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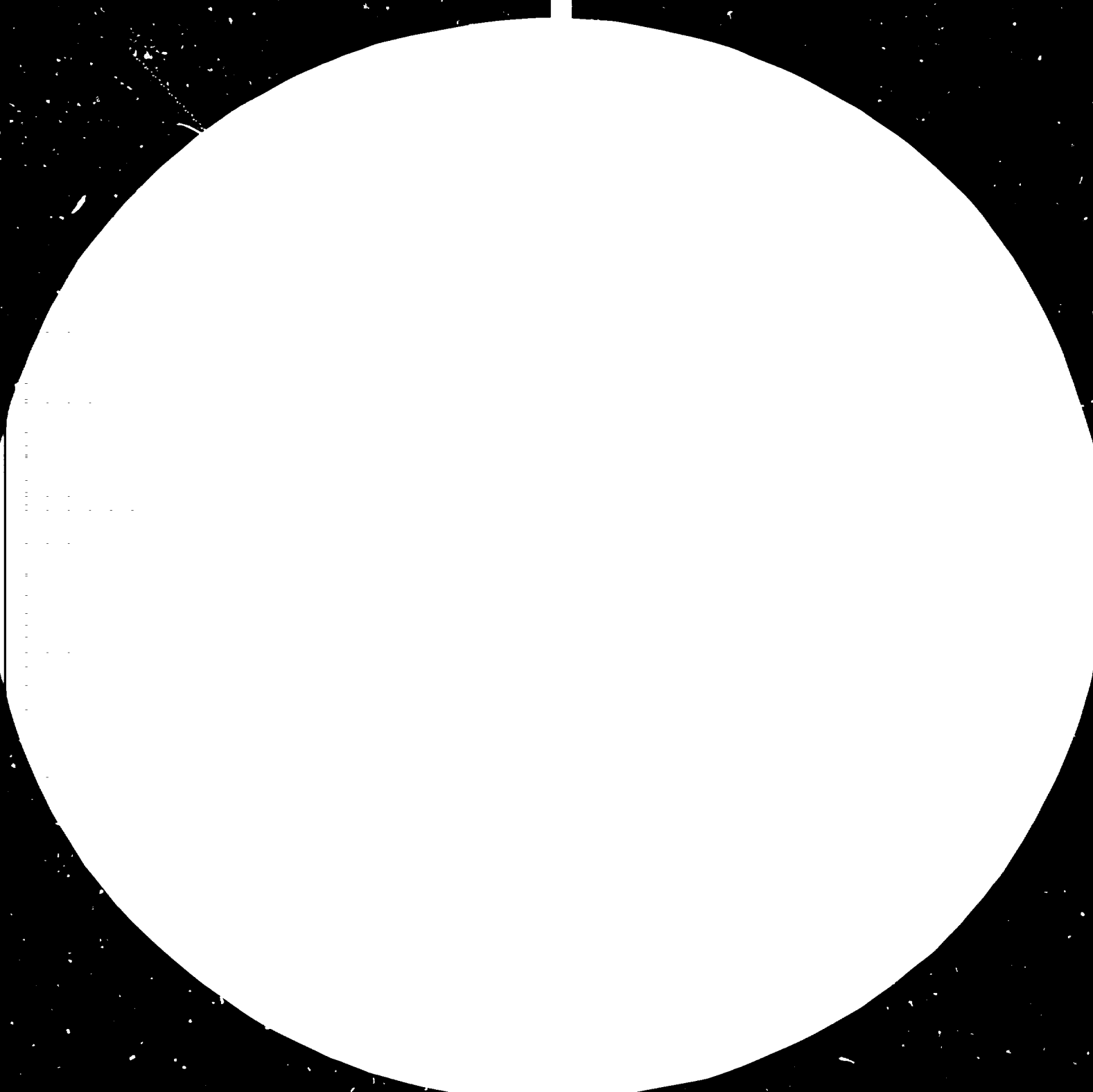

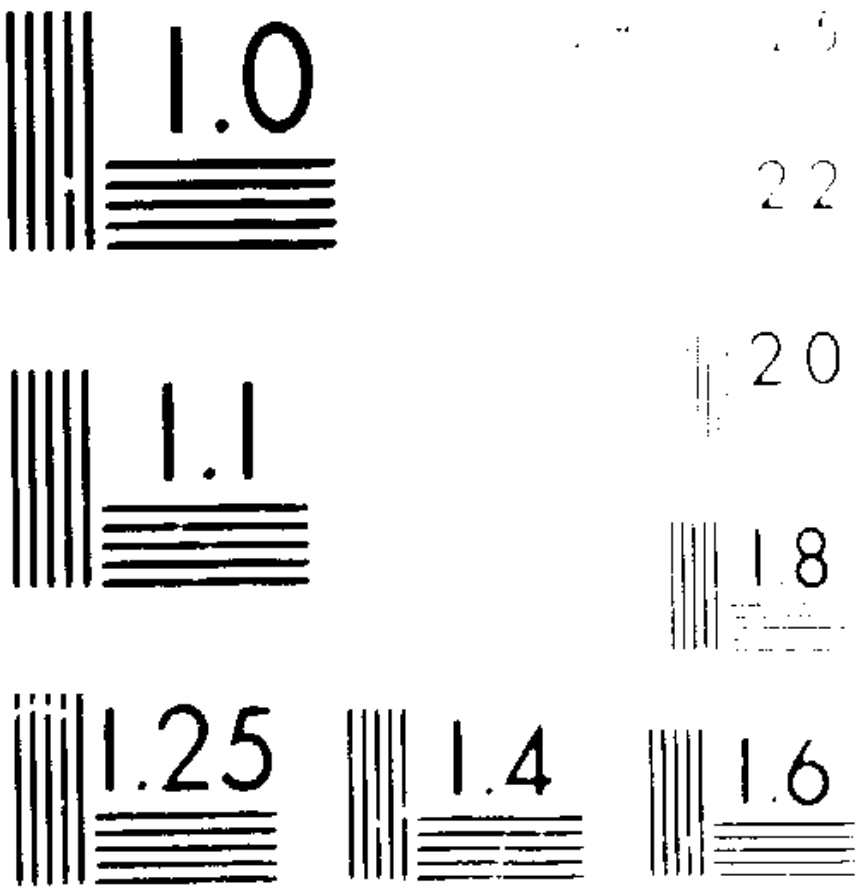
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ASSISTANCE FOR THE URGENT REHABILITATION
OF KEY TEXTILE FACTORIES

SI/NIC/80/801

NICARAGUA

# Terminal report of the expert on maintenance and repair in spinning and weaving *

Prepared for the Government of Nicaragua
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Mr. Julio Ortega Herrero,
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Vienna

* This document has been translated from an unedited original.

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PRELIMINARY NOTE

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Reference: SI/NIC/80/801/11-01/31.7.B

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Attended briefing at the end of the mission on 3 and 4 March 1982

## 1. INTRODUCTION

This terminal report is a critical study of the present situation of the textile industry in Nicaragua and of the plans which the Nicaraguan Government has in mind for that industry, the purpose being to provide UNIDO with data on which to base its appraisal of future projects in Nicaragua.

During my stay in Nicaragua, I was in close contact with textile firms and with the Corporación Industrial del Pueblo (COIP), ascertaining by personal experience their concerns and difficulties and advising them on all matters related to the textile industry.

On arrival, having reported to the United Nations Office in Managua, I was introduced to COIP and was assigned two main tasks:

(a) To carry out an evaluation of the existing textile industry in Nicaragua; this was the subject of a document handed over during the briefing on 3 March and bearing the title "Technical evaluation of the textile industry in Nicaragua and recommendations for future projections", dated Managua, February 1982. The Government of Nicaragua and the UNDP Resident Representative in Nicaragua have copies of this document.

(b) To continue the work done in TEXNICSA on my earlier mission, reference, SI/NIC/80/801, from 15 September 1980 to 30 April 1981 in which I advised on repairs to and the rebuilding of machinery, the study and introduction of control systems, incentives, etc.; the relevant manual could be distributed to other plants and I shall send them copies shortly when it is in final form. Copies of the typewritten draft have been left with TEXNICSA and at the United Nations Office in Nicaragua.

## 2. THE STATE OF THE MACHINERY AND EQUIPMENT

By and large the situation is bad - owing to the shortage of technicians, the poor state of the machinery and the lack of spare parts and accessories, caused by the shortage of foreign exchange - and the equipment is faulty.

I shall try to give as complete a picture as possible of the situation, dealing with the question in the following order: state of the machinery, installations and products.

2.1 FABRITEX

This is a vertically integrated undertaking, with spinning, weaving, dyeing and finishing equipment for the production of fine cloth. It has 20,000 spindles and 367 automatic looms.

The average age of the firm's machinery is about 15 years. It is in a good state of preservation but there is a lack of spare parts and accessories such as: porcupine devices, card clothing, pressure rollers, drafters, spares for Schlafhorst cone winders, accessories for looms, valves, automatic regulators and measuring instruments for temperature, pressure and bath level, etc. There is also a shortage of dyes and auxiliary products.

Technologically, the firm is in a state of stagnation through failure for some considerable time to introduce machinery incorporating the latest technology, such as the continuous feeding of cards and shuttleless looms.

Its products are not suitable, since the firm produces heavy cloth, whereas its machinery has been designed for fine thread and light-weight cloth. This has come about because of the great demand for blue jeans and military uniforms.

I was concerned at the production of a cloth of 50 per cent cotton and 50 per cent polyester in a country which has to use scarce foreign exchange to import polyester, when a 65/35 per cent mixture would be preferable, since increasing the proportion of man-made fibres brings hardly any improvement in quality.

2.2 TEXNICSA

This is a vertically integrated enterprise in the process of reconstruction, working at present with 12,500 spindles, and 230 automatic looms but designed for 27,000 spindles and 400 looms, with its own dyeing, preparation and finishing sections.

Its machinery is of diverse origin and has an average age of 25-30 years. This machinery is of many different makes and characteristics and is obsolete for the most part. Its replacement by either new or second-hand machinery is essential.

The shortage of spare parts and accessories of all kinds is very serious; for instance, it could have increased its production by 25 per cent 10 months ago if it had not been for the lack of bobbins for the roving frames.

Defective installations: buildings with high ceilings, with poor heat insulation and unreliable air conditioning, causing wide fluctuations in quality and output. The steam system has worn-out or poor quality pipes with no or virtually no heat insulation. The air conditioning system is good in some sheds and only half-finished in others.

Owing to the present layout of the plant, materials pass to and fro and back and forth, covering long distances. A study on, and the introduction of, an internal materials handling system is urgently required, as an estimated 30 per cent of the cost of production is accounted for by this internal moving of materials. Also, materials pass from the lower to the upper level because of the poor layout of the machinery.

Nor is the product suited to the characteristics of the machinery. The spinning frames are designed to produce yarn with an average count of 18 Ne but the yarn actually produced is 14 Ne. The looms and finishing machines are indeed appropriate for the qualities of cloth manufactured, but, as the spinning is not so, the cost of production of the cloth is high.

2.3 TELASA

This firm's machinery is worn out, being more than 45 years old and completely obsolete: it consists of a total of 2,600 cotton spindles, but its weaving facilities may be ignored.

The lack of accessories and spare parts is serious; the buildings are suitable but the installations should be replaced.

This firm has no future, unless it is completely renovated.

2.4 Knitted fabrics

The country's hosiery industry has a total of 124 large diameter circular knitting machines and 30 others of small diameter, belonging to six enterprises.

More than half of the large diameter machines produce coarse gauge double knit fabrics, normally of gauge 18. This equipment is in good condition but is not suitable because it produces articles that are not marketable.

The remainder are of finer gauge and suitable especially for single knit fabrics.

All this equipment is dispersed amongst six enterprises, there being no uniformity because of the great number of different makes and characteristics of the equipment.

As for the dyeing and finishing of knitted fabrics, there is sufficient capacity for knitwear of both cotton and 100 per cent man-made fibres, but this capacity is distributed among different enterprises.

There now follows a brief description of each enterprise.

2.4.1 TRICOTEXTIL

This enterprise is in good condition, with a balanced production in its different sections; it is devoted entirely to the production of knitted fabrics either in 100 per cent cotton or in a mixture of cotton and man-made fibres.

Its dyeing and finishing sections for cotton and for cotton/man-made fibres mixtures have excess capacity capable of absorbing the output of the country's circular knitting machines. The equipment of these sections is of high standard and in good condition.

2.4.2 HILANICA

All of the 19 circular knitting machines owned by this enterprise are of coarse gauge except three;. its finishing equipment is very rudimentary and incomplete.

2.4.3 NICARAO

In addition to its knitting machines, this enterprise operates a completely obsolete weaving section, as well as rudimentary finishing and dyeing facilities for flat and circular knitted fabrics. The enterprise has no complete line to produce a specific cloth.

2.4.4 AGROTEX

This enterprise has eight large diameter circular knitting machines, all of coarse gauge except two of gauge 22. In addition it has six 12 gauge flat Jacquard knitting machines with a needle-bed width of 180 cm. These are good machines that are quite serviceable but are now idle.

2.4.5 NICATEX

This enterprise has 12 large diameter circular knitting machines all of gauge 18, except a 22 gauge MAYER machine. It has two warp knitting machines with a working width of 180 cm, which are standing idle, an ARCT texturizer that is still serviceable, though out of date, a JET dyeing machine with a capacity of 150 kg and a complete finishing line.

It also has a dyeing autoclave for texturized bobbins

2.4.6 TEXTILES MANAGUA

Sixty-five circular knitting machines of different makes and characteristics, six Raschel machines, a JET dyeing machine, a machine for relaxing knitted fabrics, and auxiliary machinery are in the store in the premises of this enterprise, which has ceased production.

2.5 Situation of the hosiery industry

The main difficulties are due to the lack of foreign exchange, raw materials, including cotton yarn, which have to be imported, the lack of accessories and spare parts, the shortage of auxiliary products, etc.

With the exception of TRICOTEXTIL, the enterprises do not have any well defined product lines. They should be merged and relocated in order to set up mills with well defined product lines and a good layout, with appropriate dyeing and finishing facilities and standardized production.

## 3. ACTION TO BE TAKEN ON MACHINERY AND INSTALLATIONS

This type of action, to be taken by the Government of Nicaragua, is set out in the document "Technical evaluation of the textile industry in Nicaragua and recommendations for future projections", which was issued in February 1982 in relation to project SI/NIC/80/801/11-01/31.7.B; UNIDO has a copy of that document.

That exclusively technical document was drawn up without reference to the projects and efforts being undertaken by the Nicaraguan Government to revitalize the textile sector, which is of great importance for this country, since Nicaragua produces cotton but has a serious deficit in cloth production. For this reason it is urgently necessary that UNIDO should be aware of those efforts, so as to plan future help for Nicaragua in this branch of industry. A list of the action which is being taken, criticized in a constructive spirit is set out below.

3.1 Bilateral agreement with Czechoslovakia

A bilateral agreement with Czechoslovakia has been signed for the installation of textile plants in Nicaragua with Czechoslovak advisers, covering the following installations.

3.1.1 Open-end spinning

An open-end cotton spinning plant for yarn with an average count of 21 Ne; this will cover a whole range of cotton yarn from 6 to 36 Ne.

The capacity is of some 1500 kg/hour, or some 10 million kg/year. The plant has two lines for opening and cleaning and the machinery needed to absorb the output produced by such lines.

Personally, and on the technical level, I am only 50 per cent in agreement with this; since the domestic demand for coarse yarn could be met by a single opening and cleaning line, that is to say, 5 million kg/year, the quality and characteristics of the yarn produced by open-end spinning being excellent up to counts of 16 or 18 Ne.

Yarn of higher counts produced on open-end machines is not marketable, because of the unpleasant feel of the fabrics made with this yarn.

If open-end yarn is used to manufacture terry cloth or towels, the towels have a rough feel which makes them unmarketable, even though the loop and filling yarn is of 12 to 14 Ne.

I think that the decision to install two lines prejudices the future of the cotton industry in Nicaragua, since in view of current conditions on the international textile market, it would be difficult to market surplus open-end spun yarn, even for export.

3.1.2 Weaving

This second Czechoslovak project is suited to domestic demand for the articles proposed and even for the possible export of some. None the less, it is defective on two counts:

(a) There is not sufficient dyeing treatment and finishing capacity in Nicaragua, and this would have to be provided.

(b) It is proposed to install UTAS shuttle looms, when there are already shuttleless looms which are much less complicated and easy to bring within the capacity of the Nicaraguan operatives; furthermore, the cost per 1,000 picks is much lower than with the looms now proposed.

3.1.3 Sock making

This is another project under the Czechoslovak bilateral agreement which I do not support:

(a) Because the volume of output is out of all proportion to domestic demand, and the export of any surplus would perhaps be problematic;

(b) The raw material, almost 100 per cent texturized man-made yarn, false-twist or Leceron-type, will have to be imported into a country whose present economy is marked inter alia by a serious lack of foreign exchange;

(c) Dyeing and boarding have been elininated, because it was thought that yarn could be bought already dyed and that boarding is an unnecessary luxury. For stock and quality reasons, I consider it preferable to undertake the dyeing of 75 per cent of the socks produced and that boarding is indispensable in order to ensure that the socks will be a good fit and will not chafe or produce callouses on the skin.

3.2 COTEXMA - Concentration of the hosiery industry

This project has been promoted by technical assistance from Cuba; it consists in combining in one single plant all the circular hosiery frames together with the finishing equipment.

This project suffers from the following drawbacks. It would entail:

(a) Dismantling a factory like TRICOTEXTIL, which is well established and equipped with circular knitting machines either for 100 per cent cotton or for a mixture of cotton and man-made fibres, and lumping them all together in one large factory of doubtful efficiency;

(b) Combining processes which may look similar but which are in fact quite disparate, such as the manufacture of knitted goods of pure cotton and of man-made fibres;

(c) Installing all the available machines, when 50 per cent of them are 18 gauge double-knit machines that produce a fabric that is not marketable; it is therefore pointless to install them, all the more so as the available fine gauge circular knitting machines already produce a surplus over and above domestic demand;

(d) Combining in a single plant the dyeing processes for knitted goods of cotton and man-made fibres when the techniques, machinery, dyes and auxiliary products are completely different.

3.3 Technical assistance from Cuba

At the present time 60 persons are being trained in Cuba as textile technicians on a three-year course.

There can be no doubt that this is a very valuable contribution to training at the middle management level though not at the higher level.

## 4. FITTING THE PRODUCT TO THE MACHINES

In order to satisfy basic needs, the machines have been adapted to the product; this is the right policy for meeting the basic needs of the population.

This means, however, that a high proportion of the textile industry (including the hosiery industry) is working with machinery which is not suited to the product being manufactured, so that a loss is made every year if goods are sold at competitive prices.

Every effort that is made to improve productivity is to be commended, but it will not do away with this negative effect until the product is adapted to the machines.

The greatest possible efforts should be made to meet the basic needs of the population by obtaining suitable machinery for that purpose, so as to free existing equipment for manufacturing the products for which it was designed.

### 4.1 FABRITEX

All the machinery is chosen for the use of fine cotton yarn from 35 Ne up to finer counts. The looms are light to suit such yarn and fabrics; hence there is a machine to mercerize the cotton, and a printing machine for novelties, since patterns cannot be woven on the looms.

None the less, heavy and medium-weight articles predominate. This will never be profitable.

The company has sufficient twisters for two-ply yarn, and does not produce a single article with two-ply warp, which would make sizing unnecessary.

What is the advantage of making an article made of 50 per cent cotton and 50 per cent polyester? Unless it is for economic reasons or for some special articles, there is no comparative advantage as regards the durability of the fabric, since what is gained in tensile resistance is lost in resistance to rubbing and pilling. The mixture may be chosen for the sake of feel, but the cloth will not give sufficient absorption of sweat; if what is wanted is a rougher and colder feel, this can be achieved by crêping the yarn or by a resin finish.

4.2 TEXNICSA

Because of the typical characteristics and mechanical condition of its spinning machinery, this enterprise can only with difficulty produce a good yarn of over 20 Ne; economically it is suitable for spinning yarn with an average count of 18 Ne. At present it is spinning yarn with an average count of 14 Ne, which will never yield any profit.

Its looms, 55-inch Picanol and Draper machines working at 180 picks per minute, are well suited for making strong material and are profitable when they are so used. However, they are less profitable when they are used for making sheets, blankets and mosquito nets, since light looms of the same width can weave such articles at 200 picks a minute.

4.3 Knitted fabrics

Since circular knitting machines are in widespread use and both fine and coarse gauge machines are mixed together in one single factory, they are used indiscriminately with both fine and coarse yarn in order to produce the same type of garment.

Since there are many double knit and coarse gauge machines, they are started up when raw material is available; the loops are of larger diameter but more dense and of greater weight than is required for the garment for which the fabric is intended.

Furthermore these garments are more expensive because more products are needed for bleaching, dyeing and drying.

5. TECHNOLOGICAL LEVEL AND STAFF TRAINING

One of the most serious defects is ignorance of textile technology; except among the very few textile technicians, this is unknown in Nicaragua.

The few existing technical experts are engaged in production, and their opinion is hardly ever taken into account in decision-making.

Decisions are usually taken in the light of opinions given to the decision-makers by salesmen and foreign advisers, who are pursuing their own interests, are not impartial and have dubious technical training.

The officials in question believe, on the basis of the advice they receive from this limited circle, that they are thereby technically competent to take important decisions about textiles, and thus risk prejudicing the future of the Nicaraguan textile industry.

In view of this ignorance of textile technology, which seems simple but is in fact complex, it is necessary to compare and contrast the views of all possible suppliers of machinery before any decisions are taken, and to look at the problem from other angles.

5.1 High-level technical personnel

These are very rare; indeed, there are only four in the country with widely varied experience; and they are isolated from other countries.

Indeed, their contacts with the rest of the world are confined almost entirely to visits to Nicaragua by a few sellers of machinery, accessories and auxiliary textile products.

5.1.2 Action to be taken

It is necessary to intensify their postgraduate training during their working lives.

It is necessary to put an end to their stagnation and professional isolation; they ought to attend trade fairs, exhibitions devoted exclusively to textiles, congresses, symposiums, and to visit industrial plants in other parts of the world; they should also receive books and specialized journals and request catalogues and information from all manufacturers of textile machinery, and classify it by processes and machines.

Higher textile personnel should be trained in the short term, by sending qualified students with an aptitude for the profession to textile schools. These are to be found, in order of importance (and with the same or similar language), in Spain, Chile, Mexico, Venezuela and Brazil; or with other languages in Belgium, France, Italy, the United States, the United Kingdom, the Federal Republic of Germany, the German Democratic Republic and Yugoslavia.

5.2 Middle management level

Although such personnel are scarce, they are not so scarce as top management personnel and they are of fairly acceptable level. The vast majority of them are self-trained, through daily contact with senior management staff, fitters, etc. and through reading the little technical literature that comes their way.

They suffer from having little or no training in the scientific organization of work; at their level, the result is decisions that are well-intentioned but of doubtful or negative economic validity.

5.2.1 Action to be taken

The training of middle management staff should be activated immediately, in order to consolidate their professional competence and sense of responsibility; the purpose is to enable them to give better direction to workers who are under their orders, and to make full use of the machinery at their disposal.

We believe that the immediate need is for short courses on subjects connected with the scientific organization of work, in the order given below:

- Improvement of methods;
- Time control and incentives;
- Internal materials handling;
- Staff relations;
- Programming and checking output;
- etc. ...

Along with this should go the training of new middle-level managers, in both the short and medium term. Very good results have been obtained by sending assistants in the Department of Industrial Engineering into the factories, where they can take up middle management posts themselves once they are trained.

5.3 Machine operators

The total lack of training among machine operators leads to a chaotic job situation.

By and large, Nicaraguans are clever, receptive, and eager to learn and display initiative; however, when they act on their own initiative, the results are negative, through ignorance of the consequences.

5.3.1 Action to be taken

As an immediate programme, it is necessary, in close co-operation with middle management, to place in the enterprises as many supervisors or craftsmen as are needed to train newly enrolled workers and to develop the skills of the existing workforce.

Output will then rise steeply, but quality will benefit most.

In this way, it will be possible to introduce methods of work - an indispensable condition for introducing time control systems which are necessary for the establishment of standard production operations, providing incentives, programming output, estimating costs, etc.; these are the backbone of any firm.

When a new worker joins the firm, he should be shown not only how he ought to work but also the importance of his work, of his rate of work, internal regulations, etc. ...

With the experience acquired, it should be possible, both in the short and medium term, to establish as an annex to one of the factories a trade school at machine operator level to serve the Nicaraguan textile industry.

## 6. QUALITY CONTROL

Except where spinning is concerned, product quality control is confused here with process quality control.

Process quality control, the end result of which is the product, is considered to be very important but, except in the case of spinning, is not widely applied. For example, there is no checking of the weight of knitted fabrics during their production.

To my knowledge, product quality contr[illegible]formed only at TEXNICSA and there, unfortunately, it is carried out [illegible] and there is rarely any analysis with a view to making improvements.

This is the normal state of affairs: it is considered as an end in itself whereas it should be nothing more than a means to an end.

### 6.1 Action to be taken

A comprehensive system of quality control needs to be established and its importance as a means must be driven home.

In the case of spinning, the TEXNICSA system can serve as a basis, supplemented by nep control and by rational and programmed use of the USTER machine, the utilization programme for which has not been established.

In weaving and knitted fabrics it is completely lacking.

It is also completely lacking in relation to dyeing, treatment and finishing.

## 7. PRODUCTION PROGRAMMING AND CONTROL

There is annual programming in terms of absolute numbers but no daily, weekly or monthly programming in relation to the size of the plant and its requirements.

Production control in respect of units produced is carried out fairly efficiently in all the enterprises but it is more for the purpose of auditing or book-keeping than for control and is entirely distinct from programming. Hence it is not a valid procedure.

To facilitate matters it is essential, in addition to the annual programming with reference to the financial year, to carry out weekly or monthly programming, depending on requirements. These should be reflected in a Gantt diagram (factory-level or section-level).

A few days before completion of the mission, an initial attempt along these lines was made at TEXNICSA and no difficulties were encountered.

## 8. INDUSTRIAL COSTS

In small enterprises these are determined in a very superficial manner, i.e. in terms of over-all figures and normally at the end of the financial year.

At TEXNICSA a complicated system of industrial cost determination has been set up but so far it has demonstrated nothing but its own inadequacy. The reason for its failure is that it is geared to auditing or book-keeping and not to industrial accounting.

According to the designer of the system, costs are attributed on the basis of expenditures incurred. The system is not based on programming or on the annual budget and without these cost accounting is impossible.

Another shortcoming of the system is that it operates independently and is unrelated to industrial engineering. Consequently, the attribution of fixed costs is very dubious since it is made on an accounting basis which completely disregards technological factors.

What is needed is to introduce a costing system for the textile industry, the various branches of which are very similar in Nicaragua: cotton spinning, weaving, knitted fabrics, dyeing, treatment, finishing and ready-made goods.

## 9. BUREAUCRATIZATION

There is an unconscious but not ill-intentioned tendency towards bureaucracy; politics has a strong influence in creating this situation, which is undesirable and detrimental to productivity.

A post is created for each function, no attention being paid to the associated work load, which is normally much smaller than that of the specific function. This represents under-employment of a person who would be capable of assuming a number of functions.

This situation gives rise to discrepancies and malaise between various departments in that interests are created in the area between particular functions and a measure of unused capacity is expended in gaining merits to warrant holding the jobs of other persons. This leads to the development of an internal policy concerned with climbing the job ladder.

Parkinson's law is well illustrated by the process of bureaucratization in which posts are created for the supervision of supervisors, and the person who supervises best is promoted to a higher position which is very often beyond his capacity.

I do not have any bases for comparison with similar industries but, from a purely objective point of view, an enterprise like TEXNICSA, with 860 persons engaged in production and with highly developed mass production (three classes of 100 per cent cotton yarn and 8-10 different textiles), could be operated perfectly well with a managerial, sales and industrial engineering staff of 40-50 persons (as compared with the 100 which it has at the present time). The case of FABRITEX is more serious, since there are 187 administrative staff members as compared with 1,000 workers.

What has been stated in this section applies more or less to all the textile enterprises of COIP.

## 10. STRUCTURE AND ORGANIZATION

Although I am referring here to TEXNICSA, since this is the organization I know most thoroughly, what is stated in this section is applicable, generally speaking, to the textile enterprises in the People's Property Sector.

What is lacking here is a definition of the enterprises as generators of goods and a projection at least of short- and medium-term targets and of the efforts that have to be made by management to achieve them.

Such a projection should be made by COIP and its guidelines should be followed by the manager of the enterprise, who should take the action he considers most appropriate.

There is a lack of organizational and liaison activities between the various departments, which are jealous of their independence and unconcerned with the fact that another section may be making identical calculations or obtaining identical data, but in a different format.

This lack of organization and liaison results in low managerial efficiency and this in turn seriously affects production and the operation and development of the enterprise on the basis of better and more permanent systems.

The structural costs of TEXNICSA in the first half of 1981 (18.3 per cent) do not appear to be very high. However, I have not been able to determine the facts for the 1982 budget and I have seen data which lead me to doubt whether the structural costs are accurate. In FABRITEX, of course, given the ratio of 187 managerial staff to 1,000 production operatives, the figure is doubtless somewhat excessive.

Efforts are being made to carry out structural changes by modifying the hierarchical relationship between the departments, not in terms of the implementation of certain activities and functions from higher to lower levels, and vice versa, relating to instructions and responses dictated by the requirements of the enterprise, but in order to balance out the power which can in theory be assumed to result from having less or more personnel under one's responsibility.

There are no job descriptions for the primary executive staff levels that define duties, authority and responsibility.

I would recommend that a thorough study of structures be made as soon as possible, especially in TEXNICSA and FABRITEX, to indicate the lines along which solutions can be sought to the important problems of:

- Improving, standardizing and specifying duties and activities;
- Adopting a structure to meet the target requirements;
- Arranging for a satisfactory delegation of duties at the primary levels;
- Defining and publicizing the goals of the enterprise, which are at present either non-existent or unknown to most of the executive personnel;
- Devising a logical system of departmentalization to avoid the present tendency towards bureaucratization.

Special attention should be paid to initiating and strengthening organizational activitv in the structures within the textile enterprises and to establishing some kind of functional relationsbip with similar activities at a higher level of the textile industry.

## 11. ASSISTANT TO TEE EXPERT

Generally speaking, the expert is allowed to work alone, although he has access to the data he requires.

It is important that an assistant should be appointed to work in close co-operation with the expert and to assimilate as much of his experience as possible.

However extensive and detailed the documents and reports prepared by the expert may be, they will not contain all the reasoning that went into the ideas contained therein.

On the other hand, the expert is not familiar with the local environment, and the relevant facts could be supplied by the assistant from the country concerned.

The assistant should be a properly trained person and, depending upon the work being performed by the expert at a particular moment, could be replaced by a different assistant.

## 12. NICARAGUAN COTTON CLASSIFICATION

Being interested in cotton production and cotton qualities in Nicaragua, I paid a visit to the National Cotton Enterprise at Managua in order to determine the raw materials possibilities. Here they were able to give me information on production in terms of qualities but they were unable to indicate the average lengths and the Pressley and Micronaire values.

I also made a trip to Pozoltega, the site of the analytical laboratory of the Cotton Experimental Centre, where these values are obtained for nearly all the bales of cotton produced in Nicaragua.

This laboratory, which is located in the most productive cotton zone, is concerned with the selection of cotton seed and varieties in accordance with the agricultural conditions prevailing in land, and has its own cotton-growing areas.

In recent years it has proved possible to raise the average Pressley value considerably. This is an important development since it permits operation without difficulty in the high-speed spinning machine models developed in accordance with new technologies.

At the same time, ginners are sending to the Experimental Centre samples from bales which are identified in terms of the plot on which the cotton was grown. In addition, they are determining the average length and the Pressley and Micronaire values, so that they are able to obtain statistical information on the yield and quality of the seed used.

However, these data are not used in the commercial classification of cotton. The ginners classify the cotton on the basis of grade, without taking its characteristics into account, although this is very important information for the spinner.

The question arises whether this activity could be used so that the lots of cotton supplied could be classified by grade and fibre characteristics. I believe that a study along these lines would contribute to raising the price of cotton.

Terrassa, 26 March 1982