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**STRENGTHENING OF THE CHINA RAMIE TECHNOLOGY DEVELOPMENT CENTRE**

**DG/CPR/85/057/11-01**

**PEOPLE'S REPUBLIC OF CHINA**

**Technical report: Third mission\***  
**(Fourth overall report including interim mission)**

**Prepared for the Government  
of the People's Republic of China  
by the United Nations Industrial Development Organization**

**Based on the work of Mortimer O'Shea, Senior Technical Adviser**

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

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\* This document has not been edited.

## **ABSTRACT**

### **Objectives**

The objectives of this report are to highlight:

- the salient decisions of the Tripartite Review Meeting
- the means of their implementation
- the changed situation that will ensue
- any special problems

### **Major recommendations**

If the proposed new duties of the CTA are approved:

- Follow-up by the CTA, in consultation with the NPD and UNIDO on the actions to be taken in accordance with his revised remit.

### **Desired actions for 1989/90**

- Completion of the new Centre and the commissioning of the Long Fibre Pilot Production Plant by the end of 1989;
- Issuing of subcontract Terms of Reference
- Appraisal of tenders
- Signing of contracts
- Resolution of problems, for example, in the event that no suitable tender/s are submitted for a particular branch of technology or that a tender is unacceptable because of cost, it will then be necessary to implement a 'Fall-back' strategy

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**SUMMARY**

The report deals with the changed situation arising from the Tripartite Review Meeting Decision to seek subcontractors for the five major Technological areas of the Project and how it is proposed to implement the plan to the best advantage of the 'immediate client' - the RDTC.

**1.00 Tripartite Review Meeting of March 12 1989 - salient points**

- 1.01 An earlier proposal at the meeting was that those experts who could visit the PRC and be effective before the completion of the buildings might now be identified; also, those experts who would definitely need the facilities of the new centre should in turn be identified.**
- 1.02 The UNDP Project Performance Evaluation Report as submitted by the NPD to the meeting was found to have a number of omissions, errors and inconsistencies. These to be corrected with the assistance of the CTA.**
- 1.03 The need for a realistic work plan was emphasised.**
- 1.04 The NPD requested a revised Job Description for the CTA in the light of the many fundamental changes to the proposed operation of the Project.**
- 1.05 The CTA was unhappy about the existing Job Description and its concern with the kind of minutiae that would need far more time in the PRC than was in fact available. He felt that, logically, he should have a supportive role - the equivalent of an overview of the Project with sufficient flexibility in his Terms of Reference to enable him to constantly adapt to any new situations or problems as they would inevitably arise.**
- 1.06 The CTA felt that the details of project implementation correctly fall within the remits of visiting experts in their respective fields of knowledge and experience. For example, it is more aptly the function of a particular expert to determine the exact layout of a department and the planning of the correct positioning of a machine and allocation of floorspace thereto in the new centre.**
- 1.07 Arising from the foregoing and because of the intention to have the Long Staple Spinning Pilot Production Line on stream as the first such installation, the CTA feels that the spinning expertise - whether as an individual or a subcontractor - should be effectively in place in Changsha, just in time to influence the correct installation of all machines and equipment. Special attention should be given to the building-in of the potential for flexibility e.g. in the event that an additional Gill Box might be required in the line at some time in the future.**
- 1.08 The equipment list for purchase by UNIDO to be finalized by the NPD and the CTA and submitted to UNIDO for approval.**

- 1.09 It was suggested that a useful role for the CTA would be to act as the representative of the RTDC in visiting machinery makers, universities, polytechnics, research institutes, chemical manufacturers, etc.
- 1.10 Work Programme to be plotted on the new Gantt-type chart as produced by Mr. J.P. Moll. This to be planned by the NPD and CTA.
- 1.11 Following the NPD's suggestion that by cancelling certain parts of the Project, notably a reduction in some of the proposed man-months allocated to some of the visiting experts and of part of the Study Tours programme, in particular that proposed for the USA/Brazil, the financial savings are estimated at \$170,000 and it was proposed that these monies be dedicated instead to subcontracting the five main areas of technology in the preferred order of:

- Degumming
- Dyeing and Finishing
- Spinning
- Weaving
- Knitting

- 1.12 The CTA was, therefore, requested to prepare the five sets of documents or Terms of Reference for the subcontracts.
- 1.13 A revision of the Project Document is now necessary in the light of some fundamental changes.
- 1.14 NPD and CTA to put forward a recommendation on when the next Tripartite Review Meeting\* should take place.

\* The recommendation is that this should take place six to nine months after the last piece of equipment has been delivered.

- 2.00 Proposed allocation of the \$70,000 (approximately) - released from earmarked UNDP funding for the now cancelled importation of one rapier loom**
- 2.01 The NPD favours the purchase of some items of equipment for the Information and Training departments. This equipment is, broadly, as follows, the amount of money available determining the extent of purchases:**
- 2.02 A computer with graphic capability, e.g., the Apple Mac;**
- 2.03 A Slide Projector for standard 35mm slides e.g. the Kodak Carousel-type**
- 2.04 Slide film processing equipment, including mounting;**
- 2.05 An Overhead Projector;**
- 2.06 A simple Video Camera;**
- 2.07 Editing equipment for the foregoing;**
- 2.08 Slide Organizer (slide library)**
- 2.09 Microfiche apparatus**
- 2.10 The CTA is in full agreement with the NPD on the need for this equipment but feels it essential that all such equipment should have spares and servicing back-up within the PRC.**



**ANNEX I.**

**Itinerary and work schedule**

<b>Date</b>	<b>Activity</b>
06.3.89	Travel Kilkenny to Dublin and overnight Dublin
07.3	Dublin-Copenhagen; depart Copenhagen
08.3	Arrive Beijing
09.3	At UNDP office
10.3	At UNDP office and meet with Mr. J.P. Moll
11.3	Arrive Changsha; visit Zhuzhou ramie factory
12.3	Attend Tripartite Review Meeting
13.3	Social including visit to Hunan Museum
14.3	Preparation of Subcontract Terms of Reference drafts
15.3	Meeting with RTDC staff
16.3	Preparation of Subcontract TOR drafts
17.3	Completion of TOR drafts and submission to RTDC for translation
18.3	Preparation of revised Job Description for CTA
19.3	Study of Project Document and earlier reports; commencement of Mission Report
20.3	Meeting with NPD and RTDC staff who now have translated subcontract TOR draft and discuss item by item. NPD gives his views.
21.3	Documentation of NPD's observations on subcontract TOR submission of CTA's draft revised Job Description to NPD for translation; receipt of Project Performance Evaluation Report in its draft revised form for correction and editing by CTA
22.3	Correction and editing of PPER; continuation of Mission Report preparation
23.3	Meeting with NPD to discuss his views on CTA's proposed revised duties. NPD puts forward his own views. Discussion on work programme for next three years.
24.3	Continuation of Mission Report preparation
25.3	Meeting with NPD to discuss machinery and equipment purchases
26.3	Continuation of Mission Report preparation
27.3	Social
28.3	Return to Beijing
29.3	Meeting at UNDP; evening with MORFERT/CICETE/ Ministry of T.I.
30.3	To Copenhagen and overnight
	To Dublin and Kilkenny.

**ANNEX II.**

**People met**

<b>Name</b>	<b>Organization and Title</b>
<b>Mr. Chen Rong</b>	<b>Department of International Co-operation, Ministry of Textile Industry - Programme Officer</b>
<b>Mr. Huang Zhao Pei</b>	<b>Department of Development Science and Technology, Ministry of Textile Industry</b>
<b>Ms Wang Wei Li</b>	<b>The China International Centre for Economic and Technical Exchanges - Programme Officer</b>
<b>Mr. Li Ming</b>	<b>Ministry of Foreign Economic Relations and Trade, China International Centre for Economic and Technical Exchanges - Deputy Division Chief</b>
<b>Mr. Xu Kui</b>	<b>Ramie Technology Development Centre of China; China Bast and Leaf Fibres Association-Ramie Branch, Chairman, Director; National Project Director.</b>
<b>Mr. Xiang Ce Xuan</b>	<b>RTDC - Vice-Chief Engineer</b>
<b>Mr. Zhou Wei</b>	<b>RTDC - Knitting Technologist and Fellowship Candidate</b>
<b>Mr. Liu Jiyin</b>	<b>RTDC - Dyeing Printing Technologist and Fellowship candidate</b>
<b>Mr. Wang Rong Wang</b>	<b>Zhuzhou Ramie Textile Printing and Dyeing Factory - Vice-Director</b>
<b>Mr. Ding Zhen Hua</b>	<b>ditto - Director</b>
<b>Ms Du Fu Xin</b>	<b>Hunan General Textile Industrial Corporation - Vice Chief Manager</b>
<b>Mr. Zhong Changsheng</b>	<b>Department of International Co-operation Ministry of Textile Industry - Deputy Division Chief International Organization Division</b>
<b>Mr. Kenneth S. Stephens</b>	<b>UNDP</b>
<b>Ms Caterina Benardelli</b>	<b>UNDP</b>
<b>Mr. John P. Moll</b>	<b>UNIDO</b>

**ANNEX III. Visit to Zhuzhou Ramie Textile Printing & Dyeing Factory**

This was the CTA's second visit to this factory and on this visit he was accompanied by the other participants in the Tripartite Review Meeting.

Equipment and production information on this, one of the largest ramie mills in the PRC, is given in the CTA's first Mission Report of December 1987.

Although difficult to draw any conclusive inferences from such a visit, there was evidence of some considerable improvements in the general running of this factory.

## **ANNEX IV.**

### **UPDATING OF CTA'S DUTIES**

Because of the special problems of this Project, notably as listed hereunder, the role and duties of the CTA should now be revised with the objective of achieving completion of the project in the most successful and satisfactory way for the three parties involved, namely the RTDC, the PRC authorities and UNIDO.

#### **1.0 SPECIAL PROBLEMS**

- 1.1 Delays in the completion and transfer to the new Centre at Changsha
- 1.2 Financial constraints on importation of new equipment.
- 1.3 Difficulties in the recruitment of experts and in the most suitable timing of their missions in PRC;
- 1.4 The uncertainty or lack of any guarantee that the proposed experts would be able to fulfil their duties within the time-scales and earmarked financial package;
- 1.5 Time lost due to travel of experts;
- 1.6 Language/communications difficulties;
- 1.7 In particular, the changed situation that will arise when/if the decision of the Tripartite Review Meeting of March 12, 1989 to now seek Sub-contracted R&D in the technological sectors of:
  - Degumming
  - Spinning
  - Dyeing and Finishing
  - Weaving
  - Knitting

will result in positive responses to the issue of the special Terms of Reference now available.

#### **2.0 NEW SITUATION**

- 2.1 The new situation would mean in effect that the recruitment of experts in the normal sense would become unnecessary and superfluous.
- 2.2 Although the proposal by the NPD at the TPR meeting was limited to some reductions in the man-months assigned to certain experts and to certain financial savings through the prospect of acquiring certain items of equipment within the PRC instead of importing them, I feel that the logic of the concept should now be clearly understood and pursued, i.e., where a subcontract is established for a particular technological discipline, there will then be no need for the expert (in the normal sense) for that technology.

- 2.3 The pursuance of this logic will also mean that more finance would become available for re-allocation to the subcontracts.
  - 2.4 Because of the narrowness of the field of potentially available expertise it is probably inevitable that a number of the sub contractors will in fact be those same experts or their organizations/institutions already identified by the CTA.
- 
- 3.00 CTA - REVISED DUTIES - Arising from the foregoing it now becomes imperative to up-date and revise the duties of the CTA and the followin listing is now submitted:
    - 3.1 Assist UNIDO in targeting potential subcontractors for the five technological areas as put forward by the NPD at the recent TPR meeting;
    - 3.2 Assist UNIDO with the assessment of tenders;
    - 3.3 Inspect the premises and facilities of the subcontractor in order to vet their suitability
    - 3.4 Identify subcontract team and interview/brief members prior to commencement of project; reject and amend as necessary
    - 3.5 During the contract maintain liaison with all parties concerned and help with problems that may arise due to unforeseen circumstances.
    - 3.6 Monitor and report progress during implementation of contract in a number of logical stages (to be agreed) and authorize staged payments to the contractors;
    - 3.7 Assist in the recruitment of any experts not covered by the range of subcontracts.
    - 3.8 Continue to assist in the matter of Fellowships;
    - 3.9 Assist the tripartite evaluation team by providing information on project results;
    - 3.10 Participate in the Terminal Project Review Meeting;
    - 3.11 Prepare an Agency Terminal Report
    - 3.12 In the event that any of the proposed subcontract agreements fail to materialize, the CTA proposes reverting to his proposals as outlined in his second PRC mission report No. DG/CPR/85/11-01/A/J13102, dated November 1988, pp 14-16

**4.00 IN GENERAL - The CTA should have an overview role in the Project and should not be expected to carry out any operations that are logically within the remit of subcontractors and experts.**

**ANNEX V. DEGUMMING - Draft Subcontract Terms of Reference**

**UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project of the Government of The People's Republic of China**

**CO-OPERATIVE RESEARCH AND DEVELOPMENT CONTRACT**

<b>Title</b>	Strengthening of the China Ramie Technology Development Centre ( this contract to form part of Project No. DP/CPR/85/057/B/01/99) Specifically: Degumming.
<b>Government Implementing Agency:</b>	Ministry of Textile Industry
<b>Executing agency</b>	The Government of the People's Republic of China in cooperation with the United Nations Industrial Development Organization (UNIDO).
<b>Estimated Starting Date</b>	June 1, 1989
<b>Duration</b>	Three years
<b>Parties to this Agreement</b>	The immediate parties to this agreement are: the Ramie Technology Development Centre, hereinafter called the client, and the contractor which is the organization/institution providing its facilities and the services of its staff experts for the duration of the agreement.

**PART 1. LEGAL CONTEXT**

This co-operative research in Science and Technology - Degumming of Ramie - will form part of the Project Document which shall be the instrument referred to as such in Article I, paragraph 1 of the Agreement between the Government of the People's Republic of China and the United Nations Development Programme signed by the parties on 29th June 1979.

The Government Implementing Agency shall, for the purpose of the Agreement, refer to the Government Cooperating Agency described in that Agreement.

## **PART II. THE PROJECT.**

### **A. Development Objective**

The development objective is to strengthen the national economy by accelerating the development of more economical processing technologies leading to increased utilization of the indigenous ramie fibre for quality textile fabrics both for the domestic and overseas markets.

### **B. Immediate Objectives**

The immediate objective is to develop and apply modern processing technologies in the manufacture of quality textile fabrics from ramie fibre. In so doing the contractor will focus on the following areas:

- experiment with the use of various chemical and biological agents in removing non fibre matter from raw, green ramie dried ribbons (stalks)
- experiment with softening and scouring agents and any other auxiliaries as necessary in the subsequent processing stages in order to produce the optimum results of fibre purity without any significant resultant degradation of fibre length, strength and colour
- provide the client with a representative sample of fibre from each stage with reference number and full details to allow evaluation and so that the client's results can be compared and reconciled with those of the contractor.

The major objective is to achieve industrial-scale reproducibility of the laboratory-scale results in both fibre quality parameters and significantly reduced processing time and with cost-effective processing.

Particular attention must be given to the latter and appropriate technology applied to such items as fibre cages, vessels and machines and all the requisite industrial installations including the recycling of useful effluents as well as the eventual temporary storage and recommendations for environmentally safe disposal of used effluents.



The contractor shall submit specifications for the effective industrial implementation of the optimum process including equipment specifications for both laboratory and industry and assist with equipment selection, evaluation and eventual commissioning of a pilot industrial-scale processing line at the client's premises which will be the model for industrial installations throughout the PRC. It is expected that certain existing machines and processes such as scutching and softening will become unnecessary or at least greatly improved and modified.

**PART III. C**

**a) At the end of the project:**

- the contractor shall have assisted in the training of two of the client's senior textile chemists and other relevant staff so that they will have become fully conversant and competent in the implementation of the improved chemistry and technology and will further have become capable of continuously carrying out R & D work in degumming, in advising the Agronomists of the Centre on research results, in co-operating with the Spinning Department in developing improved fibre qualities and in advising the industry in applying modern degumming processing technology as will have been developed through the co-operative efforts of the contractor and the client.
- The contractor shall be responsible for the production of a manual (technology package with basic knowhow) describing efficient ramie fibre degumming technology for application in the national ramie textile industry

**b) During the course of the contract:**

- the contractor shall produce research reports on:
  - specifications for crude ramie fibre required for efficient modernised degumming processes.
  - noil and waste reduction by applying new degumming technology.
  - grading systems for ramie fibre aiming at the production of fine pure ramie tops,
  - new additives/oils for accelerated degumming
  - bio-assisted degumming

test results of pilot industrial application in the client's development unit.

The research results should contain laboratory as well as demonstration scale data and should enable development of the technology package.

- the contractor shall facilitate the implementation of the improved technology by inviting a senior expert from the client's staff to receive instruction and training at the contractor's premises and the client will allow the contractor's experts full access to and the use of his own facilities and co-operate with the contractor in the procurement, installation and commissioning of any special machinery, equipment and facilities as deemed necessary following tripartite consultation with UNIDO experts, the contractor and the client's staff.
- the client is agreeable to the contractor sub contracting any part of this assignment but will deal only with the contractor who will be responsible for the confidentiality of all information.
- the contractor is expected to give a time-phased and staged breakdown of proposed work and to apply a price to each stage and a discount for the full package.

Signed:

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On behalf of the Government

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Date

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On behalf of UNDP

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Date

**ANNEX VI. DYEING AND FINISHING - Draft Subcontract Terms of Reference  
UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project of the Government of The People's Republic of China**

**CO-OPERATIVE RESEARCH AND DEVELOPMENT CONTRACT**

**Title** Strengthening of the China Ramie Technology Development Centre (this contract to form part of Project No. DP/CPR/85/057/B/01/99) Specifically: Dyeing/Finishing including Desizing.

**Government implementing agency** Ministry of Textile Industry

**Executing agency** The Government of the People's Republic of China in co-operation with the United Nations Industrial Development Organization (UNIDO)

**Estimated starting date** June 1 1989

**Duration** Three years

**Parties to this Agreement** The immediate parties to this agreement are the Ramie Technology Development Centre, hereinafter called the client and the contractor which is the organization/institution providing its facilities and services of its staff experts for the duration of the agreement.

**PART I. LEGAL CONTEXT**

This co-operative research in Science and Technology - the Desizing, Dyeing and Finishing of pure ramie fabrics and of a wide range of fabrics made from blends of ramie with natural and manmade fibres; the preparation for and dyeing of yarns also of pure ramie and blends of various natural and manmade fibres with ramie in both plain and fancy styles; the application of resins and various coating media to a number of fabrics - will form part of the Project Document which shall be the instrument referred to as such in Article I paragraph 1 of the Agreement between the Government of the People's Republic of China and the United Nations Development Programme, signed by the parties on 29th June 1979.

The Government Implementing Agency shall, for the purpose of the Agreement, refer to the Government Co-operating Agency described in that Agreement.

## **PART II. THE PROJECT**

### **A. Development Objective**

The development objective is to strengthen the national economy by accelerating the development of more economical processing technologies leading to increased usage of the indigenous ramie fibre for quality textile fabrics both for the domestic and overseas markets.

### **B. Immediate Objectives**

The immediate objective is to develop and apply modern processing technologies in the manufacture of quality textile fabrics from ramie fibre. In so doing, the contractor will focus on the following areas:

- experiment with the use of various chemical and biological agents in the removal of size and any other contaminants from earlier processes in order to arrive at the optimum process from both cost-effectiveness and fabric quality.
- experiment with the use of various bleaching agents with similar objectives to the foregoing.
- develop cost effective and reproducible dye recipes for ramie and ramie-blended yarns and fabrics, having due consideration for the makes and types of dyeing equipment available to the client and within the PRC industry. The requisite internationally accepted fastness levels must be attained.
- introduce modern dyehouse management systems including the possibility of computer-controlled colour matching and recipe formulation
- develop fabric finishes including the best singeing technology and/or cropping technology in order to attain enhanced fabric handle and the elimination of hairiness.
- develop preparation for printing finishes.

The major objective is to achieve industrial-scale reproducibility of laboratory-scale results whilst retaining the integrity of the textile, enhancing handle and reduction of process time. Consideration must be given to the correct disposal regime for resultant effluents and recommendations on the use of heat exchangers will be expected.

The contractor shall submit specifications for the effective industrial implementation of the optimum processes including, where necessary, equipment specifications for both laboratory and industry and assist with equipment selection, evaluation and eventual commissioning of a pilot industrial-scale processing line at the client's premises which will be the model for industrial installations throughout the PRC.

The client shall provide the contractor with a listing of the machines and equipment, both laboratory- and industrial-scale available at the Centre or within the industry. The contractor will advise the client where there appear to be any inadequacies of a significant nature and duly make recommendations concerning new equipment.

**PART II. C**

- a) **At the end of the project**
  - the contractor shall have assisted in the training of two of the client's senior textile chemists and other relevant staff so that they will have become fully conversant and competent in the implementation of the improved chemistry and technology and will further have become capable of continuously carrying out the preparation of recipes and of advising the dyehouse and finishing departments' personnel of the mills.
  - the contractor shall provide the client with a technology package with basic know-how describing the technology developed for desizing, fabric preparation, dyeing and finishing; for yarn dyeing and effluent treatment and covering all other aspects of importance to the client in fulfilling his services to the China ramie industry.
- b) **During the course of the contract;**
  - the contractor shall provide research reports on reproducible dye recipes for ramie and ramie-blends in both yarns and fabrics; fabric finishes with an improved handle for ramie fabrics.

- the client shall provide the contractor with all requisite material samples (yarns and fabrics) all of which shall be labelled and have reference numbers which the contractor must adhere to throughout the project.

The research results should contain laboratory as well as demonstration scale data and should enable development of the technology package.

- The contractor shall facilitate the implementation of the improved technology by inviting a senior expert from the client's staff to receive instruction and training at the contractor's premises and the client will allow the contractor's experts full access to and the use of his own facilities and co-operate with the contractor in the procurement, installation and commissioning of any special machinery, equipment and facilities as may be deemed necessary following tripartite consultation with UNIDO experts, the contractor and the client's staff.
- The client is agreeable to the contractor sub-contracting part of this assignment but will deal only with the contractor who will be responsible for the confidentiality of all information.
- In the event that the contractor wishes to make commercial use of any novel information or product/ process development arising from this contract by passing on any information to a third party, such divulgence of information specifically arising from the contractor's work for the client may be made only with the prior consent of UNIDO in consultation with the PRC authorities and the client.
- The contractor is expected to give a time-phased and staged breakdown of proposed work and to apply a price to each stage and a discount for the full package.

Signed:

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On behalf of the Government

-----  
Date

-----  
On behalf of UNDP

-----  
Date

**ANNEX VII. SPINNING - Draft Subcontract Terms of Reference**

**UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project of the Government of The People's Republic of China**

**CO-OPERATIVE RESEARCH AND DEVELOPMENT CONTRACT**

**Title** Strengthening of the China Ramie Technology Development Centre (this contract to form part of Project No. DP/CPR/85/057/B/01/99) Specifically: Spinning and Fancy/Novelty yarn production.

**Government implementing agency** The Ministry of Textile Industry

**Executing agency** The Government of The People's Republic of China in co-operation with the United Nations Industrial Development Organization (UNIDO)

**Estimated Starting Date** June 1 1989

**Duration** Three years

**Parties to this Agreement** The immediate parties to this agreement are: the Ramie Technology Development Centre, hereinafter called the client and the contractor which is the organization/institution providing its facilities and services of its staff experts for the duration of the agreement.

**PART I. LEGAL CONTEXT**

This co-operative research in Science and Technology - Spinning of ramie and of ramie/cotton, ramie/synthetic and various other possible fibre blends and including fancy or novelty yarn production - will form part of the Project Document which shall be the instrument referred to as such in Article I paragraph 1 of the Agreement between the Government of the People's Republic of China and the United Nations Development Programme, signed by the parties on 29 June 1979.

The Government Implementing Agency shall, for the purpose of the Agreement, refer to the Government Co-operating Agency described in that Agreement.

## **PART II. THE PROJECT**

### **A. Development Objective**

The development objective is to strengthen the national economy by accelerating the development of more economical processing technologies leading to increased usage of the indigenous ramie fibre for quality textile fabrics both for the domestic and overseas markets.

### **B. Immediate objectives**

The immediate objective is to develop and apply modern processing technologies in the manufacture of quality textile fabrics from ramie fibre. In so doing the contractor will focus on the following areas:

- using degummed and purified ramie exclusively as well as a wide range of blend proportions of ramie and various natural and manmade fibres, experiment in achieving the optimum quality parameters of strength, evenness, reduction/elimination of neps, and reduction/elimination of hairiness. These to be achieved in the most efficient and cost-effective manner.
- the foregoing parameters to be applied to production systems for:
  - long
  - medium
  - short fibres
- carry out a wide and significant range of fancy/novelty yarn development experiments using a wide variety of fibre combinations in addition to pure ramie.
- provide the client with full information on the precise procedures used in the production of the samples, a full set of which, labelled with reference numbers shall be supplied to the client by the contractor.

Although the contractor may decide to carry out initial experiments on small scale machines/equipment, the major objective is to achieve industrial-scale reproducibility of any samples that will be supplied to the client; therefore, it will be essential for the contractor to eventually carry out full-scale production experiments. The client undertakes to supply to the contractor all of the raw materials that shall be required and further to clearly identify by labelling all such materials. These identification numbers must in turn be applied by the contractor to all samples and embodied in all documentation.



The contractor shall submit specifications for the effective industrial implementation of the optimum sets of manufacturing parameters including machinery and equipment specifications/modifications, any processing chemicals/auxiliaries employed as well as details of ambient temperature and humidity conditions pertaining during the experiments.

It is essential that the contractor shall pay particular attention to the makes and types of machinery and equipment already installed or available in the PRC and to any constraints that the client may deem it necessary to impose in the context of what will be available for counterpart experiments by the client.

Counterpart experiments will be carried out by the client using the precise information to be provided by the contractor and the fullest co-operation of the contractor will be expected during this phase of the development, including the direct supervision by the contractor's expert/s at the client's centre and if necessary at the mills in Hunan Province.

**PART II. C**

**a) At the end of the project**

- The contractor shall have assisted in the training of two of the client's spinning technicians and other relevant staff at the client's centre utilizing the existing spinning plant (medium and long staple spinning) complemented with any new equipment that may in the interim become available to the client, such as fancy yarn machine. The contractor's expert/s shall give guidelines to the client's technical staff to enable them to establish a programme of ongoing applied research and pilot test runs both in the industry and on equipment installed at the Centre, for a diversified range of yarns for the ramie industry of the PRC.
- The contractor shall be responsible for the production of a manual (technology package with basic knowhow) describing optimum ramie yarn manufacturing for application in the national ramie textile industry. The manual should also deal with the downstream utilization of pure ramie and ramie-blended yarns in both existing shuttle-changing looms and Rapier looms as well as knitting machines including single jersey Jacquard.

**b) During the course of the contract**

- The contractor shall produce research reports on the following:

improvement in the production of ramie combed tops from stapled and degummed fibres with emphasis on opening and repetitive carding;

utilization of ramie noils and stapled raw ramie fibre by means of an appropriate spinning system for the manufacture of fancy yarns;

development of fine pure ramie yarns complete with specifications as required for the utilization on rapier looms and circular Jacquard knitting machines;

test reports comparing yarn characteristics from industry with the research results arising from this contract with recommendations for improvement at the mills;

the use of ramie fibre in the new technologies such as cover spinning and twistless spinning.

The research results should contain laboratory as well as demonstration scale data and should enable development of the technology package.

- The contractor shall facilitate the implementation of the improved technology by inviting a senior expert from the client's staff to receive instruction and training at the contractor's premises and the client will allow the contractor's experts full access to and use of his own facilities and co-operate with the contractor in the procurement, installation and commissioning of any special machinery, equipment and facilities as may be deemed necessary following tripartite consultation with UNIDO experts, the contractor and the client's staff.
- The client is agreeable to the contractor sub-contracting any part of this assignment but will deal only with the contractor who will be responsible for the confidentiality of all information.

- In the event that the contractor wishes to make commercial use of any of the R & D findings arising from this contract by passing on any information to a third party, such divulgence of information or product development specifically arising from the contractor's work for the client may be made only with the prior consent of UNIDO in consultation with the PRC authorities and the client.
  
- The contractor is expected to give a time - phased and staged breakdown of proposed work and to apply a price to each stage and a discount for the full package.

**Signed:**

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On behalf of the Government

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Date

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On behalf of UNDP

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Date

**ANNEX VIII. WEAVING - Draft Subcontract Terms of Reference**

**UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project of the Government of the People's Republic of China**

**CO-OPERATIVE RESEARCH AND DEVELOPMENT CONTRACT**

**Title** Strengthening of the China Ramie Technology Development Centre (this contract to form part of Project No. DP/CPR/85/057/B/01/99) Specifically: Weaving Improvements from Preparation through sizing warping and winding.

**Government implementing agency** Ministry of Textile Industry

**Executing agency** The Government of the People's Republic of China in co-operation with the United Nations Industrial Development Organization (UNIDO)

**Estimated starting date** June 1 1989

**Duration** Three years

**Parties to this Agreement** The immediate parties to this agreement are the Ramie Technology Development Centre, hereinafter called the client and the contractor which is the organization/institution providing its facilities and the services of its staff experts for the duration of the agreement

**PART I. LEGAL CONTEXT**

This co-operative research in science and technology - Weaving Improvements from Preparation through Sizing Warping and Winding - will form part of the Project Document which shall be the instrument referred to as such in Article I paragraph 1 of the Agreement between the Government of The People's Republic of China and the United Nations Development Programme, signed by the parties on 29 June 1979.

The Government Implementing Agency shall, for the purpose of the Agreement, refer to the Government Co-Operating Agency described in that Agreement.

## **PART II. THE PROJECT**

### **A. Developing Objective**

The development objective is to strengthen the national economy by accelerating the development of more economical processing technologies leading to increased usage of the indigenous ramie fibre for quality textile fabrics both for the domestic and overseas markets.

### **B. Immediate Objective**

The immediate objective is to develop and apply modern processing technologies in the manufacture of quality textile fabrics from ramie and ramie-blend yarns. In so doing, the contractor will focus on the following areas:

- using yarns (to be provided by the client) of pure ramie and of various blends of ramie and natural fibres and ramie and manmade fibres, both plain and fancy and in the Nm count. range of 6's to 60's, experiment to establish sets of optimum parameters for all the relevant stages of manufacture under the heading of "Preparation and Weaving"
- It is proposed to gradually replace the existing shuttle-changing looms by modern Rapier-type machines. The contractor should, therefore, initially study ways of improving the efficiency of the existing looms: for example by upgrading the engineering through, possibly the use of ball and roller bearings in place of plain bearings; considering whether then it might be possible in the interim between replacement by Rapier machines, to adapt the existing looms to Rapier weaving, on a cost-effective basis.
- The contractor is advised that a Nuovo Pignone Rapier Weaving Machine is now being manufactured in the PRC, therefore, first preference must be given to carrying out any weaving experiments on this machine
- Among the areas to be explored are:
  - improved winding - recommendations on the most suitable machines and a study of the feasibility of using air splicing,
  - improved sizing with machine and process recommendations
  - improved warping and the use of larger knotless yarn packages
  - the introduction of modern preventive maintenance practices

testing and Q C procedures

per weaver loom allocation

the introduction of modern machine monitoring procedures

improved fabric inspection equipment and practice

atmospheric control including air cleaning, temperature and humidity control.

noise reduction

The contractor shall submit specifications and samples labelled with yarn identification as given by the client. These specifications should enable the client to reproduce comparable results both within his Centre and by the Industry. These counterpart experiments will demand the full co-operation of the contractor who will be expected to send an expert to the client's Centre in order to supervise and assist with these trials/experiments. Work in the ramie mills as deemed necessary by the client would also be expected of the visiting expert.

#### **PART II. C**

##### **a) At the end of the project:**

- The contractor shall have assisted in the training of two of the client's senior weaving technicians and other relevant staff at the client's premises, utilizing the installed weaving pilot production plant. The contractor's expert/s shall give guidelines to the client's technical staff to enable them to establish a programme of ongoing applied research and pilot test runs both within the Centre and in the mills in the development of a diversified range of fabrics suited to economic production.
- The contractor shall be responsible for the production of a manual (technology package with basic knowhow) describing the optimum sets of parameters for the production of a wide range of cloths in both Dobby and Jacquard weaves.

##### **b) During the course of the contract:**

- The contractor shall produce research reports on the following:

critical cloth constructions for some typical ramie and ramie blend fabrics and including details of machine adjustments in achieving the optimum results.

development of ramie/ramie blended apparel fabrics, including test reports.

advisory reports on setting yarn parameters for the principal cloth constructions

suggestions for the introduction of Rapier machines to the industry

Quality Control in ramie weaving mills

The research results should contain laboratory as well as demonstration-scale data and should enable development of the technology package.

- The contractor shall co-operate with the client in the procurement, installation and commissioning of any special machinery, equipment and facilities as may be deemed necessary following tripartite consultation with UNIDO experts, the contractor and the client's staff.
- The client is agreeable to the contractor subcontracting any part of this assignment but will deal only with the contractor who will be responsible for the confidentiality of all information.
- In the event that the contractor wishes to make commercial use of any of the R & D findings arising from this contract by passing of any information onto a third party, such divulgence of information or product development specifically arising from the contractor's work for the client may be made only with the prior consent of UNIDO in consultation with the PRC authorities and the client.
- The contractor is expected to give a time-phased and staged breakdown of proposed work and to apply a price to each stage and a discount for the full package.

Signed:

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On behalf of the Government

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Date

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On behalf of UNDP

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Date

**ANNEX IX. KNITTING - Draft Subcontract Terms of Reference**

**UNITED NATIONS DEVELOPMENT PROGRAMME**

**Project of the Government of The People's Republic of China**

**CO-OPERATIVE RESEARCH AND DEVELOPMENT CONTRACT**

**Title** Strengthening of the China Ramie Technology Development Centre (this contract to form part of Project No. DP/CPR/85/057/B/01/99) Specifically: Machine Knitting using yarns of pure ramie, blends of ramie and natural fibres and of ramie and manmade fibres, in the counts Nm 6's to 60's in both plain and fancy styles.

**Government implementing agency** The Government of The People's Republic of China in co-operation with the United Nations Industrial Development Organization (UNIDO)

**Estimated Starting Date** June 1 1989

**Duration** Three years

**Parties to this Agreement** The immediate parties to this agreement are the Ramie Technology Development Centre, hereinafter called the client and the contractor, which is the organization/institution providing its facilities and the services of its staff experts for the duration of the agreement.

**PART I. LEGAL CONTEXT**

This co-operative research in science and technology - Machine Knitting with pure ramie and ramie/other fibre blend yarns - will form part of the Project Document which shall be the instrument referred to as such in Article I paragraph 1 of the Agreement between the Government of The People's Republic of China and the United Nations Development Programme, signed by the parties on 29 June 1979.

The Government Implementing Agency shall, for the purpose of the Agreement, refer to the Government Co-operating Agency described in that Agreement.



## **PART II. THE PROJECT**

### **A. Development Objective**

The development objective is to strengthen the national economy by accelerating the development of more economical processing technologies leading to increased utilization of the indigenous ramie fibre for quality textile fabrics both the the domestic and overseas markets.

### **B. Immediate objectives**

The immediate objective is to develop and apply modern processing technologies in the manufacture of quality textile fabrics from ramie and ramie-blend yarns. In so doing the contractor will focus on the following areas:

- using yarns (to be provided by the client) of pure ramie and of various blends of ramie and natural fibres and ramie and manmade fibres, both plain and fancy and in the Nm counts range of 6's to 60's, experiment to establish sets of optimum parameters for the construction of a wide range of knitted apparel fabrics in plains and Jacquards with particular emphasis on Single Jersey Circular Jacquards.
- The Contractor will specially be expected to:
  - make recommendations on the most suitable make/s and gauges of machine taking into consideration such factors as cost, delivery, spares and reliability.
  - undertake assessment trials, if necessary at the machine makers' works, using typical yarns to be provided by the client and taking into consideration some possible future yarn developments;
  - make recommendations on any desirable machine modifications, e.g. hard-wearing yarn guides and needles, removal of fibre fly.
  - recommend new equipment as necessary to improve present testing methods by the client;
  - introduce the best modern practices for preventive maintenance;
  - introduce the best modern practices for fault monitoring and machine monitoring;
  - make recommendations on the most suitable ancillary equipment such as cone winders, waxing devices and slub catchers;

advise the client concerning 'state of the Art' and of any recent technological developments in the knitting field that might have potential for the client;

give special attention to the knitting of Jacquard pattern fabrics of single jersey;

make recommendations concerning modern electronics applications in the knitting field, including CAD;

have a good, practical knowledge of and approach to the problems and expectations of the garment making-up sector from the knitting industry;

make the client aware of the most appropriate system for Quality Control;

recommend the most suitable fabric inspection equipment or how to make the best use of what is already available to the client;

make recommendations for correct atmospheric control;

give consideration to noise reduction.

The contractor shall submit specifications and samples labelled with yarn identification as given by the client. These specifications should enable the client to reproduce comparable results both within his centre and by the industry. These counterpart experiments will demand the full co-operation of the contractor, who will be expected to send an expert to the client's centre in order to supervise and assist with these trials/experiments. Some work within the ramie knitting industry - as deemed necessary in consultation with the client - would also be expected of the visiting expert.

## **PART II. C**

### **a) At the end of the project**

- The contractor shall have assisted in the training of two of the client's senior knitting technicians and other relevant staff at the client's premises in the optimum utilization of duly installed machines and equipment which is to function as a pilot-scale production/industry demonstration unit. The contractor's expert/s shall provide the client's technical staff with guidelines to enable them to establish a programme of ongoing applied research and pilot test runs both within the Centre and in the industry in the development of a diversified range of fabrics suited to economic production.

- The contractor shall be responsible for the production of a manual (technology package with basic knowhow) describing the optimum sets of parameters for the production of a wide range of fabrics.
  - Have assisted in setting parameters for the most successful ramie and ramie-blend yarns in close consultation with the Spinning Unit at the client's Centre.
- b) During the course of the project
- The contractor shall produce research reports on:
    - knitting yarn parameters
    - practical tests on laboratory and industrial-scale knitting of ramie and ramie-blend yarns.
    - a range of reproducible innovative commercial plain and Jacquard knitted fabrics, complete with knitting instructions.

The research results should contain laboratory as well as demonstration-scale data and should enable the development of the technology package.

- The contractor shall co-operate with the client in the procurement, installation and commissioning of any special machinery, equipment and facilities as may be deemed necessary following tripartite consultation with UNIDO experts, the contractor and the client's staff.
- The client is agreeable to the contractor subcontracting any part of this assignment but will deal only with the contractor who will be responsible for the confidentiality of all information.
- In the event that the contractor wishes to make commercial use of any of the R & D findings arising from this contract by passing on of any information to a third party, such divulgence of information or product development specifically arising from the contractor's work for the client may be made only with the prior consent of UNIDO in consultation with the PRC authorities and the client.

- The contractor is expected to give a time-phased and staged breakdown of proposed work and to apply a price to each stage and a discount for the full package.

Signed:

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On behalf of the Government

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Date

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On behalf of UNDP

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Date

**ANNEX X.**

**NPD'S COMMENTS ON TRANSLATED SUBCONTRACT TERMS OF REFERENCE**

1. It is to be understood that all subcontract payments would be made by UNIDO.
2. By the reallocation of monies made available though the cancellation of 41 man months of certain experts' and trainees' time, the sum of approximately \$170,000 would become available for dedication to subcontracts. See Annex XIII of current Mission Report.
3. In the event that the monies available are not sufficient to meet the demands of all five of the technological areas for which Terms of Reference have been drafted, the order of preference in implementation should be:
  - Degumming
  - Dyeing and Finishing (with the emphasis on processes following dyeing rather than on dyeing per se)
  - Spinning (with the emphasis on pure ramie rather than on blends)
  - Weaving (with the emphasis on sizing and on mainly pure ramie)
  - Knitting (with the emphasis on Single Jersey Jacquard, again using mainly pure ramie)
4. All pilot experiments should be carried out at the subcontractors' premises followed by subcontractor-supervised counterpart experiments at the RTDC.
5. There might be difficulties with the mills in allowing the subcontractor to operate their equipment but there would be no obstacle placed by the RTDC on the use of their equipment or facilities or on the full co-operation of their staff.
6. The CTA understands that it would be the normal practice before the commencement of a subcontract action to provide the subcontractor with a thorough briefing at which all of the foregoing details could be discussed and then form an endorsement to the TOR and the contract.

**ANNEX XI. Work Plan for the next three years.**

**1. Study Tour**

Five national experts to have a study tour to the Philippines, Japan and Hong Kong in order to learn advanced processing and obtain an insight of marketing.

**2. Fellowships.**

	■ ■	time
Dyeing and Finishing	6	June 1989
Weaving	6	Oct. 1989
Knitting	6	Oct. 1989
Testing	6	Oct. 1990
Computer	6	Oct. 1990
Spinning	6	Oct. 1990

**3. Expert**

Degumming	1	Oct. 1989
Spinning	1	Sept 1989
Dyeing & Finishing	1	Oct. 1989
Degumming	0.8	May 1990
Weaving	1	March 1990
Knitting	1	Aug. 1990
Dyeing & finishing	1	June 1990
Training	1	Oct. 1990
Product Development	1	March 1991
Short-term consultants	3	1991

- 4. The Second Tripartite Review Meeting** May 1990  
**The Terminal Tripartite Review Meeting** Oct 1991

- 5. CTA visit to the Centre** May 1990  
**CTA visit to the Centre** Oct 1991

- 6. Evaluation of Equipment** April-May 1989  
**Procurement of Equipment** June-July 1989  
**Installation of Equipment** Spring 1990  
**Commercial training** Winter 1989









ANNEX XII.

Revised Project Budget Showing UNDP Contribution

Country, The People's Republic of China

Project Number, CPR/85/057/C/01/99

Title, Strengthening of the China Ramie Technology Development Centre

10.00	Personnel	Total		1989		1990		1991	
		m/m	\$	m/m	\$	m/m	\$	m/m	\$
11.01	CTA	5.0	45,000			1.0	9,000	1.0	9,000
11.02	Degumming expert	2.8	26,617			1.0	9,000	0.8	7,000
11.03	Spinning expert	1	9,000	1.0	9,000				
11.04	Weaving expert	1	9,000			1.0	9,000		
11.05	Knitting expert	1	9,000					1.0	9,000
11.06	Dyeing/Finishing expert	2	18,000			1.0	9,000	1.0	9,000
11.07	Training expert	1	9,000			1.0	9,000		
11.08	Product Development	1	9,000					1.0	9,000
11.50	Short-term Consultants	3	27,000	1.0	9,000	1.0	9,000	1.0	9,000
11.99	Sub-total	17	161,617						
30.00	Training								
31.00	Individual Fellowships	54	129,591	6	14,399	30	71,995	10	43,197
31.99	sub-total	54	129,591	6	14,399	30	71,995	10	43,197
32.00	Study tours	11	86,814	5	37,500				
32.99	sub-total	11	86,814	5	37,500				

**ANNEX XIII.**

**Reallocated Monies According to the TPR meeting.**

		<b>Finances (U.S.\$)</b>
<b>1. expert</b>	<b>m/m</b>	
spinning	1	9,000
weaving	1	9,000
degumming	2	16,000
knitting	1	9,000
sub-total	5	43,000
<b>2. Training</b>		
degumming	13	13,197
spinning	6	14,399
weaving	6	14,399
dyeing & finishing	6	14,399
computer	6	14,399
sub-total	42	100,793
<b>3. Study tour</b>		
1988	4	30,000
1989	5	33,186
total		206,979

U.S. \$ 180,000 from U.S. \$206,979 to be used in the subcontract research projects, the balance U.S. \$ 26,979 to be reserved for unforeseen problems.

**ANNEX XIV.      Explanation of abbreviations used**

<b>RTDC</b>	<b>Ramie Technology Development Centre</b>
<b>CTA</b>	<b>Chief Technical Adviser</b>
<b>NPD</b>	<b>National Project Director</b>
<b>PRC</b>	<b>People's Republic of China</b>
<b>UNDP</b>	<b>United Nations Development Programme</b>
<b>UNIDO</b>	<b>United Nations Industrial Development Organization</b>
<b>TOR</b>	<b>Terms of Reference</b>
<b>PPER</b>	<b>Project Performance Evaluation Report</b>
<b>TPR</b>	<b>Tripartite Review Meeting</b>
<b>R &amp; D</b>	<b>Research and Development</b>
<b>MORFERT</b>	<b>Ministry of Foreign Relations and Trade</b>
<b>CICETE</b>	<b>China International Centre for Economic and Technical Exchanges</b>
<b>MTI</b>	<b>Ministry of Textile Industry</b>

**ANNEX IV. List of equipment to be imported**

<b>Machine/Equipment</b>	<b>No. Off</b>	<b>Estimated \$</b>
Parallel yarn spinning machine	1	150,000
Fancy yarn spinning frame	1	180,000
Weft Jacquard knitting machine	1	60,000
Gripper loom	1	70,000
Non-needle knitting machine	2	40,000
Laboratory jet dyeing machine	1	30,000
Computer with graphics capability	1	20,000
Slide projector and slide-making eqpt.	1	1,000
Video camera & editing equipment	1	40,000
Micro-filming machine	1	9,000
Laboratory sample curing machine	1	20,000
Lab. package high temp. dyeing machine	1	20,000
Electronic colour matching system	1	20,000
Laboratory after-treatment machine	1	10,000
Provision for unforeseen requirements		30,000
<b>Total :</b>		<b>700,000</b>