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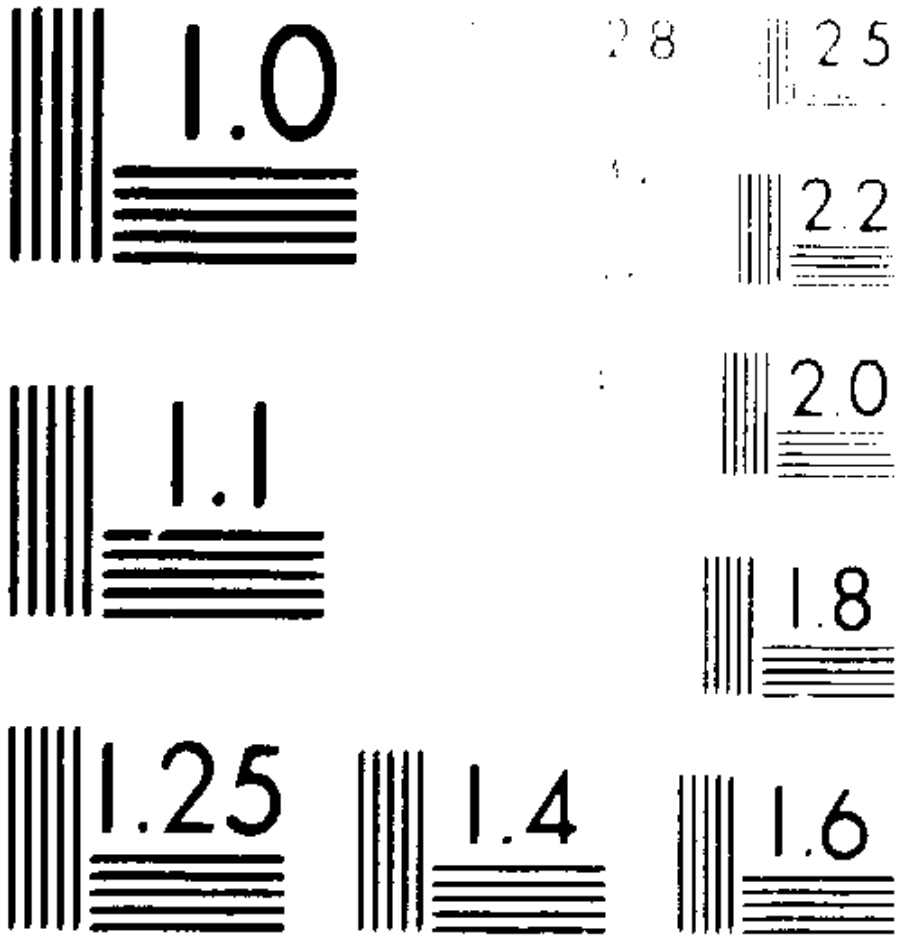
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REHABILITATION AND DEVELOPMENT OF CERTAIN ESSENTIAL INDUSTRIES - THE TEXTILE, GARMENT, PAPER AND SALT INDUSTRIES - IN MOZAMBIQUE

REPORT OF UNIDO MISSION

TO MOZAMBIQUE IN MAY 1980

BY

Nils Ramm-Ericson, Senior Industrial Development Officer (team leader)
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Michael D. Hinchliffe, Senior Consultant
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I. Introduction

1. In its resolution 34/129 of 14 December 1979 on assistance to Mozambique, the United Nations General Assembly, inter alia, requested the appropriate organizations of the United Nations system to maintain and increase their current and future programmes of assistance to Mozambique. The need for increased international assistance to enable the restoring of industrial production to the levels maintained prior to the country's implementation in 1976 of mandatory sanctions against the Southern Rhodesia regime, was emphasised.

2. At a visit to UNIDO headquarters in February 1980, Mr. Juan Blanch-Soler, UNDP Resident Representative in Maputo, stressed the importance attached by the Mozambique Government to the rehabilitation and development of the country's industrial sector and called for fullest participation by UNIDO in supporting these efforts. As initial steps, and pending the completion by mid-1980 of the Government's 10-year Perspective Plan, it was suggested that short technical advisory missions by UNIDO-staff be mounted to review and analyse plans for rehabilitation and development of certain essential industries, and formulate proposals for technical assistance in that context. In response to the request of the Government the first such technical advisory mission visited Maputo in April 1980 covering metal' 'rgical industries.

3. The present report covers the second technical advisory mission, undertaken in May 1980, which, in response to Government requests, dealt with the textiles, garments, paper and salt industries. The purpose of the mission was to review, on the basis of an analysis in respect of each of the sub-sectors of existing industry, as well as future plans and programmes, technical assistance and other requirements and formulate specific proposals in that context.

4. The mission was composed as follows:

Nils Ramm-Ericson, Senior Industrial Development Officer, Regional and Country Studies Section, International Centre for Industrial Studies, UNIDO

Antero Eraneva, Senior Industrial Development Officer, Agro-Industries Section, Industrial Operations Division, UNIDO

Michael D. Hinchliffe, UNIDO Consultant on Garment Industry

Manfred Judt, Senior Industrial Development Officer, Chemical Industries Section, Industrial Operations Division, UNIDO

Eduardo Webber, Research Assistant, Office of the Director, Industrial Operations Division, UNIDO

5. The field work in Mozambique was carried out between 12 and 22 May 1980. Comprehensive programmes were arranged by the Office for Planning of the Ministry of Industry and Energy in co-operation with the National Directorates for Light Industries and for Food and Chemical Industries of the same Ministry. Discussions were held with the Director of Planning of the Ministry of Industry and Energy, Dr. Luis Videira, and a number of other officials of that Ministry and of the National Commission for Planning. Some 15 industries, from both the public and private sector were visited in the Maputo area as well as in Beira and Chimoio. The programme of the mission, listing the persons contacted and the industries visited, is appended as Annex I.

6. The mission held several discussions with the UNDP Resident Representative, Mr. Juan Blanch-Soler who provided vital guidance to the mission. The Senior Industrial Field Adviser at Maputo, Mr. Carlos Goulart, participated extensively in the work of the mission to which he contributed in a most valuable way.

7. The mission wishes to express its appreciation of the excellent co-operation and support provided by the Ministry concerned and by the UNDP office and for the many useful suggestions and observations contributed by the persons with whom contact was made.

II. The Mozambique economy in context of the essential industries covered by the mission

8. In its review and assessment of the current situation and future plans and prospects in the case of the essential industries covered by the mission, due attention was given to the country's general economic situation in this context, the most relevant aspects of which are indicated in following paragraphs.

9. The economy of Mozambique at the time of independence was of typical colonial character; the country exported almost exclusively agricultural raw materials and imported consumable goods, equipment and raw material. The transportation system which followed an interior-to-coast pattern had been developed to serve the needs of external trade and tourism; the educational and other social services were equally geared to the foreign-oriented requirements of the economy and had little direct relevance to the needs of the local population. This pronounced bias in education and training facilities resulted in a very high dependence on expatriate personnel in all activities.

10. Because of this dependent structure of the economy, the sudden withdrawal of Portuguese administration and the consequent disruption of the established structure resulted in a serious set-back in economic growth; one example being cotton for which a decline from 140,000 tons before independence to 35,000 tons in 1976 was registered. Transport and service industries, which accounted for about 35 per cent of the GNP also sustained steep declines. Thus, the blockade against Rhodesia, adopted by the international community, greatly affected the earnings of the transport sector when the borders were closed. Furthermore, the armed attacks perpetrated by Rhodesia directed at economic targets such as bridges, railways, store houses etc., besides causing loss of lives, led to serious disruptions for Mozambique's production activities. Also, Mozambique's manufacturing registered during the first years after independence a substantial decline (to a level estimated at 60 per cent of pre-independence level) due mainly to decrease technical and managerial capacity and lack of raw materials, spare parts and repairs facilities.

11. In the manufacturing sector production has, however, been increasing again since 1977; it rose 20 per cent between 1978 and 1979 and an increase of 30 per cent is envisaged between 1979 and 1980. The sector have had a certain advantage of the fact that a large portion of the plant machinery - for instance

in the textile and clothing sectors - is relatively new, installed in the period 1970-1973 and it is not until now problems caused by lack of spare parts and maintenance are becoming very serious leading to increasing requirements of technical expertise to enable a more effective utilization of the existing plant resources. In this connexion it may be mentioned that the mission was informed that simplified procedures to facilitate the import of necessary spare parts to industry were being introduced whereby the factories would have a certain amount set aside for spare parts imports each year instead of, as hitherto, have to specify in detail in advance their requirements.

12. Attention is also being given to various avenues to stimulate the labour productivity,[1/] at macro, policy-making level as well as at micro, or plant level, for instance within the workers production councils set up in all factories.

13. It should also be mentioned that about 47 per cent of Mozambique's manufacturing industries are located in or around Maputo. Although most of the industries are consumer goods industries, also several agricultural processing industries - many based on produce grown in northern Mozambique transported to Maputo - have been established there. However, the Government is seeking to bring about decentralization by encouraging new industries to be located in northern towns like Pemba, Nampula and Mocuba. A point in case is the location of three planned new textile factories (see para.20 below).

14. The total number of workers in industry (including mining) is 120,000. The work force in textile and clothing production constitutes a significant portion thereof; over 10,000 are employed in the textile industry while close to 6,000 are working in the garment manufacturing sector.

15. Mozambique's balance-of-payments situation is precarious. The country is presently dependent upon large quantities of imported food, while considerable amounts of industrial raw material and equipment must be imported to revitalize the manufactuirng industries. Of crucial importance is a quick

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1/ In response to the interest indicated to the mission, in particular in the case of the clothing industry, a reprint of a short article 'Incentive Plans: International Perspectives' by Khawaja Amjad Saeed which appeared in the Pakistan Management Review (3rd and 4th quarter 1979) is appended to this report as Annex II.

recovery of the traditionally large invisible trade surplus (mainly port and railway charges on international traffic) which used to compensate the large trade deficit. While major concerted efforts are being made to bring about a fundamental strengthening of the agricultural sector within a fairly long time frame, particular attention is also focussed on immediate efforts to rehabilitate and further develop certain industries, namely those producing essential goods for the population and for the further development of the industrial sector and those with export potential.

16. Although the Government, in particular the National Planning Commission, is currently in the midst of a comprehensive planning exercise, according to which a 10-year Prospective Plan for the 1980s will be completed by July 1980 to be followed by the establishment of a mid-term (1981-85) plan and of the current yearly plan, guidelines of immediate nature were provided last year in the Central State Plan for the biennium 1978/80. Thus the industrial production is to grow from 1978 to 1980 by 30 per cent, investments and construction also by 30 per cent and supplies to the people by 10 per cent. Agricultural production is to achieve a growth of 35 per cent.

17. To reach the planned growth of the industry sector efforts are concentrated on

(i) utilizing to the maximum the capacity of existing industries

(ii) giving particular attention to the effort of utilizing national raw materials and the local manufacture of spares and equipment, with a view of reducing import requirements

(iii) accelerating the building up of the industrial organization in particular at management levels, in the more important industrial branches such as metallurgic and electromechanic, agricultural machinery, textiles, clothing, footwear, wood products, chemicals and food processing

(iv) giving particular attention to the increase in production of materials for construction.

18. In a key note speech at the closing of the Council of Ministers in August 1979 the President of the Republic, H. E. Mr. Samora Moises Machel stated, inter alia, that Mozambique must reach 1990 with a developed industry with the basic industry functioning and with agriculture relatively mechanized. By 1990 the problems of food, clothing, footwear, unemployment, illiteracy and endemic diseases must be solved and overcome. Mozambique was to become a developing country of advanced socialism. The private enterprises which

function correctly must be supported by the different state and financial organs to ensure that they accomplish the tasks allocated to them in the schedule of the Plan. The President of the Republic further stressed that the country was open to co-operation with all countries independent of their systems and with foreign business enterprises on a mutually advantageous basis and that the country needed from the outside, in particular, technology and financial backing.

III. The textile industry

19. There are in Mozambique four major textile factories producing woven goods. Three of these — Texlom in Maputo, Textafrica in Chimoio and Texmoque in Nampula — are in the cotton sector and one — Riopele in Maputo — is presently weaving synthetic spun and filament yarns with advanced plans to include a spinning unit for synthetic staple fibre. In addition, there are five knitting factories, one jute and polypropylene bag factory and three blanket manufacturing units.

20. Three large, integrated cotton processing factories, to be installed under bilateral contracts, are being planned. They will all be set up in the northern part of the country: in Mocuba (34.6 million m^2 under GDR contract), Montepuez (21.6 million m^2 under Chinese contract) and Niassa (about 14 million m^2 under Romania contract). When these factories are completed the total installed capacity will be 117 million m^2 annually. Further details regarding installed capacity, production and labour force in 1979 and estimated production required to cover the domestic market demand by 1990 for various textiles products are given in Table I.

21. The mission visited two of the three existing cotton spinning and weaving plants (= 70% of installed capcity in that sector), one of the knitting factories, the jute and polypropylene bag factory and the synthetic weaving mill. Short notes on the five factories visited are appended as Annex III 1-5.

22. The industry is characterized by low efficiency and low capacity utilization owing to a chronic shortage of spare parts, raw materials and auxiliaries and lack of trained personnel at all levels. Also, characteristic of the woven goods sector (both cotton and synthetic) is that the machinery is modern (on

T A B L E I

	Installed capacity 1979/80	Planned additional capacity	Production in 1979	Estimated requirement in 1990	Labour force 1979	Remarks
Cotton woven fabrics	47 mill. m^2	70 mill. m^2	30 mill. m^2	117 mill. m^2	7500	Priority sector
Synthetic woven fabrics	6 mill. m^2		2,7 mill. m^2	No estimate available	500	
Cotton knitted fabrics	23 mill. m^2 [a/]		4 mill. m^2	46 mill. m^2	1200	
Synthetic knitted fabrics	0,5 mill. m^2			5,8 mill. m^2	18	
Lingerie	Nil		Nil	1,5 mill. m^2	Nil	
Blankets	600.000 pieces		Target for 1980: 1,5 million pieces	No estimate available		
Jute and PP bags	14 million		6 million		600	

a/ Includes a new factory presently being put in operation in Beira and major expansion in another.

the average 5 years old) and of high quality (Sulzer, Saurer, Benninger, Schlafhorst, SAGM, Platt Saco Lowell). It is only now beginning to show the effects of poor handling and maintenance and its condition is deteriorating rapidly. Most of it is automated (Schlafhorst Autoconers, Sulzer shuttleless weaving machines, Sauer rapier looms, etc.) but the expensive labour-saving features are grossly under-utilized.

23. A considerable part of the textile industry is within the private or mixed public/private sector, in most cases linked with Portuguese concerns. It operates, however, along with the state-owned industry within the framework of stringent government policies and regulations concerning imports, production and pricing.

24. Much of the industry is managed by expatriates — mostly Portuguese — who are either employees of Portuguese parent companies operating factories in Mozambique or retained direct by the Mozambique government. Although the Government in most cases is satisfied with the performance of these expartriates, many of them, it is claimed, tend to totally concentrate on the plant operation and do not to give the necessary emphasis on the transfering of their knowledge to their Mozambican counterparts.

25. UNIDO assistance to the textile industry should focus on improving the productivity and product quality and on training. To demonstrate the effect of correct measures it is recommended that the assistance be initially concentrated on one single factory where the necessary prerequisites exist or can be made available. It is further recommended that the assistance programme be implemented through an intensive consulting firm assignment and supplemented by one or two OPAS expert assignments for a two year period.

26. The details of the proposed programme are set out in a draft Project Document, attached to this report as Annex IV. Its principal elements are

- installation of process control system;
- establishment of waste standards and development of a waste control programme;
- installation of a preventive maintenance systems;
- implementation of an instructor training programme;

27. The project should be carried out at the TEXLOM factory and be regarded as a demonstration programme which can be subsequently repaated in other mills.

IV. The garment industry

28. The garment industry in Mozambique comprises 34 medium-sized production units — in both the private and the public sector — with a total of 3.350 machines and a work force of 5700. Four of these enterprises have more than 500 workers and almost all the others have more than 2 0 workers. The industry suffers from an acute shortage of trained manpower at all levels and from an equally acute lack of spare parts and imported raw materials. These two, fundamental, shortcomings are reflected in the overall picture: low productivity, poor production planning and control, quality levels well below international standards and high unit cost. The industry is further characterized by lack of specialization; most factories are manufacturing a wide range of products. The result is a heterogenous machine park with serious maintenance problems and underutilization of certain machines. It is estimated that 15-20 per cent of the equipment is standing idle for lack of spare parts and many of them have been cannibalized to maintain the rest in working order.

29. The mission, having visited seven manufacturing units which account for about 45 per cent of the total garment industry in terms of employment and machinery, recommends that technical assistance to the garment industry be concentrated on selected manufacturing units rather than be diffused across the whole industry. In this manner it would be feasible to achieve significant results in the selected units which could subsequently, serve as models to other factories.

30. The recommended programme has five distinct parts:

(a) Increase the production in the SABRINA factory in Maputo by 100 per cent through the installation of appropriate production control systems and the implementation of an operator/instructor training programme;

(b) Develop a standard costing system which can be applied throughout the garment industry;

(c) Conduct a work study training course to impart knowledge of basic industrial engineering;

(d) conduct a pattern-making course;

(e) Prepare a rationalization plan for the garment industry and assess the industry's present and future machinery and spare parts requirements.

A draft project document on items (a) and (e) of the above list is attached as Annex V.

31. Further details on the garment industry and on the factories visited are contained in the WERNER report, prepared by the Consultant Mr. Hinchliffe, and issued as Addendum 1 to this report.

V. The pulp and paper industry

32. Another industry producing essential products for the Mozambiquan people is the paper industry and it is considered a matter of prime importance by the Government not to rely, on a long-term basis, on imports (of paper or of pulp for conversion into paper) for meeting the growing demand for crucial items such as the mass-consumption varieties of paper.

33. The first and only paper mill in Mozambique, the Industria Papeleira National (former Fapel-Fapacar Mill), outside Maputo, started production in the 1960s and by the mid-1970s with four paper machines (all second-hand equipment) in operation it was possible, using locally available waste paper and imported chemical pulp, to produce up to 15,000 tons of printing and writing and packaging papers for the local market.

34. During the last few years production has dropped down to 3,000 tons per annum (in 1979); the locally collected waste paper in the Maputo area being the only fibre material available for paper making. The production of the mill at present is, however, limited not only because of lack of raw material, but also due to lack of spare parts, poor maintenance, and lack of experienced personnel.

35. A team of four Cuban paper engineers has improved the manpower situation temporarily for 1980. A national campaign to collect more waste paper for the mill has been started. The paper machines No. 3 and especially No. 4 have a potential of producing at least an additional quantity of 10,000 tons/annum, if the above-mentioned handicaps of the mill are corrected.

36. Mozambique imports about 25,000 tons per year of different paper products, mostly packaging papers like kraft liner, corrugated medium and printing and writing papers; papers which were partly produced earlier in the existing paper mill. The paper consumption of 3 kg/head and annum is, compared with other developing countries in Africa, high.

37. The future prospects for developing the national pulp and paper industry are very promising. SIDA has earmarked for assistance to Industria Papeleira National an amount of 3 million Swedish Kronor envisaged to be used, inter alia, for laboratory instruments for quality control. Again with SIDA funds, a survey of the forestry sector has been carried out in 1979 and two new potential pulp and paper mill projects have been identified. In the Manika area there is enough pine wood — 13,000 ha — to produce 30,000 tons/annum of newsprint, and in the Zambesi Province there is sufficient sugar cane bagasse available to produce 60,000 tons of paper. The bagasse will be available because the local sugar mills can switch to local high quality coal as fuel for their boiler plants.

38. Furthermore, the Government plans to reforest 130,000 ha with Eucalyptus and pine trees and when these plantation forests are mature, a big export chemical pulp mill with a capacity of 100,000 tons/annum will also be possible in the 1990s.

39. Due to these promising conditions the Government is now very concerned about how to train and obtain the skilled manpower necessary to operate the two new mills for which start-up is foreseen in 1985 — the newsprint mill, 35,000 tons/annum, and the bagasse paper mill, 60,000 tons/annum.

40. The existing paper mill Industria Papeleira National has been selected to be used as a mill for training technicians and operators. UNIDO was requested to assist in its modernization and to increase the production of the mill to its former capacity, to establish within the mill such a training centre to carry out in-plant training courses for up to 150 technicians and operators, and to help in the placing at universities 3 university graduates and 15 engineers for the new bagasse pulp/paper mill where they can be trained in bagasse pulp and paper making technology. A draft project document covering this assistance is appended as Annex VI.

VI. The salt industry

41. Due to the good soil and climatic conditions the African countries along the long seashore on the Indian Ocean, have always had a great potential for producing sea salt by solar evaporation. Thus, Tanzania and Mozambique were, in the past, significant producers of sea salt and many inland African countries like Malawi, Zaire and Zambia, relied traditionally on imports of salts from these countries.

42. Mozambique produced in 1979 about 54,000 tons per annum of sea salt by solar evaporation. Most of the salt was used for the country's human and animal consumption although the production was not quite sufficient even to meet the full local demand.[1/] Furthermore, Mozambique exported 11,000 tons to neighbouring countries, at an average price of US $ 90/ton, while due to limitations of production further export orders of 90,000 tons could not be met. There is as yet no national chemical industry to produce such essential inorganic chemicals as caustic soda, soda ash and clorine, which are based on salt.

43. The national department responsible for salt industry within the National Directorate for Food and Chemical Industries, Ministry of Industry and Energy, has developed plans to increase the immediate production in the two main salt works near Maputo -- Fabrica de Hiegenizacao do Sal and Costa do Sol -- and elsewhere in the country as follows:

1980	64,000 tons/annum
1981	72,000 tons/annum
1982	80,000 tons/annum

44. A project for a large -- 150,000 tons/annum -- salt work in the north of the country, near Nacala, is presently under discussion with the French Company Salins du Midi et des Salines de L'Est. The envisaged start-up for this project is scheduled for 1983.

1/ It is considered that a certain minimum amount of salt in-take for their well-being is needed for humans (4-5 kg/head/annum) and for animals (1 kg/head/annum). In the more advanced of the developed countries, moreover, up to 10 times more salt is used for industrial purposes than for human and animal consumption.

45. The production of caustic soda and soda ash, foreseen according to the Office of Planning, Ministry of Industry and Energy, for 1983 or soon thereafter, will require big quantities of industrial salts of a higher quality than presently produced. Additional salt works will be required then.

46. At present there is only one experienced chemical engineer in the country with experience in the production of sea salt by solar evaporation and thus the need for a strengthening on the technical personnel side is acute, in particular as there are plans to establish under the salt department three regional salt departments in the country - one for the north, one for the middle area of the country and one for the area around Maputo.

47. In order to assist the Government in meeting the tasks ahead for the envisaged development of the country's salt industry, namely the creation of new salt works, the increase of production and up-grading the quality of the existing plants and the creation of an experienced middle and lower level management cadre, the mission recommends on basis of the discussions held with the officials concerned that assistance be provided for the strengthening of the salt department through the services of a techno-economic senior salt expert as well as a salt works expert for work in the existing salt plants. Provisions for fellow-ships for training and for certain laboratory and other equipment would also be included as elaborated in the draft project document attached as Annex VII.

ANNEX I

UNITO -- MISSION TO MOZAMBIQUE ON REHABILITATION OF ESSENTIAL INDUSTRIES -- TEXTILES, GARMENTS, PAPER AND SALT INDUSTRIES

PROGRAMME

Maputo

Monday 12.5.80

10.00 UNDP
Mr. Juan Blanch-Soler, Resident Representative
Mr. Carlos Goulart, SIDFA

15.00 National Directorate for Light Industries, Ministry of Industry and Energy.
Mr. Manuel Mbeve, Director
Mr. Jens Erik Torp, Deputy Director
Ms. Célia Pires, Clothing and Textile Industry Officer, Dept. of Textiles and Clothing Industry.

16.30 Department of Development of Technology, Office for Planning, Ministry of Industry and Energy
Mr. Luis Fabbri, Director
Ms. Lúcia Trindade, Officer of Dept. of Development of Technology

Tuesday 13.5.80

9.00 Riopele Textfis (Synthetic fibre textile mill).
Mr. Pedro Vieira, Production Director
Mr. Jens Erik Torp
Ms. Célia Pires

14.30 Texlom (Cotton textile mill)
General Director
Mr. Penteguana
Mr. Jens Erik Torp
Ms. Maria Helena Paulo, National Directorate for Light Industries

15.30 National Directorate for Food and Chemical Industries, Ministry of Industry and Energy
Ms. Gabriela Santos, Deputy Director
Mr. Tomé dos Santos, Officer-in-Charge of Salt Industry

Wednesday 14.5.80

8.30 National Directorate for Light Industries, Ministry of Industry and Energy
Mr. Jens Erik Torp
Ms. Célia Pires
Mr. Tomás, Technical Officer, Sovestre

8.30 Fábrica de Hiegenização do Sal- (Salt production)
Mr. Tomé dos Santos

14.30 Soveste (Garment factory)

Mr. Rodrigues Albino Mondlane, General Manager
Mr. Tomas, Technical Officer, Soveste
Mr. Jens Erik Torp
Ms. Célia Pires

16.30 Costa do Sol (Salt production)-

Mr. Tomé dos Santos

Thursday 15.5.80

8.30 Investro (Garment factory)

Mr. António Pereira Gravata, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires

9.00 UNDP

Mr. Juan Blanch-Soler, Resident Representative

11.00 SIDA

Mr. Johan Brisman

14.30 Manufatos (Garment factory)

Mr. Júlio Langa, General Manager.
Mr. Jens Erik Torp
Ms. Célia Pires

14.30 Papel/Papacar (Paper factory)

Mr. Ezequiel Vasco Tovela, Director
Mr. Miguel Palmiro, Assistant of the Technical Dept. of Machinery Production
Mr. José Carlos, Assistant of the Technical Dept. of Machinery Production
Mr. Paulino Mahumane, Representative of the Party
Mr. Wilfredo Reisino, Cuban Expert
Mr. Angelo H. Dias, Dept. of Planning and Projects Directorate of Food and Chemical Industry
Mr. Tomé dos Santos.

Friday 16.5.80

9.30 Sabrina (Garment factory)

Mr. Rui Ferreira, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires

11.00 Soberana (Garment factory)

Mr. António Costa, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires

14.30 National Commission of Planning

Mr. José Pedro, Project Service - National Commission of Planning.
Mr. Luis Carlos Fabbri, Director, Department of Technological Development of the Planning Office, Ministry of Industry and Energy.
Mr. Tomé dos Santos, Salt Department, National Directorate of Food and Chemical Industry.

Mr. Angelo Dias, Department of Planning and Projects, National Directorate of Food and Chemical Industry

16.30 Office of Planning, Ministry of Industry and Energy

Dr. Luis Videira, Director, Office of Planning in the Ministry of Industry and Energy.
Mr. Tomé dos Santos, Salt Department, National Directorate of Food and Chemical Industry
Mr. José Pedro, Project Service, National Commission of Planning
Mr. Angelo Dias, National Directorate for Food and Chemical Industry
Mr. Luis Carlos Fabbri, Director, Department of Technological Development of the Planning Office in the Ministry of Industry and Energy.
Mr. Jens Erik Torp, Deputy Director, National Directorate for Light Industries.
Ms. Célia Pires, National Directorate for Light Industries.

20.30 Office of Planning, Ministry of Industry and Energy

Lecture by Mr. Manfred Judt on the production of salt and its relation to chemical industries -- Discussion.

Saturday 17.5.80

8.30 Salt Industries Office, National Directorate of Food and Chemical Industry. Ministry of Industry and Energy.

Mr. Tomé dos Santos

10.00 National Directorate of Light Industries, Ministry of Industry and Energy

Mr. Jens Erik Torp
Ms. Célia Pires

16.00 UNDP

Mr. Juan Blanch-Soler, Resident Representative

Monday 19.5.80

8.00-9.00 Travel by air Maputo - Beira

11.00 Companhia Téxtil do Pungoé (Jute and plastic bag factory) Beira

Eduardo Cardoso da Silva, General Manager
Ms. Célia Pires
Mr. Harry Nord, Textile Spare parts Adviser (with Texlom at Maputo)

11.00 Facal (Garment factory) Beira

Mr. Vai You, General Manage
Mr. Jens Erik Torp

15.00 Belita (Garment factory), Beira

Mr. Samuel Chambuca, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires
Mr. Harry Nord

Tuesday 20.5.80

9.00-12.00 Travel by car Beira - Chimoio

15.00 Textafrica (Cotton textile mill), Chimoio

Mr. Manuel Magalhaes, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires
Mr. Harry Nord

Wednesday 21.5.80

8.00 Emma (Garment factory), Chimoio

Mr. António Teixeira, General Manager
Mr. Jens Erik Torp
Ms. Célia Pires
Mr. Harry Nord

10.00-13.00 Travel by car Chimoio - Beira

16.00-17.30 Travel by air Beira - Maputo

Thursday 22.5.80

9.00 Directorate for Light Industries, Ministry of Industry and Energy

Mr. Jens Erik Torp
Ms. Célia Pires

11.30 Mr. Manuel Mbeve, Director of Light Industries
Mr. Jens Erik Torp
Ms. Célia Pires

15.30 UNDP

Mr. Juan Blanch-Soler, Resident Representative

Annex II

INCENTIVE PLANS: INTERNATIONAL PERSPECTIVES

By

KHAWAJA AMJAD SAEED

University Professor, Department of Business Administration,
University of the Punjab, New Campus, Lahore.

Increase in productivity is the crying need of the hour in today's world. Its importance is of paramount nature in developing countries where efficient utilization of resources can help them to achieve optimum efficiency. Sharing consequential increases due to productivity are aspects which deserve special treatment. An attempt has been made in this article to present a review of various incentive plans tried all over the globe.

1. **Taylor's Differential Piece Rate System.** The Taylor Differential System paid piece-rates and was designed to discourage below average workers by providing no guaranteed minimum wage and by setting a piece-rate resulting in high take-home pay if a high level of production was attained.

Illustration

Suppose a worker earned Rs. 16 per 8-hour day and in a certain plant the production averaged 10 units per worker per hour or Rs. 0.20 per unit. The Taylor Plan might offer Rs. 0.20 per piece if the worker averaged 10 units or less per hour, but Rs. 0.30 per piece to workers averageing 11 or more units per hour in an 8-hour day. The Taylor Plan would discourage all workers who could not produce at least 11 units per hour, thus building a labour force of efficient workers. The plan is intended to prove most effective when plant capacity has to be extended to fill demand for the product; it is also designed to have all workers earn the higher rate.

Source: Pakistan Management Review -- Third and Fourth Quarter, 1979

2. **Rowan Premium Plan.** Rowan Premium Plan was introduced by David Rowan of Glassgow in 1901. The salient features of the plan are:

a. An hourly rate is guaranteed to the workman.

b. A standard time is fixed for each job or operation and besides payment of the fixed hourly rate for the time spent on the job or operation, the workman is also paid premium based on the time saved.

c. The premium is not a fixed percentage of the time saved, but varies according to the extent of such saving. It is that proportion of the time taken which the time saved bears to the standard time.

The operational aspects are now illustrated through the following data:

Time allowed to execute a piece of work.	75 hours
Time spent in executing the work.	60 hours
Hourly rate.	Rs. 2

The earnings of the workman under the Rowan Plan are calculated below:

Wages for time taken: 60 hours @ Rs. 2	Rs. 120
Proportion of time saved to time allowed = 1/5	
Bonus equal to 1/5th of time taken of 60 hours—wages for 12 hours @ 2 per hours	Rs. 24
Total earnings	Rs. 144

The advantages to employees are a bigger wage basket and the satisfaction of sharing in the benefits of greater productivity.

The benefits to an employer are that it induces the workers to greater production in a given time, with a consequent reduction in fixed overhead per unit produced. The labour cost per unit is also reduced to some extent as the time saved is normally shared by the employer and the employee.

3. **Halsey Premium Plan.** Halsey premium plan was evolved by a U. S. economist, F.A. Halsey. The salient features of this system are:

1. An hourly rate is guaranteed to the workman.

2. A standard time is fixed for each job or operation.

3. The workman is paid the agreed rate per hour for the time spent on the job or operation plus a fixed percentage ranging between 50% to 33⅓% of the time saved over the time allowed.

For fixing the standard time, the job or operation is carefully timed by making a time study of every movement and operation, supplemented by information provided by record of previous experiences.

From the data given under Rowan premium plan, the wages of the workman under the Halsey premium plan are calculated as under:

Wages for 60 hours @ Rs. 2 per hours		Rs. 120
Bonus equal to 50% of the time saved; 7½ hours @ Rs. 2		Rs. 15
Total earnings	=	Rs. 135

4. **Halsey-Weir System.** This method differs from Halsey System in that the bonus payable is to be the wage equivalent of only 30% of the time saved. In other respects, it is practically on the same lines as the Halsey plan.

5. **Emerson Efficiency System.** The following point will highlight the operating aspects of Emerson Efficiency System:

a. A minimum daily wage is assured and a standard time is set for each job or operation.

b. As soon as a worker exceeds 66-2/3% of standard, he is paid the established hourly rate plus a bonus, which increases rapidly as his production increases exactly in proportion to the increase in production. The bonus increases from .0% of the hourly rate for production at 66-2/3% of standard to 20% of the hourly rate when standard is less arbitrary until standard is reached.

c. At standard, the employee earns the hourly plus 20%. Above standard, the wage is the hourly rate plus 20% plus 1% of the hourly wage for each 1% production in excess of the standard.

d. For effective implementation, it is advisable to prepare a bonus table indicating the amount by which wages will increase as production increases. Ordinarily the bonus is computed monthly rather than on individual jobs to prevent unusual productive spurts for a few hours on one job in order to earn a high rate before coasting on the next job at the guaranteed minimum hourly rate.

Illustration

Assuming an hourly rate of Rs. 2 and standard production of 60 units per day consisting of 8 hours the following table will explain the working of the above mentioned system:

Unit Per Day	Production Rate of Standard (%)	Daily Wage (Rs.)	Bonus Pay (Rs.)	Total pay Per Day (Rs.)
39	65	16.00	0.00	16.00
48	80	16.00	0.52	16.52
54	90	16.00	1.58	17.58
60	100	16.00	3.20	19.20
69	115	16.00	5.60	21.60
78	130	16.00	8.00	24.00

NOTES: (1) The amounts indicated in the Bonus pay column against 80% and 90% are arbitrary.

(2) At 100% the bonus is @ 20% of the daily wage and beyond this the calculation has been made by adding 20% in the daily wage plus 1% of the hourly wage for each 1% production in excess of the standard.

6. **Priestman's Productive Bonus System.** According to this system, every job or operation is alloted suitable number of points depending on the nature of work, and the time it is likely to take for execution. On the basis of the number of workers, their skill, grades, timings of work, etc., the total volume of work they are capable of producing during a week or month is determined, and the same is converted into its corresponding number of points. This number of points is fixed for every department or for the factory as a whole. At the end of the period, the actual outturn of work is assessed, and the relative number of points computed. If the actual exceeds the standard, a bonus is paid to each worker in the ratio, which the excess bears to the standard.

Illustration

There are two products: A and B. A involves 10 points of labour and B 15. The quantities actually produced are 200 and 100 respectively. The stand ard fixed for the department is 3,000.

Total number of points			
Product A	200×100	=	2,000
Product B	100×15	=	1,500
			3,500
Less: Standard Fixed			3,000
Additional production			500

Relation of additional production to standard fixed 1/6th

Therefore, each worker will get a bonus equivalent to 1/6 of his normal wage for the period.

7. Towne Gain Sharing Scheme. Under this system, bonus is determined with reference to the saving in labour-cost alone. It implies the fixation of standard labour cost for every job, so that the actual saving can be compared with it for assessment of the relative saving. It is based on the consideration that a worker can normally have control only over labour-cost, and not on the other factors.

8. Merrick Differential Piece Rate System. This system differs from the Taylor System in two important aspects. The system provides for minimum day wage. It suggests a number of piece rates which increase according to the increase in production over the standard. Consequently there is one work done in standard time, a lower piece rate for work done in more than standard time, and a multiplicity of higher piece rates for work done in less than standard time. These factors may also by represented in terms of the quantities produced in a certain time, the hour or the day.

The system is advantageous to the employer since it induces increase in production to a greater degree by offering very high rates for higher levels of production. It also benefits the employees who participate in the increase in productivity.

Illustration

The following table will illustrate the working of the above system:

Case	Standard time per unit	Time taken per unit	Standard production per day of 8 hours	Actual Production per day of 8 hours	Rate of wage per unit (Rs.)	Wage as per piece rate (Rs.)	Minimum day wage (Rs.)	Wage payable (Rs.)
A	1 hr	30 mts	8 Units	16 units	1.30	20.80	8.00	20.80
B	,,	40 ,,	,, ,,	12 ,,	1.20	14.40	8.00	14.45
C	,,	48 ,,	,, ,,	10 ,,	1.10	11.00	8.00	11.00
D	,,	1 hr	,, ,,	8 ,,	1.00	8.00	8.00	8.00
E	,,	1 hr 20 mts	,, ,,	6 ,,	0.90	5.40	8.00	8.00
F	,,	1 hr 36 mts	,, ,,	5 ,,	0.90	4.50	8.00	8.00

9. **Bedeaux Premium Point System.** The following are redeeming features of Bedeaux Premium Point System:

a. A guaranteed hourly rate is paid until standard production is attained.

b. A premium or additional wage is paid for units in excess of standard.

c. Instead of being paid a piece-rate, an hour's work is converted to points by dividing a standard hour's production in units into 60 minutes.

In a situation where 20 units are standard, each unit is 3 points.

d. At standard performance the worker produces a point per minute, and for the first 60 points produced in an hour the worker receives the hourly rate. For excess production it is common to pay the worker 75% of the rate and the foreman, supervisors, inspectors, and other indirect labour personnel 25% of the rate.

The following illustration will demonstrate the working:

Units produced in 8 hours	Points	Points in excess of standard	Hrs.	Guaranteed Wages Rate	Amount	Bonus	Division worker 75%	Supervisor 25%
260	780	0	8	28	16.00	0	0	0
280	840	8	8	2	16.00	0	0	0
320	960	0	8	2	16.00	0	0	0
360	1,080	120	8	2	16.00	2.00	1.50	0.50
400	1,200	240	8	2	16.00	4.00	3.00	1.00
440	1,320	360	8	2	16.00	6.00	4.50	1.50

The other noteworthy names associated with point-system wage-incentive plans are, Mannit and Stevens.

10. **Gantt or Task Bonus System.** Under the Gantt Bonus System both time and piece rates are set and normal wages are paid at time rate or piece rate, whichever is higher. Besides, a bonus calculated at a certain percentage of time rate wage is also paid, provided the work is completed within the standard time.

The foreman also receives bonus, if the workers under him qualify for it.

The working of the System is illustrated as under:

Case	Standard Time	Time Taken	Time Rate wage Rs.	Piece Rate Rs.	Bonus percentage	Amount Rs.	Total wages	Average rate per Rs.
A	4 hrs.	5 hrs.	15.00	12.00	—	—	15.00	3.00
B	,, ,,	4 ,,	12.00	12.00	25%	3.00	15.00	3.75
C	,, ,,	3 ,,	9.00	12.00	25%	2.25	14.25	4.74
D	,, ,,	2 ,,	6.00	12.00	25%	1.50	13.50	6.75

11. **Barth Scheme.** Barth scheme is especially applicable to apprentices or beginners, until they become proficient enough to go on to some other scheme. The calculation under this scheme is done as per following formula:

$$E = RH. \sqrt{SH \times CHW}$$

(E = earnings. RH = rate per hour: CHW = clock hours worked)

Illustration:

Rate per hour = Re 1
Standard hours allowed = 3
Time taken = 5 hours

$$\text{Earnings} = 1 \sqrt{3 \times 5}$$
$$1 \times 3.873$$
$$3.87$$

12. **Scanlon Plan.** Joseph Scanlon was an ordinary worker in a steel plant but rose through sheer hard work to occupy position on the top managment of the United steelworkers of U.S.A. and later served as a Lecturer at the Massachusetts Institute of Technology.

The financial incentives under the Scanlon Plan are normally distributed to all employees on the basis of an established formula which is based on increases in employee productivity as determined by improvements that are realized with respect to "norm" that has been established for labour costs. The norm which

is subject to review reflects the relationships of the payroll to the sales value of the company products. The other features of this plan are:

a. The plan provides for the establishment of a reserve into which 25% of any earned bonus is paid for the purpose of covering deficits encountered during the months when labour costs exceed the norms.

b. After the portion for the reserve has been deducted, the remainder is distributed with 25% going to the company and 75% to the employees.

c. Any surplus that has been accumulated in the reserve at the end of a year is distributed to employees on the basis of the same formula.

d. Effective employee participation which includes the use of employee committees, is the most significant feature of this plan. The participation should offer an opportunity to employees to communicate their ideas and opinions to the management and also to influence decisions affecting their work and their welfare within the organization. The screening committee is the most important one and is composed of the management, the union officials and the members. Its basic function is to review the production figures at the end of each month to determine the bonus or the deficit that has been incurred. Further, the committee may discuss problems relating to the administration of the plan and review suggestions relating to company efficiency that have been submitted to it by various production committees.

The plan is an attempt to define a new set of roles for participants and a unique way of assessing organizational efficiency. It compensates employees for improvement in organizational efficiency as a result of hard work.

Illustration

Let us assume that a company produces Rs. 200,000 worth of goods each month. Based on past accounting records, the average amount paid in wages and salaries to produce the goods equals Rs. 60.000. This ratio will become the norm. During another month, following the installation of the Scanlon Plan, the company produces Rs. 235.000 worth of goods with the wages and salary bill not exceeding the Rs. 60,000 figure. The extra Rs. 35,000 in production, less material and other costs, is distributed, in part, on a prorated basis to employees covered by the plan.

Once the relationship between total payroll and the sales value produced by it is established, a bonus pool is created for any month when labour costs are below the norm. To protect against deficit months, a reserve of 25% is set aside from the pool. If anything is left in this reserve at the end of the year, an extra payment is made. After the reserve has been taken out for a given month, the balance of the bonus is split, with 25% usually going to the company and the remaining 75% to employees

The proponents of this plan believe that the company's total product is the result of group action and the coordination of efforts and interests of all employees, rather than the efforts of just a selected few. It embodies a co-operative goal and, consequently, to receive incentive pay, the employees work for the good of the whole group.

However, the critics of this plan argue that much of the gain over the norm is frequently due not to employee effort but rather to improvements in methods and technology, the effects of which may not be allowed at all under the plan, or if so, by a formulation which is far from precise.

13. **Rucker Plan.** The Rucker plan is also known as *Share of Production Plan* (SOP). This normally covers hourly factory workers and executives. The financial incentive is based upon the historic relationship of the total earnings of hourly employees to the production values they create. The payment of bonus to employees is based upon an improvement in this relationship that they are able to realize. Resultantly for every 1% achieved increase in production-value, an additional bonus of 1% of their total payroll costs is paid to the worker. Maximum use is made of committees in administring the plan.

TEXLOM

General Manager: Mr. Pateguana

Products: dress fabric

Processes: spinning, weaving, dyeing, finishing

Raw Material: cotton

Work Force: 1300 of which direct labour:

spinning/weaving	696
finishing	173
maintenance	90
	959

Installed Capacity: 16 million m^2

Target for 1980: 14 million m^2

Ownership: 54% MOZ Government, rest foreign capital.

Equipment: (1973-1979)

Opening: Hergeth

Spinning: SACM

- 16 cards
- 6 drawing frames
- 2 autolevellers
- 19.000 spindles

Weaving Preparation: 3 Schlafhorst Autoconers
2 Leesona Uniconers
2 Schlafhorst warpers
16 Schärer pirn winders
2 SACM slashers

Weaving: 438 Picanol President looms
117, 138, 166, 188 cm

Finishing: Amdes mercerizing and bleaching range
SACM sanforizing machine
Roller screen printing
Amdes foulards and jiggers

General

The average count is Nm 45 with a count range from 36 to 54 Nm. In weaving, the average fabric weight is 125 g/m^2 and width 117 cm. The weaving efficiency is around 60% with 8 looms per operator. The factory employs 14 expatriate technicians from Portugal, Romania and USSR.

The mill laboratory is equipped with the basic mechanical testing instruments but no systematic process control seemed to be in operation. The atmospheric controls did not function during the visit.

The factory is plaqued with an acute shortage of spare parts and auxiliaries and the level of operator and middle management skill is low.

Both machine and operator productivity is extremely low; in the spinning department frames with 20% ends down were observed.

TEXTAFRICA

General Manager: Mr. Magalhaes

Products: sheeting, shirting, popeline

Processes: spinning, weaving, dyeing, finishing

Raw Material: cotton

Work Force: 3834 of which direct labour:

(4 shifts)

spinning	1,000
weaving preparation	563
weaving	1,056
finishing	436
	3,055

Installed Capacity: weaving 30 million m^2
spinning 5,000 tons

Production in 1979: weaving 12 million m^2
spinning 3,500 tons

Ownership: Portuguese

Equipment: (mostly 1970-1974)

Opening: Platt Saco Lowell

Spinning: Platt Saco Lowell
34.000 spindles

Weaving Preparation: 4 Schlafhorst Autoconers
2 Benninger sectional warpers
1 Schlafhorst sectional warper
2 ordinary Benninger warpers

Weaving: 148 Sulzer shuttless weaving machines
85, 110 and 130"
306 Saurer 100W

Finishing: Kleinewefers mercerizing and bleaching
Reggioni rotary screen printing
2 roller printing

General

The factory is not fully balanced - yarn sales are about 500 tons annually.

The spinning efficiency is about 60% and the average yarn count 22 Ne. The weaving efficiency is 30-40% with 4-6 Sulzers per operator and 10 Saurers per operator.

The company runs an operator training school with 6 full-time instructors but this facility was not functioning during the visit.

In addition to conventional weaving there is also a blanket manufacturing unit producing 25.000 blankets/month - most of needle-punch type.

The problems are similar to other factories in Mozambique: low productivity owing to acute lack of spare parts and auxiliaries and poor operator skills combined with high absenteeism.

EMMA

General Manager: Mr. Teixeira

Products: knitted goods, elastic tape, mattresses

Processes: warp and weft knitting, sewing up

Raw Materials: polyamide, polyester, polyacrylic filament and texturized yarn.

Work Force: 1100

Installed Capacity: 2 million m^2/year of knitted fabric
120.000 pieces/year of flat bed knitted garments.

Production in 1979: 600.000 m^2 of knitted fabric and 60.000 pieces of flat bed knitted garments.

Ownership: Portuguese (Textafrica group)

Equipment:

3 Raschel Karl Mayer
2 warp knitting Karl Mayer
8 Supreme interlock
2 Morati jacquard
sewing machines
finishing

General

During the visit the factory was virtually at a standstill owing to lack of raw material and vital spare parts. It is also plagued by frequent power cuts.

FIBRUS

General Manager: Eduardo da Silva

Products: bags, sacks, cotton bale wrapping, jute yarn

Processes: a) Extrusion of polypropylene and polyethylene, circular weaving, sewing

b) spinning, weaving, sewing

Raw Material: polypropylene, high density polythylene, jute, kenaf

Work Force: PP/PE: 300
jute/Kenaf: 300

Installed Capacity: PP/PE: 10 million bags
(4 shifts) jute/kenaf: 4 million bags

Target 1980: PP/PE: 5 million bags
jute/kenaf: 1 million bags

Ownership: Portuguese

Equipment:

PP/PE: 2 extruders for HD PE (Lenzing)
(1975) 2 extruders for PP (Covema)
100 circular machines
1 Karl Mayer Raschel

Jute/Kenaf: James Mackie
(1956) 1000 spindles
20 looms

General

The factory is being managed by a Portuguese team provided by the the parent company in Portugal. With the sales prices for bags fixed at very low levels by the Government the company is losing money. According to the factory manager the company, at the moment, is selling its bags at half the production cost. A review of the pricing policy has been requested but it is unlikely that the prices would be doubled.

At the time of the visit the factory was at a standstill because of a power cut. It also suffers from a chronic lack of spare parts and raw materials - the principal reasons for the low capacity utilization.

RICPELE

General Manager: Carlos Ribeiro

Production Manager: Pedro Vieira

Products: suiting, dress and upholstery materials, 150-160 cm wide

Processes: weaving, dyeing, finishing

Raw Materials: polyester, viscose rayon, polyacrylic spun and filament yarns.

Work Force: 582, three shifts

Installed Capacity: 6 million m^2

Target for 1980: 5,7 m^2

Ownership: 30-35% Portuguese
25% Mozambique government
40% Mozambique private
The MOZ government share is estimated to increase to 50% in the near future.

Equipment: (1975-1980)

2 Benninger sectional warpers
120 Saurer Diederichs Rapier looms
1 Kranz jet dyeing machine
2 Kranz thermosetting/finishing machines
1 Turner singeing machine
5 jiggers

General

The factory started operations in 1975 and the equipment is new but beginning to show signs of wear and tear as a result of lack of spare parts and maintenance.

The equipment for a spinning department has been delivered but not yet installed (14.000 spindles, total investment US$8 million, machinery suppliers Trützschler, Rieter, Savio, Schlafhorst). The expansion will increase the work force to about 1,000 persons.

The estimated weaving efficiency is about 60% with 10 looms per weaver.

There are currently 6 expatriates (Portuguese) in charge of the various production departments.

20% of the production is exported to URT; the rest is for local consumption.

The factory poses a problem for the government. It consumes annually over US$8 million of the scarce foreign exchange for the import of its synthetic raw materials and yet the production does not cater for the poorest segment of the population whose living standards the government wants to improve. A conversion to cotton processing has been considered but it would require sizable additional investment. Probably the best course of action would be to make a concerted effort to increase the productivity and product quality to a level where increased exports would become feasible.

Annex IV

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

Mozambique

PROJECT DOCUMENT

Title: Rehabilitation Programme at TEXLOM

Number: DP/MOZ/80/.../A/01/37 Duration: 2 years

Primary function: Direct support

Secondary function: -

Sector: (Govt. Class.) Industry (UNDP class. and code) Manuf. Ind. (3521)

Government Implementing Agency: Ministry of Industry and Energy, National Directorate for Light Industry

Executing Agency: United Nations Industrial Development Organization

Estimated starting date: March 1981

Government inputs: _____ (in kind) UNDP inputs: 683,400 (US dollars)
(local currency)

_____ (in cash)
(local currency)

Signed: _____ Date: _____
on behalf of the Government

_____ Date: _____
on behalf of the Executing Agency

_____ Date: _____
on behalf of the United Nations Development Programme

PART I. Legal Context

This Project Document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of the People's Republic of Mozambique and the United Nations Development Programme, signed by the Parties on 15 September 1976.

PART II. A. Development Objective

The long-term objective of the project is to assist the Government in increasing the productivity of the textile industry sector.

PART II. B. Immediate Objective

The immediate objective of the project is to improve the productivity, product quality and the level of operator skills at the TEXLOM cotton factory and thereby provide the industry with a model that could be applied in other factories throughout the country.

PART II. C. Background and Justification

The textile industry in Mozambique comprises four major textile factories producing woven goods. Three of these are in the cotton sector and one is presently weaving synthetic spun and filament yarns with plans to include a spinning unit for synthetic staple fibre. In addition, there are five knitting factories, one jute and polypropylene bag factory and three blanket manufacturing units.

Three large, integrated cotton processing factories, to be installed under bilateral contracts (GDR, China, Romania) are being planned. When these are completed the total installed capacity will be 117 million m^2 annually.

The industry is characterized by low efficiency and low capacity utilization owing to a chronic shortage of spare parts, raw materials and auxiliaries and lack of trained personnel at all levels. Also, characteristic of the woven goods sector (both cotton and synthetic) is that the machinery is modern - on the average 5 years old - and of high quality. It is only now beginning to show the effects of poor handling and maintenance and its condition is deteriorating rapidly. Most of it is automated but the expensive labour-saving features are grossly under-utilized.

Much of the industry is managed by expatriates who are either employees of Portuguese parent companies operating factories in Mozambique or retained direct by the Mozambique Government. The Government is not entirely satisfied with the performance of these expatriates who, it is claimed, tend to perpetuate their own employment rather than transfer their knowledge to their Mozambican counterparts.

To satisfy the local demand for textiles the Government has estimated that about 170 million m^2 of woven and knitted goods will be required by 1990. The present installed capacity plus the planned new projects will reach the above figure but, with the actual production only about 50% of the installed capacity there is still a shortfall of 70-90 million m^2 at least part of which would have to be covered through increased productivity.

It follows logically from the above that a technical assistance programme should, in the first instance, focus on improving productivity. Instead of attempting to cover the whole industry and thereby spreading the resources too thin, the programme should initially concentrate, in the form of an intensive consulting firm assignment, on one single factory where the necessary prerequisites exist or can be made available for successful implementation.

PART II. D. Outputs

The principal outputs of the project will be:

1. ... trained operators in spinning and weaving and associated operations;

2. ... trained instructors, capable of independently conducting operator training courses;

3. a process control system in operation covering the entire production process and based on realistic production and quality standards;

4. a waste control system in operation;

5. a preventive maintenance system in operation;

6. a motivational remuneration system to contribute to the attainment and maintenance of a higher worker productivity level.

PART II. E. Activities

a) A consulting firm, specializing in the textile industry sector, will be engaged to:

- review the existing production programme at TEXLOM to determine realistic production standards and capacities;

- organize laboratory testing for the control of quality at each stage of the production process;

- install a process control system covering the entire production process including the establishment of standards, tolerances and test frequencies;

- establish waste standards at each stage of the production programme and install a waste control programme, including waste handling procedures, weighing, recording and reporting;

- develop and install a preventive machine maintenance system which will include:

    - overhauling schedules;
    - maintenance reports;
    - machinery standards;
    - proper methods of inspection;
    - minimum and maximum spare parts inventory levels.

- develop and carry out an operator training programme covering the spinning, weaving and associated operations;

- train instructors capable of independently conducting operator training courses;

b) to supplement the above, intensive consulting firm assignment, two OPAS experts will be engaged for a period of two years to assist the Government in ensuring that the momentum gained is not lost and to assist in introducing similar improvements in other factories in the country. (One textile technologist with training experience and one industrial engineer).

PART II. F. Inputs

a) Government inputs

The Government of the People's Republic of Mozambique will contribute to the project in the following ways:

- Counterpart personnel for the international experts:
- Premises, furniture and office supplies and equipment:
- information as necessary for project execution:
- fuel costs for project vehicles.

b) UNDP inputs

- The services of a reputable consulting firm, specializing in the textile industry under a sub-contract.
- two OPAS experts.
- project vehicle and a portable kit of testing equipment:
  - portable moisture regain tester
  - yarn tension meter
  - yarn speedometer
  - stroboscope
  - tachometer
  - roller eccentricity meter

- stop watch
- sling hygrometer
- hardness tester
- feeler gauge
- roller vibration tester
- spindle vibration tester
- roller setting gauges
- steel tape measure
- card wire inspector
- nep counting templates
- counting glass
- calipers
- line gratings
- warp tension meter
- weft unwinding tension meter
- pH papers
- thermometer
- electronic calculator

PART II. G. Preparation of Work Plan

A detailed work plan for the implementation of the project will be prepared by the leader of the sub-contractor team, in consultation with the Government Co-operating Agency. The work plan will be incorporated in the text of the sub-contract agreement and attached to the Project Document as Annex I and will be considered as part of that document.

PART II. H. Preparation of the Framework for Effective Participation of National and International Staff in the Project

The activities necessary to produce the indicated outputs and achieve the project's immediate objective will be carried out jointly by the national and international staff assigned to it. The respective roles of the national and international staff will be determined by their leaders, by mutual discussion and agreement, at the beginning of the project, and set out in a Framework for Effective Participation of National and International Staff in the Project. The Framework, which will be attached to the Project Document as an annex, will be reviewed from time to time. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical co-operation.

PART II. I. Institutional Framework

The project will be integrated within the National Directorate for Light Industry, Ministry of Industry and Energy.

The initial portion of the work will be conducted in the TEXTOM factory in Maputo. Subsequently work will be carried out in other textile factories in the country both in the public and private sector.

PART II. J. Prior Obligations and Prerequisites

Prerequisites

The Government will ensure that suitably qualified counterpart staff and the necessary physical facilities for the operator and instructor training programme will be made available prior to the start of the project. A detailed list of such facilities including demonstration equipment will be provided at the time of awarding the contract.

The project document will be signed by the Resident Representative on behalf of UNDP, and UNDP assistance to the project will be provided, subject to UNDP receiving satisfaction that the prerequisites referred to above have been fulfilled, or are likely to be fulfilled. When anticipated fulfillment of one or more prerequisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

PART II. K. Future UNDP Assistance

It is anticipated that further UNDP assistance to the textile industry will be required during or after the completion of this project but its nature and scope cannot yet be estimated.

PART III. A. Schedules of Monitoring Evaluation and Reports

The project will be subject to periodic review in accordance with the policies and procedures established by UNDP for monitoring project and programme implementation.

A technical review will be undertaken by a representative of UNIDO during the second half of the project's implementation.

PART III. B. Evaluation

The project will be subject to evaluation, in accordance with the policies and procedures established for this purpose by UNDP. The organization, terms of reference and timing of the evaluation will be decided by consultation between the Government, UNDP and UNIDO.

PART III. C. Progress and Terminal Reports

The sub-contractor will submit two progress reports during the course of the assignment and a draft final report in English. Upon receipt of UNIDO's comments on the draft final report within one month the sub-contractor will prepare a final report in Portuguese.

UNIDO

PROJECT BUDGET/REVISION

3. COUNTRY	4. PROJECT NUMBER AND AMEND.	5. SPECIFIC ACTIVITY
MOZAMBIQUE	DP/MOZ/80/.../A/01/37	31.7.B.

10. PROJECT TITLE

Rehabilitation programme at TEXLOM

15. 10. 11 PROJECT PERSONNEL EXPERTS / Post title	16. TOTAL		17. 1981		18. 1982		19. 1983		20.	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
11-01 N.a.										
02										
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
11-99 SUBTOTAL:										

21. REMARKS

UNIDO

PROJECT BUDGET/REVISION

2. PAD NUMBER

4. PROJECT NUMBER	16. TOTAL		17. 1981		18. 1982		19. 1983		20.	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
12.01 OPAS Experts Textile technologist	24	148,200	6	34,800	12	75,600	6	37,800		
12.02 OPAS Industrial engineer	24	148,200	6	34,800	12	75,600	6	37,800		
13.00 Support Personnel										
14.00 Volunteers										
15.00 Experts Travel										
16.00 Other Personnel Costs		3,000				3,000				
17.01 Locally hired Experts										
17.02 Locally hired Experts										
19.00 Total Personnel Component		299,400		69,600		154,200		75,600		
20. SUBCONTRACTS										
29.00 Total Subcontracts Component		350,000		350,000						
30. TRAINING										
31.00 Fellowships										
32.00 Study Tours, UNDP G. Training/Meetings										
33.00 In-service Training										
34.00 Group Training (non-UNDP)										
35.00 Meetings/Consultations (non-UNDP)										
39.00 Total Training Component										
40. EQUIPMENT										
49.00 Total Equipment Component		20,000		20,000						
50. MISCELLANEOUS										
51.00 Operations — Maintenance		8,000		2,000		4,000		2,000		
52.00 Reports										
53.00 Sundries		6,000		2,000		3,000		1,000		
55.00 Hospitality (non-UNDP)										
59.00 Total Miscellaneous Component		14,000		4,000		7,000		3,000		
99. GRAND TOTAL:		683,400		443,600		161,200		78,600		

(to be completed by the Res.Rep.'s office)

PROJECT BUDGET COVERING GOVERNMENT CONTRIBUTION IN KIND
(in Local Currency)

COUNTRY: MOZAMBIQUE

Project No.: DP/MOZ/80/.../A/01/37

Title: Rehabilitation programme at TEXLOM

Annex I

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

Mozambique

PROJECT DOCUMENT

Title: Rehabilitation Programme at the SABRINA Garment Factory

Number: DP/MOZ/80/.../A/01/37 Duration:

Primary function: Direct support

Secondary function: -

Sector: (Govt. Class.) Industry (UNDP class. and code) Manuf. Ind. (3521)

Government Implementing Agency: Ministry of Industry and Energy, National Directorate for Light Industry

Executing Agency: United Nations Industrial Development Organization

Estimated starting date: March 1981

Government inputs: _____ (local currency) (in kind) UNDP inputs: 369,700 (US dollars)

_____ (local currency) (in cash)

Signed: _____ Date: _____

on behalf of the Government

_____ Date: _____

on behalf of the Executing Agency

_____ Date: _____

on behalf of the United Nations Development Programme

PART I. Legal Context

This Project Document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of the People's Republic of Mozambique and the United Nations Development Programme, signed by the Parties on 15 September 1976.

PART II. A. Development Objective

The long-term objective of the project is to assist in the rehabilitation of the garment industry sector in Mozambique.

PART II. B. Immediate Objective

The immediate objectives of the project are:

- to increase the production in the SABRINA garment factory in Maputo by 100% through the installation of appropriate production control systems and through the implementation of an operator/instructor training programme;

- to prepare a rationalization plan for the garment industry and, in this connexion, assess the industry's present and future machine and spare parts requirements.

PART II. C. Background and Justification

The garment industry in Mozambique comprises 34 medium-sized production units with a total of 3,350 machines and a work force of 5,700.

The industry suffers from an acute shortage of trained man-power at all levels and from an equally acute lack of spare parts and imported raw materials and these two, fundamental, shortcomings are reflected in the overall picture: low productivity, poor production planning, quality levels well below international standards and high unit cost. The industry is further characterized by lack of specialization; most factories are manufacturing a wide range of products. The result is a heterogenous machine park plagued with serious maintenance problems and under-utilization of certain machines. It is estimated that 15-20% of the equipment is standing idle for lack of spare parts and many of them have been cannibalized to maintain the rest in working order.

The Government, concerned over the situation in the garment industry, requested, in May 1980, UNIDO to provide the services of a garment industry consultant to carry out a diagnostic mission to pinpoint the deficiencies and to recommend measures to overcome them.

The mission concluded that, apart from equipment replacement, the extent of which will have to be determined, the application of various industrial engineering techniques would be necessary and yield the quickest benefits. To demonstrate the effect of the application of such techniques it was recommended that an intensive rehabilitation programme be carried out initially in one selected garment factory only, to be repeated later in others, at least partly through local efforts. The net result of a successful programme would be both a tangible improvement in production volume, productivity and quality and a psychological effect: it would offer proof that, with a concerted effort and without capital investment, the production and productivity can be significantly increased.

In addition to a sample operation in one single factory as described above, it would be necessary, at this stage to analyse the garment industry sector as a whole with a view to rationalizing the production through specialization and to determine the extent and cost of a machine replacement programme.

By limiting the scope of an assistance programme as described tangible and measurable results could be achieved in a relatively short period of time and, while they, too, would be limited in scope their demonstrative effect would assist the Government in setting its targets realistically and in determining the resources needed to ultimately rehabilitate the garment industry sector as a whole.

PART II. D. Outputs

The outputs of the project will be:

1. a 100% production increase at the SABRINA garment factory;

2. a rationalization plan for the industry with details on machinery replacement needs and the investment required.

PART II. E. Activities

Activities related to Output 1:

- determine the production standards and capacities at the SABRINA garment factory
- establish a production programme to fit the factory capacity
- determine time standards for each operation from cutting to packing
- revise the lay-out as required and establish a balanced production line
- develop and install a production and process control system covering all operations
- to train line supervisors on-the-job how to achieve and maintain high operator performance and high quality of work at minimum costs
- to establish standards, tolerances, and sampling frequencies for the inspection of garments at all stages of manufacture
- to establish quality control and data feed-back systems to control and improve quality
- to establish waste standards and develop and install a waste control programme

- to develop and install a preventive maintenance system covering all equipment which will include:
  - cleaning schedules
  - lubrication schedules
  - belt checks
  - partial revisions
  - general annual revisions
  - maintenance reports

- to train the technical managers and counterparts in the operation of the above mentioned programmes in order to maintain a continuity of the programmes after the departure of the consulting organisation

- to develop and implement operator training for sewing machinists

- to train instructors who will be capable of conducting further courses in other units after the departure of the consulting organisation.

- to develop and install management control reports relating to:

  waste
  quality
  productivity

- develop training manuals which will be the basis of training future workers and the retraining of present workers

- develop manuals covering the various phases of work which have been accomplished and which will provide standards, procedures, and guidance to the technical staff and management.

Activities related to Output 2:

- analysis of the Government's 10 year plan for the industry in terms of production by type of garment

- details of the present production expertise and man-power/machine capacity of the 34 units in the industry

- inventory by type, make and age of the machinery presently installed in the industry

- recommendations covering

- the future structure of the industry, in terms of what products each unit should make

- the redistribution of the industry, in terms of what products each unit should make
- the redistribution of present machinery between the various units to improve manufacturing capability
- machinery replacement plans (including spare parts) for the industry.

PART II. F. Inputs

UNDP Inputs

To carry out the activities described above a consulting firm specializing in the garment industry sector, will be engaged for an estimated period of six months.

To assist the Government in implementing those recommendations that affect the garment sector as a whole, such as machinery replacement programme, a standard costing system, etc., the services of an OPAS expert (garment technologist) will be provided for a period of two years.

Government Inputs

The Government will provide:

- Counterpart personnel for the international experts:
- Premises, furniture and office supplies and equipment:
- information as necessary for project execution:
- fuel costs for project vehicles.

PART II. G. Preparation of Work Plan

A detailed work plan for the implementation of the project will be prepared by the leader of the sub-contractor team, in consultation with the Government Co-operating Agency. The work plan will be incorporated in the text of the sub-contract agreement and attached to the Project Document as Annex I and will be considered as part of that document.

PART II. H. Preparation of the Framework for Effective Participation of National and International Staff in the Project

The activities necessary to produce the indicated outputs and achieve the project's immediate objective will be carried out jointly by the national and international staff assigned to it. The respective roles of the national and international staff will be determined by their leaders, by mutual discussion and agreement, at the beginning of the project, and set out in a Framework for Effective Participation of National and International Staff in the Project. The Framework, which will be attached to the Project Document as an annex, will be reviewed from time to time. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical

PART II. I. Institutional Framework

The project will be integrated within the National Directorate for Light Industry, Ministry of Industry and Energy.

During the initial phase assessments of the industry as a whole will be conducted and consultancy work at the individual factory level will be carried out at the SABRINA factory in Maputo. Subsequently work will be carried out in other garment factories in the country both in the public and private sector.

PART II. J. Future UNDP Assistance

It is anticipated that further UNDP assistance will be required to follow up and expand the rehabilitation programme.

The exact nature and scope of such assistance can only be determined after the present project has been completed and its results evaluated.

PART III. Schedules of Monitoring, Evaluation and Reports

PART III. A. Tripartite Monitoring Reviews: Technical Reviews

The project will be subject to periodic review in accordance with the policies and procedures established by UNDP for monitoring project and programme implementation.

A technical review will be carried out by a representative of UNIDO towards the end of the sub-contract assignment to assess its impact and to determine whether and what further assistance would be required.

PART III. B. Evaluation

The project will be subject to evaluation in accordance with the policies and procedures established for this purpose by UNDP. The organization terms of reference and timing of the evaluation will be decided by consultation between the Government, UNDP and UNIDO.

PART III. C. Progress and Terminal Reports

The sub-contractor will submit two progress reports during the course of the assignment and a draft final report in English. Upon receipt of UNIDO's comments on the draft final report within one month the sub-contractor will prepare a final report in Portuguese.

UNIDO

PROJECT BUDGET/REVISION

3. COUNTRY	4. PROJECT NUMBER AND AMEND.	5. SPECIFIC ACTIVITY
MOZAMBIQUE	DP/MOZ/80/.../A/01/37	31.7.B.

10. PROJECT TITLE

Rehabilitation programme at the SABRINA garment factory

15. 10. PROJECT PERSONNEL 11 EXPERTS / Post title	16. TOTAL		17. 1981		18. 1982		19. 1983		20.	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
11-01 N.a.										
02										
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
11-99 SUBTOTAL:										

21. REMARKS

FORM PES 83/Rev. 3 (10.78)

UNIDO

PROJECT BUDGET/REVISION

2. PAD NUMBER

4. PROJECT NUMBER	16. TOTAL		17. 1981		18. 1982		19. 1983		20.	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
12.01 OPAS Experts Garment technologist	24	146,700	9	52,200	12	75,600	3	18,900		
13.00 Support Personnel										
14.00 Volunteers										
15.00 Experts Travel										
16.00 Other Personnel Costs		3,000		3,000						
17.01 Locally hired Experts										
17.02 Locally hired Experts										
19.00 Total Personnel Component		149,700		55,200		75,600		18,900		
20. SUBCONTRACTS										
29.00 Total Subcontracts Component		200,000		200,000						
30. TRAINING										
31.00 Fellowships										
32.00 Study Tours, UNDP G. Training/Meetings										
33.00 In-service Training										
34.00 Group Training (non-UNDP)										
35.00 Meetings/Consultations (non-UNDP)										
39.00 Total Training Component										
40. EQUIPMENT										
49.00 Total Equipment Component										
50. MISCELLANEOUS										
51.00 Operations — Maintenance										
52.00 Reports										
53.00 Sundries		20,000		15,000		5,000				
55.00 Hospitality (non-UNDP)										
59.00 Total Miscellaneous Component		20,000		15,000		5,000				
99. GRAND TOTAL:		369,700		270,200		80,600		18,900		

(to be completed by the Res.Rep.'s office)

PROJECT BUDGET COVERING GOVERNMENT CONTRIBUTION IN KIND
(in Local Currency)

COUNTRY: MOZAMBIQUE

Project No.: DP/MOZ/80/.../A/01/37

Title: Rehabilitation programme at the SABRINA garment factory

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

Mozambique

PROJECT DOCUMENT

Title: Assistance to the Industria Papeleira National to become a national training centre for paper making

Number: Duration: 3 years

Primary function: Direct support

Secondary function: -

Sector: (Govt. Class.) Industry (UNDP class. and code) Manuf. Ind. (3521)

Government Implementing Agency: Ministry of Industry and Energy, National Directorate for Food and Chem. Ind.)

Executing Agency: United Nations Industrial Development Organization

Estimating starting date: September 1981

Government inputs: _____ (local currency) (in kind) UNDP inputs: 942.000 (US dollars)

_____ (local currency) (in cash)

Signed: _____ Date: _____
(on behalf of the Government)

_____ Date: _____
(on behalf of the Executing Agency)

_____ Date: _____
(on behalf of the United Nations Development Programme

PART I. LEGAL CONTEXT

This Project Document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of the People's Republic of Mozambique and the United Nations Development Programme, signed by the Parties on 15 September 1976.

PART II. THE PROJECT

A. DEVELOPMENT OBJECTIVES

The Development Objective of the project is to assist the Government in increasing the capacity and productivity of the paper industry sector as an essential industry in the country's development.

B. IMMEDIATE OBJECTIVES

The Immediate Objectives of the project is to modernize and increase the production of the Industria Papeleira National paper mill to its former capacity and establish a training centre at the mill for training engineers, technicians, and operators for the national pulp and paper industry.

C. SPECIAL CONSIDERATION

N.a.

D. BACKGROUND AND JUSTIFICATION

The first and only paper mill in Mozambique, the Industria Papeleira National (former Papel-Papacar Mill) started operation in the sixties outside Maputo, and by adding four paper machines, all second-hand equipment, it was possible, using locally available waste paper and imported chemical pulp, to produce up to 15,000 tons of printing and writing and packaging papers for the local markets in the middle of the seventies.

Then production dropped down to 3,000 tons per annum in 1979 and the locally collected waste paper in the Maputo area was the only fibre material available for paper making.

The production of this mill at present is limited because of lack of raw material, lack of spare parts, poor maintenance, and lack of experienced personnel.

A team of four Cuban paper engineers has improved the manpower situation temporarily for 1980. A national campaign to collect more waste paper for the mill has been started. The paper machines No. 3 but especially No. 4 have a potential of producing at least an additional quanity of 10,000 tons/annum, if the above mentioned handicap of the mill would be corrected.

The country imports about 25,000 tons of different paper products, mostly packaging papers like kraft liner, corrugating medium and printing and writing papers, papers which were partly

produced earlier in the existing paper mill. The paper consumption of 3 kg/head and annum is high compared with other developing countries in Africa.

The future prospects for developing the national pulp and paper industry is very promising. SIDA is willing to assist the Industria Papeleira National in the funding and supply of laboratory instruments for quality control. Again with SIDA funds a survey of the forestry sector was carried out in 1979 and two pulp and paper mill projects have been identified. In the Manika area there is enough pine wood - 13,000 ha, to produce 30,000 tons/annum of newsprint, and in the Zambesi Province there is sufficient sugar cane bagasse available to produce 60,000 tons of paper. The bagasse will be available because the local sugar mills can switch to local high quality coal as fuel for their boiler plants.

The Government plans to reforest 130,000 ha with eucalyptus and pine trees and when these plantation forests are mature, a big export chemical pulp mill with a capacity of 100,000 tons/annum will also be possible in the 1990s.

Due to the very promising conditions to establish two new pulp and paper mills in the Manika area to produce 30,000 tons of newsprint, and one printing and paper mill producing 60,000 tons using locally available sugar cane bagasse in the Zambesi area, the Government is very concerned and interested to create a national cadre of pulp and paper engineers and technicians and operators to operate the existing paper mill and two new mills due to start operation in 1985.

The existing paper mill was chosen as a mill for training technicians and operators. UNIDO was requested to modernize and increase the production of the paper mill to its former capacity, to establish such a training centre, and carry out in-plant training courses for up to 150 technicians and operators, and also help in placing at universities 3 university graduates and 15 engineers for the new bagasse pulp/paper mill where they can be trained in bagasse pulp and paper making technology.

E. OUTPUTS

- The Industria Papeleira National mill fully equipped, operating at full capacity and serving as a national training centre for technicians and operators;

- A cadre of 150 technicians and operators, 15 engineers and 3 university graduates;

- Recommendations for the further improvement of the performance of the paper mill and the in-plant training programme for the technicians and operators.

F. ACTIVITIES

A consulting firm specializing in paper making will supply experts and trainers who will be required to carry out the following

tasks and should be either Portuguese or Spanish speaking:

- investigate how the paper mill caracity can be restored and which equipment and spare parts are necessary	Jan. - March 81	3 months
- prepare equipment specification and supervise its installation	April 81	1 year
- establish a controls and preventive maintenance system	March 81	1 year
- undertake studies, such as on ways and means of supporting and improving the national waste paper collection drive, on the availability of cotton linters and their use for local paper making or for export; and on the availability of textile waste and cuttings for paper making; carry out in-plant training courses for technicians and operators	April 81 - Nov. 83	2.5 years
- prepare a fellowship programme for University graduates and engineers	Nov. 80 - Nov. 83	3 years
- summarize experience and prepare recommendations regarding further improvement of paper-mill performance and in-plant training programmes	Nov. 83	
- After the initial investigations experts and trainers will go to the paper mill in split missions		
a) paper machines operations	Jan. 82 - March 83	
b) mill maintenance	April 81 - July 82	
c) paper testing	Aug. 82 - Nov. 83	

G. INPUTS

Government Inputs

The Government of the People's Republic of Mozambique will contribute to the project in the following ways:

- Counterpart personnel for the international experts;
- Premises, furniture and office supplies and equipment;
- information as necessary for project execution;
- fuel costs for project vehicles.

UNDP/UNIDO Inputs

1. Subcontract

A consulting company specializing in paper production will carry out initial investigations and supply experts and trainers who should be Portuguese or Spanish speaking for split missions over a period of three years

2. Training

- in-service training of 150 technicians and operators will be carried out by the consulting company
- individual fellowships will be awarded to 3 university graduates for 3 years each in pulp and paper technology in a Portuguese speaking country like Brazil and 108 m/m
to 15 engineers in pulp and paper operations for 6 months each in Portuguese speaking countries in the field of pulp and paper bagasse making. 90 m/m

3. Equipment

Equipment and spare parts will be provided

for paper machine No. 4	$ 120.000
for general services, boiler, crane	$ 150.000
for teaching aids, project vehicles	$ 30.000

H. WORK PLAN

A tentative Work Plan is shown in relation to activities in Chapter F "Activities". A detailed Work Plan for the implementation of the project will be prepared by the Subcontractor in consultation with his national counterparts at the start of the project and brought forward periodically. The agreed Work Plan will be attached to the Project Document as Annex and will be considered as part of the Project Document.

I. PREPARATION OF THE FRAMEWORK FOR EFFECTIVE PARTICIPATION OF NATIONAL AND INTERNATIONAL STAFF IN THE PROJECT

The activities necessary to achieve the project's immediate objectives will be carried out jointly by the national and international staff assigned to it. The National Directorate for Food and Chemical Industries will provide the requisite co-operative facilities for the implementation of the project. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical co-operation.

J. DEVELOPMENT SUPPORT COMMUNICATION

N.a.

K. INSTITUTIONAL FRAMEWORK

The project will be integrated, through the National Directorate for Food and Chemical Industries, Ministry of Industry and Energy, in the Industria Papeleira National mill. The mill is located in the outskirts

of Maruto: collaboration will take place with Government authorities responsible for the preparation of the integrated pulp and paper mill projects.

L. PRIOR OBLIGATIONS AND PREREQUISITES

1. Prior Obligations

None

2. Pre-requisites

a) Assignment of adequate technical, administrative and support personnel including a full-time national project co-ordinator.

b) Provision of adequate financial resources for travel of national personnel within the country as required.

c) Provision of suitable office premises, office equipment and transport facilities for the UN personnel.

The Project Document will be signed by the Resident Representative on behalf of UNDP and UNDP assistance to the project will be provided subject to UNDP receiving satisfaction that the pre-requisites listed above have been fulfilled, or are likely to be fulfilled. When anticipated fulfillment of one or more pre-requisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

M. FUTURE UNDP ASSISTANCE

Future UNDP assistance, if any, will be determined by a review of the project six months before project completion.

PART III. SCHEDULES OF MONITORING, EVALUATION AND REPORTS

A. TRIPARTITE REVIEW MEETINGS

The project will be subject to a technical review six months after the initial subcontractor's investigations and to periodic reviews as specified in the Terms of Reference for the subcontractor.

A special review to consider the necessity for further assistance should take place 6 months before project completion.

B. EVALUATION

The project will be subject to evaluation, in accordance with the policies and procedures established for this purpose by UNDP. The organization, terms of reference and timing of the evaluation will be decided upon by consultation between the national authorities, UNDP and the Executing Agency.

9. PROGRESS AND TERMINAL REPORTS

The sub-contractor will submit two progress reports during the course of the assignment and a draft final report in English. Upon receipt of UNIDO's comments on the draft final report within one month the sub-contractor will prepare a final report in Portuguese.

UNIDO

PROJECT BUDGET/REVISION

3 COUNTRY	4. PROJECT NUMBER AND AMEND.	5. SPECIFIC ACTIVITY
MOZAMBIQUE	DP/MOZ/	

10 PROJECT TITLE

Assistance to the Industria Papeleira National to become a national training centre for paper making

15 10. PROJECT PERSONNEL 11 EXPERTS / Post title	16. TOTAL		17. 1981		18. 1982		19. 1983		20.	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
11-01										
02										
03										
04										
05										
06										
07										
08										
09										
10										
11										
12										
13										
14										
11-99 SUBTOTAL:	-	-	-	-	-	-	-	-		

21. REMARKS

UNIDO

PROJECT BUDGET/REVISION

2 PAD NUMBER

4 PROJECT NUMBER DP/MOZ/		16. TOTAL		17. 1981		18. 1982		19. 1983		20	
		m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
12.01	OPAS Experts										
13.00	Support Personnel										
14.00	Volunteers										
15.00	Experts Travel										
16.00	Other Personnel Costs		15,000		5,000		5,000		5,000		
17.01	Locally hired Experts										
17.02	Locally hired Experts										
19.00	Total Personnel Component		15,000		5,000		5,000		5,000		
20.	SUBCONTRACTS										
29.00	Total Subcontracts Component		300,000		150,000		100,000		50,000		
30.	TRAINING										
31.00	Fellowships	198	297,000	36	54,000	81	121,500	81	121,500		
32.00	Study Tours, UNDP G. Training/Meetings										
33.00	In-service Training										
34.00	Group Training (non-UNDP)										
35.00	Meetings/Consultations (non-UNDP)										
39.00	Total Training Component	198	297,000	36	54,000	81	121,500	81	121,500		
40.	EQUIPMENT										
49.00	Total Equipment Component		300,000		250,000		50,000		-		
50.	MISCELLANEOUS										
51.00	Operations — Maintenance		24,000		8,000		8,000		8,000		
52.00	Reports										
53.00	Sundries		6,000		2,000		2,000		2,000		
55.00	Hospitality (non-UNDP)										
59.00	Total Miscellaneous Component		30,000		10,000		10,000		10,000		
99.	GRAND TOTAL:		942,000		469,000		286,500		186,500		

UNITED NATIONS DEVELOPMENT PROGRAMME

Project of the Government of

Mozambique

PROJECT DOCUMENT

Title: Assistance to the salt industry

Number: Duration: 4 years

Primary Function: Direct support

Secondary Function: -

Sector: (Govt. Class.) Industry (UNDP class. and code) Manuf. Ind. (3521)

Government Implementing Agency: Ministry of Industry and Energy, National Directorate for Food and Chemical Industries

Executing Agency: United Nations Industrial Development Organization

Estimating starting date: July 1980

Government inputs: _____ (local currency) (in kind) UNDP inputs: 966,400 (US dollars)

_____ (local currency) (in cash)

Signed: _____ Date: _____
on behalf of the Government

_____ Date: _____
on behalf of the Executing Agency

_____ Date: _____
on behalf of the UNDP

PART I. LEGAL CONTEXT

This Project Document shall be the instrument referred to as such in Article I, paragraph 1, of the Assistance Agreement between the Government of the People's Republic of Mozambique and the United Nations Development Programme, signed by the Parties on 15 September 1976.

PART II. THE PROJECT

A. DEVELOPMENT OBJECTIVES

The Development Objective of the project is to assist the Government in increasing the salt production for domestic consumption and exports as well as in meeting future demands for the emerging chemical industry.

B. IMMEDIATE OBJECTIVE

To immediate objective of the project is to assist, through the Directorate of Salt Production in the National Directorate for Food and Chemical Industries, the existing salt works in all the phases of operation to increase and improve their production and to assist the Directorate of Salt Production in all the phases of establishing new salt works in the country.

C. SPECIAL CONSIDERATIONS

N.a.

D. BACKGROUND AND JUSTIFICATION

Due to the good soil and climatic conditions along the long shore of Mozambique on the Indian ocean, the country has always had great potential for producing sea salt by solar evaporation. Therefore Tanzania and Mozambique, in the past, were producers of sea salt, and many inland African countries like Malawi, Zaire, and Zambia, relied traditionally on imports of salt from these countries.

The Government has given the development of locally produced solar sea salt a very high priority. The existing salt works should be optimized, new salt works will be built, and a cadre of local salt experts have to be formed. There is a great potential to increase exports immensely when extra production capacities have been created.

The country produced in 1979 about 54,000 t/a of sea salt by solar evaporation. Most of the salt was for human consumption, but this production is not sufficient for the human consumption of 12 million inhabitants. 11,000 tons were exported to neighbouring countries at an average price of 90 dollars/ton. Due to limitations of production, export orders of 90,000 could not be delivered.

There is no national chemical industry yet to produce such essential chemical as caustic soda, soda ash, chlorine from salt.

The Directorate of Salt, under the directorship of Mr. T. dos Santos, working under the National Directorate for Food Chemicals in the Ministry of Industry, has plans to increase the production in the two main salt works near Maputo - Fabrica de Miegenizacao do Sal and Costa do Sol - and elsewhere in the country as follows:

1980	-	64,000 t/a
1981	-	72,000 t/a
1982	-	80,000 t/a

There is sufficient good soil near the two salt plants of Maputo and the production capacity can be doubled or trebled with expert help.

A project for a big - 150,000 t/a - new salt work in the north of the country near Nacala is being discussed at present with the French Company Salins du Midi et des Salines de l'Est. Start-up of this plant is scheduled for 1983.

The production of caustic soda and soda ash is foreseen according to plans of the Office of Planning in the Ministry of Industry for 1982, but at the latest for 1985. Big quantities of industrial salts with a higher quality than the present production will be necessary then. Other salt works will have to produce the required quantities.

The former Portuguese experts supervising the existing salt works in the country have left and under extremely severe conditions it was possible to start up the local salt production again with inexperienced personnel. No scientific methods like flow control, controlled precipitation and removal of non-sodium chloride products, or Beaumé control in the ponds, or optimization of evaporation rates in the crystalization area, or salt analysis in the only salt refining plant, have been applied. Therefore urgent help is needed to upgrade and increase the production of the existing salt works.

At present there is only one experienced chemical engineer in the country with experience in the production of sea salt by solar evaporation.

The Government plans to have three regional salt directorates in the country: one in the north, one in the middle of the country and one near Maputo.

The Government has asked UNIDO for the services of a senior techno-economic salt expert to work directly with the Head of the Salt Department. Thereby it is hoped that the big tasks of the future: creation of new salt works, increase of production and upgrading the quality of sea salt, and creation of an experienced middle and lower management cadre, can be achieved.

The Government has, furthermore, asked UNIDO to provide a salt works expert who by introducing scientific methods, in the first instance at the two salt works near Maputo, will increase and upgrade the production of locally produced sea salt. By creating a salt laboratory and a training centre for local personnel, a cadre of experienced lower and middle-management personnel can be educated.

E. OUTPUTS

- A well functioning National Directorate of Salt and three regional salt directorates plus improved production capacity in the existing salt works in the Maputo area;
- Recommendations on new sites and all plans of establishing modern salt works including marketing and economic studies and a use of industrial salts in the production of inorganic chemicals;
- a quality control programme;
- a salt laboratory;
- a training programme for the personnel of new salt works.

F. ACTIVITIES

1. A senior techno-economic salt adviser will work with the Directorate of Salt Production and — Jan. 81 - 4 years

- give advise on new sites for salt works to be established along the seashore of Mozambique on the Indian Ocean;
- advise the Government in its consideration of the new salt works project proposal at Nacala already in 1980 — July 80 - 1 week, Dec. 80 - 1 month
- carry out marketing studies;
- carry out economic studies on new salt works;
- promote and advise on the use of industrial salts in the production of inorganic chemicals;
- develop a training programme for management of the three regional salt directorates and undertake on the job training.

During his 4-year mission he will continuously participate in all phases of selecting, erecting and start-up of the new modern salt works.

2. A salt works expert will work through the Directorate of Salt Production with the salt plant managers and — Jan. 81 - 3 years

- introduce scientific methods of precipitation of salts in the salt works and increase the production;
- establish a quality control programme at the salt works and in the salt refining plant;
- establish a salt laboratory;
- establish a training programme and training courses for local personnel and for the technical personnel needed in the new salt plants.

The experts will select and supervise the installation of equipment as appropriate for land surveying, climatic measurements and sea salt analysis and for the salt laboratory to be established, as well as essential spare parts for vital pumps and diesel sets in the salt works.

- They will summarize their experiences in annual reports and in final reports recommendations will be made on how to further support the country in its efforts to increase the salt production.

- They will be assisted in the above tasks by short term consultants as appropriate.

G. INPUTS

Government Inputs

- The Government will appoint counterpart staff for the co-ordination and implementation of the project. The counterpart for the senior adviser will be the Directorate of Salt Products in the National Directorate for Food and Chemical Industries. The counterpart for the salt works expert will be the directors of the two salt works - Fabrica de Hiegenizacao do Sal and Costa do Sol.
- Premises, furniture and office supplies and equipment:
- information as necessary for project execution:
- fuel costs for project vehicles:
- The Government will also provide a building and utilities for the salt laboratory.

UNDP/UNIDO Inputs

a) Personnel:

1 senior techno-economic salt adviser	48 m/m
1 salt works expert	36 m/m
Short-term consultants	15 m/m

b) Training:

A total of 54 m/m of fellowships will be awarded as follows:
3 regional manager will be trained in a Spanish/Portuguese speaking country for 8 months each:
10 operators will be trained for 3 months each;
study tours for three to four Senior Government Officials will be organized to study modern salt works, salt refineries and salt utilization in industry.

c) Equipment:

Equipment to carry out surveys, climatic measurements sea salt analysis, Beaumé measurements, etc.; for the salt laboratory; spare parts for pumps and diesel sets: and two project vehicles (detailed specifications will be drawn up by the senior adviser and expert). $ 200,000

H. WORK PLAN

A tentative Work Plan is shown in relation to activities in Chapter F "Activities". A detailed Work Plan for the implementation of the project will be prepared by the Subcontractor in consultation with his national counterparts at the start of the project and brought forward periodically. The agreed Work Plan will be attached to the Project Document as Annex and will be considered as part of the Project Document.

I. PREPARATION OF THE FRAMEWORK FOR EFFECTIVE PARTICIPATION OF NATIONAL AND INTERNATIONAL STAFF IN THE PROJECT

The activities necessary to achieve the project's immediate objectives will be carried out jointly by the national and international staff assigned to it. The National Directorate for Food and Chemical Industries will provide the requisite co-operative facilities for the implementation of the project. The respective roles of the national and international staff shall be in accordance with the established concept and specific purposes of technical co-operation.

J. DEVELOPMENT SUPPORT COMMUNICATION

N.a.

K. INSTITUTIONAL FRAMEWORK

The project will be integrated within the Directorate of Salt Production (and at the planned regional subdirectorates) in the National Directorate for Food and Chemical Industries of the Ministry of Industry and Energy.

Work at the factory level will be carried out at the two existing salt works near Maputo, Fabrica de Hiegenizacao do Sal and Costa do Sol as well as at projected new sites along the coast.

L. PRIOR OBLIGATIONS AND PREREQUISITES

1. Prior Obligations

None

2. Pre-requisites

a) Assignment of adequate technical, administrative and support personnel including a full-time national project co-ordinator.

b) Provision of adequate financial resources for travel of national personnel within the country as required.

c) Provision of suitable office premises, office equipment and transport facilities for the UN personnel.

d) Provision of a building and utilities for the salt laboratory.

The Project Document will be signed by the Resident Representative on behalf of UNDP and UNDP assistance to the project will be provided subject to UNDP receiving satisfaction that the pre-requisites listed above have been fulfilled, or are likely to be fulfilled. When anticipated fulfillment of one or more pre-requisites fails to materialize, UNDP may, at its discretion, either suspend or terminate its assistance.

M. FUTURE UNDP ASSISTANCE

Future UNDP assistance, if any, will be determined by a review of the project six months before project completion.

PART III. SCHEDULES OF MONITORING, EVALUATION AND REPORTS

A. TRIPARTITE MONITORING REVIEWS: TECHNICAL REVIEWS

The project will be subject ot periodic reviews in accordance with the policies and procedures established by the UNDP for monitoring projects and programme implementation.

B. EVALUATION

The project will be subject to evaluation, in accordance with the policies and procedures established for this purpose by UNDP. The organization, terms of reference and timing of the evaluation will be decided upon by consultation between the national authorities, UNDP and the Executing Agency.

C. PROGRESS AND TERMINAL REPORTS

Progress and terminal reports will be prepared in accordance with the UNDP Policies and Procedures Manual and as agreed upon with the Government and UNIDO. The first progress report is to be prepared six months after the appointment of the Senior Adviser and the following report six months later.

PROJECT BUDGET

Country: MOZAMBIQUE

Project Number:

Project Title: Assistance to the Salt Industry

	Total		1980		1981		1982		1983		1984	
	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$	m/m	$
10. PROJECT PERSONNEL												
11. Experts												
11-01 Senior Adviser	48	294,600	2	10,800	12	69,600	12	75,600	12	75,600	10	63,000
11-02 Salt works expert	36	220,800		-	12	69,600	12	75,600	12	75,600		-
11-03 Consultants	15	100,000		-	3	19,800	3	19,800	6	39,600	3	20,800
11-99 Subtotal	99	615,400	2	10,800	27	159,000	27	171,000	30	190,800	13	83,800
16.00 Other Person. Costs		20,000		-		5,000		5,000		5,000		5,000
19.00 Total Person. Comp.	99	635,400	2	10,800	27	164,000	27	176,000	30	195,800	13	88,800
31.00 Fellowships	54	81,000		-	24	36,000	18	27,000	12	18,000		-
32.00 Study Tours		30,000		-		15,000		-		15,000		-
39.00 Total Traing. Comp.		111,000		-		51,000		27,000		33,000		-
49.00 Total Equipment Comp.		200,000		-		150,000		50,000		-		-
51.00 Operations-Mainten.		16,000		-		4,000		4,000		4,000		4,000
53.00 Sundries		4,000		-		1,000		1,000		1,000		1,000
59.00 Total Misc. Comp.		20,000		-		5,000		5,000		5,000		5,000
99.00 GRAND TOTAL		966,400		10,800		370,000		258,000		233,800		93,800