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DEVELOPMENT OF SECONDARY WOOD PROCESSING INDUSTRIES

DP/GUY/86/005

THE REPUBLIC OF GUYANA

Terminal report*

Prepared for the Government of the Republic of Guyana
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of R. Swift
Consultant in wood furniture

Backstopping officer: Antoine V. Bassili
Agro-based Industries Branch

United Nations Industrial Development Organization
Vienna

* This document has not been edited.

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1. INTRODUCTION

This project, entitled "Development of Secondary Wood Processing Industries", was approved on 8 October 1986 for a value of US\$ 147,000 (final expenditures were US\$ 200,370).

The project's immediate objectives were:

- (i) To familiarize the private sector entrepreneurs with recent developments in the furniture and joinery industries sector so as to place them in a position to enter Caribbean markets and eventually also the markets of OECD member states.
- (ii) To provide a service centre for sawdoctoring and tool maintenance at the Forestry Commission to cater for the needs of the smaller furniture and joinery shops in the Georgetown area.
- (iii) To train local staff in the operation of the service centre and improve sawdoctoring and tool maintenance skills in the country's secondary wood processing industry.

2. SUMMARY OF INPUTS

2.1 Sawdoctoring and tool maintenance by G. A. Woods, Expert. This was a split mission in two phases, the first phase being three weeks in November 1987 and the second for 2.8 months starting in January 1990.

On his first visit, the expert prepared an inventory of the sawdoctoring maintenance equipment available at the workshop, drew up schedules of machinery, spare parts and grinding wheels required. He advised on the structure and content of training courses, visited a number of sawmills, furniture and joinery factories, giving advice where appropriate. He also prepared drawings for equipment to be manufactured before his return.

On his return, he supervised the installation and commissioning of the new machines (two weeks approximately), visited further mills (two weeks and spent the balance of his time on instruction. Two two-month fellowships were granted under the project to the expert's counterpart. They were thus able to receive further training by him in his own sawdoctoring workshop in the UK. Training time in Guyana was limited due to frequent power shortages and the non-arrival on time of the proper grinding wheels. The expert prepared a list of recommendations for the future operation of the training centre. These are given on pages 7 and 8 of document DP/ID/SER.A/919 and 12 and 13 of document DP/ID/SER.A/1353. Two one-day seminars were held for managers and technicians. They were attended by 68 persons.

2.2 A seminar on furniture production was held in Georgetown from 4 to 15 May 1987. The team leader was Mr. Desmond Cody, Industrial engineer and the other lecturers were Messrs. S. O'Driscoll, wood machining technologist, A. Edwards, industrial furniture designer, and A. Blackburn who covered marketing. In-company consultation was also provided. A programme for further international assistance was suggested on pages 7 and 8 of document DP/ID/SER.A/929.

2.3 A wood finishing course run by Mr. W. St. G. Vernon, consultant on surface finishing was held over six days in May 1987. The seminar covered all aspects of finishing and materials in use. Particular emphasis was paid to

the need for correct machining and sanding as a prerequisite for satisfactory finishing. A number of factory visits were made and appropriate advice given. Suggestions for further technical assistance were made.

3. LIST OF REPORTS PRODUCED

- DP/ID/SER.A/919 6 November 1987 Assistance in sawdoctoring and tool maintenance, based on the work of G. A. Woods, sawdoctoring and tool maintenance expert.
- DP/ID/SER.A/1353 21 May 1990 Assistance in Sawdoctoring and tool maintenance, based on the work of G. A. Woods.
- DP/ID/SER.A/929 30 November 1987 UNIDO/UNDP Seminar on furniture and joinery industries, based on the work of D. P. Cody, industrial engineer and team leader.
- (no symbol) 4 September 1987 Surface finishing, based on the work of W. St. G. Vernon, consultant in Surface finishing.

ANNEX I

DETAILS OF EXISTING EQUIPMENT
AT THE FORESTRY COMMISSION'S WORKSHOP IN GEORGETOWN

REF NO.	ITEM	TYPE OR MODEL	SERIAL OR TEST NO.	CONDITION	TRUE OR ESTIMATED VALUE USS
E1	Armstrong Stretcher rolls	3-10	12806	New	3,300
E2	Armstrong Swaging clamp	58 B 60		New	1,650
E3	Armstrong circular saw anvil	8"-10"		New	1,000
E4	Armstrong bandsaw blade shears	14"		New	2,650
E5	Armstrong Pulley Grinder	Barnhart No. 51	1387	New	2,000
E6	Armstrong Bandsaw levelling plate	48" x 8" x 4"		New	800
E7	Armstrong Bandsaw levelling plate	72" x 8" x 4"		New	1,000
E8	Armstrong Gulletting machine	54	7666	Needs parts	2,100
E9	Armstrong Welding clamp	No. 62-12"		Used	600
E10	Armstrong Bandsaw side dressing tools	No. 1 & 2		Used	720
E11	Wadkin Tool and cutter grinder	NH 1041		Used, needs attachments	17,000
E12	Vollmer, Band/circular sharpener	Lilliput S 175	14-311	Used, needs attachments	5,000
E13	Vollmer, Circular framesaw setting	ADM/VI	(1967)	Used, needs cover and parts	4,000
E14	Vollmer framesaw setting	PH 3-DBP	644 (1967)	Used, needs parts	3,500
E15	Robinson, Bandsaw Lap grinder	SQ'E 12"	371 67/48	Used, needs parts	5,000
E16	White, cutter balancing stand		M1933 2D	Used	2,000
E17	Spear & Jackson Circular saw blade vice			Used	800
E18	Unknown make bandsaw shears		6" capacity	Used	80
E19	Spear & Jackson Wide bandsaw blade brazing clamp	10"		Used	800
E20	Vollmer, Framesaw blade sharpening attachment	10"	Canal/E 51/N34	Used	2,000
				TOTAL	56,000

ANNEX II

SPARE PARTS/ACCESSORIES FOR EXISTING EQUIPMENT
RECOMMENDED TO BE PURCHASED BY THE PROJECT

<u>Ref. No.</u>	<u>Quantity</u>	<u>Description</u>	<u>Cost \$US</u>
E11		Wadkin U.K. Tool and Cutter Grinding Machine Type NH No. 1041	
	1 <u>1/</u>	Router cutter grinding attachment Type UGA	
	1 <u>1/</u>	Router side relief grinding attachment Type PRFZ	
	1 <u>1/</u>	High speed grinding wheel spindle attachment Type NHG	\$ 3000
E12		Vollmer Dornhan W.G. Lilliput S175 Narrow Bandsaw and Small circular saw blade Grinding Machine No. 14-311	
	1	Narrow bandsaw blade setting device Part No. 246.00.00	\$ 830
E 9		Armstrong Welding Clamp No. 62 - 12"	
	1	Replacement Anvil 2 $\frac{1}{2}$ "x2 $\frac{1}{2}$ "x12"	\$ 100
E 8		Armstrong Gulletting Machine 54 No. 7666	
	1	Replacement Grinding Wheel Shaft Pulley Approximately 3" Diameter with $\frac{1}{2}$ " Bore	\$ 12

1/ Low priority

ANNEX III

RECOMMENDATION FOR THE PURCHASE OF NEW
MACHINERY AND EQUIPMENT

<u>Ref. No.</u>	<u>Quantity</u>		<u>Approximate Cost</u> <u>US\$</u>
N. 1	1	Vollmer Biberach Cana/e Automatic Sharpening Machine for Circular Bandsaw and Framesaw Blades. (for specifications see page 12)	14,780
N. 2	1	Vollmer Dornhan Unilap 600 Manual Grinding Machine for T.C.T. Circular Saw Blades 90-600mm diameters. (for specifications see page 13)	4,535
N. 3	1	Vollmer Dornhan MF 600 Manual Side Grinding Machine for T.C.T. Circular Saw blades 100-600mm diameters. (for specifications see page 13)	3,617
N. 4	1	Automatic Straight Knife Grinding Machine for blades up to 920mm minimum. (for specifications see page 14)	
N. 5	1	'Ideal' Flash Butt Welding Machine for narrow bandsaw blades 3-40mm. (for specifications see page 14)	3,985
N. 6	5	Armstrong Tensioning Hammers for Circular, Bandsaw and Framesaw Blades (for specifications see page 15)	355
N. 7	1	Armstrong Swaging Tool for Wide Bandsaw Blades. (for specifications see page 15)	730
N. 8	Set	'Murex' Complete Lightweight Welding Outfit. (for specifications see pages 15 and 16)	489
N. 9	2	'Kef' or Similar Bench Grinding Machines for 150 and 200mm diameter Grinding wheel. (for specifications see page 16)	375
N.10	2	Makita or Similar Lightweight Angle Grinders to take 100 or 110mm diameter grinding discs. (for specifications see page 16)	200
N.11	200 each	Tungsten Carbide Tips Al-11 for the repair of circular woodcutting blades in six different sizes (see drawing on page 30 and specifications on page 16)	240
N.12	2-4 oz tubes	Silver Solder/Flux in form of a paste for brazing on the above T.C.T. tips. (for specifications see page 16)	100

TOTAL

29,406 approx.

ANNEX IV

LIST OF SAWMILLS AND FACTORIES VISITED
BY MR. G. A. WOODS DURING HIS FIRST MISSION

	<u>Name</u>	<u>Product</u>
1.	Demerara Woods Ltd., Mabura Hill, Upper Demerara River	Sawn Timber
2.	Guyana Sawmills Ltd., Water & Bugle Sts., Georgetown	Sawn Timber
3.	N.C.E. Screen Printers/Guyana Wood Products Limited, 6-8 Water & Schumaker Streets, Georgetown	Toys, Fancy goods
4.	Industrial, Domestic & Electrical Appliances Limited, Soedyke, East Bank Demerara	Doors & Furniture
5.	Industrial, Domestic & Electrical Appliances Limited, Water Street, Georgetown.	Sawn Timber
6.	Precision Woodworking Limited, 35 Industrial Estate, Ruimveldt, Georgetown	Furniture
7.	Fries Furniture Factory 38 Industrial Estate, Ruimveldt, Georgetown	Furniture
8.	A.H. & L Kisson Limited Industrial Estate Ruimveldt, Georgetown.	Furniture

ANNEX V

LIST OF SAWMILLS VISITED
BY MR. G. A. WOODS DURING HIS SECOND VISIT

Region 7	Guyana Sawmills Ltd.	Bartica
"	Willems Timber & Trading Co. Ltd.	Kaow Island
"	Nagasar Sawh Ltd.	Bartica
"	A. Mazaharally & Sons Ltd.	Skull Point Mazaruni
Region 2	Supenaam Sawmill Ltd.	Supenaam Essequibo River
Region 1	A. Mazaharally & Sons Ltd.	Kwebanna
Region 6	Ameerally Sawmill	New Amsterdam Berbice
"	J & Z Sawh	Crabwood Creek, Corentyne
"	Road End Sawmill	"
"	Deen's Sawmill	"
"	Ally Khan Sawmill Ltd.	"
"	N & F Shafeealah	"
"	Zaladin Lumber Ltd	"
"	Baianauth Sawmill Ltd.	"
Region 3	Demerara Woods Ltd.	Mabura Hill
Region 4	Toolsie Persaud Ltd.	Georgetown
"	Caribbean Resources Ltd.	"

ANNEX VI

PROGRAMME OF THE FURNITURE PRODUCTION SEMINAR

Monday, 4th May 1987

8.30 am - 9.30 am	Registration of Participants
9.30 am - 11.30 am	Opening Addresses Guyana Forestry Commission Cde. C. Philadelphia P.S. Ministry of Forestry Cde. B. Udit Commissioner of Forests (AG.) Ms. C. Davis UNDP Resident Representative Mr. D. Cody UNIDO Consultant Cde. Dharamdeo Sawh, M.P. Minister of Forestry Cde. Clayton Hall Director of Seminar, Guyana Forestry Commission
1.00 pm - 1.30 pm :	Scope of Seminar and Programme. Mr. D. Cody
1.30 pm - 3.00 pm	Marketing of Furniture, General Principles Mr. D. Cody
3.15 pm - 5.00 pm	Export Marketing of Furniture and Other Wood Products Mr. A. Blackburn

Tuesday, 5 May 1967

8.30 am - 10.00 am

General Principles of Furniture Design.

Mr. A. Edwards

10.15 am - 12.00 am

Furniture Design for Production.

Mr. A. Edwards

1.30 pm - 3.00 pm

Product Development

Production technology relating to materials used in furniture and joinery production.

Mr. D. Cody

3.15 pm - 5.00 pm

Product Development

Prototyping and preparation for series production.

Mr. A. Edwards

Mr. D. Cody

Wednesday, 6 May 1967

8.30 am - 10.00 am

Woodcutting Machining Technology. Machine Selection and Utilization

Mr. S. O'Driscoll

10.15 am - 12.00 am

Technology Relating to Sawing, Shaping, Moulding, Jointing and Sanding of Wood.

Mr. S. O'Driscoll

1.30 pm - 3.00 pm

Export Marketing of Furniture and Other Wood Products to the United States.

General Principles and Procedures.

Mr. A. Blackburn

3.15 pm - 5.00 pm

Products, Specifications and Potential Customers best suited to Guyana Manufacturers.

Mr. A. Blackburn

Thursday, 7 May 1987

8.30 am - 10.00 am

Woodcutting Machining Technology
Machine Set-up and Maintenance.
Mr. S. O'Driscoll

10.15 am - 12.00 am

Cutter Design; Cutter Grinding,
Saw Doctoring and Use of Pneumatics
Electrics and Hydraulics.
Mr. S. O'Driscoll

1.30 pm - 3.00 pm

Product Design
Design Clinic No. 1
Mr. A. Edwards

3.15 pm - 5.00 pm

Continuation of Design Clinic
Mr. A. Edwards

Friday, 8 May 1987

8.30 am - 10.00 am

Production Technology
Wood processing including machine
adaptation. Design and use of jigs
and Other Production Aids.
Mr. S. O'Driscoll

10.15 am - 12.00 am

Tolerance Determination and Quality
Control.
Mr. S. O'Driscoll

1.30 pm - 5.00 pm

Assignment Work with Consultants.

Monday, 11 May 1987

8.30 am - 10.00 am

Product Design
Design Clinic No. 2
Mr. A. Edwards

10.15 am - 12.00 am

Continuation of Design Clinic
Mr. A. Edwards

1.30 pm - 3.00 pm

Woodworking Factory Planning.
General Principles and factors to
be taken into consideration
Mr. D. Cody

3.15 pm - 5.00 pm

Layout of Furniture Plant
including plant selection,
location and design of individual
work stations
Mr. D. Cody

Tuesday, 12 May 1987

8.30 am - 10.00 am

Production Control and Productivity
Planning and Programming
Documentation
Mr. D. Cody

10.15 am - 12.00 am

Performance monitoring
Mr. D. Cody

1.30 pm - 3.00 pm

Timber Selection and Conditioning
Guyanese Timber Species Suitable
for Furniture & Joinery Production
Mr. C. Hall

Wednesday, 13 May 1987

8.30 am - 10.00 am

Management of a Woodworking Plant
Production and Supervisory Management.
Mr. D. Cody

10.15 am - 12.00 am

Management Functions
Including Financial Control
Personnel Selection and Training
Productivity achievement
Mr. D. Cody

1.30 pm - 3.00 pm

Panel Discussion.
Role of Government and other Agencies
in assisting in the Development of
the Furniture and Joinery Industries

Follow-up Action to Seminar.

3.15 pm - 5.00 pm

Closing Ceremony
Presentation of Diplomas.

ANNEX VII

LIST OF PARTICIPANTS TO THE FURNITURE PRODUCTION SEMINAR

<u>NAME</u>	<u>FUNCTION</u>	<u>ADDRESS</u>
1. Mr. Eustace Ageda	Draughtman	Guyana Forestry Commission
2. Mr. Prakash Balraj	Asst. Sales Manager	Toolsie Persaud Limited
3. Mr. Vibert Benjamin	Acting Charge Hand	Guyana National Engineering Corporation
4. Mr. Rustum Bulkhan	Director	Precision Woodworking Limited
5. Mr. Neville Chan	Manager (Cooperage Department)	Demerara Distillers Limited
6. Mr. Edward Chand	Sample Maker & Joiner	NCE Screen Printers Limited
7. Mr. Wendell Charles	Joiner (Department of Research & Planning)	Guyana Police Force
8. Mr. George Cole	Supervisor, Timber Products Facility	Guyana National Engineering Corporation
9. Mr. Colin Craigwell	Production Clerk	Guyana Forestry Commission
10. Mr. Ramsundar Gobin	Factory Manager	Ramsundar Gobin Woodworking Establishment
11. Mr. Patrick Greene	Joiner (Department of Research, Planning & Construction)	Guyana Police Force
12. Miss Patricia Griffith	Charge Hand	NCE Screen Printers Limited
13. Mr. Peter Griffith	Supervisor of the Joinery Unit	Guyana Forestry Commission
14. Mr. Anthony Higgins	Joiner	Guyana Forestry Commission
15. Mr. Mark Harris	Designer-Joiner	Woodwork Establishment

<u>NAME</u>	<u>FUNCTION</u>	<u>ADDRESS</u>
16. Miss Phillipa Hazel	Production Manager	NCE Screen Printers Limited
17. Mr. Jagernauth	Joiner (Cooperage Dept.)	Demerara Distillers Limited
18. Mr. Jalill Khan	Managing Director	Aziz Bacchus & Co. Limited
19. Mr. Stanley Lachmansingh	Manager	Industrial Domestic & Electrical Appliances Limited
20. Mr. Edward Lewis	Manager	Lewis & Sons Enterprises
21. Mr. John Lewis	Group Deputy Works Manager	Industrial Domestic & Electrical Appliances Limited
22. Mr. Evan Mingo	Supervisor	NCE Screen Printers Limited
23. Mr. Edward Persaud	Maintenance Supervisor	NCE Screen Printers Limited
24. Mr. Royston Peters	Joiner	Guyana Forestry Commission
25. Mr. Taijwant Prashad	Supervisor (Woodworking Department)	A.H. & L Kisson Limited
26. Mr. Negamdeo Ramadar	Supervisor (Tools & Maintenance(Machine)	A.H. & L Kisson Limited
27. Mr. Devanand Ramnarsine	Production Manager	Liana Manufacturing Co. Ltd
28. Mr. Guildford Rodney	Carpenter/Joiner	Construction Management Combine Limited
29. Mr. C.S. Shivnarine	Senior Assistant Manager (Wood Products Dept.)	Industrial Domestic & Electrical Appliances Limited
30. Mr. David Singh	Joiner	Fries Furniture Establishment
31. Mr. Khee Ram Singh	Factory Manager	Shiva Woodworking Establishment
32. Mr. Mohabir Singh	Manager	Tropical Woods
33. Mr. Derek Subramanyis	Cabinet Maker	Construction Management Combine Limited

<u>NAME</u>	<u>FUNCTION</u>	<u>ADDRESS</u>
34. Mr. Mortimer Tieschmaker	Carpenter Supervisor	Institute of Applied Science & Technology
35. Mr. Orrin Davis	Production Manager	Walvis & Sons Woodworking Establishment
36. Mr. Khemraj Surujballi	Supervisor	A.H. & L. Kisson Limited
37. Mr. Peter Gittens	Manager	NCE Screen Printers Limited

ANNEX VIII

COMPANIES ATTENDING THE SURFACE FINISHING SEMINAR

N.C.E. Screen Printers Limited,
A.H. & L. Kisson Ltd.,
Precision Woodworking Ltd.,
Ramsunder Gobin Woodworking Establishment,
Walvis & Sons Woodworking,
Harris & Sons Custom Built,
Guyana Engineering Co-Operative,
Demerara Distillers Ltd.,
Toolsie Persaud Ltd.,
Guyana Construction Combine,
Guyana Institute for Science and Technology,
Shiva Woodworking Ltd.,
Guyana Forestry Commission Workshop,
Ideal Products Ltd.

ANNEX IX

FACTORY VISITS AND ADVISORY MEETINGS
PROVIDED BY MR. W. St. G. VERNON

- Mon. 28th September - Visit U.N.D.P.
Visit Forestry Commission Workshops
Visit N.C.E. Woodworking
Visit Precision Woodworking Ltd.
Visit A.H. & L. Kisson
Visit Fries Furniture Ltd.,
- Tues. 29th September - Visit Guyana National Eng. Corp. Woodwork-
shop
Visit Precision Woodworking Ltd.
Evening Meeting - Institute Science & Tech.
- Wed. 30th September - Visit Ramsunder Gobin
Visit N.C.E. Woodworking
Evening Meeting Mr. B. Gittens, N.C.E.
- Thurs. 1st October - Visit Walvis
A.H. & L. Kisson
Evening Meeting Toolsie Pessud Ltd.
- Fri. 2nd October - Visit Ideal Ltd. (Woodworking Division)
Visit Guyana Forestry Commission Workshop
Evening meeting Mr. Bentnam re above
Workshop.
- Sat. 3rd October - Visit Guyana Construction & Maintenance
Workshop

ANNEX X

LIST OF EQUIPMENT PURCHASED BY THE PROJECT

- Idealwerk bandsaw flash butt welding machine, type BAS 040 with grind motor ESM 040 and shear Ideal type AHE 050.
- 8604-C1 No. 8-1/2 Armstrong bandsaw hand swage complete with 80 G anvil gauge, steel clamp, screws and anvil.
- 8600-C1 No. 6-G Armstrong Gangsaw Hand Swage complete with 77-G anvil gauge, steel clamp screws and anvil.
- Grifo Model 1000 grinding machine for knives for wood planer from 150-1000 mm complete with accessories and overload protection switch.
- Grifo F25 universal woodworking tool grinder complete with accessories with device for multiple drills dap.
- Bandsaw setting device 246.00.00 complete.
- Vollmer Dornhan manual carbide saw grinder unilapp complete with all accessories with spare parts.
- Vollmer Dornhan manual side grinder MF 600 complete with accessories and spare parts.
- Automatic sharpener with straight and bevel grinding for circular saws, gang saws and band saws, complete.

ANNEX XI

SUBSTANTIVE OFFICER'S COMMENTS

This project served the primary purpose of focusing attention on the needs and potential of the wooden furniture manufacturing sector in Guyana. The Seminar paved the way for collaborative action amongst private sector enterprises and helped convince the Government of the valuable contribution to the economy that could be achieved.

Despite difficult operating conditions, progress has been made by several firms, supported currently by DP/GUY/90/008, and the Guyana Manufacturing Association's activities have been strengthened in this field.

Unfortunately, there still exist problems with respect to the full use of the sawdoctoring facilities. Despite the fundamental need for these services, the trainees were not of a standard that could properly absorb the skills and no decision has yet, to our knowledge, been made on the management and use by the private sector of the equipment. This must be seen as a priority for the proper development of this sector.

This report should be read in conjunction with that of SI/GUY/90/801, DP/ID/SER.B/688 dated 6 June 1991 based on the work of Paul Hayes.