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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

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

DP/VIE/86/015

VIET NAM

Terminal report*

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

* This document has not been edited.

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TABLE OF CONTENTS

ABBREVIATIONS

AVL	AVL Looms
BSO	**Backstopping Officer (UNIDO)**
CRC	Cotton Research Centre Nhaho
CTA	Chief Technical Adviser
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
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 life of the Project the official rate of exchange changed from approximately 1 US$ = 3,000dVN to 1 USD = 12,000 dVN.

1. OBJECTIVES AND LOGIC OF THE PROJECT

The development objective is to increase the availability of good quality textiles for domestic consumption. This objective is in line with the Government's development plan which emphasizes the need to expand the production of consumer goods, especially clothing.

The immediate objective of the Project, as stated in the Project Document and refined at subsequent meetings, was to strengthen the capabilities of the existing Textile Research Sub-Institute in the following areas:

- Physical and chemical testing of textiles,
- Quality assurance testing and certification of yarns for export,
- Development of textile products - especially silk,
- Dissemination of information,

so as to enable it to expand and improve its advisory services to the textile industry in the south of **Viet Nam**.

Project Concept

The textile industry in **Viet Nam**, which comprises about 880,000 spindles and 11,000 looms roughly equally divided between the north and south was, and still is, facing serious difficulties leading to low productivity and poor product quality.

Most of the factories are processing cotton and operating at around 50% of their installed capacities. The raw material base as regards fibres, chemicals and auxiliaries is heterogeneous which makes process control difficult. Equipment for the most part is outdated, run down and originates from too many different sources for effective maintenence and spare-part procurement.

The scarcity of capital precludes new investment on the scale that would be necessary to modernize the cotton textile industry.

Access to technical information from abroad is inadequate.

Sericulture is practised to some extent in **Viet Nam** but the **Viet Namese** silk manufacturing industry has been completely run down. The raw silk is processed by hand or exported.

To supplement other measures deemed to be necessary to meet the target of increased availability of good quality textiles for clothing, the Government established in 1980, in Ho Chi Minh City, the Textile Research Sub-Institute to serve the mills in the South, with the following mandate:

- to test raw materials, dyestuffs and auxiliaries for quality and suitability for the intended end-products;

- to develop specifications for new products in accordance with the requirements of the Ministry of Light Industry and the Union of Textile Enterprises and to advise on their manufacturing;

- to carry out quality checks in the factories and assist in quality control in general at all stages of the industrial process;

- to develop standards for yarns and fabrics;

- to disseminate technical information;

- to develop and adapt technological processes in order to assist factories in coping with their perennial spare-parts problem;

Later, several additional duties were added:

- When problems arose with the supply of cotton from the USSR and the Government's decision to increase the production of medium and long staple Viet Namese cottons, the TRSI was also charged with assessing the quality of indigenous and imported cottons and cooperating in the development of new varieties.

- When some mills started to export yarns and fabrics, the TRSI was required to issue Quality Assurance Certificates.

- When the Government decided that the Viet Namese silk processing industry should be revitalized, the TRSI was given a leading role.

Background of the TRSI

The Textile Research Institute (TRI) in Hanoi was founded in 1969 to serve the textile industry. This was helpful to the factories in the North but could do little for those in the South because of the geography and problems of communication. The need for an similar institution in the South was apparent and so the TRSI was founded in 1980 in Ho Chi Minh City - in very poor premises and with whatever equipment was available, most of which was very old and unsuitable.

It was clear that a great deal of work would be required to make the TRSI viable so assistance was sought from UNDP/UNIDO.

The Pre-Project Situation

The situation before the start of the Project, therefore, was that the TRSI was housed in very poor premises. All its equipment, which included old instruments for testing fibres and yarns and machines for throwing raw silk and for weaving samples of cloth, were virtually obsolete.

The existing "laboratories", although adequate in size, were totally unsuitable for scientific investigations; they had no insulation, no controlled ventilation, no air-conditioning and very poor lighting. The instruments and other equipment were so old and in such poor condition that any test results obtained were inexact and of little value.

Before the start of the Project there was no possibility of carrying out meaningful tests on fibres, yarns or fabrics at the TRSI because of unsuitable premises and the lack of the necessary equipment and expertise. It is impossible to carry out textile testing according to international standards without the correct equipment in a laboratory maintained at Standard Atmospheric Conditions, which are 20 or 27 C +/- 2 C and 65% r.h. +/- 2% r.h.

Only the simplest yarn tests of count, twist and strength could be made for internal purposes. The only fabric test was density of fabric.

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

There was no knitting equipment and the Information Section had only a few magazines in Russian and Viet Namese.

On the positive side the management and staff of the TRSI, despite being starved of technical information from abroad and handicapped by limited physical facilities, were found to be very enthusiastic and hard-working and had embarked upon the tasks set them with enthusiasm. They were doing their best to educate themselves and carry out tests in different mill laboratories. Their services to industry were already being appreciated.

The chemical laboratory was carrying out several useful tests on 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 the obsolete machines. Embroidery yarns were successfully produced in small quantities for the hand-embroidery industry to replace yarns previously imported. The quality was remarkably good in the circumstances but productivity was very low.

It was against this background that the Project was designed.

Project Design

The main assumption in the original Project design was that the strengthened TRSI would be able to cooperate with the textile industry in South Viet Nam to increase the availability of good quality textiles for domestic consumption in accordance with the third UNDP Country Programme for Viet Nam (para 50) and in line with the Government's Development Plan for the period 1986-1990.

Since the project was conceived, the Government has planned a very substantial increase in the production of Viet Namese medium and long staple cotton, which is of good quality, to replace imported cottons and has also decided to revive the traditional silk industry with a view to producing finished goods for home consumption and export rather than exporting only raw silk. These two additional, very logical and desirable aims have brought increased pressure on the inadequate resources of the fledgeling TRSI and made the Project more pertinent and timely than ever.

The Project was designed to strengthen the capabilities of the TRSI in the following designated areas:

- Testing of fibres, yarns and fabrics;
- Testing of chemicals, dyestuffs and textile auxiliaries;
- Testing of raw silk;
- Product development, especially in processing of raw silk;
- The ability to develop standards for yarns and fabrics;
- Dissemination of technical information.

In view of the very wide mandate given to the TRSI and the limited Project budget, it was not possible to give equal priority to every aspect.

The following 4 Project Outputs were envisaged:

1. An operational physical testing laboratory;
2. An operational dyeing and finishing facility;
3. A product development facility equipped and staffed with a sampling loom, a circular knitting machine, winding, doubling and twisting machines for silk and instruments for testing raw silk; and
4. A strengthened information section.

It was planned that UNDP/UNIDO would provide training, through study tours and fellowships, expert advice and most of the equipment, whilst the Government, through the TRSI, would make sufficient staff members of suitable ability available when required and take the necessary steps to improve the buildings.

The UNDP/UNIDO inputs are shown in Annexes 1,2 and 3 and 6.

The Government inputs are outlined in Annex 5.

2. PROJECT ACTIVITIES AND OUTPUTS PRODUCED

Buildings

The Government have made great improvements to the premises:

The physical testing laboratory has been completely re-organized and is now air-conditioned. Separate rooms have been provided for the silk testing equipment and the computer aided design facility. The chemical laboratory has also been improved.

Special rooms have been prepared for the knitting section, for the silk processing machinery and sample loom, and for the library and information section.

Many other improvements not directly concerned with the Project have also been made, for example a garage for 2 cars, a new entrance, a conference room, trees and flower beds round the central quadrangle, etc.

Much of the very old machinery has been discarded and the old processing laboratory for silk has been transformed with a new roof, a suspended ceiling, improved lighting and a tiled floor.

The electrical system has been modernized and strengthened to supply power, lighting and protection for the new equipment.

Equipment

All the agreed UNDP/UNIDO equipment has been supplied. It was well selected and is in good working order.

The fibre and yarn testing instruments represent the latest technology and have sufficient capacity to meet all requirements. A fibre trash analyser would be an asset.

The fabric testing and chemical laboratory equipment supplied is very good but the range is less comprehensive.

The silk testing equipment is the same as that used throughout the world. This is the only full set in **Viet Nam.**

The silk processing machines from ICBT combine high production with high quality. This is the most modern installation in **Viet Nam.**

The sampling loom with CAD is also a first in **Viet Nam.**

The circular knitting machine is satisfactory.

The TRSI have, from their own financial resources, purchased 2 new shuttle looms suitable for silk and 2 new WAGA circular knitting machines suitable for knitting un-degummed silk.

Training

All training programmes, 2 Study Tours (10 persons) and 6 Fellowship groups (15 persons) have been successfully completed and reports have been issued.

On-the-job training and seminars have been given by the CTA and the other Experts.

Experts

The experts were fielded at appropriate times, i.e. after completion of fellowship training and delivery of the equipment. The CTA undertook split missions as planned.

Outputs

No serious difficulties were encountered, cooperation between the NPD and the CTA in implementing the Project was excellent and good support was provided by the Government authorities.

All 4 Project outputs were produced as expected.

The Physical Testing Laboratory (Output 1) has been produced. All the usual fibre and yarn tests can now be carried out rapidly and in accordance with international standards.

The Dyeing & Finishing Facility (Output 2) has been produced as planned and is working overtime. Many useful tests can now be made. However, additional inputs will be required in the future to extend the range of activities in this field.

The Product Development Facility (Output 3) is better than originally planned.

Fabrics can be designed on the CAD equipment and woven on the sample loom.

The circular knitting machine is suitable for both cotton and degummed silk. The 2 circular knitting machines provided by the TRSI are good for un-degummed silk.

All the usual tests on raw silk can be carried out on the equipment provided.

The short-length silk winding, doubling and twisting machines enable the TRSI to produce high quality yarns.

The Information Section has been strengthened (Output 4) to some extent by the supply of much needed text books and periodicals. It is hoped that a way will be found to continue the supply of periodicals to the TRSI now that the Project has ended.

3. ACHIEVEMENT OF IMMEDIATE OBJECTIVES

The main objective of the Project has been achieved in that the TRSI has been considerably strengthened in the areas specified.

Before the Project the TRSI was very weak. There were some good people but the buildings were unsuitable, the equipment was poor and the staff were hampered by lack of the necessary knowledge of modern textile technology as practised in developed countries.

During the lifetime of the Project all this has changed. The TRSI has been transformed into a strong Institution capable of providing many of the services required by the textile industry in the south.

The fibre testing laboratory is well equipped for testing cotton fibres and the staff are well trained on the modern instruments and techniques. Before the Project it was impossible to test the physical properties of cotton fibres because of the lack of the necessary equipment and expertise. Now the following tests are available:

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

Before the Project, only the simplest yarn tests could be made. The instruments were old, the procedures very slow and the results inexact. Now yarns can be tested accurately according to international standards on the latest, automatic, high speed, high volume equipment. The following tests are now available:

- Count and count variation
- Strength and strength variation (Uster Tensorapid 3)
- Evenness (Uster Tester III with Spectrograph)
- Thick and thin places and neps (Uster Tester III)
- Twist and twist variation
- Appearance.

The following fabric tests are now available:

- Fabric structure, thickness and dimensions
- Tendency to pilling (ICI)
- Abrasion resistance (Martindale)
- Tensile strength and elongation (Uster Tensorapid)
- Crease recovery
- Colour fastness to rubbing (Crockmeter)

All the above tests are carried out in a clean, spacious, air-conditioned laboratory with automatic control of both temperature and relative humidity.

The facilities for testing chemicals, dyestuffs and auxiliaries have been improved and, in addition, the following tests are now available:

- Colour fastness to washing, etc (Shirley autowash)
- Viscosity of liquids (Viscosimeter)
- Accuracy of hydrometers (Standard hydrometers)
- High temperature dyeing (Skein dyeing machine)

Sericulture (the production of raw silk) is the responsibility of the Ministry of Agriculture and FAO whilst the processing of silk (from raw silk to finished product) comes under MOLI and UNIDO. The Government wishes to revive the **Viet Namese** silk processing industry which has declined to almost zero in recent years and the TRSI is expected to play an important part in this work by:

- measuring the properties of raw silk accurately.
- producing samples of silk yarn for weaving, knitting and embroidery trials within the Institute and elsewhere.
- carrying out weaving, knitting and finishing trials on both raw silk and finished silk yarns.

As a result of the training that has been given through study tours, fellowships and expert missions, the equipment that has been provided for testing raw silk and for processing raw silk into yarns for weaving, knitting and embroidery, the TRSI is now well placed to perform these services.

The following tests are available for raw silk:

- Visual appraisal by sight and hand
- Size of yarn (Measuring meter and balance)
- Evenness, neatness and cleanliness (Seriplane)
- Strength and elongation (Serimeter)
- Cohesion of filaments (Duplan)
- Moisture content and conditioned weight (Inspection dryer)

Raw silk can be processed into knitting, weaving and embroidery yarns on the latest ICBT machinery.

Knitting trials can be made on cotton and silk yarns and raw silk.

Woven fabric designs can be prepared quickly on the computer screen, printed out on paper, and transferred to the AVL sample loom using software provided through the project. When the design is settled, sufficient quantities of fabric can be woven on the new shuttle looms for making-up into end-products.

Better facilities are now available for the information section including a conference room with facilities for overhead projection and video and a better equipped and more pleasant

4. UTILIZATION OF PROJECT RESULTS

With a view to becoming self sustaining as far as operating costs are concerned and to purchasing essential spare parts and some new equipment, the TRSI is generating income by utilization of the project results as follows:-

Source of Income	1989	1990	1991
1. National Silk Project (US$)	20,000	20,000	23,000
Other sources (dVN x 1,000)			
2. Cotton testing	45	370	7,880
3. Yarn testing	1,100	8,500	10,369
4. Fabric testing	370	1,100	1,600
5. Raw-silk testing	250	320	7,847
6. Sale of fabric designs and technical information	-	5,000	7,500
7. Embroidery yarn	30,000	55,000	127,000
8. Knitted fabric for industrial trials	20,000	50,000	150,000
9. Ribbon and woven fabric from old machines	80,000	140,000	260,000
Total (dVN x 1,000)	131,765	260,290	572,196
Exchange rate	4,000	6,000	12,000
Equivalent in US$	32,941	43,382	47,683
Total Income in US$	52,941	63,382	70,683

The TRSI has now signed contracts to supply technical advice and services to the following customers:-

- Thang Loi textile mill
- Thanh Cong weaving, knitting, finishing and garment mill
- Nha Trang spinning mill
- Phong Pho textile mill
- Dong Nam spinning mill
- Dong A weaving and finishing mill
- Vinh Thinh acrylic spinning mill
- TEXTIMEX
- VISERI
- Oratex company
- Imexco import-export company
- Sajegco trading company
- WEC embroidery company

About 30 other customers send samples for testing fairly often.

The Vice-Director of MOLI has stated at several TPR meetings that the TRSI has already made a significant contribution to the National Research Programme.

The TRSI is concentrating mainly on the following activities:

- Implementation of the National Silk Programme.
- Quality control of imported cottons.
- Quality Assurance Testing & Certification of yarns for export.
- Selling fabric designs, samples and know-how.
- Producing specialized products such as embroidery yarns.

The NPD reports that utilization of the Project results on a monthly basis includes the following:-

Physical Testing Laboratory (samples/month processed)

- Cotton fibres 10-15
- Yarn 300-400
- Fabric 30-50
- Raw silk 5-10

Chemical Laboratory (samples/month processed)

- Embroidery thread 200
- Fabric and silk 15-20
- Chemicals, dyestuffs and auxiliaries are tested as required.

Product Development Department (samples produced per month)

- Embroidery yarns on the ICBT machines 15-20
- Woven fabrics produced on AVL loom with CAD 5-10
- Knitted fabrics from various materials 3-4

Information Department

- A Testing Guide (in Viet Namese and English), describing the facilities available at the TRSI, has been produced and widely distributed.
- Standard test result forms have been developed.
- Test results are now processed and stored on computer.
- A video film with sound and colour has been produced to illustrate the activities of the TRSI.
- Another video covering the silk industry has been produced.
- Text books may be consulted in the library or borrowed.

Quality Certificates

- 15 cotton samples imported from India and the CIS have been tested for TEXTIMEX.
- Certificates have been issued for 20 silk samples exported to India and Korea.

5. CONCLUSIONS

This project has been well conceived, carefully designed and effectively implemented. Its results are real, useable and sustainable.

All the outputs have been produced as expected. All the equipment provided is of very high quality and appropriate to the needs of the TRSI. The study tours and fellowships were well organised. The expert missions were reportedly successful. Seminars and on-the-job training were given by the CTA and other Experts.

The staff of the TRSI have responded well to training. They are now capable of utilising all the equipment provided and of carrying out tests in accordance with international standards.

No very serious difficulties were met with during implementation; the various problems which did occur from time to time were quickly resolved through the good cooperation of all concerned.

Despite occasional language difficulties, the CTA and the NPD worked harmoniously and effectively together to bring the Project to a successful conclusion.

During the project, the TRSI has been transformed into a very good institute for testing raw cotton, raw silk, yarns, fabrics, chemicals, dyestuffs and the like. In addition, the basis for a very useful product development section has been created through the combined efforts of the Government, UNDP/UNIDO and the TRSI.

At the TTPR, the Vice Minister of MOLI said that the Project had enabled the TRSI to make a significant contribution to the development of the textile industry in the South.

The importance of the TRSI to the National economy will grow as the Government's plans to increase the production of raw cotton and raw silk in **Viet Nam** come to fruition.

Although the Project has fulfilled its original purpose and strengthened the TRSI in the designated areas so that it can now provide the many of the laboratory services needed for the future development of the textile industry, there are still other areas which need to be strengthened to meet changed circumstances.

Since the start of the Project, the importance of cotton testing has greatly increased because of the deteriorating cotton supply situation. Also much greater importance is now attached to quality control of yarns for export and also to reviving the **Viet Namese** silk industry. These additional requirements add to the pressure on the resources of the TRSI.

To enable the TRSI to meet these additional requirements fully, further training and additional equipment is required.

6. RECOMMENDATIONS

As UNIDO's involvement in this project is now virtually at an end, the following recommendations are made to the Government, UNDP and the NPD:-

1. In view of the need to seek new sources for the importation of cotton coupled with the Government's commitment to increase the production of medium and long staple Viet Namese cottons, it is important that the TRSI should be capable of testing not only the physical properties of the fibres but also the trash content. It is strongly recommended that the TRSI be provided with:

   - a trash analyser to measure the proportion and character of trash in a bale of raw cotton,
   - a precision balance and
   - a set of consumable spare parts for the Pressley tester;

   all of which are required to complete and sustain the work of the fibre testing laboratory.

2. To help formulate a strategy for reviving the silk processing industry it would be advisable to study the market for silk goods especially in Europe (Germany), silk processing in China and the technique used in Thailand for marketing silk goods to tourists. A study tour to Germany, China and Thailand for 4 persons for 1 month is recommended.

3. The following items which have been identified by the experts as being essential for the silk programme, should be provided:

   - a stroboscope to check spindle speeds,
   - a mini drying oven to simulate the action of a stentering machine in improving the softness of handle of silk fabric and
   - a laboratory-scale hank dyeing machine for silk.

4. The chemical laboratory needs to be further strengthened particularly in laboratory-scale work on the dyeing and finishing ofsilk and the identification and analysis of trade samples. An expert mission for 1 m/m in silk de-gumming, dyeing and finishing is recommended to train the staff and identify suitable equipment.

   The estimated cost of the above items 1 to 4 is US$ 134,000.

5. At present, the policy of the TRSI appears to be to respond to requests for testing and similar services from industry. That, of course, is very important but an institution such as the TRSI now is should have some planned on-going programmes of systematic investigation, trials and experimentation of its

own to benefit the Viet Namese textile industry as a whole.

6. A comprehensive and detailed work programme for the TRSI should be prepared to ensure that the inputs provided through the Project will continue to be fully utilized.

7. Although the TRSI should be able to generate sufficient income to meet its day-to-day expenses and be self-sustaining to that extent, it will continue to need external support to extend its capabilities and services. The Government and UNDP should continue to support the TRSI to the extent possible; from past experience, any financial assistance given to the TRSI will be well utilized.

DP/VIE/86/015

Testing Raw Materials, Yarns and Fabrics + Product Development

EQUIPMENT

Section	Item	Supplier
Fibre Testing	Pressley tester	Baer
	Micronnaire	Shirley Developments
	Fineness/Maturity	Shirley Developments
	Fibre blender	Shirley Developments
	Digital fibrograph	Shirley Developments
Yarn Testing	Uster Evenness Tester 3	
	Uster 'Tensorapid' strength tester	
	Crimp tester	Shirley Developments
Fabric Testing	Crease recovery	Shirley Developments
	Abrasion	Heal
	Thickness	Heal
	Pilling	Heal
	Crocking	Heal
	2 Piece glasses	Heal
Chemical Laboratory	Wash fastness	Shirley Developments
	Skein dyeing	Roaches
	Viscosimeter	Roaches
	Lab. steamer	Roaches
	Std. Hydrometers	Roaches
Silk Testing (Toyo)	Seriplane winder + 6 blackboards	
	Seriplane viewer + photographs	
	Manual length meter	
	Cohesion tester	
	Drying oven	
Product Development	Doubler/twister	ICBT
	2 for 1 twister	ICBT
	Winding machine	ICBT
	Design Loom	AVL
	Camber Circular Knitting Machine	
Other Equipment	Toyota Landcruiser and spare parts	
	Liebert Laboratory airconditioner	
	Tensiometer	Heal
	Thermohygrograph	Heal
	4 airconditioners	Kwan
	Plain paper copier	Kwan
	Overhead projector	Kwan
	Books/periodicals	Munksgaard

All the equipment is in operation.

DP/VIE/86/015
Testing Raw Materials, Yarns and Fabrics and Product Development

TRAINING

Number	Name	Duration	Remarks
FELLOWSHIPS			
Textile testing			
31-01	Do Van Quong	3	Implemented May 1990
31-02	Nguyen Thi Noan Ha	3	Bolton
31-03	Tran Thanh Liem	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 Du	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.
Shuttleless weaving			
31-14	Nguyen Thanh Chuong	1	Implemented June 1991
31-15	Ho Van Tu	1	Somet, Italy.
STUDY TOURS			
Textile testing			
32-01	France, UK + Hungary	5x1	Implemented 1989
Production of silk and blends			
32-02	Italy, France + S.Korea	5x1	Implemented January 90

IN-PLANT TRAINING

Seminars, lectures and on-the-job training by the CTA and Experts

DP/VIE/86/015
Testing Raw Materials, Yarns and Fabrics and Product Development

EXPERTS

Post no	Title	m/m	Remarks
11-01	CTA	6.8	* R. Nield split missions 1989/91
11-02	QC/Testing	2	H. M. Goerlach (1 m/m) 1990.
			* J. T. Mitchell (2 x 0.5 m/m) 1991
11-03	Silk weaving	2	J. C. Guigou 1990.
11-05	Degumming & Finishing	1	H. R. Hofstetter 1990.
	AVL Technician		Mr K Johnson, May 1991.
	ICBT Technician		Mr Billet, June 1991.
	* USTER Specialist		Mr Fasciati, September 1991.

* Co-ordinated with and cost shared with Project DP/VIE/86/014.

Testing Raw Materials, Yarns and Fabrics and Product Development

WORK PLAN

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

DP/VIE/86/015
Testing Raw Materials, Yarns and Fabrics and Product Development

GOVERNMENT BUDGET

Financial input excluding existing buildings and equipment.

Units: Dongs x 1.000,000

Item	Total	1989	1990	1991
1. National staff	90	30	30	30
2. Building Modifications	158	80	40	38
3. New equipment	103	40	45	18
4. Miscellaneous expenses	29	14	5	10
TOTAL	380	164	120	96

TRSI INUTS

In addition to the above, the TRSI have purchased through their own resources 2 new Hyo Chang automatic shuttle-changing looms for silk and 2 Waga GLS circular loop-wheel knitting machines suitable for knitting un-degummed silk.

For public relations and publicity purposes the TRSI have produced a brochure on the TRSI, a Testing Guide, a Video film on the work and facilities of the TRSI and another video on the Vietnamese silk industry.

Project Number	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION NON-EXPENDABLE PROPERTY CONTROL RECORD	Page No. : 1
DP/VIE/88/015		Period Ending : DECEMBER-91

Country : VIET NAM

Project Title : TESTING OF TEXTILE RAW MATERIALS, YARNS AND FABRICS AND PRODUCT DEVELOPMENT

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received			Cond.	Qty On Hand	Remarks
					Qty.	M	Y			
15-O-00346	1	AVL CAD/CAM, BASIC SYSTEM 1.	1	17,374.00		08	90			
15-O-00346	2	IMAGEWRITER B. & W. PRINTER.	1	837.00		08	90			
15-O-00346	3	16 SHAFT COMPUTER DOBBY SAMPLE LOOM (40 INCH).	1	11,118.00		08	90			
15-O-00346	4	INK JET COLOUR PRINTER.	1	3,470.00		08	90			
15-O-00858	1	SERIPLANE WINDER WITH BLACK (6 PCS).	1	14,614.00						
15-O-00858	2	SERIPLANE ILLUMINATION APPARATUS.	1	15,726.00						
15-O-00858	3	PHOTOGRAPH SET FOR THE ABOVE.	1	3,261.00						
15-O-00858	4	RUPLAN COHESION TESTER.	1	11,993.00						
15-O-00858	5	HAND-OPERATING MEASURING METER.	1	841.00						
15-O-00858	6	DRYING OVEN WITH BALANCE.	1	13,732.00						
15-O-01112	1	TWO FOR ONE TWISTER DT 355 "F".	1	29,409.00						
15-O-01112	2	UNIVERSAL RING TWISTER RTC 21 "S" WITH SWINGING CREEL FOR 6 FILLING BOBBINS.	1	43,995.00						
15-O-01112	3	REWINDING MACHINE WITH 2 SETS OF SWIFTS 10.	1	10,137.00						
15-O-01303	1	ZELLWEGER USTER TENSORAPID 3 AUTOMATIC TENSIL TESTING INSTALLATION TYPE UTR 3.	1	87,176.00						

Project Number : DP/VIE/86/015 | Page No. : 2

Country : VIET NAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received			Cond.	Qty On Hand	Remarks
					Qty.	M	Y			
15-8-01079	1	TOYOTA LANDCRUISER STATION WAGON 10-SEATER, MODEL FJ62LG-KRC. CHASSIS NUMBER ===> FJ62-103852 ENGINE NUMBER ====> 3F-0220160 REGISTRATION NO. => ???	1	14,371.00	1	03	89			
15-8-01341	1	USTER TESTER III DIGITAL TESTING AND ANALYSING INSTALLATION TYPE UT3-B/M INCLUDING: EVENNESS CONVERTER WITH TENSIONER, (TYPE D) SENSOR (TYPE B),SIGNAL PROCESSOR WITH GRAPHIC VIDEO MONITOR AND KEYBOARD, PRINTER (MATRIX PRINTER), + UNWINDING DEVICE, LARGE FOR UT3-B.	1	64,274.00	1	10	89			
15-8-01403	1	SDL19A WIRA COTTON FINENESS METER (MICRONAIRE TESTER) 220V/1PH/50HZ.	1	4,102.00	1	03	89			
15-8-01404	1	SDL 898 IIC/SHIRLEY FMT SERIES 2, 220V/1PH/50HZ (FINENESS MATURITY TESTER).	1	20,789.00	1	03	89			
15-8-01406	1	HEAL MARTINDALE WEAR AND ABRASION TESTER, MODEL 103, COMPLETE WITH INITIAL STARTING KIT.	1	5,977.00	1	04	89			
15-8-01406	2	R&B CLOTH THICKNESS TESTER MODEL 320.	1	693.00	1	04	89			
15-8-01406	3	ICI PILLING TESTER MODEL 116/2.	1	2,018.00	1	04	89			
15-8-01413	1	SDK DIGITAL FIBROGRAPH TYPE 530.	1	35,575.00	1	02	89			
15-8-01415	1	TENSIONMETER TYPE TEN RANGE 2-12Q.	1	400.00	1	03	89			

Project Number : DP/VIE/86/015										Page No. : 3
Country : VIET NAM										
Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received			Cond.	Qty On Hand	Remarks
					Qty.	M	Y			
15-8-01415	2	TENSIONMETER TYPE TEN RANGE 20-120G.	1	400.00	1	03	89			
15-8-01415	3	THERMOHYGROGRAPH MODEL 425/T9420.	1	517.00	1	03	89			
15-8-01415	4	MICROSCOPIC PICK COUNTER MODEL 96M.	1	58.00	1	03	89			
15-8-01416	1	HEAL CROCKMETER MODEL 255, COMPLETE.	1	561.00	1	04	89			
15-8-01417	1	SDL 220A 'AUTOWASH' WASHWHEEL 4 POT TESTER.	1	5,780.00	1	03	89			
15-8-01418	1	VISCOMETER MULTISPEED ROTATIONAL TYPE BROKKFIELD DIAL MODEL RVT WITH STAND, SET OF SPINDLES AND CASE.	1	2,192.00	1	04	89			
15-8-01418	2	LABORATORY STEAMER FOR DYED YARN AND CLOTH SAMPLES.	1	2,530.00	1	04	89			
15-8-01418	3	SINGLE BATH DYEING UNIT MODEL "S".	1	7,379.00	1	04	89			
15-8-01418	4	SET OF 13 STANDARD HYDROMETERS.	1	120.00	1	04	89			ENTERED FROM YEAR-END INV. 90.
15-8-01470	1	PRESSLEY TESTER TYPE 1360, MEASURING RANGE 5-21 LBS, INCLUDING NORMAL ACCESSORIES.	1	1,988.00	1	04	89			
15-8-01471	1	SDL99 SHIRLEY FIBREBLENDER, 220V/1PH/50HZ.	1	4,687.00	1	06	89			
15-9-00257	1	SDL 3A CREASE RECOVERY TESTER.	1	1,297.00	1	07	89			
15-9-00257	2	SDL 48 HATRA CRIMP RIGIDITY APPARATUS.	1	3,234.00	1	07	89			
15-9-00260	1	CANON PC-7 COPIER NO. DNJ01331.	1	1,013.00	1	03	89			

Project Number : DP/VIE/86/015 | Page No. : 4

Country : VIET NAM

Purchase Order Number	Item No.	Description	Qty. Ord.	US Dollar Equivalent	Received			Cond.	Qty On Hand	Remarks
					Qty.	M	Y			
15-9-00568	1	MICROSCOPIC PICK COUNTER MODEL 94B.	1	138.00	1	03	89			
15-9-00569	1	ELMO HP-2858 PORTABLE OVERHEAD PROJECTOR, 220V, 50/60HZ.	1	350.00	1	06	89			
15-9-00570	1	GENERAL AFX-12 AIR CONDITIONER 12,000 BTU, 220V, 50HZ, S/NOS 004623, 004424, 005116, 005128 (MODEL AFX-12SGK-10.	4	1,182.00	4	06	89			
15-9-00572	1	BROWN BOVERI YORK AIR COOLED AIR CONDITIONER FOR 200 M3 LABORATORY SPACE: ENVIRONMENTAL CONTROL A/C UNIT DATAMATE DMF 037A.	2	10,630.00		10	89			
15-9-00698	1	CHEMINIT CIRCULAR KNITTING MACHINE, 26" DIAMETER 24 NPI 78 FEEDERS.	1	28,963.00	1	09	89			
15-9-00698	2	MACHINE MOUNTED COMPRESSOR.	1	794.00	1	09	89			
15-9-00698	3	26 INCH 24 NPI 78 FEEDERS.	1	1,624.00						

Project Number	UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION NON-EXPENDABLE PROPERTY CONTROL RECORD	Page No. : 5
DP/VIE/88/015		Period Ending : DECEMBER-91

Country : VIET NAM

Project Title : TESTING OF TEXTILE RAW MATERIALS, YARNS AND FABRICS AND PRODUCT DEVELOPMENT

We certify that the quantities of non-expendable equipment received, less the quantities of non-expendable equipment written-off, reflect the physical count of the items on hand.

Unido project manager
or
Resident representative _____ (signature) Date _____

Government counterpart _____ (signature) Date _____