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RESEARCH AND DEVELOPMENT ON VARIOUS METHODS OF SPINNING SHORT STAPLE COTTON

DP/VIE/86/014

VIET NAM

Technical report: Fourth mission of the Chief Technical Adviser*

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

Based on the work of Roy Nield,
Chief Technical Adviser

Backstopping officer: J.P. Moll,
Agro-based Industries Branch

United Nations Industrial Development Organization
Vienna

* Mention of company names and commercial products does not imply the endorsement of UNIDO. This document has not been edited.

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ABBREVIATIONS

BSO	Back Stopping Officer (UNIDO)
CTA	Chief Technical Adviser
Est	Estimate
JD	Job Description
MOLI	Ministry of Light Industries
NPD	National Project Director
Prodoc	Project Document
Req xx	Requisition No. xx
TEXTIMEX	Textile Import Export Company
TOR	Terms of Reference for Joint Evaluation
TPR	Tri-Partite Review
TRI	Textile Research Institute (Hanoi)
TRSI	Textile Research Sub-Institute (HCM City)
UCD	UNIDO Country Director
UTE	Union of Textile Enterprises

I. EXECUTIVE SUMMARY

The mission took place during October and December 1990, coordinated with a mission to Project DP/VIE/86/015 in HCMC.

The project concept remains very relevant to the Government's Development Plan which emphasises the need to expand the production of consumer goods especially clothing by increased utilization of indigenous raw materials.

A TPR Meeting was held on 13 December 1990 in Hanoi. The minutes of the meeting are attached. The Chairman (the Vice Director of MOLI) stated that the Project had already made a significant contribution to the success of National Research Programme No 16A.

A progress report by the CTA is attached.

Output 1, cotton testing laboratory, has been fully produced.

Output 2, testing of yarn properties, will be produced after delivery and installation of the Uster evenness tester and the Tensorapid yarn strength tester and completion of the final expert mission.

Output 3, pilot plant, will be produced when the building is completed and the blowroom equipment (delivered in November 1990) has been installed.

Output 4, hand ginning and spinning technology, has been produced. The TRI has made a set of prototypes which are being subjected to extensive field-tested in a village under the supervision of the Institute. This is very basic equipment but first reports from the field are very encouraging.

The main objectives will be achieved within the expected life of the project (3 years from 8/8/88).

It is intended to continue implementation of the project according to the attached work plan.

The mandatory Joint Evaluation of the Project is planned to take place in April 1991, with the following timetable in Vietnam:

April 14 to 21 Hanoi (Briefing and Project 014)
April 21 to 24 HCMC (Project 015)
April 24 to 28 Hanoi (Finalizing report and Debriefing)

The CTA and the NPDs will be available if required.

The Terminal TPRs for this project and 015 are planned for 12 December 1991.

II INTRODUCTION

The development objective of the project is to increase the availability of good quality textiles for domestic consumption which is in line with the Government's development plan for the period 1986-90 which emphasizes the need to expand the production of consumer goods - especially clothing - by means of increased utilization of indigenous raw materials.

The immediate objective is to strengthen the capability of the Vietnam Textile Research Institute in evaluating cotton fibre and conducting spinning development work with particular emphasis on the use of short staple cotton.

These objectives were elaborated upon in the first mission report of the CTA (DP/ID/SER.A/1152) dated 13 February 1989.

III RECOMMENDATIONS

1. Prepare, in detail, a comprehensive work programme for the TRI to ensure that the inputs provided through the Project will be fully utilized for the benefit of the Textile Industry of Vietnam. (NPD and Government).

2. Carefully study the Experts' reports and implement their recommendations to the extent possible (NPD and Govt).

3. Increase the UNDP budget to cover existing commitments.

4. Organize the Joint Evaluation in April 1991. (UNDP, Hanoi).

5. Organize a study tour for 2 or 3 senior textile technologists of the TRI to the next International Textile Machinery Exhibition (ITMA) in September 1991. NB: This opportunity occurs only once in 4 years. (UNIDO/Government)

6. Field the CTA for 2 months starting approx 1 month before the Joint Evaluation of the Project. (UNIDO).

7. Continue implementing the Project according to the Work Plan revised in December 1990 (UNIDO and NPD).

8. Complete the civil engineering work (NPD).

9. Commission the Blowroom (NPD).

10. Field the Blowroom technician as soon as possible (UNIDO).

11. Install an automatically-controlled air conditioning system in the main spinning laboratory (Government).

12. Field a specialist from USTER to install the Evenness tester and the Tensorapid yarn strength tester as soon as these 2 instruments and the Tensorapid for Project 015 have been received. Co-ordinate with Project 015 (UNIDO).

13. Issue a revised JD for post 11-02 Textile Testing (UNIDO)

14. Field the Textile Testing Expert as soon as the instruments have been installed. Coordinate with Project 015. (UNIDO).

15. Be available to answer questions if called upon to do so at the time of the Joint Evaluation (CTA and NPD).

16. Study the recommendations of the JE and implement them to the extent possible. (Government, UNDP and UNIDO).

17. Revise the list of periodicals (NPD).

18. Organize the Terminal TPR in December 1991 (UNDP, Hanoi)

IV. ACTIVITIES AND OUTPUTS

Purpose of the Mission

To review progress since the last mission and follow up the recommendations in previous reports.

To clarify outstanding issues and decide what needs to be done.

To up-date the work plan.

To render technical and administrative assistance to the Experts and co-ordinate their activities.

To advise the NPD on the work to be carried out in the absence of the CTA.

To write a progress report for the TPR.

To participate in the TPR.

To draft the "Summary of TPR Review Report".

To revise the TOR for the Joint Evaluation in April 1991.

To prepare a mission report recording all decisions taken and recommending the actions necessary, and by whom, to expedite further implementation of the project.

Programme

The mission was combined with a mission to the TRSI in Ho Chi Minh City, which is receiving assistance through project DP/VIE/86/015.

Counterparts

The NPD is Dr Mme Nguyen Thi Bau, Director of the TRI. There has always been a good rapport and close cooperation between the NPD and the CTA in implementing the Project.

Meetings, Seminars, etc.

Frequent meetings were held with the NPD and staff of the TRI. All outstanding matters were fully discussed and agreement was reached on all points.

The CTA received excellent cooperation from the expert in Textile Testing and the OE Spinning Technician.

The CTA was debriefed in Hanoi by the UNIDO Back-stopping officer.

The status of the Project was discussed with the UNIDO Country Director, the UNIDO Field Officer and the Programme Officer.

The TPR was held on 13.12.1990 in Hanoi. Minutes are attached.

Useful meetings were held with Mr Urs Minder of Zellweger, Mr Harry Hosell of Schlafhorst and Mr Les Morris, Sales Manager of Rieter.

Inputs

The project inputs are elaborated in Annex 1. All the equipment supplied was examined and found to be in good condition.

Budget

A budget revision will be necessary to cover the increased cost, in US Dollar terms, of the equipment bought in Germany and the proposed Study Tour to the ITMA Exhibition.

Documentary Outputs

Progress report for TPR on 13.12.90.

Revised Terms of Reference (TOR) for the Joint Evaluatiom planned for April 1991.

Fourth Mission Report of CTA.

Schedules detailing the present status of the project as regards equipment, training and experts.

A detailed work plan for the remainder of the project.

Revised Job Description for the expert in Textile Testing and Quality Control Post 11-02 coordinated with Project 015.

Visits

The National Cotton Company, the Cotton Research Centre and the Nha Trang Textile Plant were visited. Reports are attached.

Visits were also made to the 8th of March Textile Mill and the Hanoi Thread Mill together with the Textile Testing Expert who has issued reports. It is expected that these mills will participate inblowroom trials at the TRI.

V CONCLUSIONS

Taking into account constraints outside the control of the project management, reasonable progress has been made during the Project's active life.

Implementation of the project has been controlled to a large extent by having to wait for delivery of the 2 major items of equipment (OE spinning machine and Blowroom line). It was known from the start that the delivery schedules would be long (up to 16 months).

The equipment budget has presented problems due to the delay in starting implementation and the steep rises in equipment prices at that time and the long delivery times coinciding with the decline in the value of the US Dollar against the German Mark and the Swiss Franc.

Implementation of the Project should be continued as outlined in this report in which case it is expected that the objectives will be reached within the intended life of the project (3 years from 8/8/88).

VI ACKNOWLEDGEMENTS

The author wishes to take this opportunity of expressing his gratitude to all those whose willing co-operation and valuable advice were so important to the successful outcome of this mission and in particular:

Mr Pham Gia Khien	Head of Science and Education Dept. State Commission for Planning.
Mr Do Van Vinh	Deputy Head of Industry Department, State Commission for Science.
Mr Tran Quang Sung	Vice-Minister of MOLI.
Mr Dinh Si Bang	Head of Science & Technology, MOLI.
Mr Nguyen Hieu	Head of Industrial Cooperation, MOLI.

Other Government Officials who participated in the TPR meeting.

Dr Pham Hoang Ninh	Director of the TRI (retired).
Dr Mme Nguyen Thi Bau	NPD and Director of the TRI.

UNIDO Country Director.

UNIDO Field Officer.

UNDP Programme Officer.

UNIDO Headquarters Representative.

Mme Bui Thi Thanh Truc	Director, Hanoi Thread Mill.
Mme Nguyen Thi Ha	Director, 8th March Textile Mill.

UNIDO Expert in Textile Testing/QC.

Schlafhorst OE Spinning Engineer.

Project No: DP/VIE/86/014

RESEARCH AND DEVELOPMENT ON VARIOUS METHODS OF SPINNING SHORT STAPLE COTTON.

PROGRESS REPORT BY THE CTA FOR THE TRIPARTITE MEETING TO BE HELD IN HANOI ON 13 DECEMBER 1990.

Implementation of the project has been continued in accordance with the decisions taken at the last TPR (December 1989). Progress has been satisfactory apart from some small delays. However, due to the very unfavourable change in the rate of exchange of the US$ to the DM since the blowroom equipment was ordered, a further US$ 60,703 will now be needed to complete the transaction. The project should be completed in 1991.

****

The development objective is to increase the availability of cotton textiles for domestic consumption by means of increased utilization of indigenous raw materials.

The immediate objectives of the project are to strengthen the capability of the TRI in evaluating cotton fibres and conducting spinning development work with particular emphasis on the use of short staple cotton and (added at a later stage) carrying out quality assurance tests and certification of yarns for export. Four outputs were envisaged, as follows:-

1. Cotton Testing Laboratory.

The equipment for rapid testing of cotton samples has been installed, the staff have received fellowship training and an expert mission has been completed. The TRI is now capable of carrying out fibre tests according to international standards and of calibrating its results relative to the best cotton testing laboratories in the world.

A new, air-conditioned laboratory has been prepared for the rapid testing equipment so that tests can be carried out under standard atmosheric conditions, 27 oC and 65% r.h.

The old laboratory and equipment will be retained so that tests can still be made for clients who prefer that system.

2. Yarn Testing Laboratory.

In accordance with a decision taken at the last TPR, the UNDP budget was increased by US$ 119,560 to permit purchase of both the Uster evenness tester and the 'Tensorapid' yarn strength tester. Both instruments have been ordered and delivery is expected at the end of 1990. The TRI staff have already been on fellowship training. The Expert in Textile Testing will return in 1991, after installation of the instruments, to give advanced training in yarn testing.

3. Pilot Spinning Plant.

The UN contribution consists of 2 major items of equipment; a blowroom line and an OE spinning machine. Both were ordered early in 1989. The delivery times quoted were very long and, in the event, both items came 2/3 months late.

The OE spinner has been installed in the special room constructed by the TRI and climatised by one of the industrial air-conditioning units supplied by UNIDO. The staff have been on fellowships. The Expert installed the machine and gave the staff advanced training. The machine is now being used for research work.

The blowroom equipment has been delivered and will be installed as soon as possible. 50 tonnes of cotton have been acquired to start the blowroom research programme. The staff have received fellowship training and further instruction will be given by the Expert after he has installed the machinery - early in 1991.

The Government have provided, through the TRI, a spinning laboratory and a range of machinery for the processes between the Blowroom and the OE Spinner. The machinery is not modern but it could be used satisfactorily, for the time being, if the laboratory were air conditioned. As discussed at the last meeting, it is essential to have a controlled atmosphere in the spinning room in order to obtain meaningful results. This is because the behaviour of cotton fibres is greatly affected by changes in temperature and humidity.

When the blowroom has been installed, the TRI will have all that is necessary to carry out research (1) in the blowroom and (2) on the OE spinner. The OE machine, being in a controlled atmosphere should give good results. Unfortunately, if the preceeding processes are are not under control, the results will not be as good as they could be.

It is strongly recommended that the entire spinning room (with the exception of the blowroom, which discharges huge quantities of air and is not usually air-conditioned) should be air-conditioned.

4. Development of a range of machines for hand ginning and spinning of short staple cotton under village conditions.

The staff have been on fellowships and an Expert in Appropriate Spinning Technology has been fielded.

A range of prototype machines has been designed and built at the TRI and installed in a village in So'n La Province, about 300 km from Hanoi. This has created a great deal of interest and first results are encouraging. In his report, the Expert has suggested many possible improvements which should be taken into account as and when further units are produced.

2. PROGRESS

A summary of the UNDP inputs is attached.
The Government inputs are detailed in the NPD's report.

3. BUDGETS

The UNDP budget is summarized as follows:

Experts	$	121,469
Training	$	177,045
Equipment	$	766,516
Sundries	$	3,215
Project Total	$	1,068,245

This budget should have been sufficient to fully implement the work plan but, due to the decline in the value of the US dollar against the German DM from 1.99 when the equipment was ordered in May 1989 to 1.48 when it was delivered in November 1990, a further $ 60,703 is now required to complete the transaction. The equipment is already on site

The Government budget is discussed in the NPD's report.

4. OPERATIONAL ISSUES

The following items need further attention:-

4.1 Completion of the civil engineering work at the pilot plant (buildings and surrounding area).

4.2 Installation of the remaining UNDP equipment (blowroom and yarn testing machines).

4.3 Air conditioning of the Spinning Department.

4.4 Increase the UNDP budget to complete payment for blowroom.

4.5 Utilization of project inputs. The facilities that have been created can be exploited in many different ways. To achieve maximum benefit for the Textile Industry of Vietnam, therefore, a comprehensive work plan should be drawn up and agreed by all interested parties.

4.6 Future extension of the facilities provided by the TRI including up-grading of the equipment between Blowroom and Open End spinning.

5. WORK PLAN

The work plan for Project implementation is attached.

6. DECISIONS/RECOMMENDATIONS

6.1 Increase the UNDP budget to cover the increased cost of the blowroom since UNIDO has no option but to complete the payment. Please note that there has been no price increase in terms of the DM.

6.2 Continue project implementation according to the Work Plan.

6.3 Install automatically-controlled air-conditioning in the spinning room (not the blowroom).

6.4 Prepare in detail a comprehensive work plan for the TRI to ensure that the facilities created through the project will be fully utilized for the benefit of the Vietnamese textile industry.

7. EVALUATION

An independent Joint Evaluation mission representing the Government, UNDP and UNIDO is planned for April 1991 to study whether there should be an extension (Phase II) of the Project and, if so, what the format should be.

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SUMMARY OF UNDP INPUTS

EQUIPMENT

Except where otherwise stated, all the equipment is now in operation.

Fibre Testing Laboratory

Fibrograph for testing fibre length parameters
Fineness/maturity tester
Fibre opener for preparing samples
Pressley tester for measuring fibre strength
Micronaire for rapid check on fibre fineness
Laboratory roller gin for separating fibres from seeds
Laboratory air conditioner

Yarn Testing Laboratory

Evenness tester for measuring the regularity of slivers, rovings and yarns, analysing wavelengths and identifying periodic variations. Also for counting the faults (thick and thin places and neps) in yarn. (Delivery expected end of 1990).

Tensorapid tester for measuring the strength and elastic properties of yarn. (Delivery expected end of 1990).

Pilot Spinning Plant

Blowroom Line (Delivered in Nov 1990. To be installed in Jan 1991)
Open-End (OE) Spinning Machine.
Laboratory air conditioner for use with the OE machine.

Other Items of Equipment

Project vehicle (Landcruiser)
Photocopying machine
Books and periodicals

TRAINING

The training programme of 2 Study Tours (9 persons) and 5 Fellowship groups (15 persons) has been completed.

EXPERTS

The CTA is undertaking split missions as planned.
The Expert in Appropriate Spinning Technology has completed his assignment.
The Expert in Textile Testing and Quality Control has completed one mission for fibre testing and will return in 1991 for yarn testing.
The OE Expert has installed the machine and trained the TRI staff.
The Blowroom expert will install the machinery in January 1991.

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EQUIPMENT - Revised December 1990 * = Installed

Req No	Item	Supplier	Cost($)	Remarks
88/1	Landcruiser +	Toyota	16,704	*
	Spare parts			*
88/2/1	Digital fibrograph	SDL)		*
/5	Fineness/maturity	SDL)	57,926	*
/2	Fibre opener	SDL	6,022	*
/3	Pressley Tester	Baer)		*
/4	Micronaire	Baer)	6,154	*
/6	Lab roller gin	Platt/SL	6,491	*
88/3	2xAir conditioner	BB/York	19,391	*
88/4/2	Blowroom line	Truetzschler	378,496	On site
88/5/1	OE spinner	Schlafhorst	148,700	*
88/7	PP copier	Kwan	1,538	*
88/8/1	Evenness tester	Uster	84,561)	Expected
/2	Strength tester	Uster	92,508)	Dec 90
88/10	Books/periodicals	Munksgaard	2,395	Revise for 91

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TRAINING - Revised December 1990

Number	Name	Duration	Remarks
FELLOWSHIPS			
Uster testing			
31-01	Hung Nguyen Manh	1	Implemented 1989
31-02	Minh Nguyen Quang	1	Zellweger Uster
Textile testing			
31-03	Dung Tran Thu	3	Implemented 1990
31-04	Hai Pham Bich	3	Bolton
31-16	Thu Ha Hoang	3	
OE Spinning			
31-08	Than Nguyen Kim	2	Implemented 1990
31-09	Duc Nguyen Minh	2	Schlafhorst
Blowroom			
31-05	Ding Giap Le	1	Implemented 1989
31-07	Quang Nhiem Huynh	1	Truetzschler, FRG
31-17	Mich Tran Van	1	
Appropriate spinning technology			
31-06	Minh Nga Tran	3	Implemented 1989
31-10	Chiem Tran Trong	3	India
31-11	Phong Pham Dinh	3	Extended to 3 m/m at
31-13	Dung Vo Thanh	3	request of UNDP
31-14	Chuyen Bui Thi (015)	3	

STUDY TOURS - Revised December 1989.

Research and Development (No 29)			
32-01	France, UK & FRG	4x1	Implemented 1987
Appropriate spinning technology (No 52)			
32-02	India & Australia	5x1	Implemented 1989

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EXPERTS - 1990 and Future - Revised December 1990

Post no	Title	m/m	Remarks
11-01	CTA	4	Dr R. Nield fielded Oct 90 Next missions Mar 91 and Nov 91. Co-ordinate and share cost with Project DP/VIE/86/015.
11-02	CC/Testing	1+1	Mr J. Mitchell fielded Nov 90. Next mission 1991 after Uster testers installed. Coordinate with 015 if possible.
11-05	Appropriate Spinning Technology	1.25	Mr Sharma fielded August 1990. Extended 1 week.
	OE Spinning		Mr Cit Duen Tai fielded August 1990. Installation and training completed.
	Blowroom		Truetzschler engineer expected early 1991.
	Uster Testers		Uster specialist to be requested as soon as equiment arrives. Share with Project 015 and charge to BL 11-05 of 015.

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WORK PLAN - PROJECT INPUTS AND ACTIVITIES - Revised December 90

	1989	1990	1991
Personnel			
11-01 Chief Technical Adviser	—	— — — — — —	
11-02 QC/Testing		— —	
11-05 App/Spinning Technology		—	
Blowroom Technician		—	
Open End Spinning Expert		— —	
Uster Specialist		—	
Fellowships			
Fibre testing. Bolton 3x3m/m		—	
Blowroom. Truetzschler 3x1m/m	—		
OE Spinning. Schlafhorst 2x2m/m		—	
Uster Equipment. Uster 2x1m/m	—		
App/Spinning Technology 5x3m/m	—		
Study Tours			
Research & Development (29) 4x1m/m	—		
App/Spinning Technology (52) 5x1m/m	—		
Equipment			
Fibre Testing	—		
OE Spinner		—	
Blowroom			—
Yarn Evenness tester			—
Tensorapid tester			—
Activities			
Fibre testing		—	—
OE Spinning			—
Short Fibre Spinning R & D			—
Design of A/T machines		—	
Manufacture of A/T prototypes		—	
Field testing of prototypes			—
Joint Evaluation of Project			—

VISIT TO THE NATIONAL COTTON COMPANY, NHA TRANG

Date of visit: 17 November 1990.
Visitors : Dr Bau, NPD and Dr Nield, CTA.
Official contacts: Dr Nguyen Tho, Director General
Dr Nguyen Huu Phiet, Vice Director.

The activities of the NCC include:-

1. Cotton breeding through its subsidiary, the Cotton Research Centre in Nhano.

2. Production of breeder seed, foundation seed and, eventually, certified seed for distribution to farmers.

3. Transfer of technology to farmers by running pilot schemes in various regions.

4. Buying raw cotton from farmers and selling cotton fibres to the textile mills.

The six regional stations contract with the farmers
- to supply seed, fetilizers, pesticides, etc
- to provide technical advice throughout the season and
- to purchase the raw cotton produced.

The cotton is then ginned by the NCC and sold to textile mills. Cotton seed oil is also controlled by the NCC.

Cotton is a traditional plant in Vietnam, but in competition with other crops. As there is a surplus in food production at this time, the Government is giving priority to cotton.

Originally, there was only Arboreum, mountain cotton, which is considered unsuitable for use by textile mills since the fibres are very short and coarse and transportation in the north of Vietnam is very difficult.

For many years, cotton has been imported for the textile mills, at subsidized prices, from the USSR but this is now going to stop. At normal market rates, imports of cotton would amount to US$ 100 million per annum.

During the past 10 years research has been carried out, with considerable success, into Hirsutum, American Upland type, cotton.

The demand from the textile industry for medium and long staple cotton is 60,000 tonnes/year which requires 250,000 Ha to be under cultivation. At present there are only 3,000 Ha. Next year it is intended to increase to 30,000 and in three years to 250,000 Ha.

Funding will be from the Central Government but production will be in the hands of Regional Governments.

VISIT TO THE COTTON RESEARCH CENTRE, NHAMO

Date of visit: 16 November 1990
Visitors: Dr Bau, NPD and Dr Nield, CTA.
Official contacts: Dr Nguyen Huu Binh, Director
Mr Le Kim Hi, Vice Director
Several Engineer

The CRC has been working for 15 years. It now employs 500 people of whom 100 are qualified. The extensive research laboratories are located on a 90 Ha site. The CRC has 2 main programmes:

1. Pest Control

- Their biggest problem is the American boll worm.
- Spraying by pesticides (by hand) may require 20 applications/year.
- By making use of various other insects to attack the eggs, larvae and the worm itself, spraying can be reduced to 3 applications/year.
- They have developed insecticides which attack the boll worm but not the other insects.

2. Cotton Breeding

- 90 Ha are under cultivation.
- Over 1,300 varieties of cotton from all countries are being studied and grown experimentally (in small lots)
- 2 varieties (MCU9 and M456-10) are now being grown on a production basis for release to farmers in Central Vietnam.
- Since ecological conditions (rainfall, soil type, etc) vary widely throughout Vietnam, promising varieties are grown experimentally in greater quantities in 6 regional stations.
- Some cottons can be grown on high ground without the use of pesticides.
- In the North, only Arboreum cotton (19-25 mm staple) can be grown because of the high humidity. The area under cultivation is 13,000 Ha.
- In Central Vietnam, medium staple Upland cotton (25-27mm) can be grown.
- In the South, long staple (30-32 mm) cotton can be grown.
- the total area under cultivation in Central and South Vietnam is 3,000 Ha.
- Next year the Government wish to increase this to 30,000.
- The target is self-sufficiency, which means 250,000 Ha, in 3 years time.
- It would be easiest to expand the growth of medium staple cotton (25-27 mm) but the textile mills insist on cotton over 28 mm staple.
- There are no textile technologists working at the CRC.

- It would be very helpful if the TRI could use its Pilot Plant to demonstrate that it is possible for the mills to produce acceptable yarns from 25-27 mm Vietnamese cotton. This would mean that the farmers would get a better price for the medium staple cotton and, therefore, they would be encouraged to grow more of it.

The 15,000 Ha of mountain cotton, grown by smallholders, is outside the system. This rough, short-staple cotton is only used locally for hand weaving. Whilst the soil in some areas of the North is very good for growing cotton, the lack of infrastructure presents a problem. Studies into how to improve the infrastructure and how to increase the staple length are in hand.

Small-holders farm 0.5 to 3.0 Ha per family and co-operatives 100-200 Ha.

The CRC use a saw gin (Platt Saco Lowell) in preference to a roller gin and intend to purchase a second saw gin.

The CRC use acid treatment to 'sterilise' cotton seeds. In other countries heat treatment is used.

Recommendations

1. The TRI should initiate tests to compare saw ginning of Vietnamese mountain cotton with roller ginning, as follows:
   - Obtain a sample of seed cotton from the north
   - Roller gin half at the TRI using the gin supplied by UNIDO
   - Saw gin the remainder at the CRC, Nhano
   - Compare the results in terms of productivity, quality of lint (especially fibre length properties - Fibrograph) and condition (openness) of the fibres leaving the gin
   - Spin both samples at the TRI and compare the yarns produced.

2. At a later stage similar tests should be carried out on medium and long staple cottons.

3. The TRI should design experiments and use its pilot plant to discover how to produce yarns acceptable to the textile mills from medium staple Vietnamese cotton.

4. If 3 does not prove completely satisfactory a study should be made of the effects of blending Vietnamese cotton with cotton imported from from the USSR. The proportion of Vietnamese cotton introduced should be increased step by step until the results become unacceptable.

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VISIT TO NHA TRANG SPINNING PLANT

Date of visit: 17 November 1990.
Visitors: Dr Bau, NPD and Dr Nield, CTA.
Official contacts: Nguyen Duy Thanh, Vice Director
Nguyen Thanh, Technical Manager

General Impression: A very good spinning mill with quite a good laboratory.

This mill was built in 1980/82 with Japanese machinery.
65% of the production is cotton yarn
35% of the production is Pe/Co yarn
The count range is Nm 34 to 102 (Ne 20 to 60).

In 1990, 2,000 tonnes of Nm 54 yarn was exported to the USSR. Smaller quantities (100 tonnes in all) were exported to Japan, Taiwan, Singapore and Thailand.

Normally cotton is imported from the USSR.

The management seemed very happy to co-operate with the Cotton Research Centre and also with the Textile Research Institute.

In 1989, in co-operation with the CRC and the TRI, 20 tonnes of yarn were produced experimentaly from Vietnamese cotton, type MCU 9. The quality was said to be satisfactory up to Nm 68 (Ne 40) but the fibres were too short for finer counts. They commented that it is a big step from experiment to production.

Quality Assurance for Exports

Either the customer gives specifications or the mill submits a sample.
The Government permits quality assurance tests to be carried out in the mill laboratory. (Is this a good idea?).

Special Features

There is a Truetzschler waste recovery plant for cleaning and baling waste from the mill.

The waste is then spun on 4 Toyoda Open-End (rotor) spinners.

A circular knitting section with 12 machines (single jersey and rib) has been recently installed.

A yarn dyeing section is under construction.

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GOVERNMENT BUDGET - Revised December 1990

Units: Dongs x 1,000

Item	Original Budget	Actual 1989	Actual 1990	Estimated 1991
1. Salaries of project personnel	1,440	10,000	20,000	15,000
2. Value of existing equipment	11,600	600,000		
3. Additional new equipment	1,260	860,000		
4. Installation of equipment		11,000	30,000	10,000
5. Locally made hand spinning equipment		12,000	20,000	
6. Construction				
- Project laboratory and pilot plant		388,000		
- Improvements to buildings	550	12,000	60,000	200,000
7. Raw materials	1,000	1,500	15,000	20,000
8. Miscellaneous	800	2,500	6,000	10,000
TOTAL	16,650	1,987,000	151,000	255,000

Annex 6
August 1990

UNITED NATIONS

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION
UNIDO

Job Description
DP/VIE/014/11-02/J13102

Post title	Textile testing and Quality Control expert
Duration	2 months
Date required	March 1991
Duty Station	Hanoi and Ho Chi Minh City (1/2 time in each)
Purpose of Project	To strengthen the capabilities of the Textile Research Institute in Hanoi and its Sub-Institute in HCMC of evaluating cotton fibres and yarns and conducting spinning development work, with particular emphasis on short staple cotton. This will enable the Institute to advise spinning mills on optimum processing conditions when using such cottons.
Duties	The expert will work with counterpart personnel, under the leadership of the CTA, and will be expected to assist the national staff to:

1. check all project instruments.
2. improve testing techniques if required.
3. organise the work of the laboratories.
4. prepare job descriptions for the staff.
5. develop procedures for routine testing and also for testing for research purposes.
6. utilise international calibration cottons to calibrate the laboratories and apply correction factors to their results.
7. evaluate Vietnamese and imported cottons.
8. evaluate yarns produced from Vietnamese and imported cottons.
9. begin to compile experience statistics.
10. establish quality assurance & certification procedures for yarns.

Qualifications:	At least 10 years experience in fibre and yarn testing and quality control and certification. Knowledge of the quality standards expected in importing countries.
Language	English
Background Information	As in Job description for post 11-01.

SUMMARY OF TRIPARTITE REVIEW REPORT BRING-UP DATE AUGUST 1991

PART A. (To be completed by the UNDP Resident Representative)

1. Project No | Title | Date of review

DP/VIE/86/014 | Short Staple Cotton | 12 December 1989

2. Agenda of review (Full agenda attached)

- Updated reports by CTA/NPD
- Operational issues
  - * Pilot plant buildings
  - * Utilization of project inputs
  - * Equipment
  - * Fellowships
  - * Budget for remainder of project.
- Relevance of project to Government's Development Plan.
- Timing and TOR for Joint Evaluation

3. Conclusions of the review concerning

(a) Follow-up of the previous review

All the decisions of the last TPR have been followed up.

(b) Project Design

It was found that the project concept remains very relevant to the Government's development plan which emphasizes the need to expand the production of consumer goods especially clothing by increased utilization of indigenous raw materials.

The Vice Minister of MOLI stated that the project had already made a significant contribution to the success of National Research Programme No 16A.

(c) Status of the project outputs

1. Output 1, cotton testing laboratory, has been fully produced.
2. Output 2, testing of yarn properties, will be produced after delivery and installation of the 2 instruments and the final expert mission.

3. Output 3, pilot plant for spinning. The Open End Spinning Machine is fully operational. The blowroom equipment has been delivered and we are awaiting the arrival of the installation engineer .

4. Output 4 has been produced. A set of hand ginning and spinning machines has been made at the TRI and installed in a village in Son La Province . A good report has been received.

(d) Status of project objectives

Considerable progress has been made and it is expected that the objectives will be fully reached within the intended life of the project (3 years from 8/8/88).

(e) Problems of implementation

These are fully explained in the CTA's progress report which was accepted as presented. A copy is attached. In general implementation is satisfactory.

(f) Follow-up to the project

This will depend upon the recommendations of the forthcoming evaluation.

(g) Outputs to be produced before the next TPR

All outputs as defined in the Project Document.

(h) Decisions and management actions

1. Continue implementation of the project according to the work plan given in the CTA's progress report (attached).

2. Owing to exchange rate fluctuations there is a budget shortfall of USD 60,703 in connection with Purchase Order 15 - 9 - 0789 Y (Blowroom). Government clearance is awaited to enable UNDP to issue an advanced authorization to UNIDO for settling the outstanding commitment to Truetzschler.

3. All participants of the TPR emphasised the need for a detailed, comprehensive work programme for the TRI to fully utilize the facilities provided by the project.

4. The Government undertook to provide automatically

controlled air-conditioning for the spinning room and to complete all civil works as planned.

5. The UNIDO Representative strongly recommended that arrangements be made for 2 or 3 staff members of the TRI to attend the next International Textile Machinery Exhibition (ITMA) in Hannover in September 1991 . The persons for this assignment should be carefully selected according to their technical expertise and their respective tasks should be clearly defined . Furthermore, they should be required on their return to disseminate the information collected . The Vice Minister welcomed this suggestion. Financial provision for this mission should be made in the next budget revision.

6. Schedule a Joint Evaluation mission for April 1991.

7. Schedule the Terminal TPR for December 1991.

In-depth evaluation needed	PPER available	Comments received before TPR			
		Ex. Aq.	Govt.	Req.	Bur.
Yes . April 1991	Yes	Yes	No		No

PART B. (To be completed by the UNDP/HQ Area Office).

Hanoi, 14 December 1990

Prepared by Dr. ROY NIELD, CTA

TERMS OF REFERENCE

JOINT EVALUATION MISSION
of the Government of the Socialist Republic of Vietnam/UNIDO/UNDP of Project VIE/86/014, Short Staple Cotton.

(Co-ordinated with a JE for Project VIE/86/015. Textile Testing)

Revised. December 1990

1. Background

1.1. The relevance of the project

The textile industry in Vietnam comprises about 880,000 spindles and 11,000 looms, roughly equally divided between the North and the South and generally operating at 50 per cent of installed capacity. Yarn production increased from 31,000 tons in 1981 to 51,000 tons in 1985 and fabric production from 116 million metres in 1981 to 203 million metres in 1985 (= 3,4 metres per capital). It is the intention of the Government to increase the fabric availability to 8 metres per capita by the year 2000. Assuming a population increase from the present 60 million to 70 million by the year 2000 this would mean a fibre raw material requirement of about 150,000 tons of which 100,000 would be cotton. The present cotton consumption is 60,000 tons per year - virtually all of it imported.

Of the 100,000 ton cotton requirement in the year 2000 the Government plans to cover 30,000 tons through local production - half of it plantation cotton* and the other half smallholder cotton** . This latter variety is the "short fibre cotton" to which the title of this project refers. It is grown on small plots mainly in the northern part of the country by villagers who convert it into coarse yarn and fabric using extremely primitive hand spinning and weaving techniques. The present production is limited to about 1,000 tons of lint cotton per year - roughly equivalent to 1,5 metres per capita among the northern hill tribes who grow and process it for their own use.

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* Hirsutum, 25-30 mm

** Arboreum, 16-25 mm

The stated goal of the Government to have 15,000 tons of this smallholder cotton available to the mill sector by the year 2000 is ambitious but not unrealistic. The Government intends to pursue it by increasing the area under cotton cultivation and the yield per hectare and by making available to the rural population improved methods and equipment for ginning and spinning part of the cotton for local use.

At present, the area under cotton cultivation in the rural areas is about 20,000 ha and the yield some 150 kg/ha. Assuming that the yield can be increased to 500 kg/ha - which would still only about one third of a normal plantation yield - the area under cotton cultivation should be increased five-fold to 100,000 ha by the year 2000 in order to produce 17,000 - 18,000 tons of lint cotton per year. The rural communities would process 2,000 - 3,000tons of this for their own use and the rest - 15,000 tons - would be available for the mill sector.

For the northern hill tribes, with a population of some 3 million, 2,000 - 3,000 tons of short fibre lint cotton would mean about 3,3 metres per capita of coarse cloth - twice their current consumption and sufficient to cover their need for that type of fabric.

Increasing the area under cotton cultivation five-fold should not present a problem, provided the farmers have an incentive for substituting cotton for other cash crops such as ground nuts, tapioca and beans. Also, it should be possible to increase the yield to about 500 kg/ha, provided that measures are taken to make available to the farmers suitable seed, fertilizer and insecticides. An FAO project* is addressing this issue.

The extremely short fibre length of smallholder cotton causes problems at all stages of the spinning process and, as stated , commercially available production equipment is normally not intended for this type of raw material, it is necessary to adjust and, in some cases, modify it to accommodate the short fibre. It will be the task of the Textile Research Institute to advise the textile mills on how to adjust and modify their production processes , and

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* DP/VIE/84/001 - Cotton Research Extension and Development (Phase II)

to be ready for this task when smallholder cotton is available for mill consumption in significant quantities. The Institute must start developing that knowledge now. To enable it to do so, external assistance is needed to provide the necessary laboratory and pilot plant equipment, expertize and training of the Institute's staff.

The sections which require updating to enable the Institute to carry out research on the use of short staple cotton are the spinning department and the testing sections associated with it - the cotton fibre and yarn testing laboratories and the miniature spinning sections. At present the spinning department possesses a range of equipment of Eastern European and Chinese origin covering the processing stages from carding through to ring spinning. This should be augmented by an integrated blow-room that would enable the opening up raw cotton and making it into laps suitable for feeding into cards. This will make it possible to transform raw cotton into yarn at the Institute without having to have the opening stages carried out elsewhere - a practice which would not only be inconvenient but also impractical when dealing with the relatively small quantities of raw cotton usually available for research purposes. Also, in most instances, the performance data from the blowroom is important to the investigation and this can only be obtained when the experiment is carried out on site. The proposed range of machines in the blowroom is the minimum possible and it is recommended that the cotton is passed through it twice to achieve the necessary degree of opening and cleaning. In addition, the Institute requires equipment for a technique, more suitable for spinning very short staple cotton than the ringframes they now possess ; a small-sized open - end rotor machine.

Both the fibre testing and yarn laboratories are equipped for slow , manual testing methods which restrict the amount of testing that can be carried out and consequently limit the lines of research that can be pursued. In the fibre test laboratories this can be overcome by installing rapid methods for measuring fibre length (Digital Fibro - graph), fibre fineness and maturity (IIC/Shirley Maturity Meter) and strength (Pressley). A Shirley Analyser (or its equivalent) will be provided so that the trash content of cotton can also be measured and, in addition, a Micronaire instrument with its associated equipment so that the Micronaire value can be determined.

(Micronaire value is a measure, obtained by an airflow method , in which values of fibre fineness and maturity are combined. Its virtues are that it is an easy measurement to make and its signifi - cance is widely understood by spinners.)

The yarn testing section will be equipped for rapid tests for single yarn strength and its variability (Uster Dynamat) and for measuring yarn irregularity, fault level and cleanliness on the Uster Evenness Tester. These last two instruments enable detailed analyses to be made of the effect of changes in the processing conditions at any stage along the yarn production sequence.

In foreseeable future, processing of small-holder cotton into coarse count yarns and fabrics for farm work clothing will continue in the northern rural communities where it is grown.If the present, primitive and totally inadequate methods and equipment for ginning, opening and spinning could be improved, it would provide an added incentive for these farmers to increase their cotton cultivation . The present equipment productivity is so low that increasing it ten -fold or more should present few technical problems. It is largely a question of choosing from the various available technologies and equipment one that could be easily adapted to the conditions in these villages and manufactured at the lowest possible cost.

The Textile Research Institute has already started work in this area and produced a few prototypes of ginning, opening and spinning equipment with improved productivity compared with the equipment currently used in the villages. However, further development work is necessary to perfect these and to experiment with alternative techniques. For this the Institute needs external assistance to give it access to potential sources of appropriate technology and to guide its staff in the development work.

1.2. The project document was signed on 8/8/88 with UNDP financial input of US$ 891,560 which was later increased to US$ 925,560 (31/8/89) and US$ 1,044,729 (15/12/89) and Government inputs of 16.65 million dongs VN (in kind). The actual Government input so far has been 689 million dongs which will increase to at least 830 million dongs in 1990.

1.3 The development objective of the project is to increase the availability of cotton textiles for domestic consumption.This objective is included in the III UNDP Country Programme for Viet Nam, Paragraph 50, and is line with the Government's development plan for the period 1986-90 which emphasizes the need to expand the production of consumer goods, especially clothing, by means of increased utilization of indigenous raw materials.

1.4 The immediate objective of the project is to strengthen the Textile Research Institute's capability of conducting cotton fibre avaluation and spinning development work, with parti - cular emphasis on the use of short staple cotton. This will enable the Institute to advise spinning mills on optimum processing conditions when using such cottons and to develop an improved hand spinning technology for use in remote rural areas.

1.5 The availability of an improved hand spinning technology would enhance the living standard of the rural population in geographically isolated, mountainous areas in northern Viet nam.

1.6 The following 4 outputs are envisaged :

(1) A cotton testing laboratory in operation, equipped and staffed to measure cotton characteristics such as length, strength, fineness, maturity and trash content.

(2) A spinning testing section equipped with rapid testing instrument for measuring yarn regularity,strength and faults determining spinning potential of various cottons by miniature spinning techniques.

(3) A pilot spinning plant in operation equipped and staffed to investigate optimum spinning conditions for full scale operation with special reference to the use of short staple cotton.

(4) A product development section engaged in the study of appropriate technology and the design and manufacture of prototype machines suitable for hand ginning and spinning of short staple cottons under village conditions.

1.7. Reasons to undertake the evaluation

- An evaluation was foreseen in the Project Document.
- Nearly all the inputs have now been completed.

2. Purpose

The purpose of the evaluation is to :

2.1. Assess the achievement of the project against the set objectives and expected outputs and in the light of this recommend any further action that might be necessary in order to improve the project ;

2.2. examine the extent to which results/outputs produced by the project have contributed towards the increase and efficiency of research and development activities on methods of spinning short staple cotton.

2.3. identify and assess the factors which facilitated the achievements of the project's objectives as well as those factors that impeded the fulfillment of those.

2.4. review the actual needs, scope and justification for an extension of the project, taking into consideration the current priorities the Government Development Plan.

3. Issues to be covered

In accordance with provisions contained in the UNDP Policies and Procedure Manual (PPM) the evaluation mission should be requested to consider the following :

3.1. Project Concept and Design

The Evaluation Mission should assess the appropriateness of the original project concept and design in the light of the present circumstances.

3.2. Implementation

- relevance, adequacy, quality and timeliness of the planned activities in relation to the project's objectives and workplan ;

- relevance, adequacy, quality and timeliness of the inputs planned both from Government and UNIDO in carrying out project activities and ability of project to utilize the inputs available ;

- quality and timeliness of the responsiveness of the project management to changes in the environment of the project ;

- quality and timeliness of monitoring and backstopping by the Government, UNIDO and UNDP .

3.3. Results

The Evaluation Mission should examine :

- the achievement of the results/outputs identified in the workplan ;

- the effectiveness and efficiency of operation of the testing equipment and pilot plant ;

- the utilization of the products produced by the pilot plant and results from scientific research and development work by the rural communities as well as the textile mills . Specifically the mission should look into the economic feasibility and potential benefits to the farmers of the

expansion of short staple cotton production in relation to other crops ;

- the utilization of the personnel trained on-site and overseas ;
- the effect on target institutions and any unintended effects which occurred.

4. Composition of the Mission

The Mission will consist of :

One representative of the Government of Vietnam

One representative of UNIDO (Textile Technologist)

One representative of UNDP (Textile Economist/Team Leader)

These representatives should not have been involved directly in the design, appraisal or implementation of the project.

5. Timetable and Itinerary

The Mission will be conducted during a period of two weeks in Vietnam. The time being shared between this project and project VIE/86/015. Both the UNDP and UNIDO representatives will receive prior briefing at the UNIDO Headquarters where substantive briefing will be provided by the backstopping branch (AGRO) while guidance on evaluation methodology and procedural requirements will be provided by the UNIDO Evaluation Staff. The UNDP Resident Representative and the UCD will brief the Mission upon its arrival in Hanoi and assist it during its stay. The Mission will complete its field work within two weeks, starting in Hanoi in April 1991 on a date to be determined. Upon completion of its work, it will be debriefed by the UNDP Resident Representative who will organize a meeting involving senior government officials where the Mission will present and be ready to discuss its initial findings, conclutions and recommendations. After completion of

the mission, the UNDP and UNIDO representatives will be debriefed at their respective Headquarters.

While in Vietnam, the Mission will draft a report on its findings and recommendation and the draft report should be presented to the Government for discussion. The report should be submitted in final form to UNDP Hanoi and UNDP and UNIDO Head - quarters (3 copies each). The UNDP will be responsible for formal submission of the report to the Government.

7. Consultation in the field

The Mission will maintain close liaison with the UNDP Resident Representative and UNIDO's field staff in Vietnam as well as with concerned Government organizations and the project's national and international staff.

Although the Mission should feel free to discuss with the authorities concerned anything relevant to its assignment, it is not authorized to make any commitments on behalf of the UNDP and UNIDO.