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TESTING OF TEXTILE RAW MATERIALS, YARNS  
AND FABRICS AND PRODUCT DEVELOPMENT

DP/VIE/86/015

VIET NAM

Technical report: Fifth 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

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ABBREVIATIONS

AVL	AVL Looms
BSO	Back Stopping Officer (UNIDO)
CRC	Cotton Research Centre Nhaho
CTA	Chief Technical Advise
ICBT	Manufacturer of silk processing machinery
JD	Job Description
JE	Joint Evaluation (UNDP, UNIDO & Government)
MOLI	Ministry of Light Industries
NPD	National Project Director
Prodoc	Project Document
Res Rep	Resident Representative of UNDP
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)
TTPR	Terminal Tri-Partite Review
UCD	UNIDO Country Director
UTE	Union of Textile Enterprises
VISERI	Vietnamese Sericulture Research Institute

Rate of Exchange

During the mission the official rate of exchange was

1 USD = 7,400 dVN

## I EXECUTIVE SUMMARY

This mission took place during March/May 1991, coordinated with a mission to Project DF/VIE/86/014 in Hanoi.

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.

The Vice Director of MOLI confirmed that the Project had already made a significant contribution to the success of the National Research Programme for the Textile Industry.

A progress report by the CTA is attached.

Output 1, physical testing laboratory, will be fully produced after the final expert mission.

Output 2, dyeing and finishing facility, has been produced.

Output 3, product development, which suffered some delays due to difficulties in selecting the most appropriate equipment for the testing and processing of silk, will be produced when the silk testing equipment is installed.

Output 4, dissemination of information, has been produced.

As expected, the main project objectives will be achieved by the middle of 1991.

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

The mandatory Joint Evaluation Mission took place in April 1991, co-ordinated with Project VIE/86/014 in Hanoi.

The CTA and the NPD were available throughout and assisted the JE as required.

The report of the JE was favourable and further UN assistance was recommended.

The TTPRs for this project and 014 are planned for 12 Dec 1991.

However, in view of the success of the Project so far, the favourable comments made at the TPR and by the JE mission, together with the Government's commitment to rapidly expand the production of raw cotton and raw silk, it is strongly recommended that the Project should be extended to build on what has already been achieved and further strengthen the capabilities of the TRSI in chemical testing and product development of silk.

## II INTRODUCTION

The main object 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.

The immediate objective is to strengthen the capability of the southern subsidiary of the Vietnam Textile Research Institute in the areas of physical and chemical testing, product development and dissemination of information.

These objectives were elaborated upon in the first mission report of the CTA (DF/ID/SER.A/1154).

### III RECOMMENDATIONS

1. Complete the building modifications. (NFD/Government)
2. Continue implementing the Project according to the Work Plan as revised in May 1991. (UNIDO/NFD/CTA)
3. Implement the recommendations of the JE to the extent possible. (Government/UNDP/UNIDO/NFD/CTA)
4. Implement the recommendations of the Experts to the extent possible. (NFD/Government)
5. Prepare, in detail, a comprehensive work programme for the TRSI to ensure that the inputs provided through the Project will be fully utilized for the benefit of the Textile Industry in the South of Vietnam. (NFD/Government)
6. In view of the success of the Project so far, the favourable comments at the TPR and the encouraging report of the JE Mission, it is strongly recommended that the Project be extended. In Phase II, the accent should be on:
  - further strengthening the chemical testing laboratory
  - studying modern industrial silk processing
  - studying potential export markets for Vietnamese silk products. (Government/UNDP/UNIDO)
7. Arrange for a specialist from USTER to check over the Tensorapid yarn strength tester, the Evenness tester and the Spinlab Digital Fibrograph. Co-ordinate with Project 014. (UNIDO)
8. Help the specialists from AVL, ICBT and USTER with formalities and provide all assistance necessary to enable them to carry out their work quickly and efficiently. (NFD)
9. Organize a study tour for 2/3 senior textile technologists of the TRSI to the ITMA International Textile Machinery Exhibition in Hannover in September 1991. NB: This opportunity occurs only once in 4 years. (UNIDO/Government)
10. Organize 2 fellowships in Shuttleless Weaving. (UNIDO)
11. Field the CTA for 2 months in the field plus 5 days home-based work within the period 17 October 1991 through 10 January 1992. (UNIDO)
12. Field the Textile Testing Expert for his final mission after the expected visit of the USTER specialist has taken place. Coordinate with Project 014. (UNIDO)
13. Organize the TPR on 12 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 identify and promote the action necessary to improve the implementation of the project.

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 containing sufficient information to facilitate appropriate decisions.

To draft the PPER for the TTPR in December 1991.

In accordance with the UCD and the Resident Representative of UNDP, to prepare a preliminary programme of meetings and visits for the JE.

To be available to answer questions as required and generally facilitate the work of the JE.

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 TRI in Hanoi, which is receiving assistance through project DP/VIE/86/014.

##### Counterparts

The NPD is Mme Pham Thi Minh Chau, Vice-Director of the TRSI. Co-operation between the NPD and the CTA in implementing the Project has always been excellent.

##### Meetings, Seminars, etc.

Frequent meetings were held with the NPD, the Director of the TRI, the Director of the TRSI and the Experts. All outstanding matters were fully discussed and necessary action agreed.

The status of the project was discussed with the Res Rep, the UCD, the UNIDO Field Officer and the UNDP Programme Officer.



On-the-job training was given to members of staff of the TRSI.

A seminar given at Textimex on Modern Methods of Spinning was attended by several members of staff of the TRSI.

Meetings were held with Mr Godi (Somet) and Mr Morris (Rieter).

The expert in Textile Testing/Quality Control gave a seminar on yarn testing.

#### Joint Evaluation Mission

Before the start of the evaluation exercise the CTA, in agreement with the Resident Representative and the UNIDO Country Director, drew up a preliminary programme including interviews with (a) the Res Rep and UCD; (b) officials of the Government coordinating and implementing agencies; (c) the National and International project staff and (d) the intended beneficiaries of the project outputs. Factory visits were also arranged. Details of the programme are given in Annex 8.

The recommendations of the JE as they apply to the TRSI are summarised in Annex 9.

#### Inputs

The project inputs are elaborated in Annex 1. All the equipment supplied was found to be in good condition apart from a few minor faults which will soon be rectified.

#### Budget

Mandatory budget revisions have been produced as required.

#### Documentary Outputs

CTA's Progress report dated May 1991.

Fifth Mission Report of CTA.

Comments by the NPD on the impact of the Project.

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

A detailed work plan for the remainder of the project.

Suggestions by the NPD for Phase II of the project.

#### Visits

The members of the JE mission were accompanied on visits to mills and other end-users of the project outputs.

#### V. CONCLUSIONS

Follow-up of the recommendations in the previous report and of the decisions taken at the TPR has been satisfactory.

All the equipment provided through the project is of very high quality and appropriate to the needs of the TRSI.

In general, the expert missions have been much appreciated and the staff of the Institute have responded well to the training provided through fellowships and in-house training.

The staff of the institute are now capable of utilising the equipment and carrying out basic maintenance on it effectively.

No serious difficulties in implementation of the Project are foreseen so, provided the work plan is followed up as outlined in this report, all the project outputs should be produced by the middle of 1991.

In view of the success of the Project so far, the comments made at the TPR and the findings and recommendations of the JE Mission, a Second Phase of the Project is strongly recommended in order to build on what has already been accomplished and to further strengthen the services provided by the TRSI to the Textile Industry in the South of Vietnam.

The importance of the work of the TRSI to the National economy will be increasingly apparent during in the next few years as the Government's ambitious plans to dramatically increase the production of both raw cotton and raw silk materialize.

VI ACKNOWLEDGEMENTS

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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 meetings.

Dr Mme Nguyen Thi Bau	Director of the TRI
Dr Tran, Quoc Thinh	Director of the TRSI
Mme Pham Thi Minh Chau	National Project Director
Resident Representative UNDP	
UNIDO Country Director	
UNIDO Field Officer	
UNDP Programme Officer	
UNIDO Headquarters Staff	
Mr J T Mitchell	UNIDO Expert in Textile Testing/QC
Mr J P F Massat	JE Mission
Mr L J Gibson	JE Mission
Prof Tran Nhat Chuong	JE Mission

## TESTING OF RAW MATERIAL, YARNS &amp; FABRICS &amp; PRODUCT DEVELOPMENT

DF/VIE/86/015  
VIETNAMPROGRESS REPORT DATED MAY 1991  
By Dr Roy Nield, CTA1. Introduction

- 1.1 The Project Document was signed on 8.9.88; the expected duration was 2 years.
- 1.2 The development objective is to increase the availability of good quality textiles for domestic consumption - especially clothing.
- 1.3 The immediate objective is to strengthen the capability of the Textile Research Sub-Institute in the area of physical and chemical testing, product development and dissemination of information to enable it to expand and improve its services to the textile industry in the South.

2. Progress

The decisions taken at the TPR in December 1990 have been followed up and implemented as follows:-

2.1 Buildings

In addition to the special room for the knitting section, another special room has been created for the silk processing section and the AVL loom.

All the processing rooms have been improved by suspended ceilings, tiled floors and better lighting. This has greatly improved the working conditions.

The library has been reorganised and is much improved.

2.2 Equipment

All the equipment selected for fibre, yarn and fabric testing and the chemical laboratory is in regular use.

The Tensorapid, the AVL loom and CAD equipment and the ICBT machines for processing silk were all installed by the staff of the TRSI. It was originally intended that installation would be carried out by the suppliers' personnel, but unfortunately it was taking too long to organize their visas and visits (e.g. the AVL had been waiting on site for 9 months) and it was realised that the time allowed for each visit would be insufficient to erect

and "clothe" the machines let alone give any training. It was, therefore decided to do as much work as possible before the arrival of the specialists.

The silk testing equipment has been shipped.

A list of the equipment supplied through UNIDO is attached

### 2.3 Training

Two Study tours (10 persons) and 13 fellowship groups have been successfully completed. It only remains to send the last 2 fellows for training in shuttleless weaving in Italy as soon as possible.

A list of the training activities is attached.

### 2.4 Experts

The experts have been fielded at appropriate times, i.e. after completion of fellowship training and delivery of the equipment.

The CTA's final split missions is scheduled for Oct 1991.

The second Textile Testing/Quality Control expert was fielded for 1 month (shared with 014) in Apr 91. His final mission is scheduled in June 1991.

Details of the Expert missions are attached.

In addition the following visits are still expected by specialists from the equipment suppliers:

AVL (3 days + travel) - to check the equipment and train the staff on the CAD and the loom.

ICBT (1 week incl travel) - to check the equipment and train the staff.

Uster (6 days shared with project 014) - to check over 2 evenness testers (minor fault at 015), 2 Tensorapids (minor fault at 014) and 2 Digital Fibrographs.

### 2.5 Outputs

Output 1, an operational physical testing laboratory, will be fully produced after the final expert mission.

Output 2, an operational dyeing and finishing facility, has been fully produced.

Output 3, a product development facility equipped and staffed with a sampling loom; a circular knitting machine; winding, doubling and twisting machines for silk and raw silk testing equipment has been produced apart from the

the silk testing equipment which is due to arrive any day.

Output 4, a strengthened information section, has been produced.

### 3. Budgets

The UNDP budget is summarised as follows:

Experts	\$ 142,991
Training	\$ 298,364
Equipment	\$ 546,813
Sundries	\$ 4,746
<u>TOTAL</u>	<u>\$ 992,914</u>

No increase is foreseen at this time.

The Government budget is attached.

### 4. Operational Issues

No particular difficulties are foreseen in providing the remaining inputs but the following issues need to be addressed:

#### 4.1 How to ensure that maximum benefit is derived from the testing facilities provided.

As a start, standard routines should be agreed for:

- Testing imported yarns.
- Quality certification of yarns for export.
- Testing the quality of the yarns produced in every cotton mill in Vietnam.
- Compiling experience statistics for future reference.

Targets for the work to be carried out should be set and reporting should be on a regular basis.

#### 4.2 How to derive maximum benefit from the product development facilities.

A comprehensive work plan for the TRSI should be produced.

In the case of cotton, there should be close co-operation with the Cotton Research Centre and, in the case of silk, with VISERI.

4.3 How to further strengthen the resources of the TRSI in future.

This is very important in view of the Government's intentions of (a) increasing ten-fold the area allocated to growing medium and long staple cottons and (b) investing heavily in development of the silk industry in 1991-95. In both these areas the TRSI will have an important part to play.

5. Work Plan

The work plan for the remainder of the project is attached.

6. Decisions and Recommendations

6.1 Finalise the building improvements.

6.2 Complete implementation of the work plan.

6.3 Study the Experts' reports carefully and implement their recommendations to the extent possible.

6.4 Study the findings and recommendations of the JE Mission and implement them to the extent possible.

6.5 Give serious consideration to the proposals put forward by the NPD designed to further strengthen the resources of the TRSI especially in the field of product development of silk (including shuttleless weaving).

7. Evaluation of the Project

A cluster Joint Evaluation mission took place in April 1991 covering this project and Q14. The main findings and recommendations are summarized in Annex 9.

The TTPR is scheduled for 12 December 1991.

STATUS OF THE UNDF INPUTS

The inputs have been provided except where otherwise stated.

1. EQUIPMENT

- Laboratory air-conditioner
- Thermohygrograph

Fibre Testing

- Fibrograph for testing fibre length properties
- Fineness/Maturity tester
- Fibre opener/blender for preparing samples
- Strength tester and accessories (Pressley)
- Micronaire for rapid check on fibre fineness

Yarn Testing

- Evenness tester (Uster) for measuring regularity of slivers, rovings and yarns, identifying periodic variations and counting faults (thick and thin places and neps) in yarns.
- Tensorapid tester for measuring strength and elastic properties of yarns.
- Crimp tester for synthetic yarns.
- Tensiometer for yarns.

Fabric Testing

- Thickness tester
- Abrasion tester
- Crease recovery tester
- Pilling tester
- Piece glasses (2) for fabric analysis

Chemical Laboratory

- Wash fastness tester
- Crocking tester for checking colour fastness
- Skein dyeing machine
- Viscosimeter for testing the viscosity of liquids
- Laboratory steamer
- Set of standard hydrometers

Silk Testing Laboratory (Delivery expected in May 1991).

- Length measuring meter
- Seriplane winder and 6 blackboards
- Seriplane illumination apparatus and standard photographs
- Duplan cohesion tester for silk filaments
- Drying oven for measuring moisture content of silk



Product DevelopmentWeaving

- Sampling loom with Computer Aided Design facility.

Knitting

- Circular knitting machine

Silk Processing

- Re-winding machine
- Doubling and twisting machine
- 2 for 1 twisting machine

Other Equipment

- Project vehicle (Landcruiser) and spare parts
- Air conditioning units (4)
- Overhead projector
- Photocopying machine
- Books and periodicals

2. TRAINING

- 2 Study tours (10 persons)
- 5 Fellowship groups (13 persons)
- 2 Fellowships in shuttleless weaving planned for 1991.

3. EXPERTS

The experts have been fielded at appropriate times:

- CTA (Split missions as scheduled)
- Silk Weaving Expert (2 months in 1990)
- Silk Degumming and Finishing Expert (1 month in 1990)
- Textile Testing/Quality Control Expert (1 month in 1990 and 1 month planned in 1991).

DF/VIE/86/015

Testing Raw Materials, yarns and fabrics + product developmentEQUIPMENT - Revised May 1991

(\* = Already Delivered)

Req No	Item	Supplier	Cost(\$)	Remarks
88/1	Landcruiser	Toyota	14,414	*
	Spare parts		2,290	*
88/2	Pressley tester	Baer	2,591	*
88/3	Micronnaire	SDL	4,947	*
88/4	Fineness/Maturity	SDL	23,113	*
88/5	Fibre blender	SDL	6,022	*
88/6	Evenness tester	Uster	75,112	*
88/7/1	Cloth abrasion	Heal)		*
/2	Cloth thickness	Heal)		*
/4	Pilling tester	Heal)	10,686	*
/3	Crease recovery	SDL)		*
/5	Crimp tester	SDL)	6,234	*
88/8/1	Wash fastness	SDL	6,888	*
/2	Crock tester	Heal	746	*
/3	Skein dyeing m/c	Roaches	8,872	*
/5	Viscosimeter	Roaches)		*
/6	Lab. steamer	Roaches)		*
/7	Hydrometers	Roaches)	6,345	*
88/9/2	Seriplane winder + 6 blackboards			
/3	Seriplane viewer + photographs			
/5	Manual length meter			
/6	Cohesion tester			Expected
/7	Drying oven	Toyo	55,058	May 91.
88/10/1	Doubler/twister			
/2	2 for 1 twister			
	Winding machine	ICBT	90,345	*
88/11	Sample loom	AVL	35,344	*
88/12	Knitting machine	Qualitex	36,650	*
88/13/1	Piece glass 25cm	Heal)		*
/2	Piece glass 20cm	Heal)		*
/3	Tensiometer	Heal)		*
/4	Thermohygrograph	Heal)	2,127	*
88/14	Overhead projector	Kwan	679	*
88/15	4 airconditioners	Kwan	2,204	*
88/16	Room conditioners	BB/York	12,326	*
88/17	PP copier	Kwan	1,649	*
88/18	Books/periodicals	Munksgaard	3,220	*
18/19	Digital fibrograph	SDL	38,082	*
	Strength tester	Uster	92,509	*

DP/VIE/86/015

Testing Raw Materials, yarns and fabrics + product developmentTRAINING - Revised May 1991.

Number	Name	Duration	Remarks
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FELLOWSHIPSTextile testing

31-01	Do Van Quong	3	Implemented May 1990
31-02	Nguyen Thi Ngan Ha	3	Bolton
31-03	Tran Thanh Lien	3	

Testing and processing of blends

31-08	Tran Gia Huyen	3	Implemented May 1990
31-09	Nguyen Anh Kiet	3	Bolton
31-10	Dinh Cong Quyet	3	

Standard testing procedures

31-12	Nguyen Thi Minh Duc	3	Implemented May 1990
31-13	Nguyen Thi Tuy	3	Bolton

Silk testing and processing

31-04	Ha Nhu Thi Viet	3	Implemented 1989
31-05	Thai Dao Duy	3	S. Korea + India
31-06	Vuong Cu Luu	3	
31-07	Thuy Pham Van	3	

Circular knitting

31-11	Lanh Tran Ngoc	1	Implemented January 90 Qualitex, UK.
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Shuttleless weaving

31-14	Nguyen Thanh Chuong	1	Scheduled 1991
31-15	Ho Van Tu	1	

STUDY TOURSTextile testing (No 53)

32-01	France, UK + Hungary	5x1	Implemented 1989
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Production of silk and blends (No 54)

32-02	Italy, France + S.Korea	5x1	Implemented January 90
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DP/VIE/86/015

Testing raw materials, yarns and fabrics + product developmentEXPERTS - 1990 AND FUTURE - Revised May 1991

Post no	Title	m/m	Remarks
11-01	CTA	4	* R. Nield appointed for split missions. Next mission Oct 91.
11-02	QC/Testing	2	H. M. Goerlach (1 m/m) Nov 90. * J. T. Mitchell (0.5 m/m) Apr 91 + final mission (0.5 m/m) Jun 91.
11-03	Silk weaving	2	J. C. Guigou Sep 90.
11-05	Degumming & Finishing	1	H. R. Hofstetter Oct 90.

AVL Technician Required as soon as possible.

ICBT Technician Required as soon as possible

\* USTER Specialist Required as soon as possible.

\* Co-ordinate with and share cost with Project DP/VIE/86/014.

DP/VIE/86/015

Testing Raw Materials, Yarns and Fabrics + Product Development

WORK PLAN - Revised May 1991

	1989	1990	1991
<u>Personnel</u>			
11-01 Chief Technical Adviser	—	—	—
11-02 QC/Testing		—	—
11-03 Silk weaving		—	
11-05 Degumming of silk		—	
AVL Technician			—
ICBT Technician			—
Uster Specialist			—
<u>Fellowships</u>			
Silk testing. S.Korea/India 4x3m/m	—		
Textile testing. Bolton 8x3m/m		—	
Circular knitting. UK 1x1m/m		—	
Shuttleless weaving. 2x1m/m			—
<u>Study Tours</u>			
Textile testing (No 53) 5x1m/m	—		
Silk and blends (No 54) 5x1m/m		—	
<u>Equipment</u>			
Physical testing	—		
Dyeing & Finishing	—		
Circular Knitting	—		
Silk testing (Toyo)			—
Product development of silk (ICBT)		—	—
Sample loom (AVL)		—	—
Tensorapid strength tester (Uster)			—
<u>Activities of TRSI</u>			
Physical testing - fibres & fabrics yarns			—
Dyeing and finishing tests			—
Testing of raw silk			—
Silk processing			—
Circular knitting			—
Sample weaving			—
Dissemination of information			—
<u>Joint Evaluation of Project</u>			
			—

DP/VIE/86/015

Testing raw materials, yarns and fabrics + product developmentGOVERNMENT BUDGET - Revised May 1991

Units: Dongs x 1,000,000

Item	Total	1989	1990	1991
1. National staff	90	30	30	30
2. Value of existing building & equipment	1,200	1,200		
3. New construction	188	110	40	38
4. New equipment	103	40	45	18
5. Miscellaneous expenses	29	14	5	10
<b>TOTAL</b>	<b>1,610</b>	<b>1,394</b>	<b>120</b>	<b>96</b>

1,610 million dVN = USD 217,500 (approx)

THE IMPACT OF PROJECT DP/VIE.36/0151. Introduction

Before the start of the project it was impossible to test the physical properties of cotton fibres at the TRSI because of a lack of the necessary equipment and expertise.

Only the simplest yarn tests could be made (count, twist and strength). The instruments were old and the results inexact. The only fabric property tested was density of fabric. The chemical laboratory tested chemicals and dyestuffs using simple equipment (mainly glassware).

Some processing of raw silk (re-winding, doubling, twisting, warping, reeling, etc) was carried out, with difficulty, on obsolete machines. Fairly good embroidery yarns were produced but the technology was not sufficiently exact for weaving yarns.

Only very old, shuttle looms were available. There were many faults in the fabrics produced. Design of new fabrics was restricted to simple structures drawn out on paper.

There was no knitting section.

The Information Section consisted of only a few Russian and Vietnamese magazines.

In spite of these limitations, the TRSI was performing some useful tasks: mainly working in the textile mills.

The Project was designed to strengthen the capabilities of the TRSI in physical and chemical testing, product development and dissemination of information.

The Government of Vietnam has contributed by improving the existing premises, including the preparation of new rooms for knitting and silk processing, and adding some equipment.

2. Impact of the Project on the Textile Research Sub-Institute2.1. Cotton Fibre Testing

As a result of the equipment and training provided through the project, the TRSI is now capable of testing cotton fibres according to International Standards (ISO, ASTM, etc). viz:-

- Fibre length characteristics (Spinlab)
- Preparation of samples (Fibre sampler and Shirley blender)
- Fibre maturity (IIC/Shirley)
- Fibre bundle strength (Pressley)
- Micronaire.

Impact of DP/VIE/86/015 (continued)2.2 Yarn Testing

The old procedures for yarn testing are still available on request but most yarn tests are now carried out according to International Standards using the high speed, high volume equipment supplied through the Project, as follows:-

- Evenness, thick and thin places and neps (Uster III)
- Strength and extensibility (Uster Tensorapid 3)
- Crimp rigidity

NB: The TRSI has recently been made a "Designated Laboratory" authorised to issue Quality Acceptance Certificates for yarns for export. It has also been charged with the duty of testing the quality of imported cottons.

2.3 Fabric Testing

The following fabric tests are now available:-

- Fabric structure (Counting glass with pointer)
- Fabric thickness
- Fabric dimensions
- Tendency to pilling (ICI)
- Abrasion resistance (Martindale)
- Tensile strength and elongation (Uster Tensorapid)
- Crease recovery
- Colour fastness to crocking

All the above tests are carried out in an air-conditioned laboratory.

2.4 Wet Processing

The facilities for testing dyestuffs and auxiliaries have been improved. The following tests are also available:-

- Colour fastness to washing, etc (Shirley Autowash)
- Viscosity of liquids (Viscosimeter)
- Testing of hydrometers (standard hydrometers)
- High temperature dyeing (Skein dyeing machine)

2.5 Testing of raw silk

Sericulture (the production of raw silk) is the responsibility of the Ministry of Agriculture and FAO whilst silk processing (yarn manufacture, weaving, knitting, degumming, finishing and making-up, etc) is the responsibility of MOLI and UNIDO. The Government wishes to revive its silk processing industry which has declined in recent years.



Impact of DP/VIE/86/015 (continued)

The first essential in starting product development work in the field of silk processing is to be able to measure the properties of raw silk scientifically. The following tests can now be carried out on raw silk:-

- Visual appraisal (by sight and hand)
- Size of yarn (measuring meter and balance)
- Evenness, neatness and cleanliness (Seriplane winder, viewing apparatus and standard photographs)
- Yarn strength and elongation (Serimeter)
- Cohesion of filaments (Duplan tester)
- Moisture content and conditioned weight (Inspection dryer)

## 2.6 Knitting section

A separate room has been made for the knitting section. One circular knitting machine has been supplied by UNIDO and one by the Government. It is possible to design new patterns and produce samples.

## 2.7 Sample Weaving

Woven fabrics can be designed quickly using a computer and software from AVL. The designs can be studied on the screen, printed out on paper or woven on a very sophisticated hand loom, as required.

Powerloom weaving is still only possible on very old machines. A modern, shuttleless loom suitable for weaving both cotton and silk would be a great asset.

## 2.8 Silk Processing

A separate room has been prepared for silk processing. Winding, doubling and twisting can now be carried out at high speed on modern machines from ICBT with regular tension and twist which can be carefully controlled over a very wide range, 50 to 4,000 turns/metre. This equipment is suitable for the production of embroidery thread as well as knitting and weaving yarns.

## 2.9 Information section

Some important works of reference (e.g. ASTM Standards) and various text books and periodicals are available for study in the information department.

Technical information is disseminated throughout the textile industry through a bulletin. Previously 500 copies were distributed monthly. Because of the costs involved, however, the procedure is under review.

Impact of Project BP/VIE 95/015 (continued)3. Impact of the Project on the Textile Industry

The immediate objective was to strengthen the capability of the TRSI in the areas of physical and chemical testing, product development and dissemination of information so that the impact of the Project on the Textile Industry will be through the enhanced activities of the TRSI in these fields.

It is too early to quantify the extent of this impact since the Tensorapid, the silk testing equipment, the silk processing equipment and sample loom have only just been delivered. However, the following end-users are expected to benefit substantially:-

3.1 Fibre Testing

- Textimex (Importing of cotton)
- Textile Factories (Selecting cottons for various end purposes)
- Cotton Research Centre, Nhao (Evaluation of new varieties)

3.2 Yarn Testing

- Textimex (Export quality control and certification)
- Textile Factories (In-plant process control)

3.3 Fabric Testing

- Textimex
- Textile factories

3.4 Wet Processing

- TRSI product development programme.
- Textile factories.

3.5 Raw Silk Testing

- TRSI product development programme
- VISERI (Independent quality tests)
- Vinacontrol (Certification of raw silk, yarns, etc)
- Small silk farmer/producers
- Small silk users (Quality control of raw materials)

3.6 Silk Processing

- VISERI (Practical tests to provide data for sericulture)
- Textimex
- Embroidery yarn producers (Generalimext, Imeco, etc)
- No 6 Mill (Weaving trials)
- Small yarn producers
- Small weavers in HCMC (Tanbinh and Govap) and in Danang.
- Thanh Cong and Tan Binh factories in HCMC.

3.7 Knitting

- Cotton textile factories
- Silk knitters

Impact of DP/VIE/86/015 (continued)3.8 Fabric Design and Sample Weaving

- Textimex
- Textile designers
- Institutes of education in textiles

3.9 Information Section

- MOI
- Textimex
- Textile factories
- Institutes of education in textiles.

JOINT EVALUATION MISSION DP/VIE/86/014 AND DP/VIE/86/015PROGRAMME

- 13.4.91 Arrival of Mr L J Gibson (UK), UNIDO, Consultant
- 15.4.91 Arrival of Mr J J P Massat (France), UNDP, Team Leader
- Joining of Prof Tran Nhat Chueng, Government of Vietnam

- Itinerary:
- 15.4.91 Hanoi
  - 21.4.91 Travel to Ho Chi Minh City
  - 27.4.91 Return to Hanoi
  - 4.4.91 Departure of Mr Massat
  - 8.5.91 Departure of Mr Gibson.

HANOI (Project DP/VIE/86/014)

- 15.4.91 Meeting with Resident Representative and UCD.  
Discussions with CTA
- 16.4.91 Meeting with the NPD (014)  
Visit to the Testing Laboratory  
Visit to the Pilot Plant  
Meeting with the Director of the Vietnamese Cotton Company  
Meeting with the Director of the Cotton Research Centre Nhaho
- 17.4.91 Visit to Hanoi Spinning Mill  
Visit to 8th March Textile Mill  
Discussions with Expert in Textile Testing
- 18.4.91 Visit to Textimex
- 19.4.91 Meeting with Government officials at MOLI (Chairman the Vice Director)
- 20.4.91 Textile Research Institute - Meeting with NPD.

21.4.91 - Travel to HO CHI MINH CITY (Project DP/VIE/86/015)

- 22.4.91 Meeting with NPD (015)  
Visit to Physical and Chemical Laboratories  
Visit to Product Development sections
- 23.4.91 Visits to Thanh Cong and Thong Loi factories
- 24.4.91 Visit to Oratex (Private sector hand embroidery factory)  
Visit to No 6 Mill (Silk trials)  
Meeting with CTA  
Meeting with NPD
- 26.4.91 Final meeting with NPD to discuss findings.

27.4.91 - Return to HANOI

- 3.5.91 Tri-Partite Meeting to present draft report of JE

FINDINGS AND RECOMMENDATIONS OF THE JE - DP/VIE/86/015

(Page 18 of the Report of the Evaluation Mission, May 1991)

III. The findings of the evaluation mission

The main finding is that the project has been well conceived and designed, properly implemented and beneficial results are already evident even before the new facilities are fully on stream. Inputs, in accordance with the project document and subsequent revisions have been implemented and the envisaged outputs have been produced (with still a few outstanding items).

The Institute is operating its new equipment, delivering service in the form of test results, quality certificates and development samples to industrial organizations in the area. It is too early to quantify performance but there is clearly close cooperation and information exchange between the Institute and its end-user organizations.

Recommendations

It is recommended that assistance be given to further strengthen the Textile Research Sub-Institute in Ho Chi Minh City as follows:

- to promote a study tour to learn about the structure organization, technology and development of successful silk processing industries in Asia (Thailand, if possible is a prime choice for study)
- to promote an expert study of the markets which are open to potential silk producers in Vietnam
- to further strengthen the capabilities of the chemical laboratories, particularly for laboratory-scale work on the dyeing & finishing of silk and the identification & analysis of trade samples
- to further strengthen the physical testing laboratory by introducing tests for the trash content, colour, stickiness and moisture content of cottons.

The evaluation mission does not recommend at this stage the extension of the product development section to include full scale, high speed weaving plus the subsequent finishing operations. Development of this type may eventually take place in cooperation with industry and on industrial premises.

SUGGESTIONS FOR THE PHASE 2

Prepared by the NPD

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1. Through the implementation of the project VIE/86/015 the TRSI has been strengthened on such fields as :

- A modern laboratory in which it is possible to carry out tests on mechanical physical properties and quality control of cotton fibres, yarns, fabrics, silk according to International standards.

- Three ICBT machines (rewinding, doubling and twisting) to produce silk yarns with high quality for embroidering, weaving and knitting.

- Possible to carry out small sample trials for silk on dyeing and steaming equipment (colour fixing device for printed silk fabric).

- All fellows have been improved on their specialities like machine installation, technology lay out, lab works etc.

- Having been supplied textile informations in the world by periodicals of the project.

2. There remain, however, some problems which restrict the development of the project results, as follows :

- There is no testing and quality control equipment for synthetic fibres.

- The capability of the chemical lab is still weak.

It is impossible to test completely physico-chemical properties for chemicals, dyestuffs, coloured yarns and fabrics.

- It is still difficult for silk experimental works because of a lack of the necessary small size equipment like degumming, dyeing, printing to make samples with the purpose of setting up optimum technological specifications and processing procedures which should be laid out in production.

- Because the weaving machines are too old they are not appropriate in the new silk yarn processing line (ICBT equipment), and it is impossible to control weaving specifications so that research results are incorrect.

3. To overcome the above things and in accordance with requirements of factories and private producers, the TRSI suggest there should be a phase 2 of the Project with the following immediate objectives :

3.1 Extending the testing and quality control facilities to cover synthetic fibres.

3.2 Perfecting the chemical laboratory capabilities to meet research and production requirements in such fields as : chemicals and dyestuffs testing; quality control and testing chemical properties of coloured yarns, fabrics and silks which are imported or exported.

3.3 Perfecting the experimental line for silk :  
weaving, degumming, dyeing, printing and finishing in order to set up optimum technological procedures which will be transferred to production.

#### 4. Equipment

1. A shuttleless loom for producing silk fabric only  
(Based on latest information, SOMET loom (Italy) is the most suitable for high quality silk fabric).
2. A small star degumming equipment of NOSEDA (Italy)
3. A small beam dyeing unit for silk woven fabric (South Korea)
4. A small unit of MEZZERAS hanks/yarn dyeing machine, also for degumming (Italy)
5. A sample printing machine for printed silk fabric (Austria)
6. High precise analysing balance for weighing chemicals and dyestuff (Germany)
7. Steamer with 500 KG/h (Japan)
8. Temperature adjustable drying oven
9. Light Fastness Tester for fabric (Germany)
10. Single Fibre linear density Tester for synthetic fibre (Germany, UK) .
11. Single Fibre Crimp Tester for synthetic fibre (UK)
12. WIRA single Fibre strength Machine for artificial and synthetic fibre.

5. Experts :

- CTA : 3 months/person
- Technical experts from the suppliers. (machine installation, instructions for use, servicing) for complicated equipment only. From 10 to 14 days for each unit.
- Expert in economy and textile market, especially for silk export market.
- Expert in silk dyeing and finishing (Mr. Raymond Hofstetter) after installation of units : 1 month/p.

6. Training :

- Studytour on fashion and market in Middle East and Europe :  
3 persons, 1 month/p.
- Training course on designs and trials of woven and knitted fabric, especially for silk.  
3 persons, 6 weeks/p (France, China)
- Training course on chemical laboratory and trials of degumming, dyeing and printing.  
3 persons, 6 weeks/p.

7. Estimated budget :

VN Government	:	750 million	DVN
UNDP	:	700,000	USD
Duration	:	1 year.	

The National Project Director

PHAM THI MINH CHAU