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# MODERNIZATION/STREAMLINING OF THE GARMENT SUBSECTOR

DG/COL/91/020/11-53

COLOMBIA

Technical report: Findings and recommendations*

Prepared for the Government of Colombia
by the United Nations Industrial Development Organization

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* This document has not been edited.

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## ABBREVIATIONS

| | |
|---|---|
| SENA | Servicio Nacional de Aprendizaje |
| PMT | Pre-determined Motion Time (System) |
| CAD | Computer Aided Design |
| US$ | United States Dollar |
| EEC | European Economic Community |
| $col | Colombian Peso |

## Conversion Rates

During the period of the mission, the following currency conversion rate prevailed:

US$1 = $col 823

# I INTRODUCTION

The mission commenced on Wednesday 27 October 1993, and was completed on Saturday 20 November 1993 with the return to the UK. The Job Description provided for the guidance of the expert required that the expert:

- evaluate the characteristics of the processing methods, processing methods, products, production plants, technology levels, labour force and demand of the subsector.

- propose alternatives so that the different subsectors can make use of the services offered by the SENA.

- make recommendations for the formulation of a rehabilitation programme or enhance the capabilities of the entrepreneurs in the garment industry.

- prepare a report with the results drawn from the study and present recommendations to modernise the subsector including concrete detailed proposals for the interrelated work between SENA and other garment companies of this subsector.

The above requirements have been paraphrased from the original document. There appeared to be some anomalies in the requirements - for example the mission was to look specifically at the garment manufacturing industry, and therefore the consultant was never in a position to be able to "propose alternatives so that different subsectors could make use of the services of the SENA"; and the last requirement implies that SENA is a garment company.

However, the general sense of the Job Description was understood, and the follow steps were actually covered in Colombia:

- Evaluation of the industry methods etc
- Evaluation of the industry's training needs
- Evaluation of the training and education systems available to the industry (including SENA)
- Preparation of a draft concept of training and development for the garment industry, and discussions with interested parties.

All contact visits were arranged by the staff of Asconfeccion, the manufacturer's association, and in the 15 available working days, some thirteen factories, five training centres, and one university were visited; the visits being carried out in Bogota, Medellin, Cali and Barranquilla.

The factory visits generally followed the same pattern - a discussion with the manager during which the company's training and production problems were identified, a tour around the factory to evaluate methods, levels of technology etc., and the inevitable "instant consultancy" advice given about how to make immediate cost-effective improvements. If the advice has been

acted upon, then millions of pesos will have been saved by the time this report has been published.

Meeting with officials from SENA were not quite as simple to arrange, did not always take place when they had been arranged, and during some, it was possible to detect a feeling of hostility from some of the SENA middle managers.

## II INDUSTRY

Asconfeccion were fairly successful in being able to arrange visits to factories across a representative section of the industry. Very small factories, with only 8 or 10 workers were visited, as well as large organisations employing several hundred workers. Products ranged from ladies and gents underwear, through 'T' shirts, gents shirts, ladies blouses, pants, jackets, jeans, childrens wear to ladies fashion wear.

The findings can be described as follows:

1. QUALITY

In general, the quality produced by all the factories visited, is very good indeed, but the cost of production is too high. This is mainly because the industry does not fully appreciate the quality standards required by the market place, and in many cases, producing a quality of product which is far too high; and also the managements do not know enough about modern methods of production to be able to eliminate unnecessary operations.

However, unlike many other countries with developing economies, the quality of the products is not a major problem to be overcome.

2. METHODS

Methods in all factories are out of date. Some factories have very poor layouts, and frequently space is wasted, particularly in some cutting rooms, where poor usage of the cutting tables results in having to use too many tables, thereby occupying space which would be better utilised avoiding congestion on the sewing floor.

3. EFFICIENCY

The efficiency of the industry is estimated to be between 50% and 60%, which is far to low for the industry to be competitive. Very few factories make any form of incentive payment to workers. Most prefer to pay an hourly wage, with the results that workers work at their own pace, which, coupled with poor methods and lack of line balancing, results in low levels of performance.

Many factories have some form of work measurement, and can (theoretically) measure the time taken to produce a garment in standard minutes. Usually, however, these times are not used as standards of performance, and frequently only serve to remind the manager that he is not achieving the required output.

In some factories, industrial engineers are employed, but these seem to spend their time in calculating standards times from PMT systems. The concept of work study does not seem to extend to the factory floor, and the implementation of the performance standards.

## 4. PRODUCTIVITY

As a result of the above items, productivity is generally quite low, and, in more than one factory visited, it is doubtful if profits are being made at all.

Productivity is defined as the ratio between the total costs of manufacturing an item, and the income gained when the item is sold.

The prices expected by the manufacturers in Colombia are not really competitive on the world market, and the only way to improve the prospects of international sales, is to increase the productivity ratio by reducing unit costs and increasing output. This will allow a greater margin of profit, and so allow prices to be brought in line with current world prices. There is plenty of scope for this to happen in all factories, by controlling waste materials, eliminating unnecessary operations, reducing labour costs (as a percentage of the unit cost), increasing output, and reducing 'work in progress'.

## 5. TRAINING

The industry carries out very little training for itself. It tends to rely on SENA, and unfortunately SENA is not delivering satisfactory training, and so very few people within the industry are properly trained. This is the most likely cause of the poor performance of the industry.

Only one organisation was seen to be undertaking a form of training which could be described as reasonable, and that was the charity, Minuto de Dios. This organisation will be described under a separate heading.

## 6. EQUIPMENT

The equipment currently in use by the industry is a very mixed bag. Some equipment is very old, but it seems to function well enough, particularly where speed is not a requirements - such as on childrens clothing. Other equipment is very modern and technologically very advanced. This appears not to function as well, or at least not to be providing all the benefits one would expect from advanced equipment. The most obvious cause is because there is a lack of training in the use of modern equipment, plus the fact that few of the factory managers have any in-depth understanding of garment technology.

Many companies have CAD systems (Lectra and Gerber were both seen). Unfortunately the concept that possession of these items gives an advantage was disproved in every single case. The best example being in Barranquilla, where a factory was using a Gerber system to plan economic lays for cutting, and indeed, had had a cutter trained by the machine suppliers to operate the equipment. The printed markers were given to the cutting room staff, who had obviously not been trained in the benefits to be gained from computer assisted lay-planning, because they were spreading fabric for the marker and leaving seven and a half centimetres

of end waste at each end of the lay. The factory manager was unaware that any wastage was taking place, and was very disturbed to find that he was losing about US$100,000 per year.

## III INDUSTRY TECHNICAL & TRAINING SUPPORT

Whatever the authorities in Colombia might believe, there is very little effective support for the garment industry, and a great deal needs to be done if this situation is to be reversed.

### 1. SENA

SENA has long been established as the multi-sector national training authority. However, it does not serve the garment industry very well. The organisation appears not to be able to focus on the needs of the industry, and most of the factories indicated that no one ever asked them what sort of training they require. SENA trains 'modistas' - dress-makers - in the belief that these will provide the industry with good all round sewing machine operators. The truth of the matter is that very few of the SENA trainees are acceptable by the industry. Industry requires operators that can sit at a machine all day and perform highly repetitive operations at speed. SENA provides people who have been taught to make a variety of garments at a very modest pace.

The SENA training courses are too long (years instead of weeks); the contents are unsuitable for the garment industry; the training methods are out of date, and realistic standards of performance are not applied.

Generally (with the exception of Barranquilla) the SENA Training Centres are reasonably well equipped to carry out industrial training, but not well enough equipped to undertake education in garment technology. Some of the Training Centres have Lectra systems, and are using them to give a marker planning bureau service to the small and medium factories. This service is laudable, but it needs to be improved up to professional standards.

The selection procedures employed by SENA appear to be based on American psychological tests and some psychometric tests, plus some other practical 'coordination' tests. Some years ago, research carried out in Britain, by the Industrial Training Research Unit at Cambridge, indicated that these tests have little or no correlation with an applicants ability to be trained as a sewing machine operator.

### 2. MINUTO DE DIOS

Minuto de Dios was started as a church housing charity to provide poorer families with low cost housing. Following the success of this venture, the organisation has now moved towards a job creation activity, and has set up a number of garment factories around the country.

The factory in Bogota has a small but very effective training centre which is used to train new recruits for the factory. This training centre is using techniques which are well in advance of

the systems used within the SENA organisation. Training of operators takes approximately ten weeks, and following my visit, this will probably be reduced down to six weeks, with the introduction of new cloth exercises, and the elimination of the out-dated paper exercises.

The management of the Bogota factory and training centre are very receptive to new methods, because they can see the benefits to be gained by reducing training times - particularly as it is the intention of Minuto de Dios to train at least 25,000 people as sewing machine operators.

3. TECHNOLOGY EDUCATION

This is virtually non-existent in Colombia. Certainly, Asconfeccion were not able to arrange visits to establishments offering education courses in Garment Technology.

The Fundacion Universidad De Bogota, Jorge Tadeo Lozano, is about to commence a course in Diseno de Modas (Clothing Design), which will encompass some garment technology. This university did express an interest in moving into garment technology, but it will require a great deal of assistance before anything is available for industry students.

## IV RECOMMENDATIONS

From the observations made during the visits to factories, industry requires assistance in four main areas. These are

- Design
- Technology
- Industrial Training
- Consultancy Service

### 1.DESIGN

The Colombian Government, with the assistance of the Italian Government, is in the process of establishing a new multi-sector Design Centre. Confeccion (Garment Manufacturing) will be one of the sectors. Some of the others are Furniture, Leather and Graphic Design.

A steering committee has been established and the process is well under way. The main activities will involve sending the prospective tutors to Italy to study design in their respective sectors, followed by a return with Italian consultants to assist in the setting up process - curriculum development etc.

It is not yet known if the Jorge Tadeo Lozano University will be included in the arrangements, but the university authorities stated that a meeting had been requested by government officials.

If the university is to be included, then this will give the design department for the garment industry a good start, as the university has already produced a good outline programme, and appears to be on course to deliver a good standard of design education.

If the university is not to be included in the new centre, then the industry will benefit by having two rival establishments; although it is doubtful if the industry really needs the combined output of students at this stage of its development.

The design requirement of the industry is therefore going to be well covered in the next two or three years.

### 2. TECHNOLOGY

There appears to be a gap in the education system, which, in countries which have an advanced garment industry, is filled by technical colleges, polytechnics, and universities which provide educational courses in garment technology - in some cases, like the UK, up to Masters degree levels.

There seems to be a belief on the part of a few people, that SENA is providing some technology training, but this is of such a low level that it should be discounted.

Garment Technology should cover the whole spectrum of technologies associated with the industry. Students should cover fabrics in depth, seam and stitch technology, equipment, patterns, design, production systems across a wide range of garments, computer assisted technology, cutting, finishing, sales and marketing as well as many other management subjects and disciplines.

It is strongly recommended that a garment technology centre, or a garment technology department of an existing education establishment, should be set up without delay.

The establishment process should follow that outlined above for the establishment of the design centre. A suitable establishment in another country - preferably Europe - should be selected. Even though almost all EEC countries would have such establishments, in order to ease the language difficulties, it would probably be best if Spain or Italy were selected as the prospective host country.

The staff should be recruited - if possible by selecting graduates with some experience of the industry, and sending them to the host establishment to undergo an intensive one year course in garment technology, including some teacher training. During this period, the necessary equipment for the centre/department should be sourced and installed, ready for the return of the trained staff and the consultant tutors from the host establishment. The curriculum should have been established as part of the development of the staff, and the foreign consultants should then assist the Colombian staff to implement the first courses - not necessarily full time after the initial period, but on a part-time basis, supervising the important stages of the programmes.

The programmes could include a mixture of full-time courses, and part-time, day-release courses for those already employed in the industry.

The process of establishing a Technology Centre/Department will probably take between two and three years before trained students emerge from their courses to take up positions in industry.

## 3. INDUSTRIAL TRAINING

This is the greatest need of the industry at the moment, and the shortage of properly training men and women in a variety of jobs is one of the main causes of the inefficiencies which have become the norm in the industry.

If SENA is prepared to make changes in the way that the training centres operate, then this would facilitate a fairly simple

method of overcoming the critical shortage.

The new range of courses should be directed at the industry needs, and should be as short as possible in order to provide trained personnel as soon as possible - not in a few years time. The courses should only concentrate on the skills required to perform the job to high standards, not on unnecessary activities. If other skills may be required in the future - say for promotion reasons, then further very short additional courses could be provided.

The industry needs people training for the following jobs:

Sewing Machine Operators (6 weeks maximum)

Supervisors (1 week)

Mechanics (12 weeks)

Cutters (1 week)

Quality Controllers (1 week)

Pattern Cutters & Graders (4 to 6 weeks)

Training Instructors (2 weeks)

Production Engineers (4 weeks plus project)

Production Managers (4 weeks plus project)

In addition short courses could be provided for existing managers in:

Budgeting and Costing (3 days)

Production Planning and Control Systems (1 week)

Equipment Selection (2 days)

Low Cost Work Aids & Attachments (1 day)

The method needed to change the SENA centres over to more modern training centres would require the assistance of experienced foreign consultants. The timescale would probably require three or three and a half man years of foreign consultant time over a one year period.

This would allow for the re-training of the staff in four of the SENA training centres - Bogota, Medellin, Cali and Barranquilla, and the introduction and supervision of the full range of new training courses. Once the new system has been firmly established in these four main centres, further expansion into other centres could easily be achieved by the re-trained SENA staff.

## 4. CONSULTANCY SERVICE

There are very few properly trained consultants operating in the garment industry - in fact these could probably be numbered in single figures.

The industry desperately needs the services of consultants to advise on methods of improving productivity. Even if managers actually know what needs to be done in their companies in order to effect improvements, they rarely have sufficient time to spare to be able to carry out the necessary changes themselves. More often the managers do not see the problems - they only experience the results.

Consultants including some of the SENA industrial training staff could be trained through a project focused on improving productivity in a number of companies in the four main cities. A short training course would be given to the consultancy staff, and then suitable sub-projects would be carried out in a number of companies, and supervised by ex-patriate consultants. This would achieve the dual objective of training the consultants on real problems, and at the same time improving a number of companies as examples/models of what can be achieved if consultancy (and training) are properly applied.

The consultancy service could operate from the SENA training centres, and could be marketed through the activities of Asconfeccion.

## 5. PROJECT COSTS

Without producing a detailed project proposal, costing of the three needed projects must be approximate.

It is likely that the establishment of a good Garment Technolgy Centre could cost between US$2,000,000 and US$2,500,000, because there is a large equipment requirement.

The cost of converting the SENA training centres into effective industry training centres would be approximately US$850,000 to US$900,000. This would largely consist of foreign consultant time, a few Study Tours, and some equipment.

The cost of running a Productivity Improvement project to train consultants, improve 16 - 20 factories, and establish a consultancy service would be approximately US$250,000 to US$300,000. Bearing in mind that the example given earlier in this report about the size of loss being experienced by the industry in fabric wastage, this figure would be very cost effective.

## 6. FUNDING OF THE SYSTEM

At the moment, the non-effective training carried out by SENA is funded by a levy imposed on the industry - a pay-roll tax. Reports varied about the amount levied on each company between

2%, and 6% of pay-roll. This is a very high cost to carry, particularly for the smaller companies, and even more so, because no-one seems to receive training services to the value of the money paid.

Ideally, the industry training centres and the consultancy service should be self financing. This would ensure that the support services would always be looking for new ways to satisfy industry, and not become complacent under the comfortable umbrella of a safe income. It would also ensure that industry would only be paying for the training received, and not supporting unidentified overheads.

Obviously it would not be practical to suddenly cease the levy system, but it should be phased out over a period of two to three years; at the same time, gradually introducing a realistic fee structure.

## V CONCLUSIONS

The garment industry in Colombia is well established, and served by an equally well established primary textile industry. At the moment, many opportunities to improve productivity, increase value added content, and expand export markets are being wasted because the industry lacks the support of a properly established and operated infrastructure to provide essential technical and training services. If Colombia is to succeed against the rising tide of competition from developing countries with very low labour costs, then projects have to be implemented as a matter of urgency.

The success of this mission was largely due to the efforts made on my behalf by the executives and staff of Asconfeccion - in particular, Andres de la Espriella, Marjorye Villabona, Jeanette Torres and Olga Salgado, who acted as interpreter.

My thanks also go to all those persons met in factories, SENA and other establishments, without whose comments and views, this report could not have been compiled. A list is attached at Appendix 1.