and semi-conductors. The proportion of American imports of these groups of products from developing countries (non-OECD) is very high in relation to imports as a whole. Within this group of products, semi-conductors represent the largest share of imports. In this sector of production, American firms have set up production units in a certain number of developing countries (non-OECD), especially in the Far East. These do not usually cover the whole manufacturing process, but only assembly and, in some cases, inspection of semi-conductors as well. The technically complex production stages requiring costly installations (diffusion process) are carried out in the parent factories in the United States.

Semi-conductors present an extraordinarily good example of a product for which the stages of production requiring large capital investments and those which require above all a large labour force can be carried out separately.

Unfortunately, the proportion of costs represented by wages is only known for the whole sector of active components, but the proportion represented by transport costs is small, which is a great advantage. For semi-conductors alone, among all electro-technical and electronic products, low transport costs should be the argument which carries least weight. This is true above all where not only discrete semi-conductors (diodes, transistors) but also highly complex integrated circuits are assembled in a developing country.

Compared with American firms, European companies have transferred very little semi-conductor production to developing countries (non-OECD). However, in this sector, EEC imports from developing countries (non-OECD) are fairly substantial. These imports consist of re-imports from subsidiaries of European companies and direct imports from foreign firms established in these countries. Nevertheless, in relation to American imports from developing countries (non-OECD), EEC imports only amount to about 7%. EEC imports from the developing countries (OECD) in 1971 only amounted to 1% in relation to American imports from the same countries. European industry cannot therefore equal that of the United States in the developing countries, as regards using low-wage countries to produce semi-conductors. It is a fact that the enormous drop in the prices of these products over the last few years has placed the European firms in a critical situation. The origin of this trend, which was most marked during the world semi-conductor crisis in 1970/71, is to be found in the policy followed by the American firms. As a result, European concerns are wondering whether they should step up their production activities in low-wage countries. In view of the fact that salaries have risen enormously in the last few years in Far Eastern countries, where this type of production has become traditional, it is not unlikely that from the point of view of costs, new localities will be considered.

The trend towards mechanizing the labour-intensive production stages is being encouraged. Progress has been made here particularly in the manufacture of contacts. There still exist, however, a certain number of stages of work subsequent to the diffusion stage which will continue, even in the long run, to require intensive labour. From this point of view, it would be worthwhile to investigate whether the assembly of semi-conductors in the AASM is profitable.

Passive components

Passive components include resistors, capacitors and inductance coils. The United States import far less passive than active components from the developing countries (non-OECD). They can only represent 4 to 5% of all imports. EEC imports from the developing countries (non-OECD) are more considerable in this field, reaching about 8%. However, EEC imports of passive components from the OECD developing countries are far more substantial: they are estimated at about 20%. A large proportion of these imports can be taken to be produced in OECD developing countries by firms in which European concerns hold interests. Whereas American companies have set up production units in the developing countries for active components in particular, it seems that European firms have concentrated more on passive components.

The transport cost fraction is not as favourable for passive components as for active components. If the range of components to be considered for export production is restricted to miniaturized components, a figure comparable to that for discrete semi-conductors should be obtained. It would be surprising if the value of the wage cost fraction were extraordinarily favourable, because the manufacture of passive components must be considered as a capital-intensive industry, although it comprises some labour-intense production stages. Unlike semi-conductors, the manufacture of passive components cannot in most cases be divided into capital-intensive production stages and labour-intensive production stages. Where such an industry is to be transferred, the whole manufacturing process must be transferred.

The production of passive components has been largely mechanized. The reduction of wage costs and the demand for high quality were leading factors here. However, many components, such as coil capacitors and coils, can be manufactured with predominantly manual techniques without necessarily sacrificing quality. It is worthwhile examining whether it is profitable to produce such equipment in the AASM.

Electromechanical components

Electromechanical components include relays, switches and connecting and disconnecting devices used in electrical equipment and telecommunications and also in radios, televisions and motor vehicles. The analysis shows that EEC imports from non-OECD developing countries and especially from OECD developing countries are relatively higher than American imports.

Subsequent analysis of the transport cost and wage cost fractions shows that some products in this group might suitably be manufactured for export.

When selecting electromechanical components to be manufactured for export, it should be remembered, on the one hand, that they are to some extent competing against replacement by electronic components (this will continue to be true, especially for telecommunication relays) and, on the other, that final assembly and final inspection include stages of production which are labour-intensive and could therefore be suitably transferred to the developing countries.

However, production has often not been stepped up, for spare parts are machined with highly complex special machines requiring considerable capital outlay. All-purpose machines cannot be used because they are not profitable and they require skilled workers.

It can be assumed that it is easier to process plastics in developing countries than to machine metals. For this reason this survey has selected items of electrical equipment comprising labour-intensive production stages and requiring a large plastics processing industry. It assesses the comparative profitability of these products.

Electronic items of mass consumption

Electronic items of mass consumption (radio and television sets) and their accessories (e.g. aerials) represent, as a whole, the largest category of imports from developing countries. Both the United States and the EEC import a large proportion of this equipment from non-OECD developing countries, in particular the Far East.

With regard to the transport cost and wage cost fractions, this group of products does not seem naturally suited for manufacture for export. If the range is limited to compact portable sets, the transport cost fraction appears to be more satisfactory. It is uncertain what the wage cost fraction amounts to because it was impossible, when calculating its proportion, to start with the added value deriving from the assembly operation and the calculation had to be based on total production value.

There are still a very large number of skilled workers involved in the assembly of radio and television sets, even if their number has been reduced thanks to the use of integrated circuits, modular elements and assembly machines.

In comparison, the unsatisfactory value of the wage cost fraction clearly suggests that manufacturing radio and television sets for export is only profitable if a large number of the necessary components are also manufactured in the developing country in question, in this case the Far East. To check this hypothesis, the study includes a profitability assessment for the assembly of portable radio sets.

Electrical measuring and control equipment

In the field of measuring and control equipment, the proportion of both American and EEC imports from the developing countries is comparatively small. The values of the transport cost and wage cost fractions are, however, satisfactory for this category as a whole. If the analysis is concentrated on compact electronic and electromechanical equipment, these products could very well be manufactured for export. For this reason the survey assesses their profitability.

During the process of identification, several products which at first sight seemed to be of some interest for an export industry in the AASM were finally eliminated, mainly electrical household appliances, electric motors and incandescent lamps. The survey sets out the arguments in favour of them and the reasons why they were finally eliminated.

The role of the AASM in the investment policy of the electrical and electronic industry

The analysis of foreign investments and of the European electrical and electronic industry's policy of overseas expansion, undertaken in order to identify which products are suitable for export production in the AASM, sheds light on more than the original objective. European, American and Japanese industrialists were questioned and information was obtained not only on the types of products which the industry itself has so far selected for production in the developing countries, but also on the motives which guided it in these transfers of production and the considerations which determine its future investment policy in the developing countries and especially in the AASM.

The enquiry among European firms showed that they had not yet considered the AASM as a site for export industries. It was also found that European companies had not invested very heavily in the developing countries to take advantage of low wages to reduce their costs.

American and Japanese firms, on the other hand, attach greater importance to these grounds for investment; those that have set up production subsidiaries in the Far East emphasized that they would immediately locate industries in the AASM if low-cost production were possible in those countries.

Even though a few of the European firms which were questioned thought that in the long term they would not locate a larger proportion of their investments in the developing countries for reasons of cost and capacities, it is doubtful whether this is the general opinion. As a result of the considerable changes in the currency parities between the United States and Europe, European firms find themselves in a completely new situation which compel them to alter their way of thinking. In Germany firms are finding that the wage level is to some extent higher there than in the United States. Heavier investments in the United States will perhaps be encouraged as a result. However, the growing pressure of competition could also result in European firms transferring production to developing countries on a larger scale than they have so far done.

Leaving aside the arguments based solely on profitability which, according to European firms, usually suggest that transferring production to the AASM is inadvisable, the question of the political and politico-economic stability of the African States was constantly raised. On this point, ideas that are both general and vague are widespread, except in France. Parallels are also drawn in this connection with conditions in South East Asia and emphasis is laid on the incentives to invest which are guaranteed from this point of view. It would seem that these countries have adopted the logical policy of encouraging export-oriented industries. For example, firms with recognized pioneer status are, subject to certain conditions, guaranteed exemption from company tax for the first 15 years in Singapore. This promise can only be considered as an incentive to invest if the investor feels that the political stability of the country is assured for this long period and that the promise will be kept. The European companies which were questioned declared that they would not find similar incentives to invest in the AASM and that comparable political stability could not be expected there either.

Such assertions were not, however, based on any specific example. In reply to the objection that the same conditions could be found in the AASM, firms pointed, among other things, to the tendency to systematically replace European with African staff, a tendency which they thought would become more and more the rule and which would run directly counter to all other efforts to induce foreign companies to make direct investment in Africa.

However, if such opinions are left aside and only the declarations of European firms which have had concrete experience with the AASM are considered, more objective conclusions are found. For example, mention is made of the customs regulations which hinder the movement of processed products intended for export. Firms declare that they realise that restrictions which derive from an industrialization policy based on substitution for imports cannot satisfy the requirements of an export-oriented industry. If some of the AASM were to decide to adopt this new policy of industrialization and if, following the example of South East Asia, they were to offer similar political and administrative conditions, then European companies would be encouraged to make a careful study of the possibility of setting up production units in these countries. It can be assumed that it is in the interest of European industry to find a genuine alternative to expansion in South East Asia, which is dominated by American and Japanese investors. These opinions on the AASM as countries in which to locate export industries, whether true or false, at any rate show that there exists a need for mutual information on the policy of the AASM towards foreign concerns and the real opportunities they can offer such firms, and also on the preset, objective terms upon which industry would be willing to transfer production to these countries. They also indicate the sensitive points to which any AASM policy of industrial promotion must pay particular attention if it is to succeed in the long run.

B. CONDITIONS OF SUPPLY IN THE AASM

The survey then examines to what extent and at what prices the factors of production - labour, means of transport, industrial sites, buildings, electricity, etc. - are available in the AASM for industrial investments.

This is followed by a concise analysis of the local markets for products of the sectors concerned to show the rough size, from the point of view of exports, of the African markets on which the future concerns specializing in that branch could count in addition to their production for export to the industrialized countries.

Labour

The analysis concentrated on assessing this factor of production. Labour costs as calculated by industrialists, and not wages and salaries paid, were taken as a basis. It was thus found that African labour costs vary considerably in the different AASM. If, for example, labour costs for the various categories of workers in Rwanda are assumed to be equal to 100, the corresponding figures for the most expensive countries are 4 to 6 times higher. The inexpensive countries include the AASM without access to the sea, whilst in the coastal countries, which have a mining industry and a relatively advanced degree of industrialization, labour costs are fairly high.

To compare these labour costs with those of non-African countries, the analysis draws up groups of AASM countries and categories of undertakings. For an undertaking in category B (400 employees), the following indices were calculated (Singapore = 100):

		<u>Labour cost indices</u>	
		Degree of Africanization	
		high	low
Group I	(Rwanda, Mali, C.A.R.)	60	89
Group II	(Niger, Madagascar, Somalia, Upper Volta)	80	107
Group III	(Togo, Chad, Cameroon, Dahomey, Senegal)	95	120
Group IV	(Gabon, Ivory Coast, Zaire, Mauritania)	109	133
Nigeria		103	127
Kenya		106	126
<hr/>			
Taiwan			85
Singapore			100
Hong Kong			119
Tunisia			128
Morocco			134
Malta			141
Portugal			164
South Africa			169
Ireland			221
France			341
Germany			411

This comparison shows that the competitiveness of the tropical African countries varies with the degree of Africanization. The analysis was based on different assumptions for each country concerning the proportion of European qualified and administrative staff. These figures show that the tropical African countries are fairly well placed compared with the Asian countries and better still compared with the countries of North Africa and Europe.

Output in the AASM is assessed differently by industrialists in Africa and in Europe; those who work with African labour in Africa find it satisfactory. Although productivity is calculated to be 15% to 30% lower in the AASM than in the other countries compared, the AASM are not revealed as being far less competitive. Even allowing for the fact that, at present and in comparison with the other countries considered, a greater number of foreign qualified and administrative staff, drawing high salaries, have to be employed in

tropical Africa, total labour costs in the relatively well-developed industrial areas of Africa are only slightly higher than in South East Asia.

Transport

As regards transport costs, the analysis is based on less precise information. Communications with Africa are subject to a variety of tariff systems and rates vary sharply: in addition to the air freight tariffs fixed by the IATA and maritime freight agreements, there exist preferential tariffs which in practice are lower to a varying extent than the normal tariffs. A system of trawlers and air charters which is being set up in tropical Africa is an additional fluctuating factor in transport costs. Because of seasonal variations in the available tonnage and therefore in the freight rates, it has become extremely difficult to assess these precisely. The figures given must consequently be considered as an upper limit; the few preferential and charter tariffs indicated show the size of the tariff reductions which might be made in the future. If goods traffic increases, transport costs for the AASM should fall considerably to a level below those for competing countries in South East Asia where more advantageous tariffs are still offered at present.

Land, buildings, energy

In the AASM, a great deal of industrial land is still available cheaply. However, the work of preparing the site must normally be done by the investor himself. The AASM do not yet have industrial zones which are well prepared and managed like Taiwan, for example. Construction costs for industrial buildings are still fairly high in tropical Africa. Leasing buildings (which firms in South East Asia often prefer) is not usual in Africa. Prices of electric power and water are to some extent much higher than in Singapore, Hong Kong and Taiwan and often vary from one AASM to another.

In the conditions of supply in the AASM, the analysis does not take into account taxation and customs laws nor the laws on investment. The study dealing with the setting up of an export-oriented electrical industry is based on the assumption that:

imports of capital goods and semi-finished products are exempt from tax or else reductions are negotiated; taxes, especially taxes on profits, can be negotiated on the basis of the investment laws concerned with incentives to industrial investments.

The markets of the AASM

The analysis of the AASM markets for electrical engineering and electronic equipment showed that they are relatively small. The local market in Taiwan for example is much greater than the requirements of all 18 AASM imported equipment. It remains true, however, that AASM imports cover a series of products (cables and strands, electric motors, radio and television sets, electric batteries, telephone and telegraph equipment, switchboards and electrical equipment for motor vehicles), which could be sold on the local markets by export firms, particularly in view of the fact that the market of the AASM for these products has increased at an annual rate of more than 12% from 1962 to 1972. This rate of progression should even continue to increase in the future. The local markets of Zaire, the Ivory Coast, Cameroon, Madagascar and Senegal in particular are of interest since the value of these countries' annual imports exceeds \$10 million.

Potential investors in the electrical construction and electronics branch, who already have at least sales offices and after-sales services in the more important AASM, do not rule out tropical Africa as a suitable area in which to set up industries. They mention various projects which have been investigated. The conditions of supply in the AASM, as the analysis showed, offer a number of advantages as regards location. However, when industrialists have to take a decision on an industrial site, they consider other factors such as the political risks. Although these factors play an important part in the strategy of industrialists - as was already mentioned above - the study confines itself to mentioning them without investigating them further, since a discussion of this subject lies outside the scope of an economic analysis.

C. ASSESSMENT OF PROJECTS

As was stated earlier, the report culminates in a series of studies on the feasibility of projects. At this stage of the analysis, these studies can only offer an initial rough assessment of the projects chosen. To define specific projects, other surveys, taking particular account of the investors' individual requirements, will have to be undertaken.

Each feasibility study comprises a description of the product, of the manufacturing programme and of the production process; what labour is needed, production capacities. These are followed by explanations of capital investment, running costs and income.

For each group of products, the study covered four AASM. Senegal and Mali are included for each study, while the other two countries vary.

In this way, a comparison can be drawn between the different groups of products for the same location, and other potential industrial sites can also be studied.

Each time, the study presents a summary of the results of the calculations of the variable factors for the four countries. These calculations are based on gross profit in terms of turnover and a few key costs. These are followed by calculations of the variables which show how gross profits in terms of capital investment change when the proportion of foreign staff and productivity or the labour costs of local staff vary.

The following products were selected for the feasibility studies:

- radio sets
- semi-conductors
- resistors
- multiple switches
- measuring apparatus.

This choice was determined by the results of the analysis of the conditions of demand as studied in the first part of this survey, which also selects products which could be considered for transfer to the AASM, in addition to the five groups of products listed above.

In accordance with the conditions explained in detail in the first part of the survey, this list covers products which:

- (i) require a labour-intensive manufacturing process;
- (ii) are already imported from developing countries;
- (iii) are already manufactured in the developing countries after transfer from the industrialized countries;
- (iv) will continue to be in great demand in the near future.

Starting from these criteria, the survey deals first with the assembly of radio sets, as these are already produced in the AASM and can employ available cheap labour when manufactured for export. It does not, however, seem altogether advantageous to transfer the assembly of radio sets because, on the one hand, existing factories in Africa at present only manufacture sets of a simple kind and, on the other, radio sets are no longer produced in Europe but in South East Asia, except for very high quality equipment. The capacity for transfer is therefore low. It only seems possible to compete with producers in South East Asia if the assembly of active and passive components is also transferred. This is why feasibility studies were also carried out for semi-conductors and resistors.

The assembly of semi-conductors can suitably be transferred since transport costs are only a small cost factor. The necessary quality and the trained staff required should also be found in the AASM. Although South East Asia again appears to be an important competitor, there are still production units in Europe which can be transferred.

For resistors, there seems to be no advantage in transferring isolated stages of the production process such as final assembly. In this case all stages of production should be transferred. This means that the capital investment per job is relatively high. Gross income is admittedly low, but the transfer should be altogether profitable if semi-conductors and radio sets are manufactured at the same time; in other words, the positive effects should accumulate in the running costs account as a result of transferring the entire manufacturing process of all three product groups. This tallies with the argument put forward by a European manufacturer of radio sets; it is only profitable to produce radio sets in Africa when roughly 50% of manufacturing materials and spare parts are produced in the country itself. On the other hand, the existence of an industry producing radio sets will be a further encouragement for producers of active and passive components, who could then sell part of their production on the local market. It remains to decide who should take the first step to encourage this transfer. The conclusions of the survey suggest that it ought to be the producers of components.

In the electrical engineering field, the survey dealt with two groups of products: multiple switches and measuring apparatus. Many electrical engineering products do not require a highly trained labour force. Transferring the production of multiple switches, in particular, seems advantageous, "production" covering not just assembly but the whole manufacturing process. The feasibility study was carried out to serve as a model for a group of products which are also manufactured profitably in Europe.

In the case of measuring apparatus, unlike multiple switches, calculations were based only on a transfer of assembly. Profits in terms of turnover are very low.

The results of the feasibility studies were presented in the form of gross profits in terms of turnover. Great differences are apparent for each group of products studied (see table below). For Senegal, for example, percentages of profits range from 1 to 48%.

If the gross profits on the various products to be transferred are compared for Senegal, for example, the following classification is obtained:

- multiple switches	B 48%
	A 38%
- resistors	A 20%
- radio sets	A 20%
- semi-conductors	B 14%
	A 12%
- radio sets	B 10%
- measuring apparatus	2%
- resistors	B 1%

For Mali, a country without access to the sea, roughly the same list is obtained.

In addition to the transfer of multiple switches, which is particularly worthwhile, the whole range of electronic products also seems worth considering. Measuring apparatus (pure assembly) and B-type resistors are scarcely appropriate and the latter can at best only be considered as additional products for factories producing other items of electronic equipment.

One of the criteria adopted in selecting countries was the lack of any access to the sea. For this reason it was necessary to know whether these countries

presented drawbacks as locations for future industries either generally, or for a few groups of products only. Their geographical situation was only an obvious disadvantage in the case of the manufacture of multiple switches and radio sets. In all other cases, and in particular for semi-conductors, these countries are at an advantage as industrial sites. The reason why firms have so far preferred countries bordering on the sea or coastal towns is undoubtedly that general economic activity is more intense there and the external effects are consequently greater in such places. It should also be noted that in the feasibility studies for coastal countries and land-locked states, the same proportions of highly-paid foreign workers to total staff were assumed. It must be expected that the opportunities of replacing foreign administrative staff by Africans are greater in the relatively more developed countries with access to the sea. This could increase costs in land-locked countries and could consequently reduce, or even cancel out, their advantages as sites for industry.

As a whole and until now, firms have considered the advantages offered by coastal agglomerations to be greater than the advantages of lower costs in land-locked countries. It remains to be seen whether this motive for investment is valid for the export industries which have been dealt with here, especially as the local markets aspect loses, in this case, some of its importance.

The following table summarizes the results of the feasibility studies carried out for the different products and sites selected.

GROSS PROFITS FROM THE PRODUCTION PROJECTS ANALYSED

Gross profits as a percentage of turnover

	Radio sets		Semi-conductors		Resistors		Multiple Switches		Measuring apparatus
	A (1)	B (2)	A (3)	B (4)	A (5)	B (6)	A (7)	B (8)	
Senegal	20	10	12	15	20	1	38	48	2
Mali	18	6	16	18	22	2	35	45	15
Ivory Coast	17	7							
Upper Volta	18	7							
Rwanda			18	20					
Zaire			13	15					
Dahomey					18	- 2			
Madagascar					13	- 1			
Cameroon							38	48	
Chad							32	43	
Niger									7
Togo									1

¹Capacity A: 100 000 sets per annum) the two production capacities concern different types of sets. For details

²Capacity B: 1 000 000 sets per annum) see Volume 3, p. 19.

³Capacity A: 204 000 000 parts per annum)
⁴Capacity B: 223 000 000 parts per annum) for breakdown see Volume 3, p. 60

⁵Capacity A: 330 000 000 units per annum) (capped resistors)

⁶Capacity B: 145 000 000 units per annum) (moulded resistors)

⁷Capacity A: 200 000 parts per annum

⁸Capacity B: 500 000 parts per annum

D. ASSOCIATED MEASURES

Feasibility studies rest on different basic assumptions which imply certain measures to encourage industries to be set up. The analysis took account of such measures in its calculations where they were already provided for in the investment laws. Experiments carried out in other countries show however that an active industrial policy must go further than such investment laws if industrial expansion is to be genuinely stimulated. The analysis of the conditions for investment in Taiwan and Singapore illustrates this fact. This is why the survey summarizes the most important associated measures required for active industrial promotion. They concern improvements in administrative organization, taxation, infrastructure and the training of African labour and administrative staff. This chapter constitutes a short supplement to the survey and is not intended to be an exhaustive and detailed analysis.

Investing in the electrical-electronic construction branch in the Associated African States and Madagascar requires the organization of appropriate reception facilities and the provision of associated measures carefully chosen in the light of the investment itself.

Reception facilities must be provided first, for if they are not, the incentive to invest is very likely to work to the advantage of developing countries which already possess and are constantly improving such facilities. The electrical and electronic construction industry which, for most of its products, is not restricted to specific localities other than those determined by the quest for the lowest production cost and the widest market, has shown that where the comparative advantages are equal it is attracted by developing countries which have a dynamic and imaginative policy towards new industry. In most of the AASM, it is a fact that organizations to aid investors exist. It is obvious, however, that they have neither the means, nor the efficiency, nor the methods of their rival countries in this field, such as the South East Asian countries.

Any reception facility is only effective in so far as its objectives are clearly accepted and recognized by the political régime which set it up. It goes without saying that the stability of this régime is first and foremost a guarantee to which investors generally attach great importance.

Although they are a set of administrative procedures, reception facilities must be organized by a full-time staff of men who are wholly convinced of the aims which they are attempting to achieve and determined to see their country's economy improve.

Apart from these general considerations on reception facilities for new industrial investments, specific associated measures seem indispensable for the promotion of electrical and electronic industries.

Administrative measures

Good relations must be established between the investor and the local administration, especially when the investment project is being carried out.

After negotiating advantages or signing an agreement or a convention in the framework of investment laws - operations which are generally carried out in a pleasant atmosphere, or which the people responsible for reception try to make pleasant - the investor will find himself faced with all the practical problems of carrying out a capital project of some size in a developing country. It is then that his relations with the Administration (Customs, Tax Office, Employment Office, Equipment, etc.) will be particularly important. It is at this point that the reception facilities will have to play their full role to facilitate the work of the investor, to settle certain disputes, to ease certain rules which are too strict and to show flexibility and initiative in many fields. At this level, the most efficient systems are the ones which have appointed for each project an official vested with certain powers and specially assigned to work with the investor to help him solve problems that arise in his dealings with the local administration. This official can be responsible himself for initiating and handling certain affairs. The ability to find a rapid solution to a problem is essential if this official is to be reliable, and he can in any case only be someone with a good knowledge of both modern industrial problems and the administrative methods, procedures and rules in use in his country.

Another form of reception facilities consists in establishing, in each administration which might have important relations with the industrialist, a department or a person specially responsible for answering investors' requests. Where administrative measures are concerned, investors' problems must at least be granted priority. It goes without saying that an investor will prefer, when his project has been carried out, to find himself dealing with the person or persons he had to deal with when he made his first contacts and during the preliminary project stage, and that these persons will be in a better position to help him than others who would not have the necessary background knowledge or the information enabling them to make an overall assessment of a situation.

At any event, bad administrative relations at the time when an investment project is being carried out will often deter other potential investors, especially if the promoter of the project has a wide acquaintance in the business world.

Fiscal measures

The investment laws of the various AASM, which are similar in more ways than one, are sufficiently clear for industrialists to find the advantages which they are looking for. They must not, however, constitute a rigid framework but should leave scope for innovation to adjust the range of advantages offered to suit the characteristics of each industrial sector.

Thus the electronic industry, which is constantly evolving, sees its products become outdated very quickly and requires amortization procedures which are quite different from those applicable to other sectors. Similarly, the need to develop a sufficiently large self-financing capacity to pay off the costs of production equipment and research and development to keep abreast of technological progress often makes it indispensable to obtain larger profit margins than those usually found elsewhere. Finally, the keenness of competition on the market in electronic equipment requires continual price adjustments, transfers of profit margins from certain products to others or from one market to another, which are operations that can only take place in a certain climate of economic liberalism for the investment considered. For the same reasons, it will be found that the local or regional market, where it exists, can play a fundamental role in the regulation of export sales. Protecting this market therefore seems to be one of the most useful associated measures. Many experiments carried out in the developing countries of South East Asia, southern Africa and Central America have highlighted satisfactory systems consisting of free zones specially conceived for export firms and solving, among other things, many tax problems. Such systems are virtually non-existent in the AASM, but they are contemplated in several countries and should appear there in the next few years. The electronics industry, which has expanded a great deal within free zones, outside the developed countries, would undoubtedly constitute a privileged clientele for future African zones of this kind.

Economic infrastructure

While it is fairly easy to organize reception facilities, and provide for fiscal and administrative rules that will meet the particular needs of one or several investors, it seems more difficult to undertake the infrastructure works accompanying or, indeed, preliminary to the project, if only for simple financial reasons. Infrastructure is very often fundamental for the production of equipment in the electrical and electronic construction branch. Of course, it is not simply a question of infrastructure in the form of ways and means of communication, land and properly equipped buildings, but also, and above all, of infrastructure in the form of services.

Most of the AASM have industrial zones near ports or airports, which are being equipped. Whether or not these sites are equipped with industrial buildings leased to potential investors at low rates is not fundamentally important, if the supply of energy and water, transport and the provision of services raise other problems. Although industrial plants in the branch concerned are not basically heavy consumers of energy, the quantities absorbed, especially of electricity, are far from negligible. Thus it will often be necessary, in order to carry out certain projects, to strengthen the electricity-generating capacity of less favoured countries and to grant preferential tariffs much lower than those at present in force in many AASM. Similarly, the poor state of the means of communication, be it telephone and telex or air services and their frequency, will undoubtedly raise serious problems of support for capital projects which have to be carried out in the less advanced AASM. Lastly, the almost complete absence of skilled workers to maintain and repair the often elaborate machines used by manufacturers in this branch can only be offset by the preparation of a training programme in the fields concerned, which the countries involved should develop on a regional scale. It goes without saying that these problems of infrastructure or services will only arise in the case of large investments, as the installation of small assembly lines does not present insurmountable difficulties, whatever the country chosen, at this level at least. On the other hand, the associated measures for large scale investment projects must generally, in the field of infrastructure, be implemented even before the first work connected with these plants is started. What the electrical-electronic construction industry needs more than anything, however, are efforts to improve transport, particularly in countries without a seaboard, and times, frequency and costs must be improved. It is undoubtedly at this level that associated measures such as ensuring priority for transport or loading, or granting the investing exporter a subsidy for a temporary contribution to transport costs, can have the greater impact.

Training and Africanization of staff

There are few electrical and electronic technicians in the AASM, although their number and qualifications vary greatly from one country to another.

The work involved in straightforward assembly generally requires only limited training, and setting up small assembly lines will raise no problems of training except for the provision of foremen.

Foremen could be specially trained in, for example, a school for supervisory staff in the electrical and electronic industry, run jointly by several States and financed partly out of the resources of those States and partly from external aid. Such a school should provide a basic training in electricity and electronics which would complement the training provided in technical schools and would concentrate more on industrial production techniques, workshop practice, and methods of organizing and simplifying work. This training should comprise a common programme together with specializations by branch which would depend on the investment projects of the sector. Trainees for this school should preferably be recruited among people having already worked for a firm, but could also be designed for people who had not yet had any trade responsibility, provided that training sessions with firms were scheduled in the training programme. The lack of local foremen, i.e., of a qualified industrial lower-grade supervisory staff, still requires, in many cases, the presence of European foremen, who are expensive and in the long run have to be replaced. The training school for foremen should enable this objective to be attained both in the electrical and electronic sector and in the other economic sectors, as the system is naturally applicable to all industries employing a relatively high number of foremen. For the middle and upper supervisory staff, the problem of training is naturally different and has to be examined for each investment. Associated measures would not consist here in providing on-the-spot training, but in providing scholarships and organizing trainee courses abroad for nationals who have been carefully selected and are intended to occupy specific posts, either as soon as the industrial operations concerned begins, or to replace European staff who have come to handle the initial stages of production units built in the AASM.