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IMPROVEMENT OF GARMENT DESIGNING  
AND MANUFACTURING ACTIVITY

STATE OF OAXACA

Technical report: Findings and recommendations\*

Prepared for the State of Oaxaca  
by the United Nations Industrial Development Organization,  
acting as executing agency for the United Nations Development Programme

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TERMS OF REFERENCE

IN CO-OPERATION WITH THE COUNTERPART STAFF, ASSIGNED TO THE EXPERT BY THE DEPARTMENTS OF INDUSTRIAL AND COMMERCIAL DEVELOPMENT, AND ECONOMIC AND SOCIAL DEVELOPMENT TO:

ACCESS THE CURRENT SITUATION IN THE GARMENT MANUFACTURING UNITS.

MAKE RECOMMENDATIONS ON MEASURES REQUIRED TO INCREASE THE PRODUCTIVITY OF THE SECTOR.

## 1. REVIEW OF CURRENT SITUATION IN THE GARMENT INDUSTRY

The observations set out below are based on information gathered during the pre-arranged visits to local manufacturing units in the time available.

All visits took place in the State of Oaxaca and included the private sector and co-operatives.

### FINDINGS

#### 1.1 Types of Manufacturing Units

The businesses visited are small, employing between two and twelve machinists at any one time. For detailed analysis refer to Annex I of this report.

The Co-Operative Units are located in single story buildings centrally located in the village with all personnel taking an active interest in production. They have access to more trained machinists but are restricted by both machines and lack of work.

The units in the private sector are more varied ranging from a small 'kitchen type unit' to a small two story building employing a manager and/or supervisor.

The garments are produced in sufficient quantity to satisfy the consumer eg. the 'one off' sold at the unit, sixteen if sold to a sports team or bulk orders mainly obtained from Government Contracts.

All units visited are using electrically driven machines but have at some time in the past used pedal driven machines for training/ sewing. Most units carry out work on the 'make through' system ie. the machinists complete all sewing required to finish the garment. Three of the units followed an assembly line make up but because of the simplicity of the garment none employ the progressive bundle unit system.

In some instances quality is poor due to absence of specialised machines ie. button hole and overlock and/or to poor construction ie. pockets out of align on pilot type shirt.

Quality of cutting is poor due to absence of proper patterns and fabric rating is high due to inefficient lay-planning.

In all instances the indigenous staff expressed interest in design to enable them to be more flexible and to supply the local market. The lack of orders and the fact that so many were competing against each other for Government Contracts left all with little or no work.

Training in the sewing units varied from 'pick it up as you go' to formal exercises given by community centres.

Only two of the units visited have enough work to employ full time personnel and both export to the United States of America. One Company that exports 98% of its production and is owned and managed by an expatriate entrepreneur is severely restricted by export quotas.

None of the Companies have formal work measurement schemes, but some set targets or daily objectives calculated from 'past experience'.

In all cases the pace of work of machinists is very low mainly due to method of construction.

## 1.2 PRODUCTS AND MATERIAL USED

A wide range of merchandise is being produced from the individual 'one off' to bulk production which in most instances is a Government Contract. Most of the units visited, especially the smaller ones are capable of producing a wide range of garments, however most have a speciality eg. trousers, sports wear, industrial uniforms. For detailed information refer to Annex I of this report.

The fabrics are all manufactured in Mexico and cover a very wide spectrum. All the co-operatives interviewed have to purchase fabric at retail, some at retail less discount due to the small quantity involved. Very few have information or know where to purchase fabric and accessories wholesale.

Two units that specialise in the manufacture of sports wear are active in screen printing and setting the dye with a domestic iron and a specially waxed paper. One unit has purchased two knitting machines for making fabric for sports tops but experienced problems when using synthetic fibres.

Many indigenous personnel are capable to some degree of copying designs but lack access to fashion books or periodicals.

## 1.3 Machines Used

Most of the machines in use, single needle lock stitch, overlock, button hole and button sew are of the industrial type, electrically driven and treadle controlled. In some units domestic single needle lock stitch, electrically driven and treadle controlled are in use.

The few pedal controlled domestic machines observed have been used only for the purpose of initial training.

All units without button hole, button sew and overlock machines prefer the Singer Needle Domestic, electrically driven, treadle controlled machine because of its flexibility.

Only two units have a cutting table of suitable dimensions for multiple body lays. All the others have one or more domestic type table of approximate dimensions 275 x 120 cms.

No mechanical means of cloth-laying are observed. Five of the units have one or more electric straight knives but the remainder cut with scissors.

A number of the units purchased specialised machines as part of a 'package deal' others due to immediate requirements. However, in all but one unit they are laying idle and have been for some time, in one case since purchase eleven years ago.

All express a need to retain the machines in case they are required later on.

All units experience mechanical problems most of which some member could repair. For major problems the machines have to be sent to Mexico City which entails delay and more importantly 'high cost'.

2. SUMMARY OF FINDINGS DURING VISITS TO GARMENT MAKING UNITS

During the visits the following points were noted:-

- a) Most of the units are competing with each other for Government Contracts in a diminishing market.
- b) Two units employ full time labour and are exporting their products to the United States of America. Both units appear to be expanding one has quota problems but hopes to export to Europe in the near future.
- c) One unit received formal training in fashion design, lay-planning and cutting in Mexico City, 1981, organised by Singer. The quality of this Company is the best observed.
- d) Little knowledge of up to date design and fashion is apparent due to limited access to fashion news or periodicals.
- e) Two units have sizable tables suitable for multiple body lays.
- f) Fifty percent of the units observed use straight knives, the remainder expressed interest as soon as funds become available.
- g) Pace of work of machinists very low due to the 'make through' system.
- h) Most machines used are single needle lock stitch, electrically driven and treadle controlled.
- i) No facilities for machine maintenance or repair and no sewing machine mechanics are observed.
- j) No formal selection procedures for recruitment and training of sewing personnel.
- k) Waste of fabric due to inefficient lay-planning.
- l) Limited assembly line type construction and no progressive bundle unit system in use.



### 3. RECOMMENDATIONS

In co-operation with the Departments of Industrial & Commercial Development and Economic and Social Development:-

- 3.1 Arrange a training course for the local sewing units, refer to Annex II of this report for course content.
- 3.2 Recruit a garment expert to carry out the training programme detailed in Annex II of this report.
- 3.3 Complete the arrangements and permission needed to run the training course at Community Development Center, Number 10, Oaxaca, using all existing equipment.

Arrange the use of one straight knife for cutting

- 3.4 Arrange a group of up to a maximum of sixteen personnel for the course, some members already identified from recent company visits.
- 3.5 It is understood that transportation, accomodation and subsistence allowances will be paid to attending members out of a fund set aside specially for that purpose.
- 3.6 The course will be conducted partly at the venue arranged and partly at the individuals company. This will facilitate the different products and the various machine types encountered.

Due to this the expert will require transport to assist and supervise project type work.

- 3.7 It is suggested that the site of the venue and all equipment could be used for establishing a permanent training center for the garment manufacturing industry.

The tutors presently instructing sewing courses at the venue could be used at the present time to commence the training of Company Personnel in design, lay-planning and cutting. On the basis that some training is better than none at all and from observations during the visits, this will greatly help the indigenous personnel involved in garment making.

- 3.8 During the visit no sewing machine mechanics were identified so it is suggested that two personnel be selected and trained to provide this very essential function of machine repair for all small companies.
- 3.9 It is suggested that a resident garment consultant be recruited to identify all manufacturing units and their capacity/capabilities. During company visits the consultant will continually help identify and resolve many of their technical problems.

The companies showing the most potential can be established and with assistance be rehabilitated.

- 3.10 It is suggested that a co-operative be established to provide all small companies with facility for purchasing at competitive rates, fabric and all accessories.

4. ACKNOWLEDGEMENTS

I would like to thank all those with whom I came in contact for the extreme kindness, understanding and hospitality shown to me during the mission.

I would give special thanks to:-

Engineer Hector Palacois Gavira	-	Director of Industrial & Commercial Development
Engineer Carlos Manuel Sada Solana	-	Secretary of Economic & Social Development
Licentate Angela Martinez De Pablo	-	Department of Investment Promotion
Engineer Glen Pinchbeck	-	Interpreter

And all others whom I came in contact.

EQUIPMENT

COMPANY	L/S DOMESTIC	L/S INDUSTRIAL	O/L DOMESTIC	O/L INDUSTRIAL	B.H.	B.S.	OTHER MACHINES	PRESSING	LAYING UP	CUTTING
"BRIGIDIA GARCIA" SAN MIGUEL DEL RIO (CO-OPERATIVE)		12		1	1	1	1 x KANSAI SPECIAL 1 x FEED OFF ARM 1 x 2 NEEDLE CHAIN STITCH			
"MARIA ESTER ZUNO DE ECHEVERRIA" CAPULALPAN (CO-OPERATIVE)	3 4 X PEDAL	3	1					1 X DOMESTIC NOT STEAM		
SAN ANDRES, HUAYAPAN (CO-OPERATIVE)	11							1 X DOMESTIC NOT STEAM		1 X ROUND KNIFE 1 X STRAIGHT KNIFE
"ANIMA YUU" YOLOTEPEC (CO-OPERATIVE)	4 (M.B.) 6 X PEDAL	5		2	1	1		2 X INDUSTRIAL STEAM IRONS (MB)		1 X STRAIGHT KNIFE
P. IN. MU. DE. HUAZAPAN	4	1					1 X EMBROIDERY			
COMMUNITY DEVELOPMENT CENTER, NO 10, OAXACA		15		1	1	1	6 X EMBROIDERY	1 X DOMESTIC NOT STEAM		

L/S - LOCK STITCH SINGLE NEEDLE  
O/L - OVERLOCK MACHINE  
B/H - BUTTON HOLE MACHINE

B.S. - BUTTON SEW MACHINE  
M.B. - MACHINE BROKEN

EQUIPMENT

COMPANY	L/S DOMESTIC	L/S INDUSTRIAL	O/L DOMESTIC	O/L INDUSTRIAL	B.H.	B.S.	OTHER MACHINES	PRESSING	LAYING UP	CUTTING
ING. LUIS ENRIQUE RAMIREZ, DEPORTIVAS DE OAXACA SA DE C.V. (PRIVATE SECTOR)	1	3		3			(SCREEN PRINTING) 1 X ZIG ZAG 1 X ELASTICATING 1 X EMBROIDERY (INDUSTRIAL) 2 X KNITTING (PROTTI)	1X DOMESTIC NOT REQUIRED		1X STRAIGHT KNIFE
IMPULSORA DE ARTESANIAS RUIZ, SA. DE C.V. (PRIVATE SECTOR)		24 (MB) 36		4 (MB) 2				NO PRESSING REQUIRED		2 X STRAIGHT KNIVES
CASA PENALOSA HUAJOLOTITLAN (PRIVATE SECTOR)	1 1XPEDAL			1			(SCREEN PRINTING)	1X DOMESTIC NOT STEAM		
RAQUEL RAMIREZ HERNANDEZ, TAMAZULAPAN (PRIVATE SECTOR)		6		1			1 X BLIND STITCH	1 X INDUSTRIAL STEAM		
MAQUILADORA ELSAN SA. DE C.V. (PRIVATE SECTOR)		12		2	1	1	1 X EMBROIDERY 1 X BLIND STITCH 1 X DRILLING 2 X STUD BUTTON 1 X BAG	1X DOMESTIC NOT STEAM		1 X STRAIGHT KNIFE

L/S - LOCK STITCH SINGLE NEEDLE  
O/L - OVERLOCK MACHINE  
B.H. - BUTTON HOLE MACHINE

B.S. - BUTTON SEW MACHINE  
M.B. - MACHINE BROKEN

PERSONNEL

COMPANY	PRODUCTS MANUFACTURED	MARKET	LAYERS UP/ CUTTERS	SEWING MACHINISTS	PRESSERS/ EXAMINERS
"BRIGIDA GARCIA" SAN MIGUEL DEL RIO	HEAVY OVER SHIRT. 1ST ORDER OF WORK IN 6 YEARS, TO ORDER	CONTRACT WORK FOR IMPULSORA DE ARTESANIAS RUIZ, S.A. DE C.V. LOCAL		10 (ALL ROUND WORKERS)	
"MARIA ESTER ZUNO DE ECHEVERRIA" CAPULALPAM	BLOUSES, SHIRTS, JACKETS DRESSES-EVERYTHING- ATTENDED FASHION DESIGN LAY-PLANNING & CUTTING COURSE ORGANISED BY SINGER, 1981. WORKED FOR WELL KNOWN DESIGNER IN MEXICO CITY	LOCAL		3 (ALL ROUND WORKERS)	
SAN ANDRES, HUAYAPAN	GOVERNMENT UNIFORMS BLOUSES, TROUSERS TO ORDER	LOCAL AND GOVERNMENT	2	9	
"ANIMA YUU"	SCHOOL UNIFORMS, DRESSES, TROUSERS, BLOUSES, SKIRTS, TO ORDER	LOCAL AND GOVERNMENT	2	16 ACTIVE WHEN NECESSARY	6 ACTIVE WHEN NECESSARY
P. IN. MU. D. E. HUAZAPAN (COMMENCED JAN 87)	SCHOOL UNIFORMS, DRESSES, TO ORDER, STATE WORKERS STORES	LOCAL	1	20 ACTIVE WHEN NECESSARY	
COMMUNITY DEVELOPMENT CENTER, NO 10 OAXACA	SCHOOL UNIFORMS, DRESSES, QUILTS, TO ORDER	LOCAL		25 (ALL ROUND WORKERS)	

PERSONNEL

COMPANY	PRODUCTS MANUFACTURED	MARKET	LAYERS UP/ CUTTERS	SEWING MACHINES	PRESSERS/ EXAMINERS
ING. LUIS ENRIQUE RAMIREZ, DEPORTIVAS DE OAXACA S.A. DE C.V.	ALL TYPES OF SPORTS WEAR SCHOOL AND INDUSTRIAL UNIFORMS, TO ORDER	LOCAL, SOLD THROUGH COMPANY STORE	1	8	
IMPULSORA DE ARTESANIAS, RUIZ, S.A. DE C.V.	HEAVY OVER SHIRT WITH HOOD, MOST OF PRODUCTION COMPLETED BY OUT WORKERS	40% EXPORTED TO U.S.OF AMERICA 60% LOCAL - BAJA CALIFORNIA	2	4	
CASA PENALOSA KAJAJOTITLAN	ALL TYPES OF SPORTS WEAR, SCHOOL SWEATERS, TO ORDER	LOCAL SCHOOLS, SPORTS CLUBS		2	1
RAQUEL RAMIREZ HERNANDEZ, TAMAZULAPAN	LADIES AND MENS JACKETS. MAKE AND TRIM ONLY, BUTTON HOLES COMPLETED IN MEXICO CITY.	CONTRACT WORK FOR COMPANY IN MEXICO CITY.	-	4	1
MAQUILADORA ELSAN S.A. DE C.V.	CHILDRENS DRESSES, OVERALLS BOYS SHIRTS AND TROUSERS, JACKETS, HEAVY OVER SHIRTS.	98% EXPORTED TO U.S.OF AMERICA AND CANADA 2% LOCAL	1	12	2

GARMENT INDUSTRY TRAINING COURSE

The problem of finding one person with the technical experience required is very unlikely, hence the course has been separated into 2 phases to allow two experts to be recruited. One for design, lay-planning, cloth spreading and cloth cutting and the other for sewing, make-up and final presentation.

The aims of the course are to provide the participating members with a basic training in:-

Design  
Pattern Making  
Pattern Grading  
Lay-Planning  
Cloth Spreading  
Cloth Cutting  
Make Up  
Final Presentation

Instead of all formal lectures the courses are to be highly participative and will allow the individual members to relate to their own product where they will be able to design, cut and make up a garment of their own choosing.

ANNEX II (CONTINUED)

GARMENT INDUSTRY TRAINING COURSE

OBJECTIVES:

All participating course members will be given the necessary tuition to enable them to:

- a) Design a garment of their own choosing.
- b) Make the patterns and cut the fabric to be used.
- c) Write out quality specifications and accessories used for the manufacture of the garment.
- d) Write out an operation breakdown to determine the operation sequence.
- e) List all machines required to complete the garment.
- f) Make up and present the garment in a saleable manner.
- g) Carry out an analysis to determine the cost of the garment.



GARMENT INDUSTRY TRAINING COURSE

PHASE I : Design, Lay-Planning, Cloth Spreading and Cutting.

DURATION : Ten Weeks.

<u>Week</u>	<u>Course Content</u>
1.	Introduction to State Officials and Course Members and final preparations for course.
2. to 6.	<u>Pattern Making and Grading</u> This should include the following subjects: Anatomy, the size and shape of the human figure Basic pattern construction. Style variations Pattern Grading Latest styles and trends Fabric and thread types, properties and uses Quality Standards
7.	<u>Fabric Utilization</u> This should include the following subjects: Effect of design and pattern making Effect of number of sizes and styles marked Effect of fabric width Various methods of making markers
8.	<u>Cutting Room Practices</u> This should include the following subjects: Laying up methods and equipment Cutting methods and equipment
9.	Project work as arranged by the Course Tutor.
10.	Summary of Phase I

ANNEX II (CONTINUED)

GARMENT INDUSTRY TRAINING COURSE

PHASE II : Garment Production and Presentation

DURATION : Ten Weeks

Week	Course Content
1.	Introduction to State Officials and Course Members and final preparations for course
2. and 3.	<u>Work Study</u> This should include the following subjects: Method Study Work Measurement Incentive Schemes Rating and Timing Practice Work Place Lay-Out Garment Engineering Quality Specifications and Standards Fault Analysis
4. to 8.	<u>Garment Production</u> This should include the following subjects: Garment Construction Garment Pressing and Finishing Factory and Line Balancing Control of Production Control of Quality Folders and Attachments
9.	Project as arranged by the Course Tutor.
10.	Summary of Phase II

MEMORANDUM

12TH APRIL 1987

FROM: R.A. HARKNESS - U.N.I.D.O. EXPERT ON GARMENT INDUSTRY PROJECT

TO: ENGINEER CARLOS MANUEL SADA SOLANA - SECRETARY OF ECONOMIC AND  
SOCIAL DEVELOPMENT

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I am taking this opportunity to record some of the actions which need to be taken in Oaxaca, in preparation for the proposed garment industry training programme, the dates to be advised.

1. Confirm the availability of Community Development Center, Number 10, Oaxaca, as the venue for the proposed course, together with permission to use all available facilities eg. cutting tables, sewing machines, classrooms.
2. Arrange to have 5 tables approximate dimensions 280 x 120 cms and 16 chairs.
3. Arrange for the duration of the course, if the expert requires it, the use of an overhead projector and any other item that the expert may require upon his arrival.

A fund should be made available for this purpose.

4. Arrange transport, accommodation and payment of subsistence allowances to attending members.